

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED



Bid Specification No.:PMMTC1-e-14/2026

<p>PROCUREMENT OF 25Nos. MPLS-TP BASED COMMUNICATION AND ASSOCIATED EQUIPMENT ON PILOT BASIS IN PLACE OF SDH TYPE COMMUNICATION EQUIPMENT</p>

<p>PROCUREMENT OF 25 Nos. MPLS-TP BASED COMMUNICATION AND ASSOCIATED EQUIPMENT ON PILOT BASIS IN PLACE OF SDH TYPE COMMUNICATION EQUIPMENT UNDER RMI 2023-24 WORKS IN APTRANSCO.</p>

CHIEF ENGINEER / TELECOM & IT, APTRANSCO,

Vidyut Soudha, Vijayawada-520 004

**Tele Ph. /Fax No.: 0866-2429244,
Extn. 2013 / 2015**

Website : www.tender.apecurement.gov.in

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SECTION-I

NOTICE INVITING TENDERS (NIT)

1.	Department Name	:	TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED
2.	Circle/ Division Name	:	Chief Engineer / Telecom & IT
3.	Bid Notice/Specification No.	:	PMMTC1-e- 14/2026
4.	Bid Subject	:	Procurement of 25Nos. MPLS-TP based Communication and associated equipment on pilot basis in place of SDH type communication equipment under RMI 2023-24.
5.	Estimated Contract Value (ECV)	:	Rs. 6,43,02,390/-
6.	Period of Contract	:	Delivery period + 18 months Guarantee period
7.	Form of Contract	:	Supply, Erection, Testing and Commissioning of Equipment
8.	Bid Type	:	Open competitive bidding.
9.	Bid Category	:	Goods
10.	BID SECURITY	:	Rs. 12,86,048/-
11.	BID SECURITY Payable to	:	Bank Guarantee in favour of Chief Engineer/ Telecom & IT, APTRANSCO, Vidyut Soudha, Gunadala, Vijayawada-04(or) Online money transfer through NEFT/RTGS or Surety Insurance bond.
			EMD ONLINE PAYMENT: Bidders can pay EMD online payment through RTGS / internet banking in beneficiary name Pay officer, APTRANSCO A/C No. 52117469736 IFSC code SBIN0016576, SBI branch address: Specialized Mid Corporate Branch, Ramavarapadu Ring Road, Vijayawada. Bidder shall indicate bid number and name of bidding entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the online payment transfer along with bid.
12.	Schedule Availability Date	:	From 17:00Hrs on 23.03.2026
	Pre-bid meeting date & time (Off line)	:	11:30Hrs on 31.03.2026
13.	Pre-bid clarifications issue Date/Bid submission start Date & Time	:	17:00 Hrs on 15.04.2026
14.	Bid Submission closing Date & time	:	15:00Hrs on 23.04.2026
15.	Bid Submission	:	Online
16.	P.Q / Technical Bid Opening Date (Qualification and	:	At 15:30 Hrs on 23.04.2026

	Eligibility stage)		
17.	Price Bid Opening Date & Time	:	Will be opened online

18. Eligibility Criteria & Qualifying Requirements (QR):

18.1 (a) QR-Supply: The bidder should be a manufacturer who must have designed, manufactured, tested, supplied, erected and commissioned to any power utilities, at least 40% of the tender quantity of the goods/equipment of same or higher versions as indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.

18.1(b) QR-Supply: The bidder should be an authorised agent who must have tested, supplied, erected and commissioned to any power utilities, at least 40% of the tender quantity of the goods/equipment of same or higher versions as indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.

18.2 QR-Performance: At least 20% of the similar material offered (same or higher versions), as indicated in the ‘Schedule of Requirements’ (Section-IV) should be in successful operation for two years in the last 5 years.

18.3 The bidder’s financial turnover during any one year of the last five years should have been equal or more than 100% value of Estimated Contract Value (ECV). The bidder shall furnish Type Test Reports as per the technical specification.

The detailed Qualifying Requirements are indicated in Section-VI.

18.4 The bidder is required to furnish the year wise supply of Material/ equipment and the maximum quantity of material/ equipment supplied in the last five years along with proof of supplies. The bidder is required to furnish evidence and certificates for the quantity of material which are in successful operation since two years as on the date of opening of the Bid to meet Performance requirement.

18.5 The bidder is required to furnish the Financial Turnover of last five years. Bidders shall submit audited financial reports (audited Profit & Loss statement, audited Income & Expenditure statement and audited Balance Sheet) counter signed by Chartered Accountant for last **five financial years** preceding the date of bid submission, in support of financial turnover and Banker’s certificates regarding Bank limits.

18.6 The Bidders should quote for 100% of the tender quantity of all items in the bid indicated in the ‘Schedule of Requirements’ (Section-IV) of Bid specification on single responsibility basis.

18.7 The Bids received without relevant proof of documents to meet Qualifying Requirements and valid type test reports will be treated as Non-Responsive.

Responsibility for correctness of the information submitted in online bid lies with bidder. If any information furnished in the bid is proved to be false at a later date, the bid will not only be rejected but the bidder will be BLACKLISTED.

19. **Officer Inviting Bids:** Chief Engineer/ Telecom & IT, APTRANSCO.

20. **Address:** First Floor, Vidyut Soudha, Vijayawada - 520 004

21. **Contact Details:** Phone : **0866-2429244, Extn. 2015/2013**

22. **Procedure for bid submission:**

22.1 The Bids should be in the prescribed format, which can be obtained from e-procurement platform from the date of electronic publication up to the time and date indicated in the bid notice. The intending bidders would be required to enroll themselves on the e-procurement market place www.tender.apetrocurement.gov.in.

Those contractors/Suppliers who register themselves in the e-procurement market place can download the Bid schedules free of cost. The bidder shall authenticate the bid with his digital certificate for submitting the Bid electronically on e-procurement platform and the bids not authenticated by digital certificate of the bidder will not be accepted on the e-procurement platform following the G.O.Ms.No.6, I.T&C Department, dated 28-02-2005. **For enrolment and Registration APTS, Vijayawada is to be contacted.**

22.2 Intending bidders can contact office of the Chief Engineer/Telecom & IT, APTRANSCO, Vidyut Soudha, Vijayawada for any clarification/ information on any working day during working hours.

22.3 The bidders who are desirous of participating in e-procurement shall submit their technical bid, price bid etc. in the standard formats prescribed in the bid documents displayed at e-market place. The bidders should invariably upload the statement showing the list of documents uploaded in the e-market place in support of their technical bid. The bidder should upload scanned copies of all the statements, certificates, documents etc. as called for hereunder, duly signed by him, owning responsibility for their correctness/ authenticity.

22.4 Technical bid evaluation of the bidders would be done on the certificates/ documents uploaded/furnished by the bidder against the qualification criteria.

22.5 The bidders shall invariably upload the scanned copy of Bid Security, either **online payment through RTGS/NEFT or Bank Guarantee**. The successful bidder shall furnish the original of the same either personally or through courier or by post within the stipulated time specified by the purchaser.

22.6 The bidder shall invariably upload the following on e-procurement platform:

- i) Bank Guarantee towards Bid security,
- ii) Statement of Supply & Performance details of equipment (as per Form-5 of Section-VII) alongwithdocumentary proofs, i.e., scanned copies of purchase orders, Invoices, delivery challans, material receipt & satisfactory performance certificates of the purchaser, etc. to meet Qualification Requirements for the required quantity as per the specification
- iii) Financial Turnover of last five years, audited financial reports (audited Profit & Loss statement, Income & Expenditure statement and Balance Sheet) counter signed by Chartered Accountant for last five financial years preceding the date of bid submission, in support of financial turnover and Banker's certificates regarding Bank limits (as per Form-13 of Section-VII),
- iv) Type test reports of the material offered as per the Bid specification,

- v) Guaranteed Technical Particulars & drawings of the equipment,
- vi) Other declarations/statements/information as per the formats of Section-VII of this specification:
 - a) Details to be furnished by the bidder (as per Form-6),
 - b) Technical & Commercial deviations (as per Form-7),
 - c) Declaration regarding relatives (as per Form-8),
 - d) Bank Account details for RTGS (as per Form-10),
 - e) Manufacturer's Bidding authorization (as per Form-11),
 - f) Undertaking to be given by the company regarding blacklisting (as per Form-12),
 - g) Bankers Certificate (as per Form-13)
- vii) Other information and relevant documents as per the Bid specification.

22.7 The bidder shall furnish original of all documents/ certificates/ statements uploaded by him whenever sought by the Purchaser. The successful bidder shall furnish their company brochures, technical write-ups and printed materials if any.

22.8 The bidder shall furnish the declaration that:

- 1) They have not been blacklisted/ debarred by any department due to any reasons, as per the Form No.12 of Section-VII of this specification.
 - 2) The soft copies uploaded by them are genuine.
 - 3) They will agree to get disqualified themselves for any wrong declaration in respect of the above and get their Bid summarily rejected.
- Any incorrectness/ deviations noticed will be viewed seriously and apart from cancelling the contract, duly forfeiting the Bid security, criminal action will be initiated including suspension of business and/ or black-listing.

23. General Terms & Conditions:

Bids are invited on the e-procurement platform for the above-mentioned procurement from the firms eligible.

- 23.1 Bid security to be paid online **through RTGS/NEFT** or in the shape of Bank Guarantee issued from any Nationalized Banks/Schedule Banks approved by APTRANSCO as per the list **enclosed** to be valid for a period of 60 days over and above the validity of Bid i.e., 150 days from the date of bid opening. Scanned copy of online payment receipt or Bank Guarantee towards Bid security shall be uploaded along with the Bids. Originals must be submitted by successful bidder to the purchaser through registered post/ courier/ in person before placing of the order. In case extension of Bid validity by the bidder at the request of APTRANSCO, the validity of the Bid security Bank guarantee shall be extended suitably.
- 23.2 Exemption for payment of Bid security is not allowed in any case. The permanent Bid Security Bank Guarantee accepted earlier is deemed to have been withdrawn. Permanent Bid Security Bank Guarantee is not accepted. Bid security extensions accorded earlier are deemed to have been withdrawn.
- 23.3 Bid schedules: Bid schedule can be downloaded free of cost from the web site

- 23.4 The bidder is subject to be disqualified, if he is found to have mislead or furnished false information in the forms/ Statements/ Certificates submitted in proof of qualification requirements and any record of abandoning supplies, not fulfilling contractual obligations in earlier contracts, inordinate delays in completion of supplies, litigation history, financial failures or participating in the previous Bidding for the same supply and quoting unreasonably high price.

Even while execution of the contract, if it is found that the bidder had produced false/fake certificates of experience, he will be black listed and the contract will be terminated and his Bid security will be forfeited and contract will be carried through other agency at his cost and risk.

- 23.5 a) Transaction fee : The participating bidders have to pay transaction fee of 0.03% on Estimated Contract Value (ECV) with a cap of Rs 10,000/- (Rupees ten thousands only) for all tenders with ECV up to Rs.50.00 crore plus service charges GST @ 18% and Rs.25,000/- (Rupees Twenty Five thousand only) plus service charges GST @ 18% for tenders with Estimated Contract Value (ECV) above Rs.50.00 crore online payment gateway with any master/visa credit card issued by any Bank and through net Banking facility (direct debit) with AXIS/ICICI or HDFC Banks at the time of bid submission. Submission is mandatory as per G.O. Ms.No.13. Payment of transaction fee through DD will not be accepted". GST on transaction fee is 18% with effect from 01.07.2017

b)Corpus Fund: The successful bidder shall pay an amount equivalent to 0.04% of ECV (estimated contract value) with a cap of Rs. 10,000/- (Rupees Ten Thousand only) for all tenders with ECV up to Rs.50.00 Crore and Rs.25,000/- (Rupees Twenty-Five Thousand only) for tenders with ECV above Rs.50.00 crore on e-Procurement platform, before entering into agreement/issue of purchase orders towards e-Procurement fund in favour of Managing Director, APTS, Vijayawada, through the Agreement authority.

- 23.6 In case of discrepancy with Bid conditions in the Bid document and NIT, the condition in the Bid document prevails.

23.7 **Note:**

- a) Any other condition regarding receipt of Bids in conventional method appearing in the Bid documents may please be treated as not applicable.
- b) The contractors are to upload the information preferably in Zip format.
- c) The contractors should upload the documents duly signing each and every paper.
- d) Bidders are requested to go through all the clauses and contents of specification thoroughly and quote the bid. Ignorance of clauses will not be entertained by the purchaser at later date.

e)The Bidders are advised to ensure that their bids are uploaded in complete shape and as per the requirement of this specification.

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SECTION-II (A)

INSTRUCTIONS TO BIDDERS

Name of the Work: PROCUREMENT OF 25 Nos. MPLS-TP BASED COMMUNICATION AND ASSOCIATED EQUIPMENT ON PILOT BASIS IN PLACE OF SDH TYPE COMMUNICATION EQUIPMENT.

The **Chief Engineer/Telecom & IT, APTRANSCO, Vidyut Soudha, Vijayawada** invites bids on e-procurement platform in two parts for the materials indicated in the “Schedule of Requirements” during the period, for which dates and time specified in the NIT(Notice Inviting Tender), and will be opened by (him) or his nominee at this office on the date and time mentioned in the NIT.

- 1.1 The intending Bidders would be required to enroll themselves on the ‘e-procurement’ market place at www.tender.apecurement.gov.in
- 1.2 The Bids should be in the prescribed form invited on e-procurement by the Chief Engineer/ Telecom & IT APTRANSCO, Vidyut Soudha, Vijayawada (as specified in NIT)that can be downloaded free of cost from the website www.tender.apecurement.gov.in.
- 1.3 The dates stipulated in the Bid notice, i.e., NIT are firm and under any circumstances they will not be relaxed unless officially extended by APTRANSCO in e-procurement plat-form.
- 1.4 The Bidder should upload scanned copies as specified in checklist and all enclosures required for the schedules and Appendices. The successful bidder shall produce copies (bid security & Transaction fee) before placing the purchase order. Bidders should produce the originals of Bid Security and all other documents for verification within 3 (Three) days if asked for, by the Competent Authority.
- 1.5 Bidders are required to register on the e-procurement market place www.tender.apecurement.gov.in. and submit their bids in two parts:
Part-I: Eligibility and Technical bid.
Part-II: Financial bid.
- 1.6 The successful bidder shall pay an amount equivalent to 0.04% of Estimated Contract value against which contract is awarded with a cap of Rs.10,000/- (Rupees Ten Thousand only) for all supplies/works with ECV upto Rs.50.00 Crore and Rs.25,000/- (Rupees Twenty Five thousand only) for works/supplies with ECV above Rs.50.00 crore on e-procurement platform before entering into agreement/issue of purchase orders, towards e-Procurement fund in favour of **Managing Director, APTS, Vijayawada** through the agreement authority.
- 1.7 The successful Bidder is expected to complete the work within the time period specified in the ‘Schedule of Requirements’ (Section-IV).
- 1.8 The uploading of bids on-line through e-procurement cannot be possible after expiry of due date and time and it is sole discretion of APTRANSCO to consider any requests for extension.

1.9 APTRANSCO reserves the right to cancel/extend/alter the bid conditions at any time. In the process, if the tender process/works are stalled due to legal intervention or due to natural calamities, no compensation will be paid.

2. Bidders / Firms eligible to Bid :

2.0 The Bidders / Firms who

- a) Possess the valid registration as mentioned in the NIT and satisfies all the conditions therein.
- b) Are not blacklisted or debarred or suspended by any department for whatever be the reason, prohibiting them not to continue in the contracting business
- c) Have complied with the eligibility criteria specified in the NIT are the eligible Bidders /Firms.

2.1 Bidders / Firms ineligible to Bid:

- a) A retired officer of the Govt. of AP or Govt. of India executing works/supplies is disqualified from Bidding for a period of two years from the date of retirement without the prior permission of the Government.
- b) The Bidder who has employed any retired officer as mentioned above shall be considered as an ineligible Bidder.
- c) The contractor himself or any of his employee is found to be Gazetted Officer who retired from Government Service and had not obtained permission from the Government for accepting the contractor's employment within a period of 2 years from the date of his retirement.
- d) The Contractor or any of his employees is found at any time after award of contract, to be such a person who had not obtained the permission of the Government as aforesaid before submission of the Bid or engagement in the Contractor's service.
- e) Contractor shall not be eligible to Bid for works/supplies in AP Transco where any of his near relatives are employed in the rank of Assistant Engineer or Assistant Executive Engineers and above on the Engineering side and Assistant Accounts Officer and above on the accounts side. The Contractor shall intimate the names of persons who are working with him in any capacity or are subsequently employed. He shall also furnish a list of Gazetted /Non-Gazetted State Government Employees related to him. Failure to furnish such information Bidder is liable to be removed from the list of approved contractors and his contract is liable for cancellation.

Note: Near relatives include

Sons, step sons, daughters, and step-daughters.

Son-in-law, and daughter-in-law.

Brother-in-law, and sister-in-law.

Brothers and Sisters.

Father and Mother.

Wife / Husband.

Father-in-law and Mother-in-law

Nephews, nieces, uncles and aunts

Cousins and

Any person residing with or dependent on the contractor.

f)The companies which have been blacklisted by any other/Power utility and whose promotor's Firms or companies have already been black listed/debarred by any other/Power utility, no work contract/order will be awarded/placed to the companies. Bidders have to furnish a declaration/undertaking in this regard along with the Bid. Bids without this declaration are liable for rejection.

3.0 Documents to be furnished for Qualification Requirements of the Bidders:

3.1 The Bidder shall furnish the following particulars in the formats provided online and supported documentary evidence shall be uploaded as required at section-V:

Attested copies of documents relating to the Registration of the firm, Registration as Electrical Licensed Contractor, Partnership deed, Articles of Association, Commercial Tax Registration, Latest Income Tax Clearance certificate/ latest IT return and PAN number from IT Department, excise department registration certificates etc. Copies of

Note: The Partnership firms, which are registered as Contractors shall intimate the change in partnership deed, if any, as per GO Ms No.58, I & CAD, dated 23-04-2002 within one month of such change. Failure to notify the change to the registration authority in time will entail the firms to forfeit their registration and their Bid will be rejected. The intimation of change of partners if any and the acceptance by the Registration authority may be enclosed.

Availability of key personnel for administration/ site management and execution viz., technical personnel required for the work.

3.2 Bids from Joint Ventures /consortiums are not acceptable.

3.3 Qualification criteria for opening of the price bid:

3.4 Even though the Bidders meet the above qualification requirements, they are liable to be disqualified / debarred / suspended / blacklisted if they have:

3.4.1 Furnished false/ fabricated particulars in the forms, statements and/ annexure submitted in proof of the qualification requirements and/or,

3.4.2 Not turned up for entering into agreement, when called upon within the time specified in the letter of acceptance,

3.4.3 Record of poor progress such as abandoning the work/supplies, not properly completing the contract, inordinate delays in completion, litigation history or financial failures etc.,

3.4.4 Participated in the previous bidding for the same work and had quoted unreasonably high Bid percentage and,

3.4.5 A history of criminal record in which the Bidder is involved if any.

3.4.6 Even while execution of the contract, if found that the contract was awarded to the Contractor based on false/fake certificates of experience, the Contractor will be blacklisted and contractor will be taken over invoking clause-61 of PS to APSS.

- 3.4.7 History of litigation with the Government during the last five years in which the Bidder is involved.
- 3.4.8 Bidders should specifically indicate whether their firm has been banned/blacklisted/debarred by any Government department/undertaking or any power utility for non-performance/malpractice or due to any reason. Bids of bidders who are banned/ blacklisted/debarred will be treated as non-responsive.

3.5 ELIGIBILITY CRITERIA:

A) PHYSICAL EXPERIENCE:

- (i) The bidder should be a manufacturer who must have designed, manufactured, tested, supplied, erected and commissioned to any power utilities, at least 40% of the tender quantity of the goods/equipment of same or higher classes indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.
- (ii) The bidder should be an authorised agent who must have tested, supplied, erected and commissioned to any power utilities, at least 40% of the tender quantity of the goods/equipment of same or higher classes indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.

B) PERFORMANCE:

At least 20% of the similar material/higher version MPLS-TP Equipment offered as indicated in the ‘Schedule of Requirements’ should be in successful operation for 2 years in the last 5 years.

(The bidder is required to furnish evidence and certificates for the quantity of material which are in successful operation for 2 years in the last 5 years.)

Note: The above eligibility criteria shall be fulfilled by the bidder against each lot separately for the lots the Bidder has quoted, in case of more than one lot.

C) FINANCIAL TURNOVER:

1. Financial turnover during any one year of the last five years should have been equal or more than the estimated contract value. (The bidder is required to furnish the Financial Turnover of last five years).
2. Reports on financial standing of the Bidder such as profit and loss statement, balance sheets and auditor’s report for the past FIVE years, in support of financial turnover and Banker’s certificates regarding Bank limits.

D) TYPE TEST REPORTS: The bidder shall furnish Type Test Reports. The type tests must have been conducted on the material offered as per the relevant IEC/IS in recognized laboratory as per the latest revision of the Relevant IEC/ IS applicable and Technical Specification. **The date of type tests shall not be earlier than Five years as on the date of bid opening.** The bids received without type test reports will be treated as non-Responsive. If any change in design was made latest type tests shall be furnished along with approved drawing. (Bidder is required to furnish the Year of Type Test Reports done for similar equipment/material in the remarks column of technical particulars).

- E) In case the bidder is an authorized agent, the erection, testing and commissioning of MPLS and NMS equipment shall be done under the supervision of manufacturer who has given Manufacturing Authorisation Form (Undertaking from the manufacturer in support of this shall be enclosed).

The detailed Qualifying Requirements are indicated at Section-VI

Responsibility of correctness of the information submitted in online bid lies with bidder. If any information furnished in the bid is proved to be false at a later date, the bid will not only be rejected but the bidder will be BLACKLISTED.

The bids not complying with the stipulated completion period will be treated as non-responsive.

While being equal or compatible in other aspects preference will be given to those bidders who have experience in erection of above works/supplies similar to that given in the specification or of higher voltages during the last five financial years.

IF A BIDDER QUOTING FOR THE BIDS IS HAVING POOR PERFORMANCE IN THE AND NOT COMMENSURATE WITH THE AGREEMENT IN THE PREVIOUS CONTRACTS, THE BID OF SUCH BIDDER WILL NOT BE CONSIDERED FOR AWARD OF CONTRACT.

4.0 One Bid per Bidder:

Each Bidder shall submit only one Bid. A Bidder who submits more than one Bid will cause dis-qualification of all the Bids submitted by the Bidder.

5.0 Cost of Biding:

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

- 6.0** The pre-bid meeting will be held on the date & time indicated in the NIT, in the office of the bid inviting authority. All the prospective bidders may attend the pre-bid meeting.

SECTION –II (B) : CHECK LIST

The bidders shall invariably upload/attach the information and records listed in the check list as given below on **e-procurement platform**, and also confirm by marking Yes or No. The same shall have to be furnished either personally or through courier or by post in the stipulated time, if asked by the Purchaser.

1	Whether Original Bid Security BG or online payment receipt uploaded?	Yes / No
2	Whether Transaction Fee is paid electronically or not. The copy of the receipt may be uploaded.	Yes / No
3	Whether Guaranteed Technical Particulars are furnished (uploaded) or not.	Yes / No
4	Whether Proof of Turnover signed by Auditors are uploaded or not.	Yes / No
5	Whether supply qualification & performance statements (Form-1 & form-5) uploaded or not?	Yes / No
6	Whether all the documents as proof of pre-Qualification Requirements i.e. 40% quantity of supply and erection in 12 months from the power utilities as called for, are uploaded with attestation or not?	Yes/No
7	Whether all the documents pertaining to the two years satisfactory performance, i.e., satisfactory performance certificates from the utilities along with relevant documentary proof with attestation, are uploaded	Yes /No
8	Whether Bankers certificate uploaded (Form-13) or not?	Yes / No
9	Whether Schedule of Deviations - Technical & Commercial are uploaded or not?	Yes / No
10	Whether 'Declaration Form' uploaded (Form-8) or not?	Yes / No
11	Whether copies of Type Test Certificates uploaded?	Yes / No
12	Whether uploaded all other sample forms as per Section-VII of the Bid Specification?	Yes / No
13	Whether uploaded the undertaking informing that firm has not been banned/black listed/debarred by any Govt. Department / undertaking or any power utility for non-performance or malpractice? (Form-12)	Yes / No
14	Whether uploaded the undertakings as per MoP (Form-14,15 & 16)	NA
15	Whether accepted for submission of Performance Bank Guarantee (as per clause 39 A) and Additional Security Deposit (as per clause 39B)	Yes / No
The Bidder shall indicate that all the forms and enclosures indicated in the checklist furnished are compiled with.		

SIGNATURE OF THE BIDDER
Designation &
Seal of the company :

SECTION – III
GENERAL TERMS & CONDITIONS OF THE CONTRACT

A. Introduction

Definitions

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

- (a) "The Contract" means the agreement entered into between the Purchaser and the Supplier, as recorded in the contract Form signed by the Parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- (b) "The Contract Price" means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations.
- (c) "The Materials / equipment" means all of the material/ equipment, machinery, and/or other materials which the Supplier is required to supply to the Purchaser under the Contract.
- (d) "The Services" means those services ancillary to the supply of the material/ equipment, such as transportation and insurance, and any other incidental Services, such as installation, commissioning, provision of technical assistance, training, and other such obligations of the Supplier covered under the Contract.
- (e) "GCC" means the General Terms and Conditions of Contract contained in the section.
- (f) "The Purchaser" means the organization purchasing the Materials / equipment.
- (g) Vendor is a supplier for supply of material/ equipment.
- (h) "The Supplier" means the firm supplying the Materials / equipment and providing Services under this Contract.
- (i) "Day" means calendar day.

2. Applicability

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

3 (a) Standards:

The equipment/material supplied under this Contract will conform to the Standards mentioned in the Technical specifications, and, when no applicable standard is mentioned, the authoritative standards appropriate to the equipment/ material, i.e.,

BIS, such standards will be the latest. All material will be of the best class and will be capable of satisfactory operation under tropical conditions without distortion or deterioration.

3 (b) Interchangeability:

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

4. Scope of Work:

The scope of work of this specification covers design, engineering, manufacture, testing, supply & delivery FADS (Free at Destination Stores/ Site) including unloading of the equipment/ material and erection, testing and commissioning of the MPLS-TP and NMS Equipment described in Section-IV ‘Schedule of Requirements’ and Section-V ‘Technical Specification’..

5. Eligible Bidders:

Vendors for supply of the equipment/ material listed in section-IV ‘Schedule of requirements’ of Bid specification and meeting the Qualification Requirements described in section-VI ‘Qualifying Requirements’ only need quote. Bids received from firms not meeting the eligibility/ Qualification criteria will not be considered.

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

B. THE BIDDING DOCUMENTS:

6. Contents of Bidding Document:

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

1. Notice Inviting Tenders (NIT) – Section-I
2. Instruction to Bidders & Check List – Section-II
3. General Terms and Conditions of Contract – Section-III
4. Schedule of Requirements of the material with Delivery Schedule – Section-IV
5. Technical Specifications – Section-V
6. Qualification Requirements – Section-VI
7. Sample Forms – Section-VII
(Qualification & Performance Statements, Bid Security form, details to be furnished by Manufacturer, Performance Security form, Schedule of Deviations and Other forms to be duly filled-in & signed and to be up-loaded).

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

7. Clarification of Bidding Documents:

Clarification of Bidding Documents: A prospective Bidder requiring any clarification of the bidding documents may notify the Purchaser in writing or by mail at the Purchaser's address. The Purchaser will respond in writing to any request for clarification of the bidding documents, which it receives no later than fifteen (15) days prior to the deadline for the submission of bids. Written copies of Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be put on e-procurement platform/ website of the purchaser or intimated by mail.

8. Amendment to Bidding Documents:

- 8.1 At any time prior to the deadline for submission of bids, the Purchaser, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, may modify the bidding documents by amendment.
- 8.2 All such amendments also would be made available on the e-procurement platform and such amendments will be binding on the respective Bidders.
- 8.3 In order to allow prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

C. PREPARATION OF BIDS

9. Language of Bid:

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

10. Cost Associated with Bidding:

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

Bidders have to pay a transaction fee @ 0.03% of ECV (Estimated Contract Value) with a cap of Rs.10,000/- for all works/ supplies with ECV up to Rs.50.00 Crore and Rs.25,000/- for works/supplies with ECV above Rs.50.00 Crore, at the time of bid submission electronically.

- Transaction Fee & other charges shall be paid by either Credit Card or Debit Card.
- Bidders have to pay 'service tax' i.e., GST as levied by Government of India on transaction fee, electronic payment gateway charges.
- Successful bidders shall pay another 0.04% of ECV to APTS towards e-procurement fund (Corpus Fund) with a cap of Rs 10000/- for all works with ECV up to Rs 50 Cr and Rs 25000/- for works with ECV above Rs 50 Cr.

Bidders shall obtain digital certificates from APTS.

11. Documents Constituting the Bid:

- a) The Bid comprises the following.
 - (i) Bid documents and Price Bid,
[Available online at www.tender.apecurement.gov.in]
 - (ii) Qualification information and supporting documents
[to be uploaded by the Bidder]
- b) Documentary evidence establishing in accordance with Clause No.19 'Documents Establishing Bidder's Eligibility and Qualifications' that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted.
- c) Documentary evidence establishing that the Materials/ equipment and ancillary services to be supplied by the Bidder are as per the Technical specification of the bidding documents
- d) Bid Security in accordance with Clause No.20 of section-III, and as indicated in the Bid Notification.
- e) Taxes and Duties clearance certificates,
- f) Schedule of Deviations -
 - a) Commercial
 - b) Technical

All the schedules will be duly filled online with full details as called for in the schedules required for evaluation of bids without which, the bids will be liable for rejection. Bidders are expected to duly fill in all the schedules and sample forms and upload the same on e-procurement platform as part of the Bid.

12. Commercial form

The Bidder will complete the commercial form appropriately on e-procurement platform.

13. Bid Prices:

- 13.1 The prices quoted for material shall be **FIRM**. Bids will be called for with prices FADS inclusive of packing and forwarding, **GST** and other legally permissible duties and levies wherever applicable, handling charges to cover the transport by road from destination railway station to site/stores, unloading at site/stores and insurance (from ware house to warehouse i.e., final destination and storage upto commissioning) towards supply.
- 13.2 Even though composite price is given the break-up for all the duties, taxes, freight, packing and forwarding etc., will be furnished. **Freight shall be quoted separately. Quoting it as 'inclusive'/'zero' will not be accepted.**
- 13.3 It is the responsibility of the Bidder to inform himself of the correct rates of duties and taxes leviable on the materials at the time of bidding.
- 13.4 It is the responsibility of the Bidder to know the prevailing statutory taxes. APTRANSCO considers evaluation of bid price on the basis of prevailing tax rates as on the date of 'Tender Calling Date'.
- 13.5 In case of difference in figures and text fields quoted by the bidder in the commercial form of e-procurement platform, the figures will be final and comments in the text field will not be taken in to consideration.
- 13.6 The Bidder will indicate the unit price and total bid price of materials appropriately and clearly in the price schedule. Any alternative offers shall be indicated only in the price schedule. Prices indicated elsewhere will not be considered.

Prices indicated on the Price Schedule will be entered separately in the following manner.

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

In case of bought out materials/equipment the bidders shall quote all-inclusive price in basic/ex-works price and can mention '**Not –applicable being bought out item' under GST column**. APTRANSCO shall pay only for the taxes involving direct transaction between the bidder and APTRANSCO and not for the transaction between bidder and his sub-vendors.

14. Variable prices & Price Variation basis: Not Applicable

15. Taxes and Duties:

- 15.1 A bidder will be entirely responsible for quoting the correct taxes and duties, other local taxes or levies if any, license fees, etc., he has to incur until completion of the contract. For the purpose of evaluation, the bidder should clearly indicate the GST applicable and any other taxes and levies payable in the respective columns provided in the Commercial form on e-procurement platform. Failure to furnish the details as prescribed in the price schedule will be loaded as indicated in the evaluation criteria.
- 15.2 If the rates of statutory levies assumed by the Bidder are less than the actual rates prevailing at the time of bidding, the Purchaser will not be responsible for such errors. If the rates of statutory levies assumed by the Bidder are later proved to be higher than the actual/ correct rates prevailing at the time of bidding, the difference will be passed on to the credit of the Purchaser.
- 15.3 Deemed Export Benefits: This is not applicable for local purchases with APTRANSCO funds.
- 15.4 **GST- reverse charge Mechanism-Contractor being unregistered:**

Reverse Charge mechanism was not applicable in respect of purchases made from the composition dealer /registered dealer, in case the service provider is an unregistered dealer, the e-way bill will be issued by the APTRANSCO. The Contractor must mention on the Tax invoice if the tax is payable on reverse charge.

E-way bills: For supply of material/equipment e-way bills are to be provided by the bidder only. APTRANSCO will not provide any way bills for the supplies against this tender unless there is clear instructions in this regard by the concerned authorities.

16. Statutory Variations:

Any variation up or down in statutory levy or new levies introduced after '**Tender calling date**' under this specification will be to the account of APTRANSCO within the scheduled delivery period as per the contract on production of documentary evidence. This is allowed only once during delivery period, i.e. at the time of delivery of goods at factory.

In cases where delivery schedule is not adhered to by the supplier and there are upward variation/ revision after the agreed delivery schedule, the supplier will bear the impact of such levies and if there is downward variation / revision, the APTRANSCO will be given credit to that extent.

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

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

17. Bid Currencies:

Prices will be quoted in Indian Rupees; and will be paid in Indian Rupees only.

18. Quantity to quote:

Bidder shall quote 100% of the bid quantity and for all items indicated in the “Schedule of Requirements” (Section-IV) of the bid specification on single responsibility basis. Bid offers less than the prescribed quantities are liable for rejection.

19. Documents Establishing Bidder’s Eligibility and Qualifications:

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

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

- (a) That the Bidder has the financial, technical, and production capability necessary to perform the contract;
- (b) That the Bidder meets the Qualification criteria listed in Section-VI. In addition, the Bidder may furnish full particulars regarding supply of the material in question made so far to APTRANSCO during the last 5 years and other reputed power utilities.

19.1 Documents Establishing Equipment/ material conformity to bidding Documents:

The Bidder will furnish as part of its bid, documents establishing conformity to the bidding documents of all Material/ equipment and services, which the Bidder proposes to supply under the Contract.

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

- (a) A detailed description of the essential technical and performance characteristics of the materials/ equipment;

- (b) The bidder should specifically mention about furnishing the type test certificates and a copy of test certificate should be uploaded along with the bid.
- (c) a list giving full particulars, including available sources and current prices of spare parts, special tools etc., necessary for the proper and continuing functioning of the Material/equipment following commencement of the use of the Material/ equipment by the Purchaser; and
- (d) an item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsive-ness of the equipment/ material and services to those specifications, or a statement of deviations and exceptions to the provisions of the Technical Specifications.

For purposes of the commentary to be furnished pursuant to above, the Bidder will note that standards for workmanship, material, and equipment, as well as references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications, are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names, and/or catalogue numbers in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

20. Bid Security:

20.1 The Bidder shall furnish, as part of its bid, a Bid Security specified in the NIT. This amount should be paid by way of BG/On line payment through RTGS/NEFT.

Bidders may furnish a **Bank Guarantee (B.G.)** as per the proforma attached. The scanned copy of BG should invariably upload along with the Bid.

20.2 The fact of having Bid security by way of Bank Guarantee along with the bid should be clearly indicated in the Bid.

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

20.4 **Exemption for payment of Bid security is not allowed in any case.** The permanent bid security bank guarantee accepted earlier is deemed to have been withdrawn. Permanent bid security Bank Guarantee is not accepted. Bid security extensions accorded earlier are deemed to have been withdrawn.

20.5 Requests for exemption from payment of BID SECURITY will not be entertained on any account.

20.6 Any bid not secured as above will be rejected by the Purchaser.

20.7 The successful Bidder's Bid Security original shall be furnished before placing of order and the same will be discharged after award of contract and acceptance of Performance Security.

20.8 The Bid Security may be forfeited:

(a) If a Bidder:

- i) Withdraws its bid or alters its prices during the period of bid validity specified by the Bidder, or
- ii) Does not accept the correction of errors pursuant to Clause No.30.2; or
- iii) Offers post Bid rebates, revisions or deviations in quoted prices and/ or conditions or any such offers which will give a benefit to the Bidder over others will not only be rejected outright but the original Bid itself will get disqualified on this account and the Bidder's BID SECURITY will be forfeited.

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

- i) To sign the contract in accordance with Clause No.38.
- ii) To furnish performance security in accordance with Clause No.39.

20.9 Bids without Bid Security will be rejected and bidder will run the risk of being banned.

21. Period of Validity of Bids:

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

21.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses there to will be made in writing (or by Fax). The Bid Security Bank Guarantee provided under Clause No.20 shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Security.

22. Tax Clearance Certificates:

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

23. Service Conditions:

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

(a)	Location	-	at various sub-stations in the state of Andhra Pradesh
(b)	Maximum ambient air temperature		50 ⁰ C
(c)	Minimum ambient air temperature		5 ⁰ C
(d)	Average daily ambient air temperature		35 ⁰ C
(e)	Maximum relative humidity		74 %
(f)	Maximum altitude above mean sea level		1000 m
(g)	Average number of thunder storm days per annum		40 days
(h)	Average number of rainy days / annum		90 days
(i)	Average tropical monsoon condition per annum		3 months
(j)	Average Annual Rain fall		925 mm
(k)	Maximum wind pressure		200 kg/Sq.m.
(l)	Isoceraunic level per annum		50 days
(m)	Seismic level (horizontal acceleration)		0.3 g

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

24. Format & Signature of Bidder: Clause deleted.

D. Submission of Bids:

25. Procedure for Submission of Bids:

25.1 Bids should be in the prescribed form, which can be obtained from 'e-procurement' platform from the date of electronic publication up to the time and date indicated in the Bid notice. The intending bidders would be required to enrol themselves on the 'e-procurement' market-place www.tender.apecurement.gov.in. Those bidders who register themselves in the 'e-procurement' market place can download the Bid specification and the Bid schedules free of cost.

The bidder shall authenticate the bid with his digital certificate for submitting the bid electronically on e-procurement platform **and the bids not authenticated by digital certificate of the bidder will not be accepted on the e-procurement platform** following the G.O.Ms.No.6, I.T&C Department, and dated 28-02-2005.

- 25.2 Intending bidders can contact office of the Chief Engineer/ Telecom & IT, APTRANSCO, Vidyut Soudha, Vijayawada-520004, for any clarification/information on any working day during working hours.
- 25.3 The bidders who are desirous of participating in “e-procurement” shall submit their technical bids, price bids etc., in the standard formats prescribed in the Bid documents, displayed at “e” market place. The bidders should invariably upload the statement showing the list of documents etc., in the “e” market place in support of their Pre-qualification/Technical bids. The bidder should load scanned copies of all relevant certificates. The bidder shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/ authenticity.

If any bidder uploads the Bid without paying Bid security, he will be blacklisted. Similarly, if any of the certificates, documents etc., furnished by the Bidder are found to be false/fabricated/bogus, the Bidder will be blacklisted and bid security forfeited.

- 25.4 The Bidder will invariably complete the Bid in full.
- 25.5 Telegraphic quotations and quotations by fax/mail will not be entertained under any circumstances. Clarification, amplifications, and / or any other correspondence from the Bidder subsequent to the opening of bid will not be entertained.

The Bidders are advised to ensure that their bids are uploaded in complete shape at the first instance itself.

26. Deadline for Submission of Bids

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

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

27. Modification and Withdrawal of Bids

No bid may be modified after the deadline for submission of bids.

No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified. Withdrawal of a bid during this interval may result in the forfeiture of its Bid Security.

E. Opening and Evaluation of Bids

28. Opening of Bids by the Purchaser

- 28.1 The Purchaser will open all the Pre-Qualification/ Technical bids meeting above criteria. In case the Technical, Financial & Pre-qualification requirements are found to be adequate and as required after the examination, Price Bids will be opened at later date.
- 28.2 If the Technical, Financial & Pre-Qualification requirements are found to be inadequate, the 'Price Bid' of such unqualified Bidders will not be opened.

29. Clarification of Bids

- 29.1 During evaluation of the bids, the Purchaser may, at its discretion, ask the Bidder for a clarification of its Bid. The request for clarification and the response will be in writing, and no change in the prices or substance of the bid will be sought, offered, or permitted.
- 29.2 No clarifications shall be asked/ entertained regarding Qualification Requirements (Supply, Performance and Financial Turnover). Tenders shall be evaluated with uploaded documents only in the e-procurement website.

30. Preliminary Examination

- 30.1 The Purchaser will examine the bids to determine whether they are complete, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.
- 30.2 The Purchaser may waive any minor informality, nonconformity, or irregularity in bid which does not constitute a material deviation, provided such waiver doesn't prejudice or affect the relative ranking of any Bidder.
- 30.3 Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the bidding documents. For purposes of these Clauses, a substantially responsive bid is one, which conforms to all the terms and conditions of the bidding documents without material deviations. Deviations from, or objections or reservations to critical provisions, such as those concerning Bid Security, and Taxes and Duties will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.
- 30.4 If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the nonconformity.

31. Evaluation and Comparison of Bids

- 31.1 The Purchaser will evaluate and compare the Technical & Pre-Qualification Bids, which have been determined to be substantially responsive. In case the Technical, Financial & Pre-qualification requirements are found to be adequate and as required after the examination, Price Bids of the qualified bidders will be opened subsequently.
- 31.2 The Purchaser's evaluation of a bid will take into consideration one or more of the following factors.
- a) All the bids, which are opened and considered for evaluation, will be checked for qualification requirements in respect of technical and commercial aspects. Such of the bids, which do not meet the qualification requirements, will not be evaluated further. The bid is to be checked for its conformity to the technical specification. If it does not meet the technical specification, the Bid will not be evaluated further. However, if in the opinion of the purchaser the bidder has offered equipment/ material better than the technical specification the same may be considered.
 - b) Further, the purchaser may enquire from the bidder in writing for any clarification of the bid. The response of the bidder will also be in writing. However, no change in the prices or substance of the bid will be sought, offered or permitted.
 - c) Bids will be examined for completeness and for any computational errors. If there is a discrepancy between the soft copy and the hard copy, the hard copy will prevail.
 - d) It will be ensured that the required sureties have been furnished and that the documents have been properly signed.
 - e) The bid may be rejected for the following reasons:
 - i) Not in the prescribed form,
 - ii) Insufficient bid security or no proof of bid security,
 - iii) The bidder is a vendor who is banned from further business transactions and the period of ban is still in force.
 - iv) Bids of bidders whose delivery against the pending orders is not satisfactory are liable for rejection.
 - f) The purchaser's evaluation of a bid shall take into consideration one or more of the following factors.
 - i) Qualifying Requirements in respect of the Supply, Performance, Financial, Type tests etc.
 - ii) Delivery schedule offered in the bid;
 - iii) Commercial & Technical deviations. (Brought out in the prescribed proforma will only be considered. Deviations elsewhere indicated in the bidding documents will not be considered)
 - iv) The cost of components, mandatory spare parts, and service;
 - (v) The availability of spare parts and after-sales services for the material offered in the Bid;

- (vi) The projected operating & maintenance costs during the life of the equipment/ material;
 - (vii) The performance and productivity of the material/ equipment offered;
 - (viii) Other specific criteria indicated in the Bidding documents.
- g) In addition, the Purchaser's evaluation of a bid will take into account the net landed cost of the material at the final destination. For the purpose of evaluation net landed cost is arrived at by adding all elements of the basic price, allowable discount, any other levies, packing & forwarding, freight charge as quoted by the bidder, interest on advance if any, unloading at final destination, erection, servicing and other charges as called for. In addition, any variation up or down in taxes and duties/new levies introduced subsequent to bid opening and before award will be considered for comparison purposes.
- i) e-way Bills: For supply of material/equipment e-way bills are to be provided by the bidder only. APTRANSCO will not provide any way bills for the supplies against this tender unless there is clear instructions in this regard by the concerned authorities
- h) The following criteria may be adopted for taxes and duties for evaluation.
- a) It is the responsibility of the bidder to quote all taxes and duties correctly without leaving any column unfilled. Where taxes and duties are not applicable the bidder should enter 'NA' and if no duty/tax is leviable the same may be entered as 'NIL'. If any column is left blank or filled vaguely like "as applicable", the same will be loaded with the maximum of the other eligible Bids.
 - b) Where there is an exemption of any tax, the documentary evidence to that effect will be enclosed by the bidder.
- i) Prior to detailed evaluation, the responsiveness of each bid will be determined. A substantially responsive bid is one that conforms to all the terms and conditions of the bidding documents without material deviations. For this purpose superscription, qualification requirement, bid security, validity, delivery, payment terms, price schedule, taxes and duties will be deemed to be the critical provisions and deviations in any one of these items will be deemed to be a material deviation.
- j) The purchaser may waive any minor informality, non-conformity or irregularity in the bid which does not constitute a material deviation, provided such waiver does not affect the relative ranking of any bidder. The purchaser will clearly indicate in the bid specification the methodology for evaluation of bids.
- a) Bid price, which will include all, costs of manufacture and services at manufacturing place as well as, Transportation to destination stores, packing and forwarding, unloading, insurance and all Taxes & other legally permissible duties & levies payable.
 - b) Delivery schedule offered in the bid.
 - c) Deviations in payment schedule from that specified in the general terms and conditions of the contract.
 - d) The cost of components, mandatory spare parts, and service

- e) The availability of spare parts and after-sales services for the equipment offered in the Bid;
 - f) The projected operating and maintenance costs during the life of the equipment;
 - g) The performance and productivity of the equipment offered; and/or
 - h) Other specific criteria indicated in the Bid Specification.
 - i) Cost of recommendatory spares if any indicated in the relevant price schedule will not be considered for bid evaluation.
- k) “The bidders for supply and works shall invariably possess “GST”, ‘TIN’ & ‘PAN’ Numbers” and the same should be furnished for Bids above Rs.5.00 Lakhs.

31.3 Any statutory variations of taxes and duties and new levies imposed after opening of the bid and before award of the contract will be taken into consideration for the purpose of evaluation.

31.4 A substantially responsive bid is one, which conforms to all the terms and conditions of the bidding documents without material deviations. For this purpose, qualification requirement, bid security, validity, delivery, payment terms, price schedule, submission of types test certificates, taxes & duties will be deemed to be the critical provisions and deviations in any one of these things will be deemed to be a material deviation.

32. Contacting the Purchaser.

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

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

F. Award of Contract

33. Post Qualification

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

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

34. Award Criteria for all the qualified bidders.

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

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

34.2 In the opinion of the purchaser in case it is undesirable to depend on one supplier, quantity maybe distributed among two or more suppliers adopting the same price.

34.3 In case of distribution of quantities among two or more sources due to

- (i) Large quantity of supplies
- (ii) Deliveries are spanning more than nine months
- (iii) For reliability of supplies
- (iv) The L1 is already executing other orders in APTRANSCO

34.4 The following ratio at the same prices shall be adopted

When the sources of supply are two, percentage distribution between L1 & L2

- i. When there are two identical L1 offers, order may be shared with 50:50 ratio
- ii. In case of urgency of material, distribution of quantities in 50:50 ratio shall also be considered even though the offers are not identical, when both L1 and L2 are industries in the private sector
- iii. If L1 already executing many other orders in APTRANSCO or other utilities, for reliability of supplies the quantities may be distributed between 2 or 3 supplies with L1-40%, L2-30% & L3-30% quantity

35. Purchaser's Right to vary Quantities at the time of Award

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

35.2 The purchaser reserves the right to vary the ordered quantity by $\pm 50\%$ during the execution of the contract.

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

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

37. Notification of Award

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

37.2 The notification of award/LOI will constitute the formation of the Contract.

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

37.4 The supplier will have to predefine the Bank Account details after receipt of LOI and before entering into contract for electronic transfer of payment.

38. Signing of Contract:

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

39. (A) Performance Security:

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

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced material will be extended to a further period of 18 months and the Performance Bank Guarantee for proportionate value will be extended 60 days over and above the extended warranty period.

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

39.3 The performance security will be...

- (a) A Bank Guarantee issued by Nationalised Banks/Schedule Banks approved by APTRANSCO as per the list enclosed acceptable to the Purchaser, in the form provided in the bidding documents.
- (b) A banker's cheque or crossed DD or Pay Order payable at the head quarter of the Purchaser in favour of the Purchaser drawn on any Nationalised Bank.

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

- 39.5 Failure of the successful Bidder to comply with the above requirement will entail cancellation of the award and forfeiture of the Bid Security.
- 39.6 In case where the performance security is not yet paid, the bid security will be forfeited and the balance to makeup the performance security deposit will be deducted from pending payments any due to the bidder from APTRANSCO on other orders. In addition, the company will also become liable for black listed by APTRANSCO.
- 39.7 The permanent performance bank guarantee accepted earlier is deemed to have been withdrawn. The Permanent performance Guarantee is not accepted.

(B) Additional Security Deposit:

- i) If the rate quoted by the bidder less than 10% of the APTRANSCO's total estimated cost will be considered as abnormally low rate. In the case of abnormally low quoted rates i.e. less than 10% additional security deposit (ASD) to be paid for the less percentage below 10% i.e. if the bidder quotes 20% below the total estimated cost then he has to pay ASD equivalent to 10% of the total estimated cost.
- ii) The Additional security may be made by Demand Draft on Nationalized bank/ Scheduled bank approved by APTRANSCO as per the list enclosed payable at Vijayawada in favour of Pay officer, APTRANSCO, Vijayawada or by way of Bank Guarantee from a Nationalized/ / Scheduled bank approved by APTRANSCO as per the list enclosed in favour of tender inviting authority covering a period of 2 months over and above the completion of material supply.
- iii) All Bank Guarantees, which are executed in accordance with this specification, shall be on a Stamp paper of value not less than Rs.100/- (Rupees one hundred only). Bank Guarantee executed on the stamp paper of value less than Rs.100/- will not be accepted.

39.8 FORFEITURE OF PERFORMANCE SECURITY AND ADDITIONAL SECURITY DEPOSIT:

The Performance and Additional Securities will be forfeited in the following cases:

1. When the successful bidder does not fulfil the obligations under the contract or proven to be false submission of the information either in the bid or the information relating to the contract.
2. When the successful bidder fails to execute the work in accordance with the clauses under this specification.
3. When the successful bidder executing the work with in-ordinate delays or with poor quality which hampers the prime object of the contract, the securities will be en-cashed and will be adjusted towards such losses incurred by APTRANSCO or towards risk purchase.

4. When the successful bidder pleads his inability and backs out of his obligations after issue of the preliminary acceptance letter or the letter of intent, the APTRANSCO will forfeit his performance/ additional/ bid securities and also recover the loss, if any, sustained by the APTRANSCO as a consequence of such backing out. In addition, the company will be blacklisted.

40. Corrupt or Fraudulent Practices:

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

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

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

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

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

41. Use of Contract Documents and Information:

41.1 The Supplier will not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, of any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract.

Disclosure to any such employed person will be made in confidence and will extend only so far as may be necessary for purposes of such performance.

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

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

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

42. Patent Rights

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

43. Places / Locations

Particulars of site location to which the equipment / material have to be supplied will be given to successful Bidders. However, it may please be noted that the destinations for supply of materials will be Site/ Stores anywhere in the state of Andhra Pradesh.

44. Delivery:

Delivery period will be reckoned from the date of issue of Letter of Intent. The delivery quoted will be firm, definite, unconditional and on the basis of receipt of materials at destination in good condition without any bearing on the procurement of raw materials or any similar prerequisites. The commencement date and date of delivery will be indicted. The preferred delivery time, which is the essence of this specification, is indicated in the 'Schedule of Requirements'. Final deliveries are however, subject to confirmation at the time of Contract. Delay in delivery of materials FADS (Free at Destination Store/site) due to non-availability of railway booking, non-allotment of wagons and any such reasons will not be considered. It is the responsibility of the supplier to make alternative arrangements for transporting the materials by road or rail so as to see that the material reaches the destination within the stipulated period. The Purchaser reserves its right to defer the delivery date at any time after orders are placed without any change in the conclusion of contract or other conditions of supply. The delivery period, which will be reckoned from the date of the Contract, will be guaranteed under penalty as in Clause-60.

45. Inspections and Tests

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

ii) The APTRANSCO may at its option get the materials inspected by the third party, if it feels necessary and all inspection charges in this connection to be borne by the supplier.

- iii) The dispatches will be affected only if the test results, comply with the specification. The dispatches will be made only after the inspection by the APTRANSCO officer and to be completed for the APTRANSCO's satisfaction or such inspection is waived by the competent authority.
- iv. The acceptance of any quantity of material will in no way relieve off the supplier of the responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection, if such material later found to be defective.
- v. As soon as the material/ equipment are ready the supplier will duly send intimation to APTRANSCO by registered post and carry out the tests in the presence of the representative of APTRANSCO. The Supplier shall give at least 15 days advance intimation to enable the Purchaser to depute his representative for witnessing acceptance and routine tests. The supplier shall arrange all charges (i.e., To & Fro tickets and accommodation charges) for the inspector deputed to their works for witnessing the tests during inspection of material.
- vi. Should any inspected or tested material/equipment fail to conform to the specification, the Purchaser may reject the material and supplier will either replace the rejected material or make alterations necessary to meet specifications/requirements at free of cost to the Purchaser.
- vii. Inspection will be conducted on 20% of the quantities offered for inspection. Samples will be collected at random to establish that the guaranteed technical parameters as per the submitted Bid by the supplier. In case of non-adherence, the purchaser may take suitable action on the supplier including cancellation of vendor registration and banning further dealings, depending on the gravity of the deviation. These random inspections may be entrusted to a third party.
- viii. The inspection of the material shall be arranged at the manufacturer premises. In case it is of abroad, the supplier shall bear the to and fro charges, local transport and accommodation at inspection place for the inspecting officer(s).

45.1 Test Reports:

- a) Four copies of acceptance test reports shall be furnished to the purchaser. One copy will be returned, duly certified by the purchaser and only thereafter shall the materials be dispatched.
- b) All test reports of tests conducted during manufacture shall be maintained by the Bidder. These shall be produced for verification as and when requested for by the purchaser.
- c) All records of routine test reports shall be maintained by the Bidder at his works for periodic inspection by the purchaser.

46. Name Plate:

Equipment should be provided with name plate giving full details of manufacturer, capacities and other details as specified in the relevant ISS or other specification stipulated. The contract number and date and year of supply and the words “APTRANSCO” must be etched on the name plate.

47. Packing and Forwarding

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

47.2 The equipment shall be packed in crates suitable for vertical/ horizontal transport, as the case may be, and suitable to withstand handling during transport and outdoor storage. The cabinets shall be covered with plastic film so as to prevent the cabinet from damage during transportation. The plastic film shall be removed at the time of commissioning.

47.3 The Supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbols. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc. shall be provided. Any material found short inside the packing cases shall be supplied by Supplier without any extra cost. Replacement of the damaged equipment and material shall not be linked with the settlement of insurance claims. The packages requiring covered storage shall be compulsorily marked.

47.4The packing, marking, and documentation and outside the packages will comply strictly with such special requirements as will be expressly provided for in the Contract and in any subsequent instructions ordered by the Purchaser. The supplier will be required to make separate packages for each consignee, each package will be marked on three sides with proper paint/ indelible ink with the following;

1. Contract Number
- 2 Supplier’s name
- 3 Packing list reference number

47.5The supplier, whenever dispatches material to a destination should prepare the following information in the form of packing slip in quadruplicate and send the same to the consignee and obtain his acknowledgement. The consignee will return to the supplier one copy of the packing slip with his remarks. The proforma of packing slip will be as follows.

PACKING SLIP:

1. Name of the Supplier
2. Purchase Order reference number
3. Name and address of the consignee
4. Details of the items in the package
5. Bill of material indicating contents of each package.
6. Gross, Net & Tare weights of the items
7. Complete address of the destination
8. Handling and unpacking instructions

Each equipment/ material shall be packed securely & separately.

- 47.6 The Supplier shall ensure that the packing list and bill of material are approved by the Purchaser and enclosed to dispatches. The Supplier shall arrange for unloading the equipment/ material at destination site/stores at no extra cost.

48. Delivery Documents

- 48.1 Delivery of the materials / equipment will be made by the Supplier in accordance with the terms specified in the contract. The latest test certificates containing the result of the tests as per the relevant IEC/IS or other specification stipulated must be submitted to the Chief Engineer and got approved by him.

- 48.2 The documents for delivery of equipment and material will contain the original and four copies of the following.
 Invoice indicating PO Number, goods description, quantity, unit price & total amount,
- a) Delivery Note/Packing List/ Lorry Receipt,
 - b) Evidence towards GST Payment.
 - c) Insurance certificate,
 - d) Manufacturer's/Supplier's Guarantee Certificate,
 - e) Certificate of Origin,
 - f) Any other document evidencing payment of statutory levies (wherever applicable),
 - g) The items and quantity so far supplied including the present package,
 - h) Supplier's certificate certifying that the defects if any pointed out during inspection have been rectified (3 copies),
 - i) Manuals in six sets along with a soft copy.

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

49. Insurance

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

The insurance will be in an amount equal to 100% FADS value of Materials / equipment on all risks basis. The policy will have a provision for extension to cover

further storage, if necessary, at destination stores / site at APTRANSCO cost. The beneficiary shall be APTRANSCO.

49.2 **The bidder shall not quote insurance charges, the same will not be reimbursed.**

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

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

50. Transportation

The Supplier is required under the Contract to transport and deliver the material/equipment to the specified place of destination i.e. any site or stores in the state of Andhra Pradesh, transport to such place of destination, including insurance and storage, will be arranged by the Supplier and the related costs will be included in the Contract Price only. **The Supplier shall arrange for unloading the equipment/ material at destination site/stores at no extra cost.**

51. Incidental Services

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

- i. Performance or supervision of on-site assembly and/or start-up of the supplied Materials / equipment;
- ii. Furnishing of tools required for assembly and/or maintenance of the supplied Material/ equipment;
- iii. Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Materials / equipment;

- iv. Performance or supervision or maintenance and/or repair of the supplied Materials/ equipment, during warranty period, provided that this service will not relieve the Supplier of any warranty obligations under this contract; and
- v. Training of the Purchaser's personnel, at the Suppliers' plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied material/ equipment.

52. Spare Parts

- 52.1 The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier.
- (a) Such spare parts as the Purchaser may choose to purchase from the Supplier, provided that this selection will not relieve the supplier of any warranty obligations under the contract; and
 - (b) In the event of termination of production of the spare parts:
 - (c) Advance notification to the Purchaser of the impending termination.
 - (d) Time to permit the Purchase to procure needed requirement; and following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

53. Warranty/ Guarantee

- 53.1 The supplier will warrant for the satisfactory functioning of the material/ equipment as per specification for a minimum period of 18 months from the check-measurement date in Form-13 i.e., receipt of the material/ equipment at TLC Stores or site in good condition or minimum 12 months from date of commissioning whichever is later.
- 53.2 The Supplier warrants that the Materials / equipment supplied under the Contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The supplier further warrants that all Materials / equipment supplied under this Contract will have no defect, arising from a design and / or materials as required by the Purchaser's specifications or from any act of omission of the Supplier that may develop under normal use of the supplied Materials / equipment.
- 53.3 All the material will be of the best class and will be capable of satisfactory operation in the tropics under service conditions indicated in clause-23.1 without distortion or deterioration. No welding filling or plugging of defective parts will be permitted, unless otherwise specified, they will conform to the requirements of the appropriate Indian, British or American Standards. (Where a standard specification covering the material in question has not been published, the standards of the American Society for testing of Materials should be followed).
- 53.4 The entire designs and construction will be capable of withstanding the severest stresses likely to occur in actual service and of resisting rough handling during transport.

- 53.5 Unless otherwise specified the warranty period will be 18 months from the date of acceptance of the Materials / equipment or minimum 12 months from the date of charging whichever is later. The Supplier will, in addition, comply with the performance guarantees specified under the contract. If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the supplier will at its discretion either, make such changes, modifications, and/or additions to the Materials / equipment or any part thereof as may be necessary in order to attain the contractual guarantees specified in the contract at its own cost and expense and to carry out further performance tests as per the relevant standards.
- 53.6 The Purchaser will promptly notify the supplier in writing of any claims arising under this warranty.
- 53.7 "Upon receipt of such notice, the Supplier will within 30 days repair or replace the defective Materials/ equipment or parts thereof, free of cost at the ultimate destination.
The supplier will take over the replaced parts/ materials/ equipment at the time of their replacement. No claim whatsoever will lie on the Purchaser for the replaced parts/ Materials/ equipment thereafter". In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material will be extended to a further period of 12 months.
- 53.8 If the Supplier, having been notified, fails to remedy the defect(s) within the above period, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense duly deducting the expenditure from subsequent bills/ bank guarantee and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.
- 53.9 **Responsibility of the supplier for loss/ damage:**
- a) The supplier is responsible for the safe delivery of the goods in good condition at the destination. He should acquaint himself of the conditions obtaining for handling and transport of the goods to destination and shall include and provide for security and protective packing of the goods so as to avoid damage in transit.
 - b) External damages or shortages that are prima-facie the results of rough handling in transit or due to defective packing will be intimated. Internal defects, damages or shortages of any internal parts which cannot ordinarily be detected on a superficial visual examination though due to bad handling in transit or defective packing will be intimated separately.

In either case, the defective or damaged materials should be replaced by the supplier free of cost to the APTRANSCO. If no steps are taken in this regard, APTRANSCO may without prejudice to its other rights and remedies cause to be repair or rectify the defective material or replace the same and recover the expenditure incurred there for from the deposit such as Earnest Money, Security

and Performance or other monies available with APTRANSCO or by resorting to legal action.

- c) For the purpose of any legal construction, the material shall be deemed to pass into APTRANSCO's ownership only at the final destination where they delivered and accepted.

54. PAYMENT FOR SUPPLY OF MATERIAL/EQUIPMENT AND ERECTION AND COMMISSIONING CHARGES: -

The payment will be made through bank under transfer procedure as per the terms indicated below-

54.1. a. 80% payment towards the equipment cost will be arranged within 45 days for the material/ equipment supplied in complete shape subject to their delivery as per the schedule of work and on its receipt in good condition at the destination / stores in good condition (i.e., from check measurement date in Form-13). The supplier will have to predefine the Bank Account details after receipt of LOI and before entering into contract for electronic transfer of payment.

b. Balance 20% payment of towards equipment along with the erection & commissioning charges will be made after commissioning of equipment/material.

c. However, payment in advance may be considered by APTRANSCO after availing a rebate /discount @ 0.3% per week or part thereof for the advancement depending on the availability of funds. **No interest will be payable, in case payment is delayed for whatever reason.**

54.2 For mandatory spares:

100% Payment towards equipment cost will be arranged within 45 days for the material/ equipment supplied in complete shape subject to their delivery as per the schedule of work and on its receipt in good condition at the destination / stores in good condition (i.e., from check measurement date in Form-13). The supplier will have to predefine the Bank Account details after receipt of LOI and before entering into contract for electronic transfer of payment.

54.3 The payment mentioned above is subject to submission of performance security as per clause-39 by the supplier. The bank charges will be made to the account of the supplier an amount of Rs.50/- (Rupees Fifty only) will be recovered from the bill amount per each disbursement on LOA raised by field unit offices.

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

54.5 The performance guarantee to be executed in accordance with this specification will be furnished on a stamp paper of value Rs.100/-. The Bank Guarantee will be extended if required suitably in accordance with the provisions of Clause No.39.

- 54.6 If the supplier has received any over payments by mistake or if any amounts are due to the APTRANSCO due to any other reason, when it is not possible to recover such amounts under the contract resulting out of this specification, the APTRANSCO reserves the right to collect the same from any other amount and / or Bank Guarantees given by the company due to or with the APTRANSCO.
- 54.7 When the supplier does not at any time, fulfill his obligations in replacing/ rectifying etc. of the damaged/ defective materials in part or whole promptly to the satisfaction of the APTRANSCO Officers, the APTRANSCO reserves the right not to accept the bills against subsequent dispatches made by the supplier and only the supplier will be responsible for any demurrages, wharfages or damage occurring to the consignments so dispatched.
- 54.8 No payments will be made for the supplies made prior to scheduled delivery or for material which are not in full shape.
- 54.9 Freight will only be reimbursed on submission of documentary evidence/ proofs, limiting to the documentary proof only.
- 54.10 Any incidental charge such as stamp duty, bank charges etc., shall be to the suppliers account and any charges in relation there to shall be received from the payment due to the supplier.
- 54.11 Payments will be made by RTGS from APTransco funds/ Bank funding. The contractor has to furnish requisite details for establishing RTGS in proforma as per Form-10 of Section- VII. Once RTGS system is established, the bank account details submitted are final and cannot be changed till completion of the contract. An amount of Rs. 50/- will be recovered from the bill amount for each disbursement on LOA raised by unit officers towards RTGS.

55. Prices

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

56. Change Orders

- 56.1 The Purchaser may at any time, by a written order given to the Supplier make changes within the general scope of the Contract in any one or more of the following:
- (a) Drawings, designs, or specifications, where Materials / equipment to be furnished under the Contract are to be specifically manufactured for the Purchaser;
 - (b) The method of shipment or packing;
 - (c) The place of delivery; and/or
 - (d) The Services to be provided by the Supplier.
 - (e) Defer the deliveries and restore them by giving 3 months' notice without any additional financial commitment

57. Contract Amendments

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

58. Assignment

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

59. Delays in Supplier's Performance

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

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

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

60. Penalty for delay in supplies

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

The Check Measurement date in Form-13 i.e., the date of receipt of materials at destination stores in good condition will be taken as the date of delivery. Material/ Equipment which are not of acceptable quality or are not confirming to the specification would be deemed to be not delivered. For penalty, the number of days would be rounded of to the nearest week and penalty calculated accordingly.

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

61. Termination for Default

- 61.1 The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:
- a) If the Supplier fails to deliver any or all of the Materials / equipment within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.
 - b) If the Supplier fails to perform any other obligation(s) under the Contract.
 - c) If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.
- 61.2 In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Materials/ equipment or services similar to those undelivered, and the Supplier will be liable to the Purchaser for any excess costs for such similar Materials/ equipment or Services. However, the Supplier will continue performance of the Contract to the extent not terminated.

62. Termination for Insolvency

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

63. Termination for Convenience

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

64. Force Majeure

- 64.1 The Supplier will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in

performance or other failure to perform its obligations under the Contact is the result of an event of Force Majeure.

- 64.2 For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- 64.3 If a Force Majeure situation arises, the supplier will promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier will continue to perform its obligations under the Contract as far as is reasonably practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- 64.4 No price variance will be allowed during the period of force majeure.

65. Settlement of Disputes:

- 65.1 If any dispute or difference of any kind whatsoever will arise between the Purchaser and the Supplier in connection with or arising out of the Contract, the parties will make every effort to resolve amicably such dispute or difference by mutual consultation.
- 65.2 If, after thirty (30) days the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.
- 65.3 Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause will be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Materials / equipment under the Contract.
- 65.4 Arbitration proceedings will be conducted in accordance with the following rules of procedure. The dispute resolution mechanism will be as follows:
- (a) In the case of a dispute or difference arising between the Purchaser and a Supplier relating to any matter arising out of or connected with this agreement, such dispute or difference will be settled in accordance with the Arbitration and Conciliation Act. 1996. The Arbitral Tribunal will consist of three Arbitrators one each to be appointed by the Purchaser and the supplier the Third Arbitrator will be chosen by the two Arbitrators so appointed by the parties and will acts as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within period of 30 days from the appointment of the Arbitrator appointed subsequently, the Presiding Arbitrator will be appointed by The Institution of Engineers (India).

- (b) If one of the Parties fails to appoint its Arbitrator in pursuance of Sub-Clause (a) within 30 days after receipt of the notice of the appointment of its Arbitrator by The Institution of Engineers (India), will appoint the Arbitrator. A certified copy of the order of the Institution of Engineers (India), making such an appointment will be furnished to each of the parties.
- (c) Arbitration Proceedings will be held at Purchaser's Headquarters, and the language of the Arbitration Proceedings and that of all documents and communication between the parties will be English.
- (d) The decision of the majority of Arbitrators will be final and binding upon both parties. The cost and expenses of Arbitration Proceedings will be paid as determined by the Arbitral Tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc., of its proceedings as also the fees and expenses paid to the Arbitrator appointed by such party or on its behalf will be borne by each party itself.
- (e) Where the value of the Contract is Rs.1.00 Crore and below, the disputes or differences arising will be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely The Institution of Engineers (India).

65.5 Notwithstanding any reference to arbitration herein,

- (a) The parties will continue to perform their respective obligations under the Contract unless they otherwise agree; and
- (b) The Purchaser will pay the Supplier any monies due the Supplier.

66. Jurisdiction

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

67. Notices

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

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

68. Foreign Exchange

68.1 No Foreign Exchange is available or expected for this purchase. Offers which do not require release of F.E. or procurement of import license by APTRANSCO

only will be considered. Where some of the components are to be imported, the manufacturer will have to make their own arrangements for import license etc., and should not look for any assistance from APTRANSCO.

69. Blacklisting/ debarring:

Any Company/ Vendor/ Supplier/ Contractor or their promoters who are blacklisted/ debarred by power utility is not eligible to participate in the tenders. No contract/order/ work will be awarded/ placed on any blacklisted/ debarred Vendor/ Supplier/ Contractor/ Company or their promoters. Bidders have to furnish a declaration/undertaking in this regard along with the bid. Bids without this declaration are liable for rejection.

70. The clauses in the purchase manual of APTRANSCO shall govern wherever the specification clauses are silent.

71. If any bidder is silent about any clause of specification it is deemed that the bidder is accepted the same.

72. The discount if any offered shall be indicated in the field provided in e-procurement only. Discount given in anywhere other than the discount field will not be considered for tender evaluation.

73. Training of purchaser staff:

The supplier shall be required to provide facilities for imparting training at no extra cost to **5 Engineers** to be nominated by the purchaser (APTRANSCO) for MPLS& NMS equipment and associated equipment at the manufacture's works place for **3(three) days**. Expenses towards To and Fro travel in respect of the trainees will be borne by the purchaser. However the bidder shall provide suitable lodging and boarding facilities as well as transportation to the place of training for the trainees. Further the supplier shall be required to provide facilities for imparting training at no extra cost to Engineers to be nominated by the purchaser (APTRANSCO). An important objective of training is to increase the ability to control, supervise and carry out maintenance work on plant and equipment supplied and installed by the contractor. The supplier shall provide boarding, lodging and transportation to the training place as a part of the contract without any additional financial commitment to APTRANSCO.

SECTION-IV
SCHEDULE OF REQUIREMENT
SPECN.No. PMMTC1-e-14/2026

Supply, Erection & Commissioning of MPLS-TP Type OLTE					
S. No.	Description of the Item	UoM	Qty.	APTRANSCO delivery Schedule	Destination
Transmission Equipment (Total Scope)					
1	FOTE Equipment (MPLS-TP) with 1G/10G Ports upto 8 directions or 4 MSP protected Directions			Supply shall be completed within 3 (Three) months from the date of Letter of Intent. Erection, testing and commissioning shall be completed within 3 (Three) months from the date receipt of site readiness from concerned field engineer.	Any TLC stores / site in A.P
i	MPLS -TP Type FOTE base equipment with power supply cards(in dual), control & cross connect cards, tributary cards, all cabling to support min. 16 EIs, & other hardware accessories including sub-racks, patch cords,DDFetc.,	No.	6		
ii	MPLS -TP Type FOTE base equipment with power supply cards(in dual), control & cross connect cards, tributary cards, <u>circuit emulation card</u> , all cabling to support min. 16 EIs, & other hardware accessories including sub-racks, patch cords,DDFetc.	No.	19		
iii	6 port x IG & 2 port x10G MPLS-TP optical line interfaces minimum in either one card or multiple cards	No.	25		
iv	minimum 8 port E1 interface card	No.	25		
v	minimum 8 port 10/100/1000 Mbps ethernet Interface card with L2 switching capability	No.	44		
vi	4 port STM1/4 CEM Interfaces (min. 2-STM4 ports) in either one card or multiple cards.	No.	19		
1 a	Utility grade MSA 2000 compliant STM 1/STM 4 SFPs suitable for all vendor SDH ports				
1	To drive upto 30 km optical distance	No.	11		
2	To drive upto 60 km optical distance	No.	11		
3	To drive upto 80 km optical distance	No.	10		
4	To drive upto 120 km optical distance	No.	6		
1 b	Utility grade MSA 2000 compliant 1 Gbe ethernet SFP+ suitable for all vendor ethernet optical ports for MPLS-TP traffic.				
1	To drive upto 10 km optical distance	No.	7		
2	To drive upto 40 km optical distance	No.	36		
3	To drive upto 80 km optical distance	No.	24		

4	To drive upto 120 km optical distance	No.	8		
1 c	Utility grade MSA 2000 compliant 10 Gbe ethernet SFP+ suitable for all vendor ethernet optical ports for MPLS-TP traffic.				
1	To drive upto 10 km optical distance	No.	7		
2	To drive upto 40 km optical distance	No.	36		
3	To drive upto 80 km optical distance	No.	24		
4	To drive upto 120 km optical distance	No.	8		
2	Equipment Cabinets for MPLS-TP type FOTE equipment				
i	Cabinet of standard size for housing MPLS-TP equipment	No.	25		
3	TMN-Network Management System				
i	Supply of NMS and EMS in redundant server architecture including Remote workstation as well as craft terminal and all other associated H/w and S/w along with perpetual licences complete in all aspects per 100 No NEs	Set*	1		
4	Mandatory Spares for MPLS-TP type				
i	Mandatory Spares for MPLS-TP type OLTE Equipment with 1G/10G Ports for Item 1(i) i.e., Common cards, control cards, Optical base/Tributary card, Power supply cards, power cabling, other hardware & accessories (each) for Item 1(i)	Set\$	1		
ii	Mandatory Spares for MPLS-TP type OLTE Equipment with 1G/10G Ports for Item 1(ii) i.e., Common cards, control cards, circuit emulation card, Optical base/Tributary card, Power supply cards, power cabling, other hardware & accessories (each) for Item 1(ii)	Set\$	1		
5	Erection & commissioning of MPLS-TP Type OLTE communication Equipment				
i	Erection, commissioning and testing of MPLS-TP FOTE base equipment	No.	6		
ii	Erection, commissioning, testing of MPLS-TP FOTE base equipment and integration with legacy SDH FOTES	No.	19		
iii	Erection of Equipment Cabinets for MPLS-TP equipment	No.	25		
iv	Erection and commissioning of NMS and EMS in redundant server architecture including Remote workstation as well as craft terminal and all other associated H/w and S/w along with perpetual licences complete in all aspects per 100 No NEs	Set*	1		

Note*: Set shall include all required hardware/software for complete TMN system as specified in technical specifications for MPLS-TP Type FOTE Equipment. NMS facilities for MPLS-TP Type equipment shall include monitoring of Ethernet ports also.

Note\$: One set means one of each type of module/unit card etc.

Note: Supply is inclusive of necessary cables, connectors etc. required for integration with the existing communication system.

Note

1. Prices shall be quoted on **Firm** basis. Bidder shall quote for all the items.
2. Prices shall be free at destination site/stores anywhere in the state of Andhra Pradesh.
3. Conditional discounts are not accepted.
4. Freight charges shall invariably be quoted separately and quoting them as '0' (zero) or 'inclusive' will not be accepted.
5. **The bidder shall not quote insurance charges, the same will not be reimbursed.**
6. Freight will be reimbursed on submission of documentary proofs only.
7. **Evaluation shall be done by considering the cost of equipment/material, Freight, Erection and Commissioning charges inclusive of GST.**
8. **Bidders shall quote all incidental charges inclusive of GST. Quoting GST extra on incidental charges in the remark's column will not be considered for evaluation.**
9. Bidder should meet QR for all the items
10. **The Prices quoted shall be inclusive of Training Cost**
11. **The bidders are requested to quote the Erection & Commissioning chargers including taxes in "Accessories" column in 'commercial form' of e-procurement platform for MPLS-TP Equipment.**

Signature of the Bidder:

Name in Capitals:

Designation:

Seal of the company:

Address of the company:

SECTION – V
TECHNICAL SPECIFICATION

SPECIAL INSTRUCTIONS TO BIDDERS

Please read the following instructions carefully before submitting your bid.

1. The MPLS-TP FOTEs offered under this project should have the feature of communicating all VOIP data, RTU data, Video signals and other protection signals (differential and distance inter trip).
2. The MPLS-TP FOTEs offered shall have single rack solution having all required features of APTRANSCO as above for integrating under one NMS platform.
3. All the drawings, i.e. elevation, side view, plan, cross sectional view etc., in AutoCAD format and manuals in PDF format, for offered items shall be submitted. Also, the hard copies as per specification shall be submitted before commencement of works. Also, the bidder shall have to ensure for correctness of the operation of the MPLS-TP FOTE equipment which will require to be connected in ring topology for various applications viz. Speech and Data communication, tele-protection Hybrid signal transmission/reception and SCADA connectivity as per Technical Specification.
4. The bidder shall have to submit all the required type test reports for the offered item or higher platform. The offered equipment shall be tested for cyber security compliance as per IEC standard 62443-3-3 in any Govt. laboratory or International authorized laboratory. **In case of non-submission of the type test reports with the offer, or bogus/false type test reports are submitted, the bid shall be liable for rejection.**
5. The bidder must fill up all the point of GTP (**same order in the tender document**) for offered item/s. Instead of indicating “refer drawing, or as per IS/IEC”, the exact value/s must be filled in.
6. All the points other than GTP, which are asked to confirm in technical specifications must be submitted separately with the bid.
7. Training: The bidder shall have to arrange for imparting extensive training at free of cost including cost of travel, boarding and accommodation to at least twenty(20)nos. officers of APTRANSCO at OEM/Bidders works with in India for minimum five days covering complete installation, testing & commissioning procedure, working functionality of different modules, supporting software installation & management (both EMS & NMS), individual capability of Handling the equipment (both hardware & software configuration), fault diagnosis & attending, etc in two batches. The training should be given by a qualified experienced trainer having the working knowledge of the equipment supplied. In the event of order, the bidder shall have to get approval of training literature/ documents, qualification and experience of the trainer from APTRANSCO. Training literature /documents shall be provided for all participants.

8. The bidder shall also arrange to impart training to minimum 10 nos. officials in each of the Telecom Circles in the respective Zones covering complete installation, testing & commissioning procedure, working functionality of different modules, supporting software installation & management, individual capability of Handling the equipment (both hardware & software configuration), fault diagnosis & attending, etc. The training should be given by a qualified experienced trainer having the working knowledge of the equipment supplied. Training literature/documents, shall be provided for all participants. The bidder shall have to supply LCT – Local Craft terminal ., i.e. laptop (as per specification enclosed) along with EMS free of cost under this package.
9. All the NMS configurations, user interface configurations, low level and high-level commands in main servers, works station, LCT etc., should be in English language only.
10. The bidder shall bring out all the technical deviation/s only at the specified annexure.
11. The bidder should indicate manufacturing capacity by submitting the latest updated certificate of a Chartered Engineer (CE).
12. Training to be arranged before commencement of work.
13. The bidder shall support the system for minimum 10 years from the date of expiry of warranty, for repairs, supply of spares/additional cards, Up-gradation etc., An undertaking in this regard in Indian non- judicial stamp paper of value Rs. 100/- shall be submitted along with the bid. In case the bidder is not an OEM of the offered equipment, such an undertaking shall be obtained from the OEM and submitted along with the bid. Otherwise, the bid will be liable for rejection.
14. **The interoperability feature with other vendors has to be ensured.**
15. The bidders /OEM those who are offering MPLS-TP, the NMS shall be supplied duly fulfilling all the requirements of APTRANSCO and all required software with life time free license to manage the MPLS-TP FOTEs.

SECTION-II

TECHNICAL SPECIFICATION OF MPLS-TP FOTE

1. SCOPE OF SPECIFICATION

This specification is to cover planning, design, engineering, supply, installation, termination, testing, commissioning of Fiber Optic End Terminal Equipment with MPLS-TP Technology & integration with NMS. The system shall provide one single platform for a whole range of applications from 1G bits/sec to 10G bits/sec Ethernet traffic under MPLS-TP technology. The Contractor shall offer type tested equipment as per requirement of technical specifications.

- (i) Integrating the new F.O. links with the existing (SDH&PDH) F.O. network.
- (ii) MPLS-TP Compatible Equipment along with suitable interfaces etc.
- (iii) Provision of an efficient Network Management System licensed to accommodate at least 100 Network Elements (MPLS-TP) and upgradable to accommodate at least 300 Network Elements. All cabling, wiring, patch facilities, equipment DDF's and interconnections to the supplied equipment side of the defined interfaces.
- (iv) Integration of MPLS-TP equipment with Network Management System (NMS) and other make SDH FOTEs.
- (v) VOIP system integrating with the Hybrid network using Ethernet Ports of MPLS-TP Equipment, existing EPAXs, proposed EPAXs with Dual Server architecture at Vidyut Soudha, Vijayawada.
- (vi) All cabling, wiring, Digital Distribution Frame patch facilities, equipment MDF and interconnections to the supplied equipment at the defined interfaces.
- (vii) MDF &DDF cross connects required to route and activate circuits.
- (viii) System integration of the supplied sub-systems.
- (ix) Supply of mandatory spares.
- (x) All other associated works and items described in the technical specifications for a viable and fully functional communication network.
- (xi) The system shall offer complete solution for SCADA on IEC 60870-5-104, Voice using VOIP, Video conferencing, Phasor Measurement Unit (PMU) (Future), differential and distance tele-protection as per IEEE 37.118 standard, and RTU/SAS data, including IP/Ethernet and status/control signals.
- (xii) Supply, laying, terminations along with cable trays, tags, and connectors of all DC/AC power cables, control cables, communication, F.O. patch chords & Earthing cables necessary for commissioning the FOTE equipment and NMS as per site requirement for a fully functional system in this tender is in the scope of bidder. For AC supply: 3x2.5sqmm Multi strand Copper unarmoured cable. The minimum requirement of cable size for DC supply is 2x4 sq.mm multi strand copper unarmoured cable (for each DC source) approximately 25mtrs of Power cable will be required for each Substation.
- (xiii) Power supply to all the equipment supplied under this contract is in the scope of the Bidder.

2.0. GENERAL REQUIREMENTS:

Introduction:

The proposed equipment shall be designed to operate in electrical high-voltage networks and suitable for installations in substations with harsh environments and high electro-magnetic interference. It shall be highly reliable and provide secure communication. The MPLS-TP equipment shall be designed and field proven to ensure maintenance free operation and comply with the environmental conditions in the substation environment.

The equipment offered shall comply with the latest ITU-T and IETF recommendations, ETSI and IEEE standards. The equipment shall comply with the environmental conditions in the substation environment. It shall also with stand extreme temperature conditions and a particle environment. The equipment shall have a very high MTBF.

On PACKET TRANSPORT LEVEL, interfaces for optical L2/MPLS-TP based transmission minimum 1Gbit/s shall be available. Enhanced traffic engineering using L2/MPLS-TP technology as per relevant IETF standards shall be supported by providing VPWS, VPLS services using the L2/MPLS-TP infrastructure. The equipment shall support high end security and industry standard encryption features with lower latency and higher through put.

End to end channel supervision should be supported. The equipment shall have a combination of MPLS-TP and L2 packet switched technology with traditional legacy interfaces and shall be complemented with synchronization and cyber security features.

The platform shall have the means to cross- connect legacy services into one or several bundled E1 streams for circuit emulation over packet switched network/SAT operations as and when required by addition of modules.

Enhanced traffic engineering using MPLS-TP technology as per relevant IETF standards and comply with all service standards and shall support E-Line, E-LAN, E-Tree and E-Access services.

Static configuration of bidirectional and co-routed communication channels shall be supported using the NMS. Dynamic routing shall be prohibited for all critical data channels. End to end channel supervision should be supported. The equipment shall be software controlled, of modular design and all modules shall form an integrated part of a 19” shelf. A separate rack arrangement shall be provided for housing the MPLS-TP equipment as per the standard adopted for SDH F.O. end terminal equipment. Each network element shall be manageable locally as well as from an operation center.

EQUIPMENT TECHNICAL REQUIREMENTS:

Description:

The proposed MPLS-TP fibre optic communication equipment should provide a Network with aggregation layer at MPLS-TP traffic along with legacy TDM interfaces and a core /Backbone Network on MPLS-TP technology.

The primary function of the communication network is to provide a highly reliable voice, video conferencing, tele-protection and data communication system in support of the SCADA/EMS. The communications support requirement for SCADA/EMS systems is for low & high-speed data, express voice circuits and administrative voice circuits & VOIPs.

The communication system shall provide data & voice (VOIP) connectivity across the various locations and connectivity of RTUs with Sub- LDCs and Sub-LDCs with MLDC.

A brief summary of the communication system requirements is as follows:

- (a) Standalone distance tele-protection commands interface preferably fully manageable from a common control center.
- (b) Data transport supporting Network Management channels in MPLS-TP technology.
- (c) The connectivity envisaged between RTUs/SAS and Control Centre in Wide Area Network (WAN) on TCP-IP using IEC610870-5-104 protocol. The equipment shall support digital VOIP subscriber & gateway functionality (SIP-Session Initiation Protocol) by connecting an integrated/external VOIP gateway.
- (d) Integrated differential protection functionality fully manageable under the same NMS.

Management: Remote management system with IP/Ethernet interface.

Redundancy Capabilities.

The equipment shall provide enhanced redundancy features in order to ensure highest availability of the communication network. The following redundancy schemes shall be supported (Hot standby) as per the BoQ:

- Redundant power supply unit or Distributed Power Supply
- Enhanced PSN traffic protection schemes
- Minimum 1:1 LSP protection switching

Telephony:

To support Digital VoIP subscriber and gateway functionality (SIP) by Connecting an external VoIP Gateway.

Traffic Protection Scheme.

1:1 Path protection

Minimum 1:1 protection of MPLS LSPs shall be supported. Switching from main to backup path shall be automatic, bidirectional and symmetrical. Configuration options shall exist for reversible or non-reversible operation. The main requirement of the network protection mechanisms is that they should be able to recover traffic very quickly (switching time should be less than 50msec as per MPLS-TP standard). Further, protection should also operate autonomously from the network operation center (without involvement of control plane or management system).

Synchronization.

- It shall be possible to synchronize the equipment using an external clock source, derived from a network or from an internal oscillator. The synchronization shall be configurable and it shall be possible to distribute the synchroni-

zation to other equipment as well. The system shall have the means of switching to select the synchronization source as well as a means of preventing the system from creating synchronization loops.

- The equipment shall support synchronous Ethernet and a synchronization selection process based on ESMC (Ethernet Synchronization Message Channel).
- The precision time protocol (PTP) as defined by IEEE/IEC shall be supported for frequency and time of day synchronization.
- The equipment shall support PTP transparent clock and PTP boundary clock functionality. The equipment shall be able to be synchronized to a GPS grandmaster and provide time of day information to other devices by using IRIG-B or SNTP.
- GPS Clock with NTP server should be supplied with NMS
- Configuration support for Sync E and PTP synchronization shall be available **e.g. by means of wizards or guided configuration.**
- Synchronization-Multiple type soft timing references should be available from multiple timing sources:
 - E1/T1/IECC.37.94 interfaces.
 - An external input of 2.048MHz
 - Synchronous Ethernet (SyncE) from GBEor10GE.
 - G.813 internal clock,free-run,accuracyof±4.6ppm
 - Precision Time Protocol(PTP)-IEEE1588v2PTP
 - Used in multicast Ethernet encapsulation modeITU-TG.8275.1
 - Must support atleast the following1588v2 PTP types
 - Boundary Clock(BC)
 - Ordinary Clock(OC) Master
 - Ordinary Clock(OC) Slave
 - Transparent Clock (TC)
 - Synchronization Status Message(SSM)support
 - Jitter and Wander according to ITUTG.823, G.825.
- The system time must support PTPv2 as the Time-of-Day (TOD) source (RFC 6374) for OAM time stamping.

The following GBE interfaces as per the distance given in BoQ should be supported:

- 1000 Base X
- SX, LX, EX, ZX, Bi-directional, preferably coloured.
- 10/100/1000BaseT/preferably GPONONU interface

The following SFP+1 GE interfaces should be supported:

- ER ,ZR ,SR ,LR ,BD ,preferably Colored &Tunable

All SFPs and SFP+ shall be of MSA 2000 compliant in order to work with any vendor FOTE equipment that is of MSA 2000 compliant.

The offered equipment should support the following environmental conditions

a. operation mode:

- ETSI-300-019-1-3Class3.1
- Temperature range:-5°Cto+55°C
- Relative humidity:5%to95%
- The offered equipment should support the following:

- EMC according to EN300386/2000,IEC61850-3,IEC61000-6-2
- Safety according to EN60950/2000
- Laser Safety according to IEC60825-1&2(AS/NZS2211.2)

b) In particular the following type tests should be complied as per IEC 61850-3/ equivalent IEC /EN Standard .

a. Power

Input: Auxiliary Voltage

b. Insulation Tests:

- i. Dielectric Tests
- ii. Impulse Voltage with stand Test

C. Influencing Quantities

- i. Limits of operation
- ii. Permissible ripples
- iii. Interruption of input voltage

e. Electro magnetic Compatibility Test:

- i. 1MHZ.burst disturbance test
- ii. Electrostatic Discharge Test
- iii. Radiated Electromagnetic Field Disturbance Test
- iv. Electrical Fast transient Disturbance Test
- v. Conducted Disturbances Tests induced by Radio Frequency Field
- vi. Magnetic Field Test
- vii. Emission (Radio interference level)Test.
- viii. Conducted Interference Test

f. Functional Tests as applicable for MPLS–TP equipment

g. Environmental tests:

- i.Cold Temperature
- ii. Dry Heat
- iii. Wet heat
- iv. Humidity(Damp heat Cycle)
- v. Vibration
- vi. Bump
- vii. Shock

Cyber Security:

The equipment shall support integration into a cyber-security architecture enabling cyber secure operation of communication network. The equipment shall be type tested for cyber security robustness by DSAC, a Device Security Assurance Center/ Cyber Security Certification obtained from Indian Govt. approved organizations. Type test certification by DSAC, a Device Security Assurance Center/ Cyber Security Certification obtained from Indian Govt. approved organizations, for cyber security robustness shall be done.

- Authentication ,Authorization and Accounting(AAA)
 - Local management port disabling
 - User roles (privilege-levels)
 - Radius based authentication
 - Security relevant local event logging (audit log)
 - Sys log

- Secured management communication
 - SNMPv3
 - SSH
- Denial of service (DoS) prevention for device functions and user traffic
 - Rate limiters for different traffic types
 - Firewall towards device management
- Traffic authentication.
- Access Control Lists(ACL)

The equipment shall be of robust design and hardening shall be done considering cyber security aspects.

- Preferably 802.1xdynamic port-based user authentication
- MAC level Port security
- In P2MPservice, spokes must not be able to talk to each other, unless otherwise configured.
- In MP2MP service, it must be possible to limit the number of MAC states a customer can inject into Edge Devices on a per VPN per end-point basis.
- OSPF Encryption must be supported for the equipment management.

Cyber Security Compliance:

The fibre optic terminal equipments proposed in this tender shall comply all the cyber security requirements defined in the IEC standard 62443-3-3.Necessary type test report obtained from Indian Govt. laboratory (CPRI)/ Authorized International laboratories for the above cyber security features shall be uploaded with the bid.

2.2.7.2 Other mandatory test:

As per the order dated 02.07.2020 of the Ministry of Power, Govt of India that apply to any item imported for end user or to be used as a component or as a part in manufacturing, assembling of any equipment or to be used in power supply system or any other activity directly or indirectly related to power system the compliance to following requirements are to be ensured. In this context all expenses towards the mandatory testing is to be borne by the project contractor.

- d)All equipments, components and parts imported for use in the power supply system and network shall be tested in India to check for any kind of embedded malware/ Trojans/ cyber threat and for adherence to Indian standards.
- ii) All such tests shall be done in certified laboratories that will be approved by the ministry of power, Govt of India.
- iii) Any import /equipment /components /parts from:“Prior reference” countries as specified or by persons owned by controlled by or subject to the jurisdiction or the direction of these “Prior reference” countries will require prior permission of the Govt of India.
- iv) Where the equipment / components /parts are imported from “Prior reference” countries with special permission, the protocol for testing in certified and designated laboratories shall be approved by the by ministry of power, Govt of India.

It is mandatory for the bidders/OEM from prior reference countries to obtain the type test report for having tested for cyber security features as per relevant standard from CPRI laboratory of India at their own expenses. As per CEA guidelines 2021, “All ICT based equipment/system deployed in infrastructure/system mandatorily CII are sourced from the list of the “Trusted Sources” as and when drawn by MoP/CEA”.

2.2.8. MTCTE Certification:

As per recent MoP guidelines MTCTE certification has to be obtained by OEMs /Importers before sale of Notified Telecom, Networking products and the same has to be furnished by the successful bidder before the award of work. The bidder shall furnish a undertaking in the offer towards submission of MTCTE certification before the award of work.

2.2.9 Quality of Service

Hardware support to ensure device internal and user traffic quality of service shall be provided.

- ≥ 8 hardware queue per physical port
- Configurable scheduling profiles
- Priority mapping tables (DSCP, PCP, EXP, PHB, TC, Source/Destination MAC, etc.,)
- Priority configuration for individual protocols (e.g. PSC, MCC,...)
- Port and service based rate limiting (at least single rate two color marker (SR2CM))
- Configurable to remote control for unicast, unknown unicast, multicast and broadcast per port.
- QoS (IEEE802.1p)VLAN services including QinQ (IEEE802.1ad)

Aggregation/Transport Interface Requirement.

MPLS-TP Functionality.

The following MPLS-TP functionality shall be supported:

- The equipment shall be capable of operating as a label edge router (LER) and label switch router (LSR) in MPLS-TP networks.
- Static configuration of MPLS-TP tunnels via configuration tool as well as network management system
- Bi directional MPLS-TP tunnels
- Priority handling using L2/L3 class of service information
- Mission critical services & guaranteed performance parameters for tele- protection applications meeting IEC60834-1 standard for distance protection along with security, dependability and transmission time using **stand-alone protection coupler connected to MPLS-TP Devices on Ethernet/E1 Ports.**
- Mission critical services & guaranteed performance parameters for differential Tele-protection applications meeting C 37.94 standard. For differential protection, relay to relay communication channel shall be provided through MPLS-TP equipment using IEEE C37.94 optical interface.

- The following topologies shall be supported.
- Point to point virtual private wire services (VPWS)
 - Tree structures
 - Virtual private LAN structures (VPLS)
 - Hierarchical VPLS structures (H-VPLS)
- End to end Operation Administration and Maintenance (OAM) channel with at least the following functionality
 - Continuity check messages (CCM)
 - Remote defect indication (RDI)
 - Route tracing (LSP ping /trace route)
- 1:1 traffic protection with <50ms switch over time
- Management functionality using dedicated MPLS channel.
- Port based MPLS assignment
- VLAN based MPLS assignment
- Circuit emulation of legacy services via MPLS-TP shall be supported..
- Monitoring through port function facility for all channels to know the load & traffic up to the lower level of the network.
- Mission critical services & Guaranteed performance parameters for tele- protection applications meeting IEC 60834-1 standard for distance protection along with security, dependability and transmission time using standalone protection coupler connected to MPLS-TP Devices on Ethernet Ports.

Ethernet Requirements:

- The proposed network shall support 802.3-2005 frame format
- The proposed network shall support automatic MAC address learning without impact on line-rate performance.
- The proposed equipment shall have Minimum 6x1Gbit/s optical ports & 2 x 10Gbit/s Optical Ports as per requirement shall be available for Ethernet up-link purposes.
- All 1 Gbit/s /10Gbits/s optical shall be available for Ethernet uplink purposes as well. The uplink 1Gbit/s/10Gbits ports must also support MPLS-TP encapsulation.
- Ethernet electrical connection: 10/100/1000BaseT
- Ethernet optical connection: 1000Base-X
- Protection by means of STP
- Port and VLAN based rate limiting
- VLAN based forwarding
- Supports Classification of Service (CoS) prioritization within a single VLAN.
- Supports QoS, optimizing Bandwidth allocation and simplifying network infrastructure.

- Priority handling(PCP/TC/PHB/EXP)shall be configurable
- Port based access(all traffic is mapped into MPLS-TP services)
- VLAN based access(separation o VLANs into different MPLS-TP services)
- Mix of port and VLAN based access and mapping into VPWS on the same physical port
- Traffic type filtering shall be supported (multicast, broadcast, unicast)
- VLAN mapping shall be possible
- SNMP MIBs.
- The proposed network shall support 802.3-2005 frame format
- The solution must support 1Gbps Ethernet client interfaces using pluggable optics.
- The proposed network shall support disabling MAC learning for point to point (E Line) Ethernet virtual circuits
- The proposed network shall support static MAC FIB entries as part of policy forwarding.
- The proposed network shall support a jumbo Ethernet frame of more than 9000 bytes; Supplier to mention the max size supported.
- The solution must support EPL, EVPL, E-LAN and E-TREE services.
- The proposed network shall support the participation and discard options for IEEE 802.3x Flow Control on access ports. Policing and bandwidth allocation.
- Preferably the proposed network shall support 802.1x authentication on UNI Ethernet ports.
- The proposed network shall support tunnelling and discard options for all Bridge management groups of protocols.
- Preferably the proposed network shall support programming Ethernet type value for Q-in-Q tunnelling globally and on port-basis.
- Preferably the proposed network shall support VLAN based VLAN stacking/ tunnelling with the ability to support multiple outer VLAN tunnels per E-UNI. The proposed network shall be able to apply multiple outer VLAN tags on a E-UNI based on inner/customer VLAN ID if the customer frame is tagged or a configurable VLAN ID for untagged frames.
- The proposed network shall support VLAN ID Translation (not tunneling/stacking), i.e., translating VLAN ID received from one node to a different (network) VLAN ID at originating E-UNI and translating back to customer VLAN ID at terminating E-UNI.
- Ethernet circuits must be completely transparent to any traffic. Detail any traffic types that are not transparently carried across circuits.
- The solution should support color-aware and color-blind policing.
- The solution should support Broadcast Storm Control (BSC)
- Protected services must have adversely routed back up path to which traffic is

switched to in less than 50ms when the primary path fails.

- Protected services must failover to the backup path based on complete failure of the primary path and based on partial traffic loss (signal degradation).
- The solution must support arbitrary network topologies including rings, mesh and partial mesh topologies.
- The solution must support VLAN swapping for EVPL services such that each side of an EVPL may use different VLANs or one side may be untagged with the other being tagged.
- The solution shall support data link OAM:ITU-TY.1731 or equivalent IETF G-8113.1 for Fault management and performance monitoring and covering Fault Management, Proactive Connectivity, Verification, Continuity Check, and Remote Defect Indication for MPLS-TP Equipment.
- The solution shall support 802.3ah EFM.
- The solution must support transparent transport of customer class of service markings when present, including 802.1p, IP DSCP and MPLS EXP
- Preferably the proposed network shall have UNI (User Network Interface) and NNI (Network Node Interface). Typically, UNI would be configured in 802.1Q mode or Q-in-Q mode and NNI shall be in MPLS-TP(P2P) or VPLS/H-VPLS (MP2MP) mode. In order to simplify the operation of the product it is intended that no restriction be placed on UNI and NNI ports and all the ports shall be capable of supporting any mode of operation.
- The proposed network shall support configuring all 4094 VID on all ports and at the same time support all 4094 VLANs simultaneously. The operator must be able to reuse the same VLAN-ID on a different port on the same switch and terminate it into a different PW.
- The proposed network shall support the capability of designating an Ethernet port as a primary and another as a backup for that port. When the primary port is active, The proposed network will always receive and send traffic on the primary port. The proposed network could receive traffic on the backup port, but will not pickup that traffic as long as the primary port is active. When the primary port fails, the backup port becomes active and The proposed network immediately starts receiving and transmitting traffic on that port. The application of this requirement is to allow 1:1 redundancy on the client side. The proposed network shall support the primary and back up ports being on different slots. When the primary port recovers after a failure, The proposed network shall revert the primary port to the active state and the backup port to the standby state.

Ethernet over MPLS-TP Requirements

- The proposed network shall support Ethernet MPLS Pseudo Wires per RFC 5462.
- The proposed network shall support Ethernet MPLSPWs for Ethernet frames arriving over physical Ethernet interfaces.
- The proposed network shall support the configuration of IEEE 802.1p user priority bits to MPLS PW EXP bit mapping on ingress when performing

MPLS encapsulation. The proposed network shall be able to write the EXP bits accordingly.

- The proposed network shall support static setup of Ethernet MPLSPWs
- The proposed network shall transparently pass customer BPDU control frames over MPLSPWs, by configuration on an attachment circuit level (e.g., VLAN ID, Ethernet port)
- Preferably the proposed network shall support mapping of VLAN Tunneled/Stacked (Q-in-Q) Ethernet frames to a pseudo wire based on double look-up of outer and inner IEEE 802.1q VLAN IDs.
- The proposed network shall support the configuration of IEEE 802.1d user priority bits + DEI to MPLS PW EXP bit mapping when performing MPLS encapsulation. The proposed network shall be able to write the EXP bits based on the outcome of this mapping.
- The proposed network shall support MAC address flushing across the VPLS instance when it learns of a local topology change on the access network.
- MPLS-TP should allow pseudo-wire services for the following Ethernet Services:
 - Ethernet Line (E Line) for P2P connectivity, used to create Ethernet private line services, Ethernet based internet access services, and P2P Ethernet VPNs. These include:
 - Ethernet Virtual Private Line (EVPL): P2P connectivity over shared bandwidth. Service can be multiplexed at the user to network interface (UNI) level.
 - Ethernet LAN (E LAN) for multipoint to multipoint (MP2MP) (any to any) connectivity, designed for multipoint Ethernet VPNs and native Ethernet Transparent LAN Services (TLS). These include:
 - Ethernet Private LAN (EPLAN): Multipoint connectivity over dedicated bandwidth, where each subscriber site is connected to multiple sites using dedicated resources (so different customers' Ethernet frames are not multiplexed together).
 - Ethernet Virtual Private LAN (EVPLAN): Multipoint connectivity over shared bandwidth, where each subscriber site is connected to multiple sites using shared resources. This is a highly cost effective service, as it can leverage shared transmission bandwidth in the network.
 - Ethernet Virtual Private Tree (EVP Tree): An EVP Tree is an E Tree service that provides rooted multipoint connectivity across a shared infrastructure supporting statistical multiplexing and oversubscription. EVP Tree is used for hub and spoke architectures in which multiple remote offices require access to a single headquarters, or multiple customers require access to an internet SP's point of presence (POP).
- The proposed network shall support rate limiting (policing) on all Ethernet interfaces per RFC 2697 and 2698.
- The proposed solution shall provide traffic management support with the following key functionalities:

- Dedicated traffic manager role in NMS enabling definition of traffic management related parameters for services.
- Service profiles, enabling a traffic manager to create “templates” for users configuring services
- Queueing profiles and traffic scheduling algorithm should be configurable
- QoS with ratelimiting and optionally hierarchical QoS
- The proposed network shall support L2 Ethernet classification based on physical port, IEEE 802.1q service VLAN ID (EVC), 802.1p user priority bits field value (EVC plus CoS), and IP DSCP/precedence bits (EVC plus DSCP). Any of these fields could be a wildcard in a given configuration.
- The proposed network shall support VPLS (Virtual Private LAN Service)
- The proposed network shall support Hierarchical VPLS(H-VPLS)
- The proposed network shall support Q-in-Q as access to a virtual switching instance
- The proposed network shall support Ethernet MPLS PWs as access to a virtual switching instance
- The proposed network shall support multi-class PWs with mapping between 802.1p bits and MPLS PW exp bits as defined for Ethernet MPLS PWs
- The MPLS Packet Transport shall support mapping between incoming exp bits on MPLS PW spokes to VPLS MPLS PW exp bits on ingress upon transmission over the VPLS and on egress upon transmission on the spokes

MPLS-TP Requirements

- The proposed network shall support Bidirectional Forwarding Detection (BFD) for MPLS LSP as defined in IETF draft draft-ietf-bfd-mpls-04.txt or any subsequent revision of that draft
- Setting BFD message frequency for both the transmission and minimum receive interval shall be as low as 3.3, 10, 100 m secs.
- MPLS-TP implementation should be based on NMS based provisioning of services and LCT based provisioning of services.
- Tunnel OAM should be based on BFD.
- The proposed network shall support configuring the exp field value of the MPLS BFD messages
- The proposed network shall support MPLS ping in both ping and trace mode as specified in IETF RFC 6426
- The proposed network shall support egress shaping per LSP.
- The proposed network shall support user configurable mapping between outer MPLS exp bits and Ethernet user priority bits per 802.1d
- The proposed network shall support MPLSPW encapsulation over GFP-F
- MPLS-TP OAM will be based on the GAL/G-ACH concept) and must work independently of the control plane.

- OAM must work within the data plane, forward and backward traffic must follow the same path and optimal protection mechanism for all topologies including ring and star topologies (Segment, Ring and Linear protection).
- BFD OAM should be according with the ITU-TG8113.2 or later relevant document (IETF)
- The solution should use Hierarchical methods to reduce and support the mesh of tunnels / Paths.
- The proposed network shall support static MPLS label addition, swapping and popping as specified in RFC 3032.
- It shall support configuring failure detection time in absolute time or as a multiple of the receive frequency
- It shall support Proactive Connectivity Verification, Continuity Check, and Remote Defect Indication for the MPLS Transport Profile as per RFC 6428
- The proposed network shall implement class based queuing at each logical interface.
- Preferably the proposed network shall support hierarchical Queuing whereby a diffserv scheduling system can apply on an LSP basis.
- Preferably the proposed network shall support the definition of a Diffserv scheduling system per logical interface.
- The proposed network shall support rate limiting per interface and per sub interface on all interfaces.
- The proposed network shall provide the capability of setting the MTU size
- The proposed network shall provide the capability for configuring the PWID
- The proposed network shall support binding a PW to an LSP.

OAM Requirements

- The OAM support should be based on recommendations in G.8113.1 and G.8113.2. Operations, administration and maintenance mechanisms for MPLS-TP networks using the tools defined for MPLS.
- Preferably the system shall support Ethernet OAM in full compliance with 802.1ag, 802.3ah, Y.1731 or G 8113.1 covering Fault Management, Proactive Connectivity, Verification, Continuity Check, and Remote Defect Indication.
- The proposed network shall support a full suite of OAM features and functionality to easily monitor, administer and troubleshoot all the services.
- The proposed network shall support OAM framework as defined in RFC 6371 and requirements defined in RFC 5860
- The system shall support OAM for
 - a) Detection & recovery of Path Defects
 - b) Diagnosis of a Broken Path

- c) Preferably Service Level Agreement Measurement for Jitter, Packet Loss and Latency.
- d) Frequency of OAM Execution
- e) Inter-working for Fault Notification
- f) Detection of Denial of Service Attacks
- g) LSP/PW ping & traceroute
- h) Preferably VPN ping. LSP Ping for OAM as per RFC6426 standard through MPLS-TP tunnels
- i) Preferably SNMP traps.
- j) Mac Pinging – Continuity Check LSP Ping for OAM as per RFC6426 standard through MPLS-TP tunnels. Continuity check or Bi-Directional forward detection must be included in MPLS-TP Tunnels
- k) Trace-route
- l) Loop-back Connectivity check
- m) Ethernet–Local Management Interface(E-LMI)
- n) Maintenance End Points(MEP)on switch ports
- o) Maintenance Intermediate Points(MIP)
- p) ConnectivityFaultManagementover802.1adlinks
- q) SNMP traps
- r) Preferably the System shall support Link Layer OAM (802.3ah) with following functionalities or as per relevant IETF standards

OAM discoveries

Link Monitoring

Remote Loopback

Remote Fault Indication

- The OAM packet should interoperate with third party network element All attributes of OAM packets should be understandable by third part network elements(attributes like timers, no.of retries, dead interval, enable, disable OAM etc)
- OAM should inform the management system / third part application about the status of service, connection per box basis and per user basis. Details information should be available like ingress and egress value, connection ID, port ID.
- There should be mechanisms to fetch delay, jitter and round trip delay, packet loss and frame loss for MOS, unicast & multicast.

- There shall be a mechanism to measure delay, jitter and round trip delay, packet loss and frame loss end-to-end for a given flow by any means. The system should synchronize the counters on both ends.
- The exchange of OAM packets should be end-to-end with provision to count the number of times connections were down. It should identify the status of the link.
- OAM should provide a mechanism for trace-route to help operators to trace the path from ingress to egress network element with details of intermediate element.
- The OAM packet should be isolated to the user's datapacket and it should be given highest priority.
- OAM packet should have attributes pertaining to ingress and egress filter.
- OAM should run per connection basis. The connection can be made using VLAN, Port, or other attributes.
- The solution shall support debugging through Event Logs, Alarm Logs, Performance logs, debug files in Equipment.
- Selective debugging of data plane aspects shall be supported including logging of individual ACL rules, FIB events, etc.
- Configuration management: backup/restore of configuration from a remote system using standard protocols like FTP, or TFTP. All of these functions shall be able to be performed through in-band interfaces and OOB management Ethernet port.
- SNMPv1, v2c and v3 shall be supported.
- Intensive OAM processing shall be supported on per LSP/PW basis (GAL/GAch for every LSP/PW),
- Sub-50ms PG (protection group) processing needs to be implemented on per LSP/PW basis.
- Continuity Check messages
- Remote defect Indication
- Route tracing
- The proposed network shall support 802.1ag Connectivity Fault Management standard
- The proposed network shall discard customer frames that contain unassigned customer VLANs on 802.1q port (including untagged customer frames).
- The proposed network shall support counters for the number of broadcast, unicast, multicast, and unknown unicast frames flooded per VLAN.
- The proposed network shall support MPLS-TP OAM requirements per RFC 6428
- The proposed network shall support the MPLS-TP OAM bundled with MPLS-TP tunnel for the monitoring and the protection.

- The MPLS OAM or BFD packet sending interval should be user configurable down to 3.3 ms.
- The proposed network shall support RMTF(Remote Fault)/FEFI(Far End Fault Indication) capability over management plane
- The proposed network shall support AIS and RDI (also 802.1ag)for ELine EVCs.
- The proposed network shall discard customer frames that contain unassigned customer VLANs on 802.1q port (including untagged customer frames).
- The proposed network shall support tunneling /discard of customer BPDUs

Scalability:

- Every UNI port must be able to support full range Customer VLAN IDs both in transparent and Channelized (mapped) mode. Different customers must be able to re-use the same range of CVIDs if they are attached to different UNIs.
- Every customer VLAN IDs (minimum 4089 CVIDs) on each physical port should have at least 8 queues for customer traffic /QoS handling.
- Each physical port should have buffering inbuilt. (Mention the amount of buffer per interface in terms of ms)
- The solution should use Hierarchical methods to reduce and support the mesh of tunnels / Paths.
- The solution should support multi segment pseudo wires.

Management Communication Channel:

- Support Management LAN interface for DCN.
- Support in-band MCC for Ethernet MPLS network.
- IPV4andOSPFV2should be supported.
- Management VLAN should be supported.

3.8.Security Requirements

- The proposed equipment shall support the following security features
- 802.1xdynamic port-based user authentication
- MAC level Port security
- SSH support
- Customer-facing ports(UNIs)on the CE device must be disabled and should not forward any traffic as default security behavior.
- Customer-facing ports (UNIs) on the CE device must not forward any traffic even after it is enabled, until it is attached to a service, e.g. PW
- Customer-facing ports (UNIs) must not allow access to Management Network, even though Customer may use/spoof combination of MAC addresses, VLAN IDs, IP Subnet (Address) that are legally allowed access to Management network.
- Customer-facing ports (UNIs) must ensure that they do not have access to other customer's traffic in any way.

- Network control Protocols must not be coupled with customer control protocols to maintain the stability of the Provider network. Customer control-plane traffic such as BPDU, ISL etc. must be tunneled end-to-end without interacting with SP control-plane.
- In P2MP service, spokes must not be able to talk to each other, unless otherwise configured.

Proof of Concept Test:

~~The Proof of concept test for the offered FOTE is a part of tender evaluation process for MPLS-TP FOTE equipment. The MPLS-TP vendors those who have already carried out Proof of concept for the offered FOTE successfully in APTRANSCO should attach the copy of document for having executed the Proof of concept in APTRANSCO and no need to conduct the Proof of concept in APTRANSCO again.~~

~~16. If the bidder /OEM fails in the Proof of concept test, they will be disqualified by APTRANSCO. The bidder/ OEM shall conduct a proof of concept test for VOIP voice data, RTU data, Video signals and other protection signals (differential and distance inter trip) through MPLS-TP technology and for having integrated with other OEM FOTEs (MPLS-TP). The functionality of Tele protection coupler through E1 link and differential protection through IEEE C37.94 over MPLS Network is to be tested.~~

~~APTRANSCO will provide necessary help in following aspects:~~

- ~~a. Arranging access permissions from Operation wing.~~
- ~~b. 48V DC supply and single phase AC supply for the equipment at communication room DCDB and ACDB, space for temporary equipment installation.~~
- ~~c. Test setup may consist of more than one station as per the plan.~~

Power Supply:

The equipment shall operate from a nominal 48V DC (-15% /+20%) battery. The equipment should be cut-off beyond this range and automatically restored in the operating range. The equipment /system shall support dual power feed or (1+1 hardware protection) i.e. that two power sources can be connected directly to the equipment (two connection points) or dual power feeder. The operating voltage should be 48V DC.

The equipment shall supervise the power source and provide corresponding alarm in case of loss of either power source. Supervision relay having potential free contacts and audible alarm shall be provided. Necessary surge protection shall be provided to filter all surges.

4.0 Safety:

The equipment shall be safe to use and shall comply with EN 60950-1 and IEC 60255-27 Measuring relays and protection equipment product safety requirement.

5.0 Ambient Conditions:

Storage and transport:

- Temperature range: -25°C...+70°C
 - Humidity: max. 95% (no condensation)
- Operation;
- Temperature range: -5°C...+55°C
 - Humidity: max.95%(no condensation)

6.0 Electro magnetic compatibility (EMC):

The equipment shall comply with the EN55022classA, EN61000-6-2, EN 61850-3, and shall be in conformance with CE.

7.0 Mechanical Construction

The equipment shall be available as a 19” shelf to be mounted in a 19” rack or 19” cabinet. It shall be of robust design. All modules shall be integrated in the same shelf. All connectors shall be accessible from the front and comply with international specifications.

Equipment Sub Racks shall be steel/ aluminum fabricated and finished on all surfaces. All metal and welds shall be thoroughly cleaned and sanded to obtain a smooth finish .All surfaces shall be treated for rust and primed to form a bond between metal and the finish coats of paint. All equipment racks, enclosures and equipment, including distribution frames, shall be clearly labelled with unique identifiers consistent with Contractor supplied floor plans and rack elevations. Dust and moisture protection shall be as per the IP41 specification, or better standard. The equipment cabinet shall be built in such a way that it prevents the entry of all type of rodents.

The Contractor is required to provide and install all additional necessary indoor and outdoor cable raceways. Signal cabling and power cabling shall require separate cable raceways. Signal and power cabling shall not share the same raceways and shall be installed as far apart as is practical. Adequate shielding shall be provided as required. Especially, all the F.O. patch cords from FODB to FOTE cabinet shall be enclosed with a minimum of 1" flexible standard steel/Aluminum hose. All the cables including power, control, communication cables etc.,will be in the scope of contractor/bidder as per the site requirement.

The Contractor shall be required to provide protection from lightning and transient voltages for all wideband communications equipment. Suitable surge voltage protection devices shall be installed in all panels. Proper design approval shall be obtained from APTRANSCO before supply.

All equipment provided under this specification, shall be physically mounted in sub-racks and cabinets (enclosures).The Contractor shall determine and propose for the Employer approval, the type, size, weight and manner of installation for each location.

Equipment Sub Racks shall be steel/aluminum fabricated and finished on all surfaces. All metal and welds shall be thoroughly cleaned and sanded to obtain a smooth finish. All surfaces shall be treated for rust and primed to form a bond between metal and the finish coats of paint. All equipment racks, enclosures and

equipment, including distribution frames, shall be clearly labeled with unique identifiers consistent with Contractor supplied floor plans and rack elevations.

Dust and moisture protection shall be as per the IP41 IEC 60529 / IS12063 and the type tests and routine tests prescribed in IS/IEC 60947 Low - voltage Switchgear and Control gear standards shall be performed on the complete panel assembly. The degree of protection and the panel thickness shall be mentioned in the drawing. Typical panel drawing shall be enclosed. The equipment cabinet shall be built in such a way that it prevents the entry of all type of rodents.

The Contractor is required to provide and install all additional necessary indoor and outdoor cable raceways. The cable raceways shall be in conformance with the following:

Signal cabling and power cabling shall require separate cable raceways. Signal and power cabling shall not share the same raceways and shall be installed as far apart as is practical. Adequate shielding shall be provided as required. Especially, all the F.O. patch chords from FODB to FOTE cabinet shall be enclosed with minimum of 1" flexible standard steel hose.

The Contractor shall be required to provide protection from lightning and transient voltages for all wideband communications equipment. Suitable surge voltage protection devices shall be installed in all panels. 36-72V DC supervision relay (For supervising DC-I and DC-II source) having potential free contacts and audible alarm should be made available in the rack.

8.0 Earthing:

For each facility, the Contractor is responsible for meeting the following station and equipment earthing requirements:

- (1) All safety earthing shall be in full compliance with EMI/EMC requirements as per relevant international standards.
- (2) Each cabinet (enclosure) or cabinet (enclosure) group shall include suitable signal ground and safety earth networks. The signal ground network shall terminate at a separate signal ground stud connection isolated from safety earth.
- (3) Each earth/ground network shall utilize copper bus bars, copper braids and/or 16 sq mm or bigger earth cable. All equipment earth/ground connections shall be made directly to the equipment chassis utilizing grounding lugs and secured metal-to-metal with star washers. Use of the enclosure frame, skin or chassis mounting hardware as part of the earthing /grounding networks, is not acceptable.
- (4) The safety earth network shall be connected to "earth ground" at the safety earth stud. The earth stud connection shall be sized for an external earthing cable equipped with a 2/0 solid copper lug secured metal-to-metal with star washers. Primary AC feeds and distribution within enclosures requires earthing wire connection to the safety earth stud.
- (5) The Contractor is responsible for providing all required earthing/grounding cable and installation. Cabinet (Enclosure) and equipment safety earthing shall be subject to the Employer's approval. Dedicated earthing for the offered MPLS -TP equipment shall be provided by means of a separate earth pit in compliance with

the standards mentioned for earthing the equipment and the separate earth pit of MPLS-TP equipment shall be connected with the earth mat of the substation through earth flat riser and flexible tinned copper strip.

NETWORK MANAGEMENT SYSTEM (NMS):

The network management system (NMS) shall have facilities to supervise, monitor, control and configure each equipment and the whole network. It shall have capabilities of fault, configuration, performance and security management.

It shall provide various graphical views to the network such as geographical overview, logical network structure, and hierarchical view. The network management system shall allow defining different user profiles.

A comprehensive alarm management shall show current alarms such that icons of the network elements change their colors according to the alarm level. The alarms shall be categorized as critical, major, minor alarms and warnings. A summary shall indicate the total number of alarms and warnings in the entire network. An alarm list shall list all alarms of the entire network according to the time of their occurrence. It shall be possible to filter alarms with various filter criteria. Operators shall be able to add comments to the alarms.

The NMS shall support end-to-end service provisioning for MPLS-TP as well as for TDM based services. For MPLS-TP based services, (all service types VPWS, Tree, VPLS) shall be supported by the end-to-end service provisioning functionality. The NMS shall perform channel calculations based on various parameters such as available bandwidth, number of hops, through put, provisioned bandwidth/services and channel diversity requirements.

- The adequate information about proposed TMN system architecture implying all relevant detailed data about compliance with mentioned ITU-T recommendations as well as about technology-specific (SDH/Data) issues must be supplied.
- Detailed system and interface documentation, including specification of their capabilities as well as the state of compliance with ITU-T and ETSI standards is required.
- State of compliance with other related standards, in particular with ISO,IETF and TMF, is required. The list of complied industrial standards must be provided.
- TMN system must include following levels and components concerning network management and operation:
 - Element Management System(EMS),
 - Network Management System(NMS),
 - Remote Management Client (RMC),
 - Local Craft Terminal (LCT)
- The EMS should represent the HW and SW components used for managing of one or more NEs.The EMS should provide management across a subset of NEs on an individual or collective basis, typically across single vendor equipment.
- The EMS must perform management functions across the Element Management Layer (EML, as per ITU-TM.3010) of the TMNLLA. The NMS should represent HW and SW components used for managing of an SMSN (SDH Management Sub-

Network) as a whole.

- The NMS should provide end-to-end network view of the entire management domain enabling management of the NEs contained in the SMSN.
- The NMS must perform management functions across the NML of the TMN LLA. The NMS must have a Client/Server architecture enabling a scalable expansion of the Management capacity and tasks distribution.
- The Management System must have at least one NE that is connected to an OS, called a Gateway Network Element (GNE). An interface to establish this connection must be provided.
- The Management System must have Gateway Protection for GNE redundancy.
- Management solution must provide end-to-end view and manage of the entire domain.
- Both EMS and NMS must have MMI (GUI). Provided MMI must demonstrate similar look and feel for all SMSN involved. User-friendly MMI is essential.
- The offered management system must include a single unified NMS (network management system) and multiple EMSs (element management systems) for different product lines and/or scalability purposes of same vendors.
- Single EMS and NMS to manage the network on the Access Metro and core
- All data/SDH/Optical trails as well as maintenance actions should be managed by the NMS (top to bottom).
- The NMS must support Control Map to enable easy viewing and impact assessment of the various management channels and links carrying them. This includes DCC and GCC.
- The NMS must support upto 100NEs
- The NMS must support multiple physical and logical graphical views of the same network (Physical, Optical, ETH/MPLS, etc.) with Logical Element.
- The NMS must support Resource Domain Partitioning with fine granularity to allow different users access to different network resources (per NE/card/port/HO trail).
- The NMS must support Graphical network usage chart – graphically show used/free resources over the whole network or drill-down into a link. For links, it should be possible to display availability in case of network growth.
- The NMS must support Automatic PM History collection and built-in report generation (graphical and tabular) for Historical PM.
- The NMS must support multi-route trails (protection/restoration).
- The NMS must implement the Network Management Layer (NML) as defined in the TMN Logical Layer Model.
- The NMS must have a rich Graphical User Interface (GUI). It is required that it will be possible to perform any Network Management operation via GUI without the need for the user to perform Command Line Interface (CLI) commands.
- The NMS architecture must be based on client-server relationships using standard technologies.
- The NMS must scale to manage upto atleast 300 devices. List and describe the device management capabilities. Standalone and integrated Tele protection shall be

manageable through same NMS.

- The management system should support display of:
- Data logical layer showing Switches and the topology
- The NMS will allow the provisioning, monitoring, operation and troubleshooting of the entire network from a single interface location. The single unified NMS must support management of MPLS, Describe this facility, addressing amongst others the ISO conceptual model of all key functional areas (fault management, configuration management, performance management, and security management) of network management.
- It should be possible to present 3rd party equipment as topology links and trails
- An upper level management system is required. Management functions must be based on TMN concepts of management layering (as per M.3010). This system will provide unified management capabilities to the entire managed domain. The interface to upper Management level should be based on the CORBA Technology or SNMP.
- Connectivity of the various management layers (NMS system and lower management systems, EMSs) must rely on a standard Management Communication Network (MCN). Both LAN and WAN connectivity must be enabled. Lower level management systems must be accessed directly or by MCN.
- The NMS should enable integration of additional equipment types (related technologies as well as multi-vendor sub-networks as per SNMP).
- Interfaces between EMS and NMS should be based on the CORBA technology and should relay on TMF guidelines (TMF 509, TMF 513, TMF 608, TMF 814) that provide CORBA object models or SNMP.
- Insertion and Removal of NEs should automatic once the function activated
- The management system will have the ability to integrate 3rd-party SNMP equipment.
- The Offered TMN system shall be capable of integration to other OEM's NMS/UNMS upwardly through SNMP-NBI. The interface shall accommodate all required functionalities to implement any open source software (OSS) such as
 - (i) Real time formalities & Synchronization
 - (ii) Providing of Circuits
 - (iii) Upload of N/W topology.
 - (iv) Monitoring of circuits for topology & circuit changes
 - (v) Alarm handling

The OEM NBI has to support the PDH, SDH and MPLS-TP related data and is not limited to the following.

NBI Support required for Network Inventory:

1. NE details
 - a. Name
 - b. Location

- c. IP Address
 - d. Product name(NE Model)
 - e. Version
- 2. Physical Ports details
 - a. Name
 - b. Layer rates
 - c. Directionality(Unidirectional/Bidirectional)
- 3. Hardware Inventory details
 - a. Name
 - b. Expected Equipment type
 - c. Installed Equipment type
 - d. Part Number
 - e. Serial Number
 - f. Version
 - g. Occupying Holder name
 - h. Holder Type(Rack/Shelf/Sub-Shelf/Slot/Sub-Slot)
 - i. Holder State(In Service/Out of Service)
- 4. Protection Groups(MSP/MSSP)details
 - a. Protection Group name
 - b. Protection Group Type(MSP 1+1,MSP 1:n,2F-BLSR,4F-BLSRetc)
 - c. Layer rate
 - d. Reversion Mode
 - e. Protection Group Parameters(MSSP Ring Node ID, WTR Time etc)
 - f. Worker Port(s)
 - g. Protecting Port
- 5. Topological Links details
 - a. Layer rate
 - b. Directionality
 - c. A End Port details
 - d. Z End Port details
- 6. Cross-Connection(As individual cross-connects for each network element) details
 - a. Rate
 - b. Cross Connection Type(2way, 3way and 4way)
 - c. Directionality (Unidirectional / Bidirectional)
 - d. Active status
 - e. Source & Destination CTPs for both working and protecting direction
- 7. Sub-Network Connection (As trails, as exposed from under lying NMS/EMS) de-
tails
 - a. Name
 - b. Layer rate
 - c. SNC Type(2way,3wayand4way)
 - d. Directionality(Unidirectional/Bidirectional)
 - e. Source & Destination details

- f. Route details(List of all cross-connects in this SNC)
- 8. Support to expose Ethernet bridges called as Matrix Flow Domains (MFDs)
- 9. Support to expose Ethernet services called Flow Domain Fragments(FDFrs)
- 10. Support for extracting and configuring the maintenance operation such Local Loopback / Remote Loopback.
- 11. Support for Trail Remaining, facility to set the Circuit label against each mapping.

NBI Support required for Alarms data:

The under lying NBI of NMS/EMS or the NEs should support the following.

- 1. Alarm notifications
- 2. Alarm synchronization

NBI Support required for Performance data:

- 1. Require Performance data from NMS/EMS NBI or from the NE level.
- 2. The U-NMS has the facilities to support Text NBI, FTP or any other vendor proprietary NBI interface(s).
- 3. Should support 15mins performance data KPIs
- 4. Should support 24hrs performance data
- 5. Should support current performance data
- 6. Support facility to Enable and Disable PM data for any Physical ports, time slots.

NBI support for Activation / Deactivation:

- 1. NBI should support to create / modify the cross connections in the ports involved in the service.
- 2. NBI should support to create/modify the user labels of NE, Port, Cross Connections and Physical Links (Topological Links)
- 3. NBI support for Ethernet service upgrade, down grade and end point shifting support for Services.

System HW Requirements

- o System must be designed in a way that would ensure that no database information would be lost at shutdown procedure.
- o Back up management Workstation should be provided and ensure full Management Redundancy. All information must be mirrored automatically between the management stations in order to prevent data loss in case of a failure of the working station.

- Switching from active to the stand-by station and vice versa must be automatic or available only for the authorized operator. This action must be without any effect on the traffic.
- The server/workstation and craft terminal shall have suitable processor(s) which shall be sufficient to meet all the functional requirement and expansion capabilities stipulated in this specification. Only reputed make like Dell, IBM, HP make shall be supplied.

System SW Requirements

- EMS/NMS Operating system (OS) must be based on a widespread commonly accepted latest version of OS, which is also independently commercially available. OS upgrading must not affect traffic, database, communication SW, EMS/NMS SW or other SW.
- EMS/NMS database must be a relational database and SQL support is mandatory. The database must be independently available .It must be possible to duplicate the EMS/NMS database. The upgrade of the database SW must be carried out without any data corruption and traffic interruption.
- EMS/NMS SW upgrading must be carried out without affecting traffic, EMS/NMS DB, OS or other SW.
- Functional concept of the proposed system must comply with the FCAPS Management Functional Areas function sets requirements defined in the ITU-T M.3400.
- SW reset (including hot reset) must not affect traffic or element configuration. Present SW configuration must be stored in each NE. It must be possible to store more than one SW version in each NE.
- In the case of management connection loss, traffic must not be affected and the performance monitoring data must be stored into NEs. This data must be available to the operator view when connection with the management station is re-established.
- After a power break, NE must always return to its predefined settings in designated time that must not be longer than 30 minutes. That designated time must herein be stated.
- It must be possible to remotely download and activate SW to all NEs from the EMS/NMS. Both downloading and activating SW processes must not affect traffic. In case of the activation of system software that may require rebooting of MPLS-TP equipment, the equipment shall restore to functionality and traffic within 5 minutes. This is stipulated to minimize the outage of Communication Equipment.
- It must be possible to download data from EMS/NMS to all NEs such as NE configuration. It also must be possible to upload data from all NEs to EMS/NMS such as: performance and NE configuration. These processes must not affect traffic.
- It should be possible to select a number of trails from the trail list and print all their endpoints and resources, as well as selected attributes.
- A Timing Map window should enable the user to conveniently monitor the network's timing topology.
- The NMS should provide Customizable /Standardized Alarms color codes.
- SW Enhanced Features

- A thorough description is required regarding the support and implementation of the following features in the proposed Management System:
- Automatic Path-finding End-to-End for SDH/MPLS-TP/ETHERNET/Optical trail creation at the NMS level using configurable criteria.
- Shared ducts allowing the user to specify the shared resources the link/trail may use. In case two links/trails use the same resources, the management system should be able to find out that the same resources are used by multiple links/trails.
- The Bidder shall specify if the management system can be used to complete the topology and represent external, passive or unmanaged NE and to which extent.
- A Sophisticated Customer Network Management (CNM) providing the ability to partition the managed network's resources (domains) amongst various users/clients and assigning them different rights and capabilities (profiles) should be available. This will enable to lease ports, cards, or entire NEs to CNM clients, and give them the means to monitor or even manage these resources.

Performance Monitoring Requirements

- The following features should be provided:
- Performance monitoring data collection ,processing ,storage
- Source for Performance Monitoring (PM)data: TDM/Ethernet traffic
- PM data presentation using tabular and graphical report
- PM database management:
- The NMS must provide information for all its managed elements via a single north bound interface.
- The NMS north bound interface must support at least one of the following:
- TM Forum's Multi Technology Network Management (MTNM) TMF-814 CORBA based standard or SNMP.
- SNMPV3.
- The SNMP north bound interface must support alarms management functionality.
- The NMS must have 1 no. North bound and 1 no. south bound interfaces at present and shall support at least two (2) concurrent northbound/southbound interfaces in future.
- Different performance at the interface, device, and protocol levels will be collected on a regular basis. The polling engine in the network management system will be utilized for data collection purposes. The network management systems shall be capable of collecting, storing, and presenting polled data.
- The NMS will show all current values of 15M and 24HPM counters forth at trail.
- The management system shall support display and collection of all PM data and counters supported by the NEs.
- Current PM data shall be visible from the management system on a per trail/service basis.
- Historical PM data shall be collectable to files for export/browsing.
- Historical PM data for ETH ports shall be collected and displayed as a report per port with graphical display of the information
- Historical PM reports need to support export to CSV

- It will be possible to collect historical PM data into a dedicated database from which reports may later be retrieved in different cross-sections including:
 - In table form
 - In different aggregation periods
 - For a given date range
 - Per trail/service
 - The management system shall support display and collection of multi technologies of optics, SDH and Data.

Reports and analysis

- The system must support inventory reports with details on total number of cards and sub cards installed in the network, the utilization of cards and ports in percentage and inventory attributes per element
- The system should provide detailed and flexible reporting capabilities to answer the following information requests:
 - Total no. of free services lots
 - Total no. of free client ports
 - Cards and ports installation and removal trend over time—detailed per location, card type, operation, date.
 - Total no. of installed cards and transceivers—in their name, type, category, location, part number, SW/HW version.
 - Cards configuration mismatch report— where card were wrongly configured and hence do not function properly
 - The system should have the capability to generate new, customized reports per demand
 - The system should be able to send information by mail upon a threshold cross in any inventory value
 - The system should be able to export reports in CSV/HTML /PDF/ formats.

NMS Hardware capability.

The network management system (NMS) shall have facilities to supervise, monitor, control and configure each equipment and the whole network. It shall have capabilities of fault, configuration, performance and security management. It shall provide various graphical views to the network such as geographical Overview, logical network structure, and hierarchical view. The network management system shall allow defining different user profiles.

A comprehensive alarm management shall show current alarms such, that icons of the network elements change their colors according to the alarm level. The alarms shall be categorized as critical, major, minor alarms and of the warnings and a summary shall indicate the total number of them in the entire network. An alarm list shall list all alarms of the entire network according to the time of their occurrence .It shall be possible to filter alarms with various filter criteria. Operators shall be able to add comments to the alarms.

The DCN (Data Communication Network) to access all Network Elements shall be based on TCP-IP. - The management system shall offer an SNMP interface for alarm integration into higher order networks.

a) Local User Terminal

It shall be possible to connect the craft terminal to any Network Element in the network using the TCP-IP protocol. The craft terminal shall support configuration, maintenance, and status information.

b) Alarms

Each module shall supervise its functions and shall have an alarm-indication LED on its front. All alarms shall be collected by the NMS. Each node shall be capable of collecting up to 8 external alarms.

c) Test Loops

The equipment shall provide means to loop signals on 64kBit/s level as well as on 2Mbit/s level. It shall indicate an alarm if a loop is activated.

d) Maintenance facilities

Preferably every Network Element shall have a built-in Signal Generator and Analyzer to analyze communication paths. It must be possible to connect the Generator and Analyzer to the communication channels and terminate the signal on other Network Elements. It shall be possible to configure circuits locally with the craft terminal and remotely from the NMS or the craft terminal. It shall be possible to loop-back signals locally and remotely using the craft terminal or the NMS.

System Capacity (To be supported):

Equipment supplied for the system shall be sized and equipped with sufficient capacity to support BOQ and shall require to support the capacity as specified here under. The system supplied shall be sized (to be equipped as specified) to support full system expansion.

Data communications channelization required to support the NMS specified in Technical Specifications (TS) are not identified in the appendices. Therefore, the Contractor is required to size and equip the system to include all channelization and channel cards required to support the NMS function.

NMS Architecture

a) The Network Management System (NMS) structure:

NMS should be structured according to the NMS Logical Layered Architecture established in section 5 of ITU-T Recommendation M.3010 and cover the Element & Network Management layers of this architecture.

The system should be designed using a client-server paradigm and use a SQL compliant Database to store alarm and configuration data.

Access to the system shall be possible for many users at the same time using NMS Client software. Client software shall be installed on the server machine itself and on separate client PC.

The NMS main server shall be provided at Vidyut Soudha, Vijayawada. Appropriate convertors/cables/interfaces shall be provided by the bidder to achieve the connectivity between the equipments and the NMS server.

b) Platform and Redundancy

The NMS server software should be based on a secure operating system with latest version of software preferably Linux/Unix. The NMS software with life time free license for managing total nodes of about 100 nos. MPLS-TP. Any up- gradation in the software shall be done at free of cost. Patches/Service Pack up- gradation will be provided free of Cost as when required in life cycle of offered NMS Software. The NMS server hardware should have dual hard disks configured as a RAID system level 5 (mirroring).

There should be a possibility to add a second NMS server to create a Main/Standby system using an interconnecting link with a minimum bandwidth of 2Mbit/s. The Standby should automatically switch to active mode if it loses contact to the Main. It shall also be possible to operate the two NMS independently if the connection between the two servers is down.

For quick fault recovery and minimum NMS downtime it shall be possible to manually create a backup of the database and store it on the local disk or on a DVDs. A facility should exist to create a bootable backup of the complete system either on tape or DVDs.

c) Supported Network Elements

For ease of management and monitoring by APTRANSCO, the System shall be able to manage all the offered communication equipment and Tele-protection equipment from a single software and hardware.

d) Graphical User Interface

The Graphical User Interface should have definable network displays (maps). Icons symbolizing sub-networks, equipment and links are to be placed on an optional background image and can be opened to display greater details down to equipment port level. Context sensitive menus and online help should be available. It should be possible to create any number of network maps to create different views of the network, e.g. geographical, schematic, sub-network, etc.

The Bidder shall submit for APTRANSCO's approval the NMS architecture describing in detail the following sub systems/features:

- i. Database used in NMS
- ii. Master Processor, server/workstation, LAN, Peripherals and hardware
- iii. Software and operating system
- iv. Local Consoles/remote consoles
- v. Craft Terminals
- vi. Data communication between NEs, Remote /Local Consoles and TMN Processor(s)

- vii. Routers /Bridges
- viii. Expansion Capabilities

Management Functions

The NMS shall support following Management functions:

Configuration Management

Configuration management is concerned with management, display, and control of the network configuration. Minimum specific requirements that shall be satisfied include the following:

- a. Provide tools to establish and maintain the backbone topology and configuration information and provide graphical maps depicting the configurations.
- b. Gather descriptive information about the current configuration of the equipment, provide operator displays, and prepare reports.
- c. Provide tools for planning, establishing, and changing the static equipment configuration. Provide for changes of the equipment configuration in response to equipment failures, planned upgrades, and operator requests to take equipment offline for testing.
- d. Provide verification testing to support new equipment installation.
- e. The through put current value, trends graph of each port for a period of minimum one year like daily, monthly and annually should be made available.

NMS Configuration

A graphical User Interface should exist to create network Domains, the NEs to be managed by the system and NE supervision processes. (Domains are used to structure the network in areas of responsibilities and are used in the definition of access right. The supervision processes allow grouping the NEs for supervision and enabling the supervision of a group of NEs to be turned to ON or OFF.)

NE Configuration

Once an NE is discovered by the NMS its configuration shall be automatically uploaded and stored on the NMS hard disk. It shall be possible to configure the NMS to automatically keep a definable number of the most recent NE configurations accessible for inspection and/or download. All NE configuration changes should be done from the NMS using easy to use graphical windows accessible via drop down menus starting from the NE symbol on the graphical network view. The NMS shall fully support the administration of the NE configuration data (upload, download, backup, copy) and the NE embedded software (upgrade).

End to End Circuit/Trail Configuration

As an NMS option a facility for automated end-to-end configuration of trails and circuits (trail management) shall be offered including the 64kBit/s cross- connections.

The option shall enable the operator to create and maintain database tables containing all the communication services configured into the network. A graphical user interface shall be available to browse, modify or delete the existing end to end connections or to create new

ones .To create new connections it shall be sufficient to specify the type of connection, the required bandwidth, the protection type and the two end points. The software should then suggest routes through the network and can be used to automatically download the required cross-connections to all the NEs which belong to the selected route.

Trails e.g. at VC4, VC12 or E1 level can be inspected for the number of used/free channels.

Various reports shall be printed and information extracted in a format which is suitable to be imported into a spreadsheet program such as Excel.

Fault Management

The Network Management System should provide comprehensive and efficient fault management, based on a graphical network view and coloured symbols representing the alarm state of the respective network element.

Fault management is concerned with detecting, diagnosing, bypassing, directing service restoration, and reporting on all the backbone network equipment, systems, and links. Minimum specific requirements that shall be satisfied include the following:

- a. Display equipment status in a consistent fashion regardless of the source of the data on a graphical topological, map-type display. Status shall be displayed through the use of colours on links and nodes as well as through text.
- b. Obtain status and detect faults through periodic polling, processing of unsolicited alarms and error events, and periodic testing for connectivity.
- c. Maintain an alarm summary of unacknowledged alarm events on the management station display and maintain a log of all received alarms. The operator shall be able to acknowledge and clear alarms individually and as a group. The use of alarm correlation techniques is encouraged to minimize the proliferation of alarms caused by a single, common event. All alarms shall be configurable as critical alarms, major alarms and minor alarms with different colours.

Additionally the following fault management features are required:

- The NEW symbols on the layered network views must have markers to indicate
 - a) If an NE is reachable,
 - b) Disabled through the operator,
 - c) Has an attached operator note,
 - d) if there are unacknowledged active alarms (one marker for each severity level),
 - e) if there are unacknowledged cleared alarms
- An Alarm Summary View to display alarm counters per severity
- An Alarm List containing all active alarms and all cleared and unacknowledged alarms. The alarm list should be displayed in a tabular form with extensive filtering possibilities. It must be possible to adjust the size and the order of the displayed columns. Alarms are selectable for operator actions (e.g. acknowledgement) indi-

vidually or in groups using the mouse and the Ctrl or Shift key.

- New active alarms should appear in the alarm list marked as unacknowledged until they are confirmed by the operator. New cleared alarms must be either marked as unacknowledged or alternatively self-acknowledged by the NMS software. The preferred behavior should be an NMS configuration option.
- For each alarm a detailed alarm view must exist to display all alarm properties including raise and clear times, the time of acknowledgement and the username of the person which performed the acknowledgment. It must be possible to add operator notes for each alarm.
- For external equipment with alarm output contacts (common alarm outputs, door contacts etc.) the fault management should provide an option to display the respective alarm states by colored symbols on the map.
- Sections (Links - typically fibre optic inter connection between nodes) should be dynamic and displayed in the colour of the most severe alarm of the ports which the link is connected to.

Synchronization Map

Since this is a large network, to facilitate the identification of synchronization problems within the communication network, the NMS should provide a dynamic synchronization view/map. This synchronization view must display the active synchronization sources for every network element using a graphical representation, so the clock distribution in the network can be easily tracked.

Security Management

Access to the different functional areas of the NMS shall be strictly controlled by the privileges assigned to the individual NMS users. Accounts which shall have access to the NMS must be assigned NMS access rights by an NMS administrator. There shall be one overall NMS administrator which is able to create additional regional administrators which have full control e.g. to assign NMS access rights, but are limited to their domain – corresponding to e.g. a geographical region.

To simplify the task of access right assignments, customer specific user profiles can be predefined which then can be assigned to the individual NMS users. It should allow to create users which have access rights to several/all domains with a different profile for each domain.

Specifically, the following features must be individually assignable to different user classes and/or user accounts:

- Administrative functions such as adding, modifying and deleting NMS user accounts
- Different levels of access rights to the network elements (modify, monitor only, software download)
- Access to individual network elements or groups of network elements (regions)

- The right to create and modify network maps
- Use function such as Alarm Forwarding, Trail Configuration, etc.

Performance Management

Performance management is concerned with evaluation of the use of network equipments and their capability to meet performance objectives. Minimum specific requirements that shall be satisfied include the following:

- a. Provide support for an operator to initiate, collect, and terminate performance metrics under both normal and degraded conditions. For example, BER of each link, together with other data measured at each node, shall be available on operator request.
- b. Monitor point to point & end to end signal quality and history. Provide operator controls to monitor performance of specified events, measures, and resources.

Specifically provide displays to permit the operator to:

1. Select/deselect network equipments, events, and threshold parameters to monitor
2. Set monitoring start time and duration or end time
3. Set monitoring sampling frequency
4. Set/change threshold values on selected performance parameters
5. Generate alarm events when thresholds are exceeded.
6. Set multiple thresholds on certain performance parameters. Alarm categories include as a minimum a warning and a failure.
7. Calculate selected statistical data to measure performance on selected equipment based on both current and historical performance data maintained in performance logs. Performance data provided is limited to what is available from the equipment Contractors.
8. Provide graphical displays of point to point and end to end current performance parameter values. Provide tabular displays of current, peak, and average values for performance parameters.
9. Generate reports on a daily, weekly, monthly, and yearly basis containing system statistics in table and graphical form.

15 Minute and 24 hour Performance counters according to G.826 must be collected and stored on the NEs for a limited time. As an NMS option a function shall be available to cyclically collect these counters from the NEs and store them on the hard disk in XML format. The operator shall be able to specifically define which individual data collection points on which equipment shall be included in the collected datasets.

Interfaces to external systems

As a future option, to provide the possibility to send data to other NMS or to support additional non native equipment the system should support two open software interfaces, one to export data to external systems (northbound interface) and a second one to be able to feed basic equipment and alarm data to the NMS from external customer specific software (south bound interface).

Communication Channel Requirement and Integration

The Bidder shall provide Communication requirements for NMS system as a part of NMS system. The Bidder shall provide all required interface cards / devices, LAN, routers/bridges, channel routing, cabling, wiring etc. and interfacing required for full NMS data transport.

The NMS data transport shall utilize the wideband communications transmission system service channel in the overhead whenever possible. This will provide inherent critical path protection.

Should the configuration requirements dictate multiple NMS station processors, the NMS Master Station shall require bidirectional data transport with its station processor(s). This communications interfacing shall be via critically protected data channels. It shall be the Bidder's responsibility to provide for and equip all necessary critically protected NMS data channel support.

In case supervisory channels are not available, the Bidder shall provide suitable interfaces in their supplied equipment for transport of NMS data. The Bidder shall also be responsible for providing suitable channels with appropriate interfaces to transport the NMS data.

The bidders shall describe in the proposal the NMS data transport proposed to be used by the bidder in detail including capacity requirements and various components /equipment proposed to be used.

Craft Terminal

Each MPLS-TP FOTE on the fibre optic communication network shall include provision for connecting a portable laptop to be known as craft terminal to support local commissioning and maintenance activities. Through the use of this laptops and local displays /controls, the operator shall be able to:

- a. Change the configuration of the station & the connected NEs.
- b. Perform tests
- c. Get detailed fault information

The craft terminal shall be connected to the interface available in the communication equipment.

Hardware Requirements

Master Processor, Server/Work station and Craft Terminal

The server/workstation and craft terminal shall have suitable processor(s) which shall be sufficient to meet all the functional requirement and expansion capabilities stipulated in this specification. Only industrial grade reputed make Like DELL, IBM, HP make shall be supplied.

a.) The NMS & EMS on independent 1+1 redundant rack servers and each server shall have the following minimum configuration. Intel® Xeon® E-2388G 3.2GHz, 16M Cache, 8C/16T, Turbo (95W), 3200 MT/s Processor. 1x32GB UDIMM, 3200MT/s, ECC RAM. 2x800GB SSD SAS ISE Mix Use 12Gbps 512e 2.5in Hot-plug AG Drive, 3 DWPD.C3, RAID1 for 2 SSDs. Motherboard with Broadcom/Intel 5720 Dual Port 1 Gb On-Board. Dual, Hot-Plug, Redundant Power Supply (1+1), 600W. Red Hat Enterprise Linux

Operating system with required permanent License & subscription. 19"LED Monitor
However, the internal hard disk drive for the server shall be redundant and all the data shall be mirrored. Further, the NMS software shall support data mirroring on redundant disk drives.

b.) The workstation shall have minimum configuration of Intel Core i7-12700 processor, 16GB-DDR4-3200 MHz RAM, 256GB M.2 SSD and 1TB HDD @ 7200 rpm, 1G Ethernet port, serial port, USB Port, HDMI port, A/V port, USB-Wired keyboard and mouse, 21.5" LED monitor IPS. Appropriate network drive card shall also be provided wherever required.

CPU enclosures shall be desktop type and shall include available expansion slots except for the Craft Terminal which shall be a laptop.

c.)The craft terminal shall have minimum configuration of Intel Core i7-12700 (4.7 GHz, 24 MB Cache), 16 GB DDR4 RAM, 500GB SSD, 4GB graphics, DVD-RW drive, built in webcam, built in speakers, Keyboard, mouse, USB Port-2 No., HDMI port, A/V port, 1G Ethernet port, 15" monitor and battery back-up of at least 4 hours. Appropriate network drive card shall also be provided wherever required.

Peripherals and hardware

NMS system consists of 1 No. main server, redundant server, work station, craft terminal to be installed at Vidyut Soudha, Vijayawada).

Local/Remote Operator Consoles

The Bidder shall provide operator consoles sized and equipped to support the system furnished and in compliance with the specification. The console shall Provide hardware interfacing for the NMS users to the software operating support systems. At a minimum, a console shall include the hardware similar to a work station.

Power Supplies

The NMS system shall use 220 volts 50 Hz A.C or 48 volt D.C as available at site for its operation as available at site.

General Software/Firmware Requirements

Due to various alternative design approaches, it is neither intended nor possible to specify all software and firmware characteristics. It is the intent herein to provide design boundaries and guidelines that help to ensure a demonstrated, integrated program package that is maintainable and meets both hardware systems requirements and the customer's operational requirements.

Operating System Software

Operating system software shall be provided to control the execution of system programs, application programs, management devices, to allocate system resources, and manage communications among the system processors. The BIDDER shall make no modifications to the OEM's operating system, except as provided as USER installation parameters.

Applications Software

All application essential software for proper functioning shall be written in a high-level programming language unless developed using industry proven application programs and development tools provided with the system. The each craft terminal(laptop)shall be provided with MS office 2016 basic OEM single and Antivirus .The BIDDER shall make no modifications to the applications program except as provided as USER development tools.

Software Utilities

A utility shall be provided to convert all reports into standard PC application formats such as excel.

Revisions, Upgrades, Maintainability

All firmware and software delivered under this specification shall be the latest field proven version available at the time of contract approval. Installed demonstration for acceptance shall be required. All firmware provided shall support its fully equipped intended functional requirements without additional rewrite or programming.

All software shall be easily user expandable to accommodate the anticipated system growth, as defined in this specification. Reassembly, recompilation or revision upgrades of the software or components of the software shall not be necessary to accommodate full system expansion. All Software provided shall be licensed software and shall be compliant with national and international industry standards.

Database(s)

The contractor shall develop all the databases for the final wideband network following the global acronyms for all stations. Database(s) to be provided shall contain all structure definitions and data for the integrated functional requirements of the NMS system.

NMS operator Groups shall share the same virtual database. This means that they shall share the same database and database manager, whether or not physically separate databases are maintained.

HELP:

All applications shall be supported by USER accessible HELP commands that shall assist the user in the performance of its tasks. HELP commands for an application shall be available to the user from within the active application and shall not interfere with the activities of the application.

SYSTEM MAINTAINABILITY

To facilitate performance trending, efficient diagnosis and corrective resolution, the system shall permit in-service diagnostic testing to be executed both locally and from remote locations, manually and/or initiated under NMS control. Such testing shall not affect the functional operation of the system.

Preventive and problem oriented maintenance of the communications system shall be performed using diagnostics tools such as NMS and test equipment (Optical power meter, communication analyser etc.). They shall support complete maintenance of all system elements and shall permit the diagnosis of any without requiring additional test equipment. The Contractor shall provide specialized training required to operate above mentioned diagnostic tools. For all redundant systems, disconnection and repair of any failed device shall not interrupt the operation of the system.

SYSTEM UPGRADABILITY AND EXPANDABILITY

Equipment supplied shall be sized for atleast a backplane capacity of 40G/100G Power supplies and NMS shall be sized for maximum equipped system capacity.

11.0 EQUIPMENT LIFE SPAN:

All equipments supplied shall have a minimum expected life of fifteen (15) years from the date of operational acceptance.

12.0 REVISION LEVELS AND MODIFICATIONS

All hardware, firmware and software delivered as part of the communications network shall be field proven and at the most current revision level. All modifications and changes necessary to meet this requirement shall be completed prior to the start of the factory tests or under special circumstances, on written approval of APTRANSCO, prior to the completion of SAT.

All field modifications of the hardware, firmware and software that are required to meet installation and/or performance specifications, shall be fully documented as part of the deliverables, both as a separate field modifications record and as corrected equipment/configuration documentation. All the updates of software related to this project then and there should be provided at free of cost until the expiry of life span of the equipment /NMS supplied under this project.

13.0 FODP to MPLS_TP Equipment/ Optical Amplifier Connectivity

The Contractor shall be responsible for connectivity between the FODB and the FOTE equipment. The Contractor shall provide FC/BC coupled patch cords. The location of FODB shall be finalized during detailed engineering.

The patch-cord length between the FODB & equipment rack shall be suitably protected from rodents, abrasion, crush or mechanical damage .Preferably steel flexible hose shall be provided as per requirement.

14.0 CES (Circuit Emulation Service) Support:(Where ever applicable)

The equipment shall fully comply with SAT oP (RFC 4553) and CES oP SN (RFC 5086) and support the following CES (Circuit Emulation Service) functions over ETH and MPLS-TP:

- The E1CES card shall have at least 8 ports.
- On TRANSPORT LEVEL the equipment shall support / future upgradable to the following connection ports:
 - Upto 4x1Gbit/s MPLS-TP capable transport ports
 - Nx2Mbit/s electrical E1ports, G.703/IECC.37.94for differential tele protection.
 - 8 port Ethernet10/100/1000Mbps.
 - All optical MPLS-TP and Ethernet ports shall support SFP or SFP+ modules (small-factor pluggable unit) for short, medium, long and extra-long optical communication. ALS (Automatic Laser Shut-down) shall be fully supported.

15.IP/Ethernet Interface

Ethernet module shall comply with the following specification: Ethernet electrical connection: 10/100Base T Ethernet optical connection:1000Base-LX/SX

Switching: by passmode for IEEEStd802.3 frame or based on port or VLAN tagID

This module shall provide WAN connectivity of VC-12 or VC-3 and also support configuration of Logical WAN port.

Framing: According General Framing Procedure (GFP) ITU-TG.7041 Capacity:

Virtual Concatenation (VCAT) acc. ITU-TG.707

Protection: Link Capacity Adjustment Scheme (LCAS) acc.ITU-TG.7042.

Alarm Interface.

The module shall provide means to collect at least 8 alarms, which shall be displayed on the Network Management System. It shall be used to supervise external equipment by the Network Management System. A minimum of 2 outputs, which can be controlled from the Network Management System, shall be available.

It shall be possible to label an alarm. The label-text shall be read from the interface module and visible on Network Management System as well as on the local craft terminal. The equipment failure shall be indicated with one audible alarm.

13.0 MDF, DDF AND CABLING

For the purposes of the specification, the contractor shall provide cabling, wiring, DDF patching facilities and MDFs interfacing to the wideband telecommunications system. Equipment and material components for MDF, DDF and cabling are also part of this procurement. It shall be the Contractor's responsibility to provide all cable support required for full supplied equipment interconnection with the MDF and shall be in accordance with communications industry standard practices and the requirements mentioned in the technical specifications.

14.0 MDF AND DDF PATCHING FACILITIES

The Contractor shall supply and install all cabling, wiring, connectors, cross connects, Digital Distribution Frames (DDF) and Main Distribution Frames (MDF) associated with the installation and interconnection of equipments procured under this package.

- a. Any other cables, connections etc required for a fully functional, integrated telecom system and spares as per site requirement.

The connections amongst various equipment such as FOTE and subscriber MDFs etc shall always be routed through DDF and MDF to provide maintenance access.

The equipment shall make provision for an Ethernet port (hence forth called “local management interface”) that allows access only to the local management agent (i.e. to the management agent running on the equipment itself but not to management agents running on remote equipment).

The equipment shall make provision for interface(s) that allow access to the management agent from a remote site through an IP network (henceforth called “routed management interface(s)”).

The equipment shall make provision for a VLAN dedicated exclusively to the traffic to /from the management agent (out-of-band management). The VLAN identification must be configurable.

The priority of the traffic flowing through the routed management interfaces shall be configurable (i.e. capability to assign a Class of Service to the management traffic).It shall be possible to enable/disable the local management interface by configuration. It shall be possible to enable/disable the routed management interface(s) by configuration. The IP address of the local management interface shall be configurable with proper authentication. The IP address/addresses of the routed management interface(s) shall be configurable. The local management interface shall be browser based one. It shall not participate in dynamic routing protocol (i.e. the local interface and its IP address are not propagated outside the local equipment).It shall be possible for a routed management interface to participate in a dynamic routing protocol. The participation shall be configurable.

The equipment shall support the following protocols for the communication between the management agent and the network management system (NMS)/craft terminal (CT):

- a. Telnet
- b. SSH
- c. SNMPv3
- d. SYSLOG

The equipment shall support the capability of sending event messages to up to ten different remote syslog servers. Each server is identified by its IPv4 address.

OSPF authentication

The equipment shall provide the capability to authenticate OSPF messages (e.g. MD5).This capability shall be provided for both DCN and user traffic OSPF capable routers. The DCN protocol of all OEMs which are designed as per relevant IEC/IETF/ITU-T standard and satisfy the requirement of APTRANSCO will be accepted.

e. Cyber Security Compliance:

The fibre optic terminal equipments proposed in this tender shall comply all the cyber security requirements defined in the IEC standard 62443-3-3. Necessary type test report obtained from Indian Govt. laboratory (CPRI)/ Authorized International laboratories for the above cyber security features shall be uploaded with the bid.

17. Other mandatory test:

As per the order dated 02.07.2020 of the ministry of power, Govt of India that apply to any item imported for end user or to be use data component or as a part in manufacturing,

assembling of any equipment or to be used in power supply system or any other activity directly or indirectly related to power system the compliance to following requirements are to be ensured. In this context all expenses towards the mandatory testing is to be borne by the project contractor.

- a. All equipment, components and parts imported for use in the power supply system and network shall be tested in India to check for any kind of embedded malware/Trojans/cyber threat and for adherence to Indian standards.
- b. All such tests shall be done in certified laboratories that will be approved by the ministry of power, Govt of India.
- c. Any import /equipment/ components/ parts from: “Prior reference” countries as specified or by persons owned by controlled by or subject to the jurisdiction or the direction of these “Prior reference” countries will require prior permission of the Govt of India.
- d. Where the equipment /components /parts are imported from “Prior reference” countries with special permission , the protocol for testing in certified and designated laboratories shall be approved by the by ministry of power, Govt of India.

It is mandatory for the bidders /OEM from prior reference countries to obtain the type test report for having tested for cyber security features as per relevant standard from CPRI laboratory of India at their own expenses. As per CEA guidelines 2021,

18.0 Equipment Availability

The availability requirements are categorized in two parts. The Contractor shall ensure the availability for subscriber to subscriber where they will have to provide the new equipment (MUX/Drop-Insert) under this contract. The availability requirements areas follows, which shall be demonstrated at site for the equipment being provided under this contract:

A. New nodes with requirement of MPLS-TP equipment:-

- (1) The average per link subscriber to subscriber availability shall be at least 99.97%.The average per link subscriber to subscriber availability is defined as the availability between any two data or voice subscribers/Tele-protection channel.
- (2) The network-wide subscriber to subscriber availability shall be at least 99.8%.The network-wide subscriber to subscriber availability is defined as the availability between any two data or voice subscribers /Tele-protection channel on the wideband network.

The calculated availability is defined as the theoretical availability determined by a statistical calculation based on the mean-time-between-failure (MTBF) and the mean- time-to-repair (MTTR) of the components and modules comprising the FOTE. The down time of the fibre optic cable shall not be considered in the aforesaid availability calculations.

In order to ensure that the equipment & configuration proposed by the bidders shall be capable of demonstrating the specified availability figures, it is required that the Bidders shall include in their proposal a calculated availability analysis for the proposed equipment. The calculated failure rates of the units and the calculated availabilities of the equipment

being offered shall be provided in the proposal. The analysis shall be based on an availability block diagram and shall include the mean-time-between failure (MTBF) and mean-time-to-repair (MTTR) of all of the components on the link. The Contractor shall indicate in the analysis the MTBF and MTTR and the resulting availability of each point-to-point link. For this analysis, an MTTR of at least 4 hours shall be assumed.

19.0 Lost Signal Recovery

At any digital signal level, reapplication of a lost signal shall result in automatic resynchronization and full restoration to normal operation without manual intervention. All alarms incident to the signal failure, shall be automatically cleared at the equipment, rack and monitoring levels and normal operation indications restored and reported if applicable.

20.0 TESTS

TYPETEST

- The MPLS-TP FOTE offered shall be fully type tested within five years in any Indian or International accredited laboratory as per the relevant standards. The bidder shall submit the complete type test reports for the offered MPLS-TP FOTE along with the offer **otherwise the offer shall be liable for rejection.**
- The purchaser reserves the right to demand repetition of some or all the type test in the presence of the purchaser's representative. For this purpose the bidder may quote unit rates for carrying out each type test.

21.0 DOCUMENTATION for NMS:

The bidder shall have to submit the working diagram (hard copy as well as Soft copy) for the NMS system comprising various nodes of the OPGW network showing a connection diagram with details of interface port from central control stations to nodes of the network. (2 Copies)

Drawings shall be of A-3 size. (297mmX420mm). Final Drawing, Technical literature and commissioning manuals shall be printed and not photocopy. Each consignment shall be accompanied by a detailed packing list containing the following information.

- Purchase order reference.
- Name of consignee
- Details of consignment
- Destination
- Total weight of consignment
- Handling and unpacking instructions.
- Bill of materials indicating contents of each package
- Sign showing upper /lower side of the crate.

For any deviation from the specification which is not specifically brought out in the schedules shall be supported by authentic documents, standards and clarifications; otherwise the offer may be liable for rejection.

22.0 Test Documentation

The Contractor shall provide documentation for all factory and field tests. The test documentation shall include the following:

- a. Test Procedure Document

- b. Type test documents
- c. Factory Acceptance Test Documents
- d. Site Acceptance Test Documents
- e. Availability Test Documents

Factory Acceptance Test results will be included in factory test data. Test results, for any un-witnessed equipment tests, shall be shipped along with the associated equipment. All FAT and SAT test documents shall be got approved before the dispatch of first lot of equipment.

23.0 SPARES

The successful bidder shall furnish unit rates for mandatory spares and also for various types of all modules, SFP+, Boosters, Wave length translator etc. along with the price bid after award of contract .Also bidder shall have to submit the offer for the spares other than specified in BOQ if required, with unit price separately. The bidder is bound to supply for maintenance as and when required for service life of the MPLS-TP FOTE & NMS.

Note: All SFPs shall be of MSA2000 compliant in order to work with any vendor FOTE equipment.

24.0 Summary of applicable Standards:

The equipment shall conform to the following standards

1. Immunity
 - IEC/EN61000-4-2:Electro static discharge Immunity, level 6/8KV
 - IEC/EN61000-4-3:Immunity to electromagnetic field radiated ,level 10V/m
 - IEC/EN61000-4-4: Immunity against electrical FastTransients,Level4KVon DC i/p and all other ports.
 - IEC/EN61000-4-5Immunity against voltage surges, DCterminals.Level 2KV, others 1KV.
 - IEC/EN61000-4-6 Immunity against radio frequency voltage conducted in Power terminals, level 10V/m
 - IEC/EN61000-4-17 ripple on DC input port Immunity
 - IEC/EN61000-4-18 Damped Oscillatory wave Immunity
 - IEC/EN61000-4-29 Immunity against short voltage dips, interruption and voltage variations
2. **EMISSION:**
 - EN55022(CISPR-22)conducted emission, Level Class B
 - EN55022(CISPR-22)radiated emission, Level Class B
3. **SAFETY**
 - IEC/EN60950-1Information technology equipment safety.
 - IEC60255-27Measuringrelaysandprotectionequipmentproductsafetyrequirement.
4. **MECHANICALTEST-TRANSPORT (IEC60721-3-2CLASS2M1)**
 - a) Vibration 5-9 Hz displacement amplitude IEC 60068-2-6 +/-0.3mm

(Sinusoidal) 9-200Hz displacement amplitude 1 m./sec sq.

b) Shock-Shock response spectrum type L IEC 60068-2-2740 m/ secsq
 Peak acceleration

c) Freefall -Height of fall IEC60068-2-31 0.25m

5. ETS/EN

- EN60825-2:Laser Safety

6. ITU-T

- ITU-TG.664: Optical safety procedures and requirements for optical transport systems.

**GUARANTEED TECHNICAL PARTICULARS AND REQUIREMENTS–GTP
FOR MPLS-TP FOTE EQUIPMENTS**

GENERAL		REQUIRED	OFFERED
Type of multiplexer		L2/MPLS-TP, Legacy TDM	
Complying to IEC/ ITU-T/ IETF recommendations		YES	
Transmission Capacity	Gbit/s	1Gbit/s upgradable to 10Gbit/s MPLS-TP/L2	
Packet switching capacity	Gbit/s	Minimum 40Gbits/sec meeting the cross-connect capacity	
Hardware supported QoS scheduling		YES	
SNMP north bound interface supported		YES	
Integrated cyber security features		YES	
Equipment used in substation environment		YES	
The equipment is type tested by an independent, accredited test laboratory(e.g. VDE, DNV/KEMA)		YES	
Redundancy of protection signal transmission over MPLS-TP at port level		YES	
PACKET SWITCHING FEATURES			
Number of transit LSPs		≥128	
Number of terminating (protected) tunnels		≥8	
Number of VPWS instances		50	
Support of MPLS-TP2MPtree service		NO	

Number of fast BFD sessions($\leq 10\text{ms}$)		0	
Number of medium BFD sessions($\leq 50\text{ms}$)		0	
Number of slow BFD sessions($\geq 100\text{ms}$)		8	
1:1 bidirectional, symmetrical LSP protection		YES	
Support of L2GP protocol		YES	
L2GP dual homing support		YES	
Support of RSTP protocol		YES	
Number of supported VLANs	Amount	≥ 4000	
VLAN tag stacking support		YES	
MAC address table size	Amount	≥ 8000	
SYNCHRONIZATION			
Support of Synchronous Ethernet		YES	
Support of IEEE1588v2PTP ordinary clock		YES	
Support of IEEE1588v2PTP boundary clock		YES	
Support of a ITU-T 8275.1/ 8275.2 telecom profile compatible PTP profiles		YES	
Accuracy of PTP time of day information per node	μs	$\leq 1,5\mu\text{s}$	
PACKET TRANSPORT INTERFACES			
Optical 10Gbit/s MPLS-TP interface	Amount	≥ 2	
Optical 1Gbit/s MPLS-TP interface	Amount	≥ 6	
Alarm Ports	Amount	Yes	

Circuit emulation module			
Complying to ITU-T G.703/ G.704, configurable		YES	
HDB3linecodesupport		YES	
CES PW IF available for serial and telephony access interfaces		YES	
SAT oP method support		YES	
POWERSUPPLY			
Operation	VDC	48V(-15%/+20%)	
1+1 Power Supply Redundancy/ Dual Power Feeding Option.		YES	
CONFIGURATIONTOOL			
Local/remote operation		YES/YES	
Data communication network(DCN)		Ethernet/IP	
NETWORKMANAGEMENTSYSTEM			
Fault management		YES	
Configuration management		YES	
Alarm management		YES	
Inventory management		YES	
Security management		YES	
Synchronization management		YES	
Ethernet service andQoS management		YES	
Data communication network(DCN)		Ethernet/IP	
NMS configurations, user interface configurations, low level and high level commands in main servers, works station, LCT etc., software configuration tools(both front end and back end), displays, management tools etc., are in English Language only.		YES	

NMS should support third party UNMS over NBI(North Bound Interface) for all management functionalities.		YES	
Inter operability with other MPLS-TP FOTE vendors is possible at all levels of band width. Necessary Proof of concept document is furnished.		YES	
Multi Source agreement (MSA) standard SFPs/SFP+/smart SFPs will be provided which is suitable for all MPLS-TP FOTE Equipment vendors.		YES	
The equipment shall restore to functionality and traffic within 5 minutes in case of		YES	
AMBIENTCONDITIONS			
Storage:ETS300019-1-1,class1.2	°C / %	-25...+70°C/95% ROH(non condensing)	
Transport:ETS300019-1-2,class2.2	°C / %	-25...+70°C/ 95% ROH(non condensing)	

SECTION – VI
QUALIFICATION REQUIREMENTS
Bid.No. PMMTC1-e- 14/2026

1. QR-Supply:
 - (a) The bidder should be a manufacturer who must have designed, manufactured, tested, supplied, erected and commissioned to any power utilities, at least 40% of the tender quantity of the goods/equipment of same or higher class as indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.
 - (b) The bidder should be an authorised agent who must have tested, supplied, erected and commissioned to any power utilities at least 40% of the tender quantity of the goods/equipment of same or higher class as indicated in the “Schedule of Requirements” (Section-IV) in the last five years as on the date of opening of bid.
2. QR-Performance: At least 20% of the similar material offered against each item as indicated in the ‘Schedule of Requirements’ should be in successful operation for two years in the last 5 years.
3. QR-Turnover: The financial turnover of the bidder, during any one year of the last five years should have been equal or more than 100% value of the estimated contract value.
4. QR-Type Test Reports: The bidder shall furnish Type Test Reports. The type tests must have been conducted on the material offered as per the relevant IEC/IS in recognized laboratory as per the latest revision of the Relevant IEC/ IS applicable and Technical Specification. **The date of type tests shall not be earlier than Five years as on the date of bid opening.** The bids received without type test reports will be treated as non-Responsive. If any change in design was made latest type tests shall be furnished along with approved drawing. (Bidder is required to furnish the Year of Type Test Reports done for similar equipment/material in the remarks column of technical particulars).
- ~~5. Purchase preference shall be given to Class I/Class II local supplier as per the Public Procurement Policy Make in India (PPP-MII orders).~~
6. The bidder should furnish the information on all past supplies and satisfactory performance as per proforma under Form-5 of Section-VII, along with documentary evidence in support of the same such as copies of purchase orders, invoices, delivery challans etc.
7. In case the bidder is an authorized agent, the erection, testing and commissioning of Digital Tele Protection Signalling equipment shall be done under the supervision of manufacturer who has given Manufacturing Authorisation Form (Undertaking from the manufacturer in support of this shall be enclosed).

8. All bids submitted will also include the following information:
 - a) Copies of original documents defining the constitution or legal status, place of registration and principal place of business of the company or firm or partnership, etc.
 - b) The bidder should furnish a brief write-up, backed with adequate data, explaining his available capacity and experience (both technical and commercial) for the manufacture and supply of the required equipment within the specified time of completion after meeting all their current commitments.
 - c) The bidder should clearly confirm that all the facilities exist in his factory for inspection and testing and these will be made available to the purchaser or his representative for inspection.
 - d) Reports on financial standing of the Bidder such as profit and loss statement, balance sheets and auditor's report for the past three years, bankers certificates etc.
9. Even though the bidder meets the above qualifying criteria, they are subject to be disqualified if they have...
 - a) made misleading or false representations in the forms statements and attachments submitted in proof of qualification requirements and / or,
 - b) record of poor performance such as not properly completing the contract, inordinate delays in supply completion, litigation history or financial failure etc.
10. Bidders should quote for 100% of the tender quantity of all items in each lot indicated in the 'Schedule of Requirements' of Bid specification on single responsibility basis. Offers less than the prescribed quantity will be treated as non-responsive and liable for rejection.
12. Notwithstanding anything stated above the purchaser reserves the right to assess bidders' capability and capacity to perform the contract should circumstances warrant such an assessment in the overall interest of the Purchaser.

SECTION - VII

SAMPLE FORMS

FORM - 1: QUALIFICATION & PERFORMANCE PARTICULARS

Bid Specification No. : **PMMTC1-e- 14/2026**

Material Description: **Supply, Erection, Testing and Commissioning of Digital Tele Protection Signalling Equipment and Cabinets.**

I. Qualification Requirements as per Bid Specification:

S. No	QR		MPLS	NMS
a)	Quantity as per schedule of requirement		25 Nos	1 No
b)	Supply	40%	10 Nos	1 Nos
c)	Performance	20%	5 Nos	1 Nos
d)	Turnover	100% of Requirement	Rs. 6.43Crores	
e)	Type Test Reports :	Not earlier than Five years from the date of Bid opening		

II. Bidders past supply details to be furnished by the Bidder

Sl No	Particulars	Name of the Purchaser and quantity						Total
		(1)		(2)		(3)		
		Purchaser Name	Quantity	Purchaser Name	Quantity	Purchaser Name	Quantity	
Quantity supplied during the last five years								
1.	2021							
	Supply Qty							
	Turnover Amount							
2.	2022							
	Supply Qty							
	Turnover Amount							
3	2023							
	Supply Qty							
	Turnover Amount							
4	2024							
	Supply Qty							
	Turnover Amount							
5	2025							
	Supply Qty							

	Turnover Amount							
6	Maximum supply in 12 months period in last 5 years. From To							
7	Performance for similar equpt. Qty							
8	Year of Type Test Reports enclosed							

- Note :
- 1) Documentary evidence in support of the above shall be furnished along with Bid. Month wise supply details for the above shall also be furnished.
 - 2) If any of the information furnished above is found to be false the firm will be debarred.
 - 3) If the Bidder has supplied to more than three purchasers to meet the qualifying requirement a separate sheet may be enclosed to include the other purchasers and total indicated.
 - 4) This above schedule shall be enclosed to the qualification bid.
 - ii) Place :
 - iii) Date
- Signature of Bidder :
Name in Capitals :
Designation :
Name of the firm :
Seal of the company :
Address of the Company:

2. BID SECURITY FORM

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

KNOW ALL PEOPLE by these presents that WE.(name of bank) having our registered office at.(address of bank)(hereinafter called "the Bank"), are bound unto.(name of Purchaser) (hereinafter called "the Purchaser") in the sum of for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this day of 2026 .

THE CONDITIONS of this obligation are:

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

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

This guarantee will remain in force up to and including sixty (60) days after(Specification Date) the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

.
(Signature of the Bank)

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

3. CONTRACT FORM

THIS AGREEMENT made the. day of. 2026 Between.(Name of Purchaser) of the one part and.(Name of Supplier) of the other part:

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

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions will have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents will be deemed to form and be read and construed as part of this Agreement, viz.:
 - (a) the Bid Form and the Price Schedule submitted by the Bidder;
 - (b) the Schedule of Requirements;
 - (c) the Technical Specifications;
 - (d) the General Conditions of Contract;
 - (e) the Purchaser's Notification of Award.
3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Materials / equipment and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Materials / equipment and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

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

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

TOTAL VALUE: (Rupees _____ only)

DELIVERY SCHEDULE:

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

Signed, Sealed and Delivered by the
said.(for the Purchaser)

in the presence of.

Signed, Sealed and Delivered by the
said.(for the Supplier)

in the presence of.

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

4. PERFORMANCE SECURITY FORM

To:(Name of Purchaser)

WHEREAS.....(Name of Supplier) (hereinafter called "the Supplier") has undertaken, in pursuance of Contract No.....dated.....2026 to supply.(Description of Materials / equipment and Services) (hereinafter called "the Contract").

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

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

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

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

Signature and Seal of Guarantors

.....
Date.2026.

.....
.....
Address:.....

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

5. PROFORMA FOR PERFORMANCE STATEMENT

Bid No. _____

Date of Opening _____

Time _____ Hours

Name of the Firm _____

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

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

Signature of the Bidder _____

FORM 6 : DETAILS TO BE FURNISHED BY THE MANUFACTURER/Authorised Agent

1.	Specification No.	:	
2.	Name of the Material	:	
3.	Bidder's vendor Registration No. for this item	:	
4.	Quantity to be procured	:	
5.	Last date and time for submission of Bid	:	
6.	Date and time for opening of Bid	:	
7.	State whether Bid Security is enclosed or Permanent Bid Security available	:	
8.	Whether willing to furnish performance Security B.G. @ 10 % if order is placed	:	
9.	Whether a local SSI Unit/ Local Unit	:	
10.	Whether APTRANSCO delivery schedule accepted?	:	
11.	Prices whether variable / Firm	:	
12.	Whether any other tax / duty payable. If so give details and the same is included / not included.	:	
13.	State whether APTRANSCO terms of payment are accepted.	:	
14.	Quantity offered for supply	:	
15.	State whether 90 days validity offered	:	
16.	Whether sample is enclosed (if specified)	:	
17.	Whether the material / equipment offered conforms to the relevant APTRANSCO Specification	:	
18.	Whether you have executed orders of the APTRANSCO previously for these items. (Please give details)	:	
19.	Similar details in respect of supplies made to other utilities	:	
20.	Whether Bid Security exemption letter enclosed, if exempted.	:	
21.	Whether GST clearance certificate enclosed	:	
22.	Whether Income-tax clearance certificate Enclosed.	:	
23.	Furnish the max production capacity per month of your plant for each type of the quoted materials.		
24.	Whether APTRANSCO penalty clause accepted		
25.	Whether APTRANSCO Guarantee clause accepted		

**7. SCHEDULE OF DEVIATION
TECHNICAL**

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

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

Place :

Signature of the Bidder :

Date :

Name :

Business address:

**SCHEDULE OF DEVIATION
COMMERCIAL**

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

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

Place :

Signature of the Bidder :

Date :

Name :

Business address:

8. DECLARATION FORM
UNDERTAKING TO BE GIVEN BY THE COMPANY / PARTNERSHIP FIRM /
CONTRACTOR ALONG WITH THE TENDER

(Regarding Relatives)

I, _____ representing the
Company / Partnership Firm / Supplier responding to the bid invitation by the APTRANSCO /
APEPDCL / APSPDCL / APNPDCL / APCPDCL vide Specification No.

_____ hereby sincerely and solemnly affirm and state as follows:

(STRIKE OUT THAT WHICH IS NOT APPLICABLE)

(a) that myself or any of the representatives of my company / firm do not have any relatives as defined in the appended Annexure III in the APTRANSCO / DISCOM.

OR

(b) that the following officers / employees of the APTRANSCO / DISCOM are related to me and to the representatives of my company / firm and their status in the APTRANSCO / DISCOMS is as under:

Sl.No	Name of the Officer Employee	Designation and Place of working	APTRANSCO / DISCOM	Relationship
1.				
2.				
3.				
4.				
5.				
6.				

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

Signature of the Authorised Representative

9.DECLARATION TO BE GIVEN BY THE COMPANY / PARTNERSHIP FIRM / SUPPLIER AT THE TIME OF ENTERING INTO AGREEMENT WITH APTRANSCO / DISCOMS:

(STRIKE OUT THAT WHICH IS NOT APPLICABLE)

(a) I declare that myself or any one of the representatives of my company / firm do not have any relatives as defined in the appended annexure II in the APTRANSCO / DISCOM.

OR

(b) that the following officers / employees of the APTRANSCO / DISCOM are related to me and to the representatives of my company / firm as mentioned hereunder:

Sl.No	Name of the Officer Employee	Designation and Place of working	APTRANSCO / DISCOM	Relationship
1.				
2.				
3.				
4.				
5.				
6.				

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

Signature of the Authorised Representative

LIST OF RELATIVES:

- | | |
|---------------------------------------|--------------------------------------|
| 1. Father | 14. Daughter's Husband |
| 2. Mother (including step mother) | 15. Daughter's Son |
| 3. Son (including step son) | 16. Daughter's Son's Wife |
| 4. Son's Wife | 17. Daughter's Daughter |
| 5. Daughter (including step daughter) | 18. Daughter's Daughter's Husband |
| 6. Father's Father | 19. Brother (including step brother) |
| 7. Father's Mother | 20. Brother's Wife |
| 8. Mother's Mother | 21. Sister (including step sister) |
| 9. Mother's Father | 22. Sister's Husband |
| 10. Son's son | 23. Son's Wife's Father |
| 11. Son's Son's Wife | 24. Son's Wife's Mother |
| 12. Son's Daughter | 25. Daughter's Husband's Father |
| 13. Son's Daughter's Husband | 26. Daughter's Husband's Mother |
- } and their siblings

10. FORM : : BANK ACCOUNT DETAILS FOR RTGS

1. Name of the Bank :
2. Name of the Branch :
3. Branch code :
4. City :
5. Account No.
6. MICR No.
7. IFSC No.
8. Income Tax PAN Number :
9. GST Registration Number :
10. Date of GST Registration :
11. Place of GST Registration :

Signature of the Bidder

11. MANUFACTURERS' BIDDING AUTHORISATION FORM

No.dated

To

Dear Sir,

SPECIFICATION No.PMMTC1-e-14/2026

We (Name & complete Address) who are established and reputable manufacturers of _____(Name & descriptions of Materials / equipment offered) having factory at (address of factory) do hereby authorize _____ (Full name and Designation) whose specimen signature is attested here under to submit the bid, and sign the contract with you for the above Materials / equipment manufactured by us against the above Specification No..

Specimen Signature

Yours faithfully,

(Name)

(Name of manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer .It should be included by the Bidder in its bid.

The Bidder's complete postal address and their factory complete postal address with phone and fax numbers shall be invariably mentioned in the above proforma.

.....

FORM - 12

**UNDERTAKING TO BE GIVEN BY THE COMPANY ALONG WITH THE BID
REGARDING BANNING/BLACK LISTING**

I, _____
representing the Company responding to the bid invitation by the APTRANSCO vide Specification
No. _____ hereby sincerely and solemnly affirm and state as follows:

(a) We, _____ (Name of Company) or our
promoter's firm(s) have not been banned/ black-listed/debarred by any Govt. Department/
undertaking or Power Utility for non-performance or malpractice or due to any reasons.

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

Signature of the Authorised Representative

13. FORM: : BANKERS CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/s. _____,
having their plant at _____ is our
customers and have satisfactory record of transactions. They are having the credit limits of
Rs. _____ lakhs in our Bank.

Place:
Date:

Signature of the Manager
Name:
Bank address and Seal.

FORM-14 - Not Applicable

Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order **and MoP Order**, if applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date:

I _____ S/o, D/o, W/o, _____ Resident of _____ hereby solemnly affirm and declare as under:

I am the << Designation of the Authorized signatory >> of _____ and I am duly authorized to furnish this undertaking declaration on behalf of -----

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated 19/07/2024(hereinafter **PPP-MII order**).

‘Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)’ order dated 28/07/2020 issued by Ministry of Power (hereinafter MoP order) and Revised on 17/09/2020 in respect of Power Sector.

Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content), Further Revised Order No. A-1/2021-FSC-Part(5)dt. 16/11/2021 issued by Ministry of Power (MoP Order) .

As per Orders vide G.O.Ms.NO.9, Industries and Commerce (PROG-I) Department Dt.25.02.2021

and any subsequent modifications/Amendments, if any and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/ POWERGRID or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for (Enter the name of the package).

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the ‘Local Content ‘as defined in the PPP-MII order and MoP order in the goods/services/works supplied by me for (Enter the name of the package/procurement) is percent (%).

That the goods/services/works supplied by me for (Enter the name of the package/procurement) meet the ‘Local Content‘ requirements defined in the PPP-MII order **and MoP order for ‘Class –I local supplier’/‘Class-II Local supplier (choose as applicable).**

That the value addition for the purpose of meeting the ‘Local Content ‘has been made by me at (Enter the details of the location(s) at which value addition is made).

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/APTransco/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

i Name and details of the Local Supplier

(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Local Content prescribed for **'Class – I local supplier'/'Class-II Local supplier (choose as applicable)**

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of..... (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

FORM-15 - Not Applicable

Certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of Local Content, in line with PPP-MII order **and MoP order** , if applicable[to be submitted on the letter head of the issuer.]

Dear Sir,

We have read and understood the provisions of “Public Procurement (Preference to Make in India) Order, 2017” dated 15/06/2017, its revision dated **04/06/2020**[hereinafter, “PPP-MII Order”] issued by **Department for promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce and Industry, Government of India,

‘Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)’ order dated 28/07/2020 issued by Ministry of Power [hereinafter, “MoP order”]

**As per Orders vide G.O.Ms.NO.9, Industries and Commerce (PROG-I) Department
Dt.25.02.2021**

and any subsequent modifications/Amendments, if any.

In line with the provisions of the PPP-MII Order **and MoP Order**, M/s.[Enter the name of the Bidder] [here in after, “**Class-I Local Supplier**”/”**Class-II Local Supplier**”(choose as applicable)] have submitted an Affidavit of self-certification to M/s. APTRANSCO regarding Local Content in Goods/Services/Works to be supplied by the “**Class-I Local Supplier**”/”**Class-II Local Supplier**”(choose as applicable)for [Enter the name of the package], wherein they have agreed to abide by the terms and conditions of the PPP-MII Order **and MoP Order**.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company (**in the case of companies**) or a practicing cost accountant or practicing chartered accountant (**in respect of suppliers other than companies**) shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the “**Class-I Local Supplier**”/”**Class-II Local Supplier**”(choose as applicable)for [Enter the name of the package].

Accordingly, we, the Statutory Auditor(s) /Cost auditor of the “**Class-I Local Supplier**”/”**Class-II Local Supplier**”/ a practicing cost accountant or practicing chartered accountant [**choose as applicable**], certify that the Local Content as defined under the PPP-MII **and MoP Order**, in the Goods/Service/Works to be supplied by the “**Class-I Local Supplier**”/”**Class-II Local Supplier**”(choose as applicable)for [Enter the name of the package]is percentage [specify the percentage of Local content].

For and on behalf of,

Date:

<<Statutory Auditor’s/Cost auditor’s/ Cost accountant’s/Chartered accountant’s attestation>>

Firm Reg No. Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by APTRANSCO.

FORM-16 Not Applicable

Certification by the Bidder per order no. F.No.6/18/2019-PPD dated 23/07/2020 issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order) in line with NIB 19.0

(In case of a Joint Venture bid, declaration/certification shall be given by the by all partners of the Joint Venture)

- | | |
|------------------------------|-----------------|
| ● Bidder's Name and Address: | ● To: |
| ● Name:..... | ● Name:..... |
| ● Address:..... | ● Address:..... |
| ● | ● |
| ● | ● |

Dear Sir,

We have read and understood the provisions of Order no. F.No.6/18/2019-PPD(Order Public Procurement no.1) dated 23/07/2020 regarding "Restriction under Rule 144(xi) of General Financial Rules" and F.No.6/18/2019-PPD (Order Public Procurement no.2) dated 23/07/2020 regarding "Exclusions from Restriction under Rule 144(xi) of General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively "**DoE Order**"] and any subsequent modifications/Amendments, if any.

Particularly, we, the Bidder, have read the clause regarding restrictions on procurement from a 'Bidder of a country which shares a land border with India' and on sub-contracting to contractors from such countries.

We certify that we, the bidders/are not from such a country or, if from such a country, has been registered **as per provisions of the Bidding Documents** with the Competent Authority and will not sub contract any work to a sub contractor/sub vendor from such countries unless such sub contractor/sub vendor fulfils all requirement in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]

We further declare that any misrepresentation or submission of false/forged document/information in this regard shall be dealt with as per the provisions of Integrity Pact and/or Bidding Documents and/or APTRANSCO's policy and procedures.

- | | |
|----------|-----------------|
| ● Date: | ● Printed Name: |
| ● Place: | ● Designation: |

SECTION-VIII

General guidelines to be Followed.

1. The bidder shall have to be an entity registered in India in accordance with law.
2. The bids shall be in the language as prescribed by the tenderer /procurer.
3. The bids shall be in Indian Rupees (INR)
4. The bidder shall follow Indian laws, regulations and standards.
5. The technologies /products offered shall be environmentally friendly, consuming less energy safe, energy efficient durable and long lasting under the prescribed operational conditions.
6. The supplier shall ensure supply of spares, materials and technological support for the entire life of the project.
7. The equipment/material sourced from foreign companies may be tested in accredited labs in India before acceptance wherever such facilities are available.
8. The tender fee and the Bank Guarantee (BG) shall be in Indian Rupees only.
9. The bidder shall have to furnish a certificate regarding cyber security/safety of the equipment/process to be supplied/services to be rendered as safe to connect.
10. Applicable safety requirements shall be met. Regular safety audit shall be carried out by the manufacturer.
11. Statutory laws/regulations including the labour and environmental laws shall be strictly complied with during supply, storage, erection, and commissioning and operation process. A regular compliance report shall be submitted to the procurer/appropriate authorities.
12. Tendering by the authorised agency shall be accepted.
13. In case local testing is not considered necessary by the procurer, the original test report in the language prescribed by the procurer may be accepted. The translated test report shall not be accepted unless it is notarized.
14. Certificate/compliance as per the Indian Standards/International standards/Indian Regulations/specified standards shall be mandatory, wherever applicable.
15. Quality assurance of the product shall be carried out by the procurer or an independent third-party agency appointed by the procurer. Manufacturing quality plan as approved by the procurer shall be followed by the manufacturer.

LIST OF SCHEDULED BANKS APPROVED BY APTRANSCO

Sl. No.	NAME OF THE BANK
1	Allahabad Bank.
2	Andhra Bank.
3	APCO. Bank, Main Branch, Hyderabad.
4	Bank Of Baroda.
5	Bank Of India.
6	Bank Of Maharashtra.
7	Bank Of Punjab Ltd.
8	Central Bank of India.
9	Centurion Bank Ltd.
10	Citi Bank.
11	Corporation Bank.
12	Federal Bank.
13	HDFC Bank.
14	HSBC Bank.
15	I.C.I.C.I. Bank.
16	I.D.B.I. Bank.
17	Indian Bank.
18	Indian Overseas Bank.
19	ING Vysya Bank Ltd.
20	Karnataka Bank.
21	Karur Vysya Bank.
22	Kotak Mahindra Bank.
23	Lakshmi Vilas Bank.
24	Oriental Bank Of Commerce.
25	Punjab National Bank.
26	Standard Chartered Bank.
27	State Bank Of India and other State Bank group Banks/Associate Banks.
28	Syndicate Bank.
29	U.T.I. Bank Ltd.
30	Union Bank Of India.
31	Vijaya Bank.
32	YES Bank Ltd.