

**Information to Bidder for the “Procurement of Routers, Racks, SFPs and other Misc. items through GeM”**

**Ref: GeM Bid No. GEM/2023/B/3170874 dated: 22.02.2023**

- The item/items in this bid should be quoted as per the technical specifications. *The details of the specifications along with consignee/site details are also available on website [www.railtelindia.com](http://www.railtelindia.com)*

**(The technical specs which are not available on GeM portal for the required product, same will be uploaded in ATC as one time exercise. In future all the specs will be available on GeM portal.)**

1. In the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/licenses. Thus, all hardware/software/licenses required for enabling the support/feature shall be included in the offer. The technical specifications are mentioned in **Annexure-I**.
2. OEM or Authorized distributor/Partner of OEM should have a registered office in India to provide sales and 24x7 support in India. The certificate to this effect should be submitted. The bidder should be either OEM or his authorized dealer/distributor.
3. In case of the authorized distributor/partner certificate from the OEM to this effect should be submitted. If OEM is quoting then OEM should submit the certificate. **In the tender, either the manufacturer or its authorized dealer will be considered as valid bidders. In cases where the manufacturer has submitted the bid, the bids of its authorized dealer will not be considered and EMD will be returned. And in case of violations, both infringing bids will be rejected.**
4. Equipment offered shall have complete data sheets and detailed description on OEM web sites.
5. Bidder shall submit the detailed BOM of the equipment offered duly verified and certified by the respective OEM.
6. GSTIN RC of vendor for state should be provided from where goods will be supplied.
7. **Delivery Period, Consignee Address, Inspection and Installation**
  - 7.1 **Delivery Period:** The supplier will have to supply the material within 90 days from the date of issue of confirmed LOA/PO. If material is not supplied within the approved delivery period then penalty of 0.5% of undelivered/uninstalled quantity per week to the maximum to the 10% of the contract value will be levied.

**7.2 Consignee Address:**

**Sr. Manager/Stores,  
RailTel Office, New Delhi,  
Northern Region.**

**Note: In addition to the above consignee address i.e. Regional store, bidder may also be required to send items to RailTel Northern Region Territory stores/sites, without any cost to RailTel.**

**7.3.1 Inspection: Inspection shall be carried out by authorized representative of RailTel's.**

**8. Estimated cost of tender & Earnest Money Deposit (EMD)/Bid Security:**

- 8.1 Estimated cost of tender:** Estimated cost of the Tender is **Rs. 1,55,07,717/- (Incl. GST).**
- 8.2 Earnest Money Deposit (EMD)/ Bid Security: Earnest Money Deposit (EMD)/ Bid Security: Bid Security: Rs. 3,10,154/-** in the form of Pay Order/ Demand Draft drawn in favor of RailTel Corporation of India Ltd. payable at New Delhi on or before 15:00 Hrs of Bid Opening Date. The Bid received without EMD will be summarily rejected.
- 8.3** In addition to clause 8.2 above, Tenderer has an option for online submission of EMD also. The EMD should be remitted in following account of RailTel Corporation of India Limited before the stipulated time and date of bid submission:

|                        |                                                                   |
|------------------------|-------------------------------------------------------------------|
| Name of bank & address | Union Bank of India, 14/15-F, Connaught Place, New Delhi- 110001. |
| Name of Account holder | RAILTEL CORPORATION OF INDIA LIMITED N R COLLECTION A/C (RCIL)    |
| Account No.            | 307801010917906                                                   |
| IFSC Code              | UBIN0530786                                                       |
| Branch/MICR Code       | Connaught Place/110026006                                         |

**8.4 Eligible MSEs are exempted from EMD.**

- 9.** This bid complies with “Public Procurement (preference to make in India) Policy Order, 2017 issued by DIPP and Public Procurement Policy for Micro and Small Enterprises (MSEs) order,2012” issued by MoSME.”

The bidders claiming the preference have to submit relevant documents prescribed under relevant order.

**10. Security Deposit/Performance Guarantee:**

The successful tenderer shall submit security deposit in the form of DD/irrevocable BG from any scheduled bank for due fulfillment of contract as per the details given below:

- i. Security Deposit/Performance Bank Guarantee @ 3% of total value of Purchase Order is required to be submitted within 30 days of issue of Purchase Order with validity of 3 months beyond warranty period, failing which a penal interest of 15% per annum shall be charged for the delay period i.e. beyond 30 (thirty) days from the date of issue of LOA/PO.
- ii. The security deposit/PBG shall be submitted to RCIL/RO/NR, Shastri Park, Delhi.
- iii. A separate advice of the BG will invariably be sent by the BG issuing bank to the RailTel's Bank through SFMS and only after this the BG will become acceptable to RailTel. It is therefore in own interest of bidder to obtain RailTel's bank IFSC code, its branch and address and advise these particulars to the BG issuing bank and request them to send advice of BG through SFMS to the RailTel's Bank.

The security deposit/Performance Bank Guarantee shall be released after successful completion of Contract obligations under the contract, duly adjusting any dues recoverable from the successful tenderer. Payment of Security Deposit in the form of Pay Order/Demand Draft should be made in favor of "RailTel Corporation of India Ltd" payable at New Delhi.

**Note 1: In case value of BG comes to Rs. 5 Lakhs or less, same should be submitted in the form of DD/Banker cheque only.**

**Note 2: In case of change in the value of Security Deposit/Performance Guarantee as per latest guidelines issued by GoI, bidder has to submit the revised BG accordingly.**

#### **11. Eligibility Criteria for OEM (Routers, SFPs and Racks (Type- III & IV)):**

- The equipment offered by the OEM or equipment of the same series/family from the same OEM should have been satisfactorily working in Government /PSUs/Telecom Service Providers network for at least 12 months as on opening of bid, in India or Abroad. The certificates from the actual users will have to be submitted online.
- The OEM should have supplied at least 35% of the tendered quantity (rounded to the nearest whole number) of the equipment offered or equipment of the same series/family during last preceding 3 financial years (i.e. current year and three previous financial years) as on opening of bid to Government/PSUs/Telecom Service Providers. OEM should submit self-certificate with proper contact detail of clients along with quantities supplied (Firm Name, Contact person, Designation, Telephone Number, Fax, Official mail id etc.). The same should be issued by authorized signatory.
- The OEM should have proven facilities for Engineering, manufacture, assembly, integration and testing of **Routers, SFP's and Racks** and basic facilities with respect to space, Engineering, Personnel, Test equipment, Manufacture, Training, Repair, Service Center Supports for at least past three years in the country from where the proposed equipment are planned to be supplied. In case OEM is located outside India, it should have training repair and service center facilities in India also. The certificates/Undertaking for the same will have to be submitted online.

(The bidder will have to submit the proof of establishment for the facility)

## **12. Eligibility Criteria:**

### **12.1 Technical Eligibility for Bidder:**

The tenderer must have successfully completed any of the following during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:

- Three similar works# each costing not less than the amount equal to 30% of advertised value of the tender, or
- Two similar works# each costing not less than the amount equal to 40% of advertised value of the tender, or
- One similar work # each costing not less than the amount equal to 60% of advertised value of the tender.

**# Similar Work# Supply / Supply and Installation of a Work/Project in the field of IT/ICT/Telecom** for any Government department or Public Sector Units or public listed companies (as per note below).

**Note:** Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, PSU or any reputed TELCO, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of opening of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates. In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate

### **12.2 Financial Criteria for Bidder:**

The tenderer must have received total contractual payments/operating turnover in the previous three financial years and the current financial year up to the date of inviting of tender, at least 150% of the advertised value of the tender. The tenderers shall submit Certificates to this effect which may be an attested Certificate from the concerned department / client or Audited Balance Sheet /Certificate from Chartered Accountant duly supported by Audited Balance Sheet. (Note: Client certificate from other than Govt. Organization should be duly supported by Form 16A/26AS generated through TRACES of Income Tax Department of India).

Credentials if submitted in foreign currency shall be converted into Indian currency i.e., Indian Rupee as under: The conversion rate of US Dollars into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date. Where, relevant date shall be as on the last day of month previous to the one in which tender is invited. In case of any other currency, the same shall first be converted to

US Dollars as on the last day of month previous to the one in which tender is invited, and the amount so derived in US Dollars shall be converted into Rupees at the aforesaid rate. The conversion rate of such currencies shall be the daily representative exchange rates published by the International Monetary Fund for the relevant date.

**12.3.** The Bidder should be OEM or System Integrator authorized by OEMs for Supply, Warranty/AMC Support for the following products:

- (i) Routers
- (ii) SFPs
- (iii) Racks

In case of System Integrator, Bidder should have authorization specific to this tender from respective OEM as per Annex-IV.

**13. Splitting of Quantity:**

13.1 Deleted

13.2 In case bidder claims PMA, Government of India Guideline/Instruction regarding splitting of order to Local supplier shall be applicable. Govt. Guidelines in regard to MSME shall be followed.

**14. Warranty:**

**14.1** The materials are to be warranted for **3 years** from the date of delivery to the consignee. The supplier shall warrant that stores to be supplied shall be new and free from all defects and faults in material, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards of materials of the type ordered and shall perform in full conformity with the specifications and drawings.

The supplier shall be responsible for any defects that may develop under the conditions provided by the contract and under proper use, arising from faulty materials, design or workmanship such as corrosion, inadequate quantity of material to meet Cards/Modules requirements, inadequate contact protection, deficiencies in design and/ or otherwise and shall remedy such defects at his own cost when called upon to do so by the Purchaser who shall state in writing in what respect the stores are faulty.

**14.2 SLA:**

After having been notified of the defects / service requirement during warranty period, Seller has to complete the required Service / Rectification within time limit of max. 7 days. If the Seller fails to complete service / rectification within defined time limit, a penalty of 0.5% of Unit Price of the product shall be charged as penalty for each week of delay from the seller & upto max. of 100% of Unit Price of the product. Seller can deposit the penalty with the Buyer directly else the Buyer shall have a right

to recover all such penalty amount from the Performance Security (PBG) or from the running bills.

**15. Purchaser's Right to Vary Quantities:**

The purchaser shall be at liberty to enhance or reduce the quantity mentioned in the LOA as indicated in below para without assigning any reasons. The bidder shall comply with such modifications unconditionally provided these are made before completion of the deliveries under the purchase order/LOA.

(A) Upto maximum extent of +/- 50% subject to following condition

- i. Upto +25% with no rebate.
- ii. From +25% to +40% with 2% rebate
- iii. From +40% to +50% with 4% rebate

(B) For variation beyond +50% of the quantity mentioned in the SOR may be done after proper negotiation with the selected bidder.

(C) AMC rates for items under Variation Order will be at same percentage as finalized in the main contract.

**16. Long Term Maintenance Support:**

Tenderer (OEM) shall provide maintenance support after successful completion of the warranty obligations for a minimum period of 5 years. The long term maintenance support shall be comprehensive and include all hardware and software of equipment supplied against this contract. RailTel should be extended the benefits of periodical software patches/updates made by OEM on the system from time to time for equipment security/performance without any additional cost to RailTel.

Buyer reserves the right to enter into AMC @ 5% of ordered value of equipment before 30 days of expiry of warranty period. In case bidder refuses to enter into AMC, PBG will be forfeited. Separate agreement for AMC (Long term Maintenance Support) before expiry of warranty period shall be entered into with OEM/the authorized partner of OEM by RailTel. A fresh Performance Guarantee valid for Five years and four months for 3% of the Long Term Maintenance Support cost of five years, shall be required to be submitted by bidder for due fulfillment of long term maintenance support obligation. Quarterly payment for AMC Charges would be made by RailTel after successful completion of AMC Services of that quarter and on the certificate furnished by concerned RailTel representative.

**Note 1: The acceptance of the above clause is mandatory and specific acceptance from OEM is required to be enclosed as per Annexure-VI. Any deviation / non acceptance will lead to rejection of the bid summarily.**

**Note 2: In case of change in the value of Security Deposit/Performance Guarantee as per latest guidelines issued by GoI, bidder has to submit the revised BG accordingly.**

## **17. Payment Terms:-**

### **17.1 For Supply Items:**

- (i)** 100% payment on full supply.
- (ii)** 80% payment against part supply of the ordered quantity. In case bidder completes the supply order for one SOR, he can claim part payment of 80% against each SOR's completed supply of the said SORs. Balance payment shall be made after full supply. The following documents are to be submitted for payment:
  - Original Tax Invoice. (With separate Tax amount, containing POS, RailTel GSTN and Supplier GSTN).
  - Delivery Challan.
  - Original Consignee receipt.
  - Original Inspection Certificate.
  - Transit Insurance Certificate.
  - Warranty Certificate of OEM.
  - Proof of SD/PG submitted.
  - Certificate of receipt of Goods in Good Condition.
  - Declaration of non-applicability of e-invoicing, if applicable.
  - Declaration regarding 206AB/206CCA of IT act.

### **17.2 For Supply and Installations Items:**

- (i)** 80% of the value of the part supply of equipment on receipt by the consignee at site duly inspected and accompanied with valid documents as listed under para 17.1(ii).
- (ii)** Balance 20% of the value of the part supply on successful installation and commissioning at site. Bidder has to install and commission the equipment within 30 days from the communication by RailTel EIC (Engineer In-Charge). In case installation and commissioning is delayed on account of RailTel then 20% payment can be released after submission of a Bank Guarantee of equal amount valid for a period of one year.
- (iii)** 100% payment of service/installation items shall be made on successful installation and commissioning at site.

**17.3** Bill Passing Authority will be JGM/NTP/NR and Bill Paying Authority will be JGM/Finance/NR.

**18.** The tenderers shall submit a notarized affidavit on a non-judicial stamp paper stating that they are not liable to be disqualified and all their statement/documents submitted

along with bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as **Annexure-V. Non submission of an affidavit by the bidder shall result in summarily rejection of his/their bid.** And it shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting **documents duly self attested** by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. It will not be obligatory on the part of Tender Committee to scrutinize beyond the submitted document of tenderer as far as his qualification for the tender is concerned.

The RailTel (RCIL) reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the RailTel (RCIL), make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification by the RailTel (RCIL) shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the railway thereunder.

In case of any wrong information submitted by tenderer, the contract shall be terminated. Earnest Money Deposit (EMD), Performance Guarantee (PG) and Security Deposit (SD) of contract forfeited and agency barred for doing business on RailTel (RCIL) for 5 (five) years.

**19. Power of Attorney:**

Power of attorney in favor of the signatory duly authorizing the signatory shall be submitted online before the due date and time of submission of the e-Tender and Original copy is needed to be submitted by the successful bidder before issuance of PO.

**20. On line Submissions:**

The bidder is required to upload and submit the following documents on line before due date & time of bid. The due date & time for closing of the bid is \_\_\_\_ Hrs of \_\_\_\_\_.\_\_\_\_\_ and the bid will be opened at \_\_\_\_ Hrs of \_\_\_\_\_.\_\_\_\_\_.

- (i) Offer letter as per Annexure-II.
- (ii) EMD Submission details.
- (iii) BOQ of offered equipment.
- (iv) Clause wise compliance along with all mentioned documents/annexures for all clauses of GeM Bid and ATC documents.
- (v) Data Sheet of offered equipment.
- (vi) Financial (Certified copies of audited balance sheets/annual reports of last three preceding financial years) and Technical Eligibility Criteria documents.
- (vii) Technical Compliance of all Specification of items as per GeM Bid and ATC documents.
- (viii) Certificate from the End user against the Eligibility criteria for OEM para 11.
- (ix) Proof of document required against Eligibility criteria of OEM and Bidder vide para 11 & 12 respectively.
- (x) Long Term Maintenance Support Proforma as per Annexure-VI.
- (xi) MAF/OEM Authorization as per para 12.3 and Annexure-IV.
- (xii) Notarized affidavit on a non-judicial stamp paper as per Annexure-V.

- (xiii) Certificate as per Annexure-VII.
- (xiv) Nil Deviation as per Proforma attached in Annexure-VIII.
- (xv) Power of Attorney as per clause 19.

**Note:** 1) The bidder is required to give acceptance of all the clauses mentioned in the **“Information to the Bidders”** document is mandatory. Any deviation / non-acceptance may lead to rejection of the bid.

2) Information to Bidder viz. corrigendum /addendum/ amendments etc. for this bid shall be posted on [www.railtelindia.com](http://www.railtelindia.com) only.

3) This bid is governed by the Specific Additional Terms & Conditions and General Terms & Conditions laid down by the GeM against **GeM Bid No: \_\_\_\_\_**.

In case, if any contradiction between GeM Additional Terms & Conditions and General Terms & Conditions, RailTel Terms & Conditions will prevail.

**Technical Specifications****1. All Equipment should be:**

- i. With 3 years warranty & 5 years AMC.
- ii. Equipped with necessary hardware/software to comply all above required / support features.
- iii. Back-to-Back warranty with respective OEMs for both Hardware and Software. The certificates/Undertaking for the same will have to be submitted along with bid from respective OEM.
- iv. OEM (**Routers, SFP's and Rack**) should have its Service Centre at min 04 locations in major cities in India. Service center details to be shared along with address and contact no. and person.
- v. UL, CE and FCC Certification is not required for PMA. However, they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to UL, CE and FCC and meets all standard and specification of UL, CE and FCC.

**2. SOR wise details are as:**

| <b>SOR</b> | <b>Item Description</b>                                                                      | <b>Units</b> | <b>Qty.</b> |
|------------|----------------------------------------------------------------------------------------------|--------------|-------------|
| SOR-1      | Supply of Router Type-I as per technical specifications of SOR-1 of Information to Bidder.   | Nos.         | 1           |
| SOR-2      | Supply of Router Type-II as per technical specifications of SOR-2 of Information to Bidder.  | Nos.         | 5           |
| SOR-3      | Supply of Router Type-III as per technical specifications of SOR-3 of Information to Bidder. | Nos.         | 9           |
| SOR-4      | Supply of Router Type-IV as per technical specifications of SOR-4 of Information to Bidder.  | Nos.         | 33          |
| SOR-5      | Supply of SFP Type-I as per technical specifications of SOR-5 of Information to Bidder.      | Nos.         | 84          |
| SOR-6      | Supply of SFP Type-II as per technical specifications of SOR-6 of Information to Bidder.     | Nos.         | 8           |
| SOR-7      | Supply of SFP Type-III as per technical specifications of SOR-7 of Information to Bidder.    | Nos.         | 4           |
| SOR-8      | Supply of SFP Type-IV as per technical specifications of SOR-8 of Information to Bidder.     | Nos.         | 4           |
| SOR-9      | Supply of SFP Type-V as per technical specifications of SOR-9 of Information to Bidder.      | Nos.         | 4           |

|        |                                                                                                                                   |       |      |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|-------|------|
| SOR-10 | Supply of SFP Type-VI as per technical specifications of SOR-10 of Information to Bidder.                                         | Nos.  | 26   |
| SOR-11 | Supply of SFP Type-VII as per technical specifications of SOR-11 of Information to Bidder.                                        | Nos.  | 2    |
| SOR-12 | Supply of SFP Type-VIII as per technical specifications of SOR-12 of Information to Bidder.                                       | Nos.  | 6    |
| SOR-13 | Supply of Rack Type-I as per technical specifications of SOR-13 of Information to Bidder.                                         | Nos.  | 36   |
| SOR-14 | Supply of Rack Type-II as per technical specifications of SOR-14 of Information to Bidder.                                        | Nos.  | 1    |
| SOR-15 | Supply of Rack Type-III as per technical specifications of SOR-15 of Information to Bidder.                                       | Nos.  | 6    |
| SOR-16 | Installation, Testing and Commissioning of Rack Type-III as mentioned in SOR-15.                                                  | Nos.  | 6    |
| SOR-17 | Supply of Rack Type-IV as per technical specifications of SOR-17 of Information to Bidder.                                        | Nos.  | 22   |
| SOR-18 | Installation, Testing and Commissioning of Rack Type-IV as mentioned in SOR-17.                                                   | Nos.  | 22   |
| SOR-19 | Supply of GI Pipe Type-I as per technical specifications of SOR-19 of Information to Bidder.                                      | Meter | 1800 |
| SOR-20 | Laying/Fixing/Clamping of GI Pipe Type-I as mentioned in SOR-19.                                                                  | Meter | 1800 |
| SOR-21 | Supply of GI Pipe Type-II as per technical specifications of SOR-21 of Information to Bidder.                                     | Meter | 4800 |
| SOR-22 | Laying/Fixing/Clamping of GI Pipe Type-II as mentioned in SOR-21.                                                                 | Meter | 4800 |
| SOR-23 | Supply of Flexible GI Pipe - 25MM as per technical specifications of SOR-23 of Information to Bidder.                             | Meter | 900  |
| SOR-24 | Supply of PVC Flexible Pipe - 32MM as per technical specifications of SOR-24 of Information to Bidder.                            | Meter | 980  |
| SOR-25 | Laying/Fixing/Clamping of PVC Flexible Pipe - 32MM as mentioned in SOR-24.                                                        | Meter | 980  |
| SOR-26 | Supply of PVC Conduit Pipe - 32MM as per technical specifications of SOR-26 of Information to Bidder.                             | Meter | 1470 |
| SOR-27 | Laying/Fixing/Clamping of PVC Conduit Pipe - 32MM as mentioned in SOR-26.                                                         | Meter | 1470 |
| SOR-28 | Supply of HDPE Duct as per technical specifications of SOR-28 of Information to Bidder.                                           | Meter | 1470 |
| SOR-29 | Laying/Fixing/Clamping of HDPE Duct as mentioned in SOR-28.                                                                       | Meter | 1470 |
| SOR-30 | Supply of ADSS OFC-24F as per technical specifications of SOR-30 of Information to Bidder.                                        | Meter | 9800 |
| SOR-31 | Blowing/Pulling of ADSS OFC- 24F as mentioned in SOR-30.                                                                          | Meter | 9800 |
| SOR-32 | Supply of OFC 12F Unarmoured as per technical specifications of SOR-32 of Information to Bidder.                                  | Meter | 1800 |
| SOR-33 | Blowing/Pulling of OFC 12F Unarmoured as mentioned in SOR-32.                                                                     | Meter | 1800 |
| SOR-34 | Supply of FDMS 24F as per technical specifications of SOR-34 of Information to Bidder including with all installation accessories | Nos.  | 98   |

|        |                                                                                                                                                                  |       |      |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
|        | like patch cord, pigtails etc.                                                                                                                                   |       |      |
| SOR-35 | Installation, Testing and Commissioning of FDMS 24F above as mentioned in SOR-34.                                                                                | Nos.  | 98   |
| SOR-36 | Supply of FDMS 12F as per technical specifications of SOR-36 of Information to Bidder including with all installation accessories like patch cord, pigtails etc. | Nos.  | 98   |
| SOR-37 | Installation, Testing and Commissioning of FDMS 12F above as mentioned in SOR-36.                                                                                | Nos.  | 98   |
| SOR-38 | Supply of Joint Closure 24F as per technical specifications of SOR-38 of Information to Bidder.                                                                  | Nos.  | 49   |
| SOR-39 | Supply of Electrical Wire as per technical specifications of SOR-39 of Information to Bidder.                                                                    | Meter | 1800 |
| SOR-40 | Blowing/Pulling of Electrical Wire as mentioned in SOR-39.                                                                                                       | Meter | 1800 |
| SOR-41 | Supply of MCB as per technical specifications of SOR-41 of Information to Bidder.                                                                                | Nos.  | 30   |
| SOR-42 | Supply of Electricity Meter as per technical specifications of SOR-42 of Information to Bidder.                                                                  | Nos.  | 30   |
| SOR-43 | Supply of Patch Cord Type-I as per technical specifications of SOR-43 of Information to Bidder.                                                                  | Nos.  | 148  |
| SOR-44 | Supply of Patch Cord Type-II as per technical specifications of SOR-44 of Information to Bidder.                                                                 | Nos.  | 160  |
| SOR-45 | Supply of SIP Phone as per technical specifications of SOR-45 of Information of Bidder.                                                                          | Nos.  | 8    |

## Technical Specification of SOR Items

### SOR1: Router Type-I

| SN | Description                                                                                                                                                                                                                    |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Router should support minimum 1G/10G SFP+ ports (Including 8X10G SFP+ module) and 4 number of 100G interface (excluding XFP/SFP/QSFP) from day one.                                                                            |
| 2  | Total throughput (Full duplex): Minimum 280 Gbps                                                                                                                                                                               |
| 3  | MAC Table Size : 64K                                                                                                                                                                                                           |
| 4  | IPv4 RIB/FIB : Minimum 1M/128K                                                                                                                                                                                                 |
| 5  | IPv6 RIB/FIB : Minimum 512K/32K                                                                                                                                                                                                |
| 6  | MPLS Labels : Minimum 32K                                                                                                                                                                                                      |
| 7  | Label Stack : 5                                                                                                                                                                                                                |
| 8  | L2 / L3 VPN VRF : Minimum L2 1000, Minimum L3 256                                                                                                                                                                              |
| 9  | Support of number of queues per system : Minimum 4K                                                                                                                                                                            |
| 10 | Number of VLAN support : 1000                                                                                                                                                                                                  |
| 11 | Operating Temperature : (0 to 40 degree C or better)                                                                                                                                                                           |
| 12 | Storage Temperature : (-10 to 60 degree C or better)                                                                                                                                                                           |
| 13 | Router can be of either modular/fixed type and shall have modular Operating system where it shall support individual restart of critical processes without affecting other processes or rebooting the entire operating system. |
| 14 | All 10G interfaces should support LR, ER and ZR.                                                                                                                                                                               |
| 15 | Router shall have option checking configuration before committing and option of rolling back to at least five configurations.                                                                                                  |
| 16 | Router should have redundant DC ( with the operating range of -40 to -72 VDC) power supplies                                                                                                                                   |
| 17 | Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/TX-power, threshold-monitoring/alarming, inventory.                                                                          |
| 18 | It shall support role based privileges for the system access and radius authentication for the System admin.                                                                                                                   |
| 19 | The router should have a Console or Out-of-band Management.                                                                                                                                                                    |
| 20 | Alerts for environmental or other hardware based alarms should be visibly implemented on the chassis.                                                                                                                          |
| 21 | All interfaces shall support services like L2VPN, L3VPN, VPLS and multicast VPN for both IPv4 and IPv6                                                                                                                         |
| 22 | The router should have mechanism to protect itself from DDoS attack.                                                                                                                                                           |
| 23 | The router should be IPv6 ready from day one.                                                                                                                                                                                  |
| 24 | The router should support filtering based on different parameters like: src ip, dst ip, src port, dst port, protocol etc                                                                                                       |
| 25 | The router should support Netflow, Jflow or equivalent                                                                                                                                                                         |
| 26 | The router should support IP SLA or RPM (or equivalent) for performance measurements, it should also support monitoring of IP SLA/RPM (or equivalent) probes using SNMP polling (OEM has to provide SNMP MIB information)      |
| 27 | Shall support QoS, option of traffic shaping per Interface based.                                                                                                                                                              |
| 28 | Shall support following class of service features:                                                                                                                                                                             |
|    | a) Classification, policing, marking, shaping, filtering                                                                                                                                                                       |
|    | b) Manage congestion using a weighted random early detection (WRED) algorithm                                                                                                                                                  |
|    | c) RFC 2474, Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers                                                                                                                                      |
|    | d) Single Rate Three Color Policer RFC 2697                                                                                                                                                                                    |

|    |                                                                                                                                    |
|----|------------------------------------------------------------------------------------------------------------------------------------|
|    | e) RFC 2698, A Two Rate Three Color Policer                                                                                        |
|    | f) congestion Management through CBWFQ, Round-Robin or equivalent, WFQ or equivalent                                               |
|    | g) RFC 2597, Assured Forwarding PHB Group                                                                                          |
|    | h) RFC 2598, An Expedited Forwarding PHB                                                                                           |
|    | i) Router should be able to classify based on 802.1 ad, 802.1 p, EXP and DSCP bits                                                 |
|    | j) The router shall support traffic interface mirroring in both ingress & egress directions for both IPv4 & IPv6                   |
| 29 | The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers   |
| 30 | The router shall support aggregated Ethernet and it shall be possible to bundle Upto 16 links.                                     |
| 31 | Shall support following MPLS features                                                                                              |
|    | a) LDP and RSVP signalling                                                                                                         |
|    | b) RFC 5036, LDP Specification                                                                                                     |
|    | c) RFC 3212 OR Constraint-Based LSP Setup using LDP                                                                                |
|    | d) RFC 3215, LDP State Machine                                                                                                     |
|    | e) RFC 3478, Graceful Restart Mechanism for LDP                                                                                    |
|    | f) RFC 2858, Multiprotocol Extensions for BGP-4                                                                                    |
|    | g) RFC 3063, MPLS Loop Prevention Mechanism                                                                                        |
|    | h) RFC 3031, Multiprotocol Label Switching Architecture                                                                            |
|    | i) RFC 3032, MPLS Label Stack Encoding                                                                                             |
|    | j) The router should be able to do load-balancing over multiple equal cost MPLS LSP                                                |
| 32 | The Router shall support MPLS Fast Reroute both link protection and Node protection.                                               |
| 33 | MPLS Ping, MPLS Trace Route                                                                                                        |
| 34 | Fast Reroute Extensions to RSVP-TE for LSP Tunnels                                                                                 |
| 35 | The router shall Support of Sync-E & PTP technology (License price to be quoted separately)                                        |
| 36 | Shall support MPLS based VPN services                                                                                              |
|    | a) L3VPN, L2VPN (Kompella BGP/ Martini LDP),                                                                                       |
|    | b) Internet draft, draft-ietf-l2vpn-vpls-bgp-08.txt, Virtual Private LAN Service (VPLS) Using BGP for Auto-discovery and Signaling |
|    | c) RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling                                   |
|    | d) Next Generation mVPN (P2MP) based on ( Draft-ietf-13vpn-2547bis-mcast-01.txt) & mVPN (draft-rosen-vpn-mcast).                   |
| 37 | The router shall support the following routing features                                                                            |
|    | a) BGPv4, BGP confederations and route reflector                                                                                   |
|    | b) Dynamic Host Configuration Protocol (DHCP)                                                                                      |
|    | c) RFC 3101, The OSPF NSSA Option                                                                                                  |
|    | d) RFC 2328, OSPF Version 2                                                                                                        |
|    | e) RFC 3623, OSPF Graceful Restart                                                                                                 |
|    | f) RFC 3630, Traffic Engineering (TE) Extensions to OSPF Version 2                                                                 |
|    | g) RFC 1195, Use of OSI IS-IS for Routing in TCP/IP and Dual Environments                                                          |
|    | h) RFC 2104, HMAC: Keyed-Hashing for Message Authentication                                                                        |
|    | i) RFC 2973, IS-IS Mesh Groups                                                                                                     |
|    | j) RFC 3358, Optional Checksums in IS-IS                                                                                           |
|    | k) RFC 3359, Reserved Type, Length and Value (TLV) Code points in IS-IS                                                            |
|    | l) RFC 3373, Three-Way Handshake for IS-IS Point-to-Point Adjacencies                                                              |
|    | m) RFC 5305, IS-IS Extensions for Traffic Engineering                                                                              |
|    | n) RFC 3847, Restart Signalling for IS-IS                                                                                          |
|    | o) RFC 3590, Source Address Selection for Multicast Listener Discovery Protocol                                                    |

|    |                                                                                                                                                                                                                                                                                                         |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | p) IGMP v2 and v3 as described in RFC 2236 and RFC 3376 with IGMP Routing Policies to filter IGMP requests.                                                                                                                                                                                             |
| 38 | The router shall support Virtual Router Redundancy Protocol (VRRP) as per IETF RFC 3768                                                                                                                                                                                                                 |
| 39 | Router shall support SNMP v2/v3 and NTP                                                                                                                                                                                                                                                                 |
| 40 | Shall support BFD for both single hop and multihop sessions                                                                                                                                                                                                                                             |
| 41 | Shall support the following OAM features and actions such as syslog/link down should be configurable on OAM event trigger:                                                                                                                                                                              |
|    | a) 802.3ah                                                                                                                                                                                                                                                                                              |
|    | b) 802.1ag                                                                                                                                                                                                                                                                                              |
|    | c) Y.1731                                                                                                                                                                                                                                                                                               |
| 42 | Shall support Multi-chassis LAG                                                                                                                                                                                                                                                                         |
| 43 | IPv6 Features                                                                                                                                                                                                                                                                                           |
|    | a) IPv6 Ping                                                                                                                                                                                                                                                                                            |
|    | b) IPv6 trace route                                                                                                                                                                                                                                                                                     |
|    | c) OSPF v3                                                                                                                                                                                                                                                                                              |
|    | d) IS-IS                                                                                                                                                                                                                                                                                                |
|    | e) VRRPv3                                                                                                                                                                                                                                                                                               |
|    | f) IPv6 CoS (classification & rewrite, scheduling based on TC )                                                                                                                                                                                                                                         |
|    | g) IPv6 ACL                                                                                                                                                                                                                                                                                             |
|    | h) 6PE and 6VPE                                                                                                                                                                                                                                                                                         |
| 44 | Multicast Feature: It shall support following:                                                                                                                                                                                                                                                          |
|    | a) It shall support IGMP snooping v2/v3                                                                                                                                                                                                                                                                 |
|    | b) The router shall support PIM Sparse Mode, RFC 4601(optional)                                                                                                                                                                                                                                         |
|    | c) Rendezvous Point (RP) - ability to be configured as an RP                                                                                                                                                                                                                                            |
|    | d) RFC 3569, Source Specific Multicast (SSM)                                                                                                                                                                                                                                                            |
|    | e) RFC 2365, Administratively Scoped IP Multicast                                                                                                                                                                                                                                                       |
|    | f) RFC 3446, Anycast Rendezvous Point (RP) Mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP).                                                                                                                                                         |
|    | g) RFC 3618, Multicast Source Discovery Protocol (MSDP).                                                                                                                                                                                                                                                |
| 45 | The proposed router should be NEBS level 3 compliant. NEBS Certification is not required for PMA. However, OEM has to produce certificate from standard lab approved or authorized by Govt. of India that the supplied Products are equivalent to NEBS and meet all standard and specification of NEBS. |
| 46 | The device should comply to the following safety standards                                                                                                                                                                                                                                              |
|    | a) EN 55022 Class A Emissions (Europe)                                                                                                                                                                                                                                                                  |
|    | b) FCC Class A (USA) Radiated Emissions                                                                                                                                                                                                                                                                 |
|    | c) UL 60950-1 Information Technology Equipment – Safety                                                                                                                                                                                                                                                 |
|    | d) EN 60825-1 Safety of Laser Products                                                                                                                                                                                                                                                                  |
|    | e) EN-61000-4-11 Voltage Dips and Sags                                                                                                                                                                                                                                                                  |
|    | f) ETS-300386 Electromagnetic Compatibility Requirements                                                                                                                                                                                                                                                |
|    | g) The device will conform to the following EN/IEC standard:                                                                                                                                                                                                                                            |
|    | i. 61000-4-2 – ESD                                                                                                                                                                                                                                                                                      |
|    | ii. 61000-4-3 Radiated Immunity                                                                                                                                                                                                                                                                         |
|    | iii. 61000-4-4 – EFT                                                                                                                                                                                                                                                                                    |
|    | iv. 61000-4-5 – Surge                                                                                                                                                                                                                                                                                   |
|    | v. 61000-4-6 – Low Frequency common immunity                                                                                                                                                                                                                                                            |
| 47 | The offered devices must support following functionalities to support 3rd party SDN (in future)                                                                                                                                                                                                         |
|    | (a) The router should support RFC 6020, YANG - A Data Modeling Language for the Network Configuration                                                                                                                                                                                                   |
|    | (b) Protocol (NETCONF)                                                                                                                                                                                                                                                                                  |

|    |                                                                                                                                                                                         |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | (c) The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241 |
|    | (d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.                                                                            |
|    | (e) The router should support PCECP as defined in RFC5440.                                                                                                                              |
|    | (f) The router should support BGP link-state (BGP-LS), RFC 4655                                                                                                                         |
|    | (g) The router should support SPRING                                                                                                                                                    |
| 48 | Devices shall support following for Provisioning                                                                                                                                        |
|    | (a) Use NETCONF (RFC 6241, RFC 6242, RFC 5277)                                                                                                                                          |
|    | (b) REST based CRUD operations for configuration and management.                                                                                                                        |
|    | (c) Web Services based operations for configuration and management                                                                                                                      |
| 49 | The offered devices must support API/NBIs for auto discovery of Services and Physical & Logical Topology                                                                                |
| 50 | TELEMETRY Function: It shall support following:                                                                                                                                         |
|    | a) The router should support telemetry based on push model for monitoring network devices                                                                                               |
|    | b) The router should support various software models/sensors for capturing different health parameters from the devices                                                                 |
|    | c) The router should support sending telemetry data to multiple consumers simultaneously                                                                                                |
|    | d) The router shall support GPB/GRPC/KAFKA encoding for telemetry data                                                                                                                  |
|    | e) The software model/sensors should be based on either yang, xml or open config                                                                                                        |
|    | f) The solution shall use either UDP or GRPC for transport of telemetry data                                                                                                            |
|    | g) The system should support streaming granularity of atleast 10 sec                                                                                                                    |
|    | h) The router shall have the ability to interact with open standard based tools                                                                                                         |
|    | i) The system should support REST API for communication with third party tools and applications                                                                                         |
|    | j) Enabling telemetry should not have any adverse impact on the performance of the device/router                                                                                        |
|    | k) Some of the streaming models/sensors the router should support are:                                                                                                                  |
|    | <u>System</u>                                                                                                                                                                           |
|    | Chassis Environment                                                                                                                                                                     |
|    | Line card utilization (memory , processor, QoS, Temp, Port utilization ), errors counters                                                                                               |
|    | Controller Card sensors (memory, CPU, Temp etc)                                                                                                                                         |
|    | Fabric statistics                                                                                                                                                                       |
|    | ARP table state                                                                                                                                                                         |
|    | Routing prefix information                                                                                                                                                              |
|    | <u>Interface</u>                                                                                                                                                                        |
|    | Interface statistics (Physical and logical interfaces)                                                                                                                                  |
|    | Interface optical diagnostic                                                                                                                                                            |
|    | Congestion and latency                                                                                                                                                                  |
|    | Filter statistics                                                                                                                                                                       |
|    | Protocol                                                                                                                                                                                |
|    | BGP peer information                                                                                                                                                                    |
|    | ISIS State, Interface, Adjacency statistics, LSDB                                                                                                                                       |
|    | ISIS SPRING / Segment Routing Statistics                                                                                                                                                |
|    | RSVP Interface Statistics                                                                                                                                                               |
|    | LSP statistics                                                                                                                                                                          |
|    | LSP Event Export, Experimental                                                                                                                                                          |
|    | IP SLA/RPM (or equivalent) reporting                                                                                                                                                    |
|    | Segment Routing statistics                                                                                                                                                              |
|    | DHCP statistics                                                                                                                                                                         |

|      |                                                                                                                                                                                  |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 51   | Router should support Dual Image/Partition with USB flash drive booting option for OS recovery                                                                                   |
| 52   | Router should support jumbo frame.                                                                                                                                               |
| 53   | Router should support port mirroring                                                                                                                                             |
| 54   | Router should support security features of Broadcast/Multicast/Unicast Storm control.                                                                                            |
| 55   | Router should comply to following Temperature performance parameters:                                                                                                            |
|      | i. Operating Temperature: 0 to 40 degree C or better                                                                                                                             |
|      | ii. Storage Temperature: -10 to 60 degree C or better                                                                                                                            |
| 56   | Routers should support following Metro Ethernet Features:                                                                                                                        |
|      | i. ITU-T G.8032 Ethernet Ring Protection designed for loop protection or alternate mechanism to achieve ring protection in less than 50 ms.                                      |
|      | ii. Should support multiple Ring up to 8 ring(main and sub ring) protection failover within 50 ms or ITU-T G.8032 v2.                                                            |
| 57   | The operating system of the Routers category/series/family should be MEF-9/14 or CE(Carrier Ethernet) Certified.                                                                 |
| 58   | The Router shall be designed for continuous operations with dual fan system.                                                                                                     |
| 59   | Router should support CFM and LFM alarms.                                                                                                                                        |
| 60   | Shall support HQoS, option of traffic shaping per VLAN based.                                                                                                                    |
|      | i. Shall support at least 4K Queues.                                                                                                                                             |
|      | ii. Per-VLAN policing.                                                                                                                                                           |
|      | iii. Per-VLAN rewrite                                                                                                                                                            |
|      | iv. Per-VLAN two-rate tri-color marking.                                                                                                                                         |
|      | v. Per-VLAN classification                                                                                                                                                       |
|      | vi. Per-VLAN filtering                                                                                                                                                           |
| 61   | Support for P and PE router functionality for MPLS on the same router simultaneously and on all the interfaces.                                                                  |
| 62   | Router shall support E-Line or E-LAN MEF standards.                                                                                                                              |
| 63   | Routers should be rack mountable to fit into a standard 19-inch rack                                                                                                             |
| 64   | OEM shall ensure that use of third party optics shall not be explicitly blocked on the Router. Router must support all MSA complied Optics available in market.                  |
| 65   | Segment Routing                                                                                                                                                                  |
| i    | Router should be able to support SR standards on IPv6 whenever it is required without any cost to RCIL.                                                                          |
| ii   | The router should support SR-MPLS dataplane and protocols OSPF,IS-IS and BGP Segment routing extensions                                                                          |
| iii  | Traffic Steering of SR policies with Autoroute Include and Segment Routing TI-LFA SRLG Protection                                                                                |
| iv   | LSP ping, trace-route, Pseudo wire Ping over Segment Routing, trace route for binding-SID                                                                                        |
| v    | MPLS-LDP interworking with SR-ISIS and SR-OSPF                                                                                                                                   |
| vi   | TI-LFA with IGP (Link, Node, Local SRLG, Remote SRLG protection)                                                                                                                 |
| vii  | Controller instantiated SR Policy (PCEP, BGP) and SR policy based on On demand next hop                                                                                          |
| viii | Router should have capability to calculate Bandwidth based path using centralized controller.                                                                                    |
| ix   | Shall support SR and MPLS (LDP) Interworking Mapping Server                                                                                                                      |
| x    | The router shall support dynamic point-to-point interface latency performance measurement. The measurement must be integrated in the IGP and BGP LS for SDN Controller Analysis. |
| xi   | Label distribution protocol and segment routing should coexist and there should support option to prefer LDP over segment routing.                                               |
| 66   | EVPN Features                                                                                                                                                                    |
| i    | Router should have support of Ethernet VPN (EVPN with single homing, multi homing                                                                                                |

|      |                                                                                                                                                                                                                                                   |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ii   | Router should have support of following features on EVPN: EVPN-IRB, EVPN VPWS, EVPN VPWS Preferred Path over SR-TE Policy                                                                                                                         |
| 67   | i) Specification Router to support GRE tunnels (RFC 2784).                                                                                                                                                                                        |
| Note | <b>NEBS Certification is not required for PMA. However, they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to NEBS and meets all standard and specification of NEBS.</b> |

## **SOR 2: Router Type-II**

| SN | Description                                                                                                                                                                                                                                                                                                               |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | The Router shall be designed for continuous operations. The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.                                                                                         |
| 2  | In case of full system failure, Router shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.                                                                                                                                                                              |
| 3  | Router shall have built in power on diagnostics system to detect hardware failures.                                                                                                                                                                                                                                       |
| 4  | Should have DC power supply arrangement without any external adaptors with redundant power supply.                                                                                                                                                                                                                        |
| 5  | Router shall have suitable Visual Indicators for diagnostics and healthy /unhealthy status of ports & modules.                                                                                                                                                                                                            |
| 6  | Router shall have 8 Nos. of Gigabit SFP ports and 4 Nos. RJ45 10/100/1000 Base – TX / SFP Port with RJ-45 SFP and 4 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 802.3u and 802.3ab standard, supporting half duplex mode, full duplex mode and auto negotiation on each port of 1G to optimize bandwidth. |
| 7  | Router shall have minimum of 52 Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.                                                                                                                                                                                                                      |
| 8  | Router shall have a minimum of 16000 MAC address space.                                                                                                                                                                                                                                                                   |
| 9  | Bidder to propose Router having Operating and Storage Temperature as per environmental requirement. However, the Router should be capable of working at temperature 0 to 45 degree (minimum).                                                                                                                             |
| 10 | It should be possible for the Router to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.                                                                                                                                                                                      |
| 11 | Should support jumbo frame.                                                                                                                                                                                                                                                                                               |
| 12 | Shall have the following MPLS features:                                                                                                                                                                                                                                                                                   |
|    | i. Shall support Static IPv4 and Ipv6 routing. It shall also support OSPFv2 and OSPFv3.                                                                                                                                                                                                                                   |
|    | ii. Shall also support BGP and ISIS based routing.                                                                                                                                                                                                                                                                        |
|    | iii. Shall also support MPLS with RSVP and LDP signaling. It shall support MPLS FRR and L3 VRF with upto 128 VRF/L2 VPN/VPLS.                                                                                                                                                                                             |
|    | iv. Shall support a scale of 250 VLAN and shall support Ethernet OAM features like BFD, 802.3ah, 802.1ag and Y.1731                                                                                                                                                                                                       |
|    | v. Shall support at least 12K MPLS labels.                                                                                                                                                                                                                                                                                |
|    | vi. Shall support 16K for IPv4 routes and 4K for IPv6 routes.                                                                                                                                                                                                                                                             |
|    | vii. It shall support LSP ping and trace.                                                                                                                                                                                                                                                                                 |
|    | viii. It shall support 8 hardware queues per port and shall support ingress policing and egress shaping.                                                                                                                                                                                                                  |
|    | ix. Should support Segment routing, TI-LFA, R-LFA, MPLS-TE                                                                                                                                                                                                                                                                |
|    | x. Shall support MPLS based L3, L2 VPN & VPLS services.                                                                                                                                                                                                                                                                   |

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|    | xi. It shall also support SYNC Ethernet / IEEE 1588V2 (PTP) and SNMPv3.                                                                                                                                                                                              |
|    | xii. Shall support remote telnet and SSH capabilities and it shall be possible to integrate with NMS system                                                                                                                                                          |
|    | xiii. Shall conform to UL 60950 or IEC 60950 Standards for safety requirements\ of IT Equipment.                                                                                                                                                                     |
|    | xiv. Shall conform to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B for EMC for (Electro Magnetic Compatibility) or latest.                                                                                                                                 |
| 13 | Shall have the following features. All software's/hardware's/License required for this must be supplied along with the Router.                                                                                                                                       |
|    | i. Link Aggregation Control (LCAP) as per IEEE 802.3ad.                                                                                                                                                                                                              |
|    | ii. Support for IEEE 802.1Q VLAN on all ports.                                                                                                                                                                                                                       |
|    | iii. Support for minimum 256 VLANs.                                                                                                                                                                                                                                  |
|    | iv. Support for IEEE 802.1 D spanning tree protocol / 802.1 s MSTP                                                                                                                                                                                                   |
|    | v. Support for IEEE 802.1 s MSTP.                                                                                                                                                                                                                                    |
|    | vi. Support Dynamic Host Configuration Protocol (DHCP).                                                                                                                                                                                                              |
|    | vii. Support Auto –MDIX (Media Dependent Interface Cross over )                                                                                                                                                                                                      |
|    | viii. Support Inter VLAN IP routing for full layer -3 routing.                                                                                                                                                                                                       |
|    | ix. Support for IPv6.                                                                                                                                                                                                                                                |
|    | x. Support Strict Priority Queuing.                                                                                                                                                                                                                                  |
|    | xi. Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based.                                                                                                                                                                                 |
|    | xii. RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.                                                                                                                                                                                 |
|    | xiii. Support RADIUS protocol for console access restriction and authentication as per RFC 2138.                                                                                                                                                                     |
|    | xiv. Support 4 group of embedded RMON (history, static's and alarms). or advanced level monitoring like Performance monitoring, Statistics, Alarm logging and event management, Telemetry and SNMP Polling of data                                                   |
|    | xv. Support multiple privilege level to provide different level of access on console port and telnet sessions                                                                                                                                                        |
|    | xvi. Support classification and scheduling as per IEEE 802.1P on all ports.                                                                                                                                                                                          |
|    | xvii. Support Port Spanning functionally for measurements using a networks analyzer.                                                                                                                                                                                 |
|    | xviii. Support all the standard MIBs (MIB-I&II).                                                                                                                                                                                                                     |
|    | xix. Support for console port Interface for configuration and diagnostics purposes.                                                                                                                                                                                  |
|    | xx. Support Port Spanning functionally for measurements using a networks analyzer.                                                                                                                                                                                   |
|    | xxi. ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies                                                                                                                                    |
|    | xxii. Should support multiple Ring up to 8 ring (Main and Sub Ring ) protection failover within 50 ms (up to 10 Router in ring) or ITU-T G.8032 v2 (Confirmed roadmap within a year time is also acceptable for ITU-T G.8032 v2 with no additional cost to RailTel). |
|    | xxiii. Should support Optical Transceiver Digital Diagnostic Monitoring.                                                                                                                                                                                             |
|    | xxiv. Priority queues: Eight hardware-based queues per port for flexible QoS management                                                                                                                                                                              |
|    | xxv. Traffic prioritization: Flow-based QoS with internal and external (a.k.a., remarking) prioritization                                                                                                                                                            |
|    | xxvi. Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port.                                                                                                                                                    |
|    | xxvii. Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR) or better. Rack Mountable clamps for standard 19 inch Rack for each item.                                      |
|    | xxviii. The following Metro Ethernet features should support:                                                                                                                                                                                                        |

|    |                                                                                                                                                                                                                                                                          |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 1. IEEE 802.1ad Provider Bridge.                                                                                                                                                                                                                                         |
|    | 2. Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept.                                                                                                                                                                                 |
|    | 3. CVLAN to SVLAN translation and mapping                                                                                                                                                                                                                                |
|    | 4. IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs).                                                                                                                                                                                           |
|    | 5. Ethernet OAM compliant with IEEE 802.3ah.                                                                                                                                                                                                                             |
|    | 6. ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fastconvergence times (sub 50 ms) in ring topologies.                                                                                                                                          |
|    | 7. Should support Optical Transceiver Digital Diagnostic Monitoring.                                                                                                                                                                                                     |
|    | 8. Router should support minimum of 500 Ethernet flow points (EFP) or equivalent functionality.                                                                                                                                                                          |
|    | 9. L2 Protocol Tunneling.                                                                                                                                                                                                                                                |
| 14 | Router shall have support of following Standards:                                                                                                                                                                                                                        |
|    | I. IEEE 802.1D (STP) / 802.1s MSTP                                                                                                                                                                                                                                       |
|    | II. IEEE 802.1p (CoS)                                                                                                                                                                                                                                                    |
|    | III. IEEE 802.1Q (VLANs)                                                                                                                                                                                                                                                 |
|    | IV. IEEE 802.1ag (Connectivity Fault Management)                                                                                                                                                                                                                         |
|    | V. IEEE 802.1s (MSTP)                                                                                                                                                                                                                                                    |
|    | VI. IEEE 802.3x (Flow Control)                                                                                                                                                                                                                                           |
|    | VII. IEEE 802.3z (Gigabit Ethernet)                                                                                                                                                                                                                                      |
|    | VIII. IEEE 802.3ab (1000Base-T)                                                                                                                                                                                                                                          |
|    | IX. IEEE 802.3ac (VLAN Tagging)                                                                                                                                                                                                                                          |
|    | X. IEEE 802.3ad (Link Aggregation)                                                                                                                                                                                                                                       |
|    | XI. IEEE 802.3ae (10 Gigabit Ethernet)                                                                                                                                                                                                                                   |
|    | XII. IEEE 802.3ah                                                                                                                                                                                                                                                        |
|    | XIII. ITU-T G.8032/Y.1344 2010: Ethernet Ring                                                                                                                                                                                                                            |
| 15 | Router shall have the following Certifications:                                                                                                                                                                                                                          |
|    | i. The model of the Routers series shall have MEF-(9 & 14)/CE2.0 or IEEE standards or higher certification from authorized agencies.                                                                                                                                     |
|    | ii. Deleted.                                                                                                                                                                                                                                                             |
|    | iii. CE / FCC.                                                                                                                                                                                                                                                           |
|    | iv. Shall conform to UL 60950 or IEC 60950 or EN 60950 Standards for safety requirements of IT Equipment.                                                                                                                                                                |
|    | v. Shall Confirm relevant standards of EN/CE/FCC for EMC for (Electro Magnetic Compatibility).                                                                                                                                                                           |
|    | vi. Deleted.                                                                                                                                                                                                                                                             |
| 16 | OEM should have a valid ISO 9001 & ISO 14001 certification on the date of opening of bid                                                                                                                                                                                 |
| 17 | IPv6 feature should be ready from day 1.                                                                                                                                                                                                                                 |
| 18 | "Router/ Router OS should be tested and certified for EAL 2 / NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India." |

### **SOR 3: Router Type-III**

| SN       | Description                                 |
|----------|---------------------------------------------|
| <b>1</b> | <b>Architecture:</b>                        |
| 1.1      | Proposed Routers should support SDWAN ready |

|          |                                                                                                                                                                                                                                               |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.2      | The router should be a single box configuration for ease of management.                                                                                                                                                                       |
| 1.3      | It shall support hardware based VPN (3DES/AES) Encryption, MD5, SHA, SHA-256                                                                                                                                                                  |
| 1.4      | The router shall support complete Firewall features.                                                                                                                                                                                          |
| 1.5      | Router shall support minimum 200K IPv4 and 50K IPv6 routes.                                                                                                                                                                                   |
| 1.6      | The Router shall have enough "High-performance multicore processors capacity and 4 GB DRAM and 4GB Flash Memory from Day1. so as to efficiently meet all the functionalities laid down in the specifications.                                 |
| 1.7      | It shall have integrated USB port.                                                                                                                                                                                                            |
| 1.8      | It shall be supplied with necessary power cards, data cables, connectors, bracket accessories, wire managers and other appropriate accessories. Routers shall be capable of working with 110 – 240 Volts AC nominal at frequency 50 +/- 2 Hz. |
| <b>2</b> | <b>Performance:</b>                                                                                                                                                                                                                           |
| 2.1      | It shall support high performance traffic forwarding with con-current features like firewall and encryption.                                                                                                                                  |
| 2.2      | Router shall support aggregate WAN throughput of 200 Mbps from Day-1 and IPSEC Throughput of 50 Mbps from Day-1.                                                                                                                              |
| 2.3      | It shall support variety of Ethernet Interfaces – 1 RJ45 GigE and 1 SFP GigE port & 4 port LAN 10/100/1000 Mbps port.                                                                                                                         |
| 2.4      | It shall support other IP Services like GRE tunneling, ACLs, IPSEC VPNs, Firewalling, NAT services.                                                                                                                                           |
| <b>3</b> | <b>High Availability:</b>                                                                                                                                                                                                                     |
| 3.1      | It shall support non-stop forwarding for fast re-convergence of routing protocols.                                                                                                                                                            |
| 3.2      | It shall support VRRP or equivalent                                                                                                                                                                                                           |
| <b>4</b> | <b>Protocol Support:</b>                                                                                                                                                                                                                      |
| 4.1      | The router shall have routing protocols like IS-IS, RIP ver1 & RIP Ver.2, OSPF ver2, BGP4.                                                                                                                                                    |
| 4.2      | It shall support multicast routing protocols IGMPv1/ v2/v3, PIM                                                                                                                                                                               |
| 4.3      | It shall support DHCP, IPv6 QoS and IPv6 Multicast, OSPFv3                                                                                                                                                                                    |
| <b>5</b> | <b>Quality of Service (QoS) Features:</b>                                                                                                                                                                                                     |
| 5.1      | The router shall support the following:                                                                                                                                                                                                       |
| 5.1.1    | Classification and Marking: Policy based routing, IP Precedence, DSCP.                                                                                                                                                                        |
| 5.1.2    | Congestion Management: WRED, Priority queuing, Class based weighted fair queuing.                                                                                                                                                             |
| 5.1.3    | Traffic Shaping and Policing for QoS                                                                                                                                                                                                          |
| <b>6</b> | <b>Security Features:</b>                                                                                                                                                                                                                     |
| 6.1      | The router shall support GRE Tunneling & NAT Services.                                                                                                                                                                                        |
| 6.2      | It shall support MD-5 route authentication                                                                                                                                                                                                    |

|           |                                                                                                                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.3       | It shall support AAA support using Radius.                                                                                                                                                                                                                               |
| 6.4       | It shall support DoS prevention                                                                                                                                                                                                                                          |
| 6.5       | It shall support IP Access list to limit Telnet and SNMP access to router.                                                                                                                                                                                               |
| 6.6       | It shall support multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server.                                                                                                                        |
| 6.7       | It shall support IEEE 802.1x support for MAC address authentication.                                                                                                                                                                                                     |
| <b>7</b>  | <b>Debug, Alarms &amp; Diagnostics:</b>                                                                                                                                                                                                                                  |
| 7.1       | The router shall have display of input and output error statistics on all interfaces.                                                                                                                                                                                    |
| 7.2       | It shall have display of dynamic ARP table.                                                                                                                                                                                                                              |
| 7.3       | Trace-route and Ping shall be available.                                                                                                                                                                                                                                 |
| <b>8</b>  | It should support Network Time Protocol.                                                                                                                                                                                                                                 |
| <b>9</b>  | <b>Management:</b>                                                                                                                                                                                                                                                       |
| 9.1       | The router shall have support for CLI, Telnet and SNMPv3.                                                                                                                                                                                                                |
| 9.2       | It shall support Secure Shell for secure connectivity.                                                                                                                                                                                                                   |
| 9.3       | It shall have to have dedicated console for Local management / login through USB port / RJ45 port / Serial                                                                                                                                                               |
| 9.4       | Event and System logging: Event and system history logging functions shall be available. The Router shall generate system alarms on events. Facility to put selective logging of events onto a separate hardware where the analysis of log shall be available.           |
| <b>10</b> | <b>Certification Requirements:</b>                                                                                                                                                                                                                                       |
|           | "Router/ Router OS should be tested and certified for EAL 2 / NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India." |

#### **SOR-4: Router Type-IV**

| SN       | Description                                                                  |
|----------|------------------------------------------------------------------------------|
| <b>1</b> | <b>Architecture:</b>                                                         |
| 1.1      | Proposed Routers should support SDWAN ready                                  |
| 1.2      | The router should be a single box configuration for ease of management.      |
| 1.3      | It shall support hardware based VPN (3DES/AES) Encryption, MD5, SHA, SHA-256 |
| 1.4      | The router shall support complete Firewall features.                         |
| 1.5      | Router shall support minimum 100K IPv4 and 50K IPv6 routes.                  |

|          |                                                                                                                                                                                                                                                  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.6      | The Router shall have enough "High-performance multicore processors capacity and 4 GB DRAM and 4GB Flash Memory from Day1. so as to efficiently meet all the functionalities laid down in the specifications.                                    |
| 1.7      | It shall have integrated USB port.                                                                                                                                                                                                               |
| 1.8      | It shall be supplied with necessary power cards, data cables, connectors, bracket accessories, wire managers and other appropriate accessories.<br>Routers shall be capable of working with 110 – 240 Volts AC nominal at frequency 50 +/- 2 Hz. |
| <b>2</b> | <b>Performance:</b>                                                                                                                                                                                                                              |
| 2.1      | It shall support high performance traffic forwarding with con-current features like firewall and encryption.                                                                                                                                     |
| 2.2      | Router shall support aggregate WAN throughput of 100 Mbps from Day-1 and IPSEC Throughput of 50 Mbps from Day-1                                                                                                                                  |
| 2.3      | It shall support variety of Ethernet Interfaces – 1 RJ45 GigE and 1 SFP GigE port & 4 port LAN 10/100/1000 Mbps port.                                                                                                                            |
| 2.4      | It shall support other IP Services like GRE tunneling, ACLs, IPSEC VPNs, Firewalling, NAT services.                                                                                                                                              |
| <b>3</b> | <b>High Availability:</b>                                                                                                                                                                                                                        |
| 3.1      | It shall support non-stop forwarding for fast re-convergence of routing protocols.                                                                                                                                                               |
| 3.2      | It shall support VRRP or equivalent                                                                                                                                                                                                              |
| <b>4</b> | <b>Protocol Support:</b>                                                                                                                                                                                                                         |
| 4.1      | The router shall have routing protocols like IS-IS, RIP ver1 & RIP Ver.2, OSPF ver2, BGP4.                                                                                                                                                       |
| 4.2      | It shall support multicast routing protocols IGMPv1/ v2/v3, PIM                                                                                                                                                                                  |
| 4.3      | It shall support DHCP, IPv6 QoS and IPv6 Multicast, OSPFv3                                                                                                                                                                                       |
| <b>5</b> | <b>Quality of Service (QoS) Features:</b>                                                                                                                                                                                                        |
| 5.1      | The router shall support the following:                                                                                                                                                                                                          |
| 5.1.1    | Classification and Marking: Policy based routing, IP Precedence, DSCP.                                                                                                                                                                           |
| 5.1.2    | Congestion Management: WRED, Priority queuing, Class based weighted fair queuing.                                                                                                                                                                |
| 5.1.3    | Traffic Shaping and Policing for QoS                                                                                                                                                                                                             |
| <b>6</b> | <b>Security Features:</b>                                                                                                                                                                                                                        |
| 6.1      | The router shall support GRE Tunneling & NAT Services.                                                                                                                                                                                           |
| 6.2      | It shall support MD-5 route authentication                                                                                                                                                                                                       |
| 6.3      | It shall support AAA support using Radius.                                                                                                                                                                                                       |

|           |                                                                                                                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.4       | It shall support DoS prevention                                                                                                                                                                                                                                          |
| 6.5       | It shall support IP Access list to limit Telnet and SNMP access to router.                                                                                                                                                                                               |
| 6.6       | It shall support multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server.                                                                                                                        |
| 6.7       | It shall support IEEE 802.1x support for MAC address authentication.                                                                                                                                                                                                     |
| <b>7</b>  | <b>Debug, Alarms &amp; Diagnostics:</b>                                                                                                                                                                                                                                  |
| 7.1       | The router shall have display of input and output error statistics on all interfaces.                                                                                                                                                                                    |
| 7.2       | It shall have display of dynamic ARP table.                                                                                                                                                                                                                              |
| 7.3       | Trace-route and Ping shall be available.                                                                                                                                                                                                                                 |
| <b>8</b>  | It should support Network Time Protocol.                                                                                                                                                                                                                                 |
| <b>9</b>  | <b>Management:</b>                                                                                                                                                                                                                                                       |
| 9.1       | The router shall have support for CLI, Telnet and SNMPv3.                                                                                                                                                                                                                |
| 9.2       | It shall support Secure Shell for secure connectivity.                                                                                                                                                                                                                   |
| 9.3       | It shall have to have dedicated console for Local management / login through USB port / RJ45 port / serial                                                                                                                                                               |
| 9.4       | Event and System logging: Event and system history logging functions shall be available. The Router shall generate system alarms on events. Facility to put selective logging of events onto a separate hardware where the analysis of log shall be available.           |
| <b>10</b> | <b>Certification Requirements:</b>                                                                                                                                                                                                                                       |
|           | "Router/ Router OS should be tested and certified for EAL 2 / NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India." |

### **SOR 5: SFP TYPE-I (SFP-1G-BIDI-10 KM)**

| SN       | Description                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| <b>2</b> | Should support 10 km optical distance on single fiber.                                                            |
| <b>3</b> | Should have LC type connector.                                                                                    |
| <b>4</b> | Should have capacity of bidirectional transmission.                                                               |
| <b>5</b> | Should have 1 Gigabit Ethernet capacity on single mode fiber.                                                     |
| <b>6</b> | Should support DDMI feature.                                                                                      |
| <b>7</b> | OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                      |

|   |                                                                           |
|---|---------------------------------------------------------------------------|
| 8 | Should have CE and FCC regulatory compliances.                            |
| 9 | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F) |

**SOR 6: SFP TYPE-II (SFP-1G-BIDI-40 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 20-40 km optical distance on single fiber                                                          |
| 3  | Should have LC type connector.                                                                                    |
| 4  | Should have 1 Gigabit Ethernet capacity on single mode fiber.                                                     |
| 5  | Should support DDMI feature.                                                                                      |
| 6  | OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                      |
| 7  | Should have CE and FCC regulatory compliances.                                                                    |
| 8  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

**SOR 7: SFP TYPE-III (SFP-1G-Dual-10 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 10 km optical distance (1550/1310 nm) on dual fiber.                                               |
| 3  | Should have LC type connector.                                                                                    |
| 4  | Should have 1 Gigabit Ethernet capacity on single mode fibre.                                                     |
| 5  | Should support DDMI feature.                                                                                      |
| 6  | OEM Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                      |
| 7  | Should have CE and FCC regulatory compliances.                                                                    |
| 8  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

**SOR 8: SFP TYPE-IV (SFP-1G-Dual-40 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 10 km optical distance (1550 nm) on dual fiber.                                                    |
| 3  | Should have LC type connector.                                                                                    |
| 4  | Should have 1 Gigabit Ethernet capacity on single mode fibre.                                                     |

|   |                                                                                              |
|---|----------------------------------------------------------------------------------------------|
| 5 | Should support DDMI feature.                                                                 |
| 6 | OEM Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid. |
| 7 | Should have CE and FCC regulatory compliances.                                               |
| 8 | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                    |

#### **SOR 9: SFP TYPE-V (SFP+ 10G-BIDI-20 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 20 km optical distance on single fiber.                                                            |
| 3  | Should have LC type connector                                                                                     |
| 4  | Should have 10 Gigabit Ethernet capacities on single mode fiber.                                                  |
| 5  | Should support DDMI feature. Option should be available for both SFP+ and XFP                                     |
| 6  | Should should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                   |
| 7  | Should have CE and FCC regulatory compliances.                                                                    |
| 8  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

#### **SOR 10: SFP TYPE-VI (SFP+ 10G-BIDI-40 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 20-40 kms optical distance on single fiber                                                         |
| 3  | Should have LC type connector                                                                                     |
| 4  | Should have 10 Gigabit Ethernet capacities on single mode fiber.                                                  |
| 5  | Should support DDMI feature. Option should be available for both SFP+ and XFP                                     |
| 6  | Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                          |
| 7  | Should have CE and FCC regulatory compliances.                                                                    |
| 8  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

**SOR 11: SFP TYPE-VII (SFP+ 10G-Dual-40 KM)**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 20-40 kms optical distance on dual fiber                                                           |
| 3  | Should have LC type connector                                                                                     |
| 4  | Should have 10 Gigabit Ethernet capacities on single mode module fiber.                                           |
| 5  | Should support DDMI feature. Option should be available for both SFP+ and XFP                                     |
| 6  | Should should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                   |
| 7  | Should have CE and FCC regulatory compliances.                                                                    |
| 8  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

**SOR 12: SFP TYPE-VIII (SFP-1xGigE Electrical (1000 Base TX))**

| SN | Description                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------|
| 1  | SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment. |
| 2  | Should support 90 meter distance on copper cable.                                                                 |
| 3  | Should have RJ45 Connector                                                                                        |
| 4  | Should have 1 Gigabit Ethernet capacities                                                                         |
| 5  | Should should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.                   |
| 6  | Should have CE and FCC regulatory compliances.                                                                    |
| 7  | Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)                                         |

**SOR-13: Rack Type-I**

| No. | Item        | Description                                                                                                    |
|-----|-------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Dimension   | 42U (Height) x 600 mm (Width) x 600 mm (Depth)                                                                 |
| 2   | Side panels | To be provided across whole height of the rack should be openable with latching arrangement at top and bottom. |
| 3   | Front door  | Rack should have front door tough and transparent glass fitted on MS/CRCA sheet on sides with Lock and key.    |
| 4   | Rear side   | Shall be perforated for appropriate level as per industry standard.                                            |

|    |                                                                                                                                                                                                                                                   |                                                                                                                                                                                                   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | Top & Bottom                                                                                                                                                                                                                                      | Rack top and bottom should be MS/CRCA steel made with cable entry provision with glands at both side.                                                                                             |
| 6  | Fan module                                                                                                                                                                                                                                        | Compact fan module of 90 CFM working on 48V DC 4 nos. with each rack properly fitted at top of rack.                                                                                              |
| 7  | Earthing Provision                                                                                                                                                                                                                                | Rack Should have earthing provisions.                                                                                                                                                             |
| 8  | Cable manager                                                                                                                                                                                                                                     | 2 nos. horizontal and 2 nos. vertical cable manager with cable loops to be provided with each rack.                                                                                               |
| 9  | Power Distribution Unit (PDU)                                                                                                                                                                                                                     | PDU should be an arrangement for providing 6 MCBs and 1 no. 16 Amp single pole MCB & 1 no. 32 Amp double pole MCB should be provided MCB should be branded make complying IS/IEC 60898-1 standard |
| 10 | Material used                                                                                                                                                                                                                                     | CRCA/MS with Thickness varying from 1.6 Mm to 2.0 mm                                                                                                                                              |
| 11 | The rack should be fitted with one modem tray 19"                                                                                                                                                                                                 |                                                                                                                                                                                                   |
| 12 | The earthing kit consisting of copper bus bar with dimensions 20 inch length, 1.0 inch breadth & 5mm thickness (min.) having 12 holes and 3 brass nut bolts and washers for fixing of earthing cables shall be fixed near the bottom of the rack. |                                                                                                                                                                                                   |
| 13 | The good quality powder coating light grey in colour shall be used for painting of the rack                                                                                                                                                       |                                                                                                                                                                                                   |
| 14 | The rack should be fitted with dual source power supply distribution board.                                                                                                                                                                       |                                                                                                                                                                                                   |
| 15 | "RailTel Logo along with Year" in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.                                                                                            |                                                                                                                                                                                                   |
| 16 | OEM should have a valid ISO 9001 certification on the date of opening of bid.                                                                                                                                                                     |                                                                                                                                                                                                   |
| 17 | Rack should also comply with EIA 310/DIN 41494 standards.                                                                                                                                                                                         |                                                                                                                                                                                                   |

#### **SOR-14: Rack Type-II**

| No. | Item               | Description                                                                                                    |
|-----|--------------------|----------------------------------------------------------------------------------------------------------------|
| 1   | Dimension          | 42U (Height) x 800mm (Width) x 1000 mm (Depth)                                                                 |
| 2   | Side panels        | To be provided across whole height of the rack should be openable with latching arrangement at top and bottom. |
| 3   | Front door         | Rack should have front door tough and transparent glass fitted on MS/CRCA sheet on sides with Lock and key.    |
| 4   | Rear side          | Shall be perforated for appropriate level as per industry standard.                                            |
| 5   | Top & Bottom       | Rack top and bottom should be MS/CRCA steel made with cable entry provision with glands at both side.          |
| 6   | Fan module         | Compact fan module of 90 CFM working on AC 4 nos. with each rack properly fitted at top of rack.               |
| 7   | Earthing Provision | Rack Should have earthing provisions.                                                                          |
| 8   | Cable manager      | 2 nos. horizontal and 2 nos. vertical cable manager with cable loops to be provided with each rack.            |

|    |                                                                                                                                                                                                                                                   |                                                                                                                                                                        |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | Power Distribution Unit (PDU)                                                                                                                                                                                                                     | Adequate and Redundant power distribution units with electronically controlled circuits for surge and spike protection, isolated input to ground and output to ground. |
| 10 | Material used                                                                                                                                                                                                                                     | CRCA/MS with Thickness varying from 1.6 Mm to 2.0 mm                                                                                                                   |
| 11 | The rack should be fitted with one modem tray 19".                                                                                                                                                                                                |                                                                                                                                                                        |
| 12 | The earthing kit consisting of copper bus bar with dimensions 20 inch length, 1.0 inch breadth & 5mm thickness (min.) having 12 holes and 3 brass nut bolts and washers for fixing of earthing cables shall be fixed near the bottom of the rack. |                                                                                                                                                                        |
| 13 | The good quality powder coating light grey in colour shall be used for painting of the rack                                                                                                                                                       |                                                                                                                                                                        |
| 14 | The rack should be fitted with dual source power supply distribution board.                                                                                                                                                                       |                                                                                                                                                                        |
| 15 | "RailTel Logo along with Year" in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.                                                                                            |                                                                                                                                                                        |
| 16 | OEM should have a valid ISO 9001 certification on the date of opening of bid.                                                                                                                                                                     |                                                                                                                                                                        |
| 17 | Rack should also comply with EIA 310/DIN 41494 standards.                                                                                                                                                                                         |                                                                                                                                                                        |

### **SOR-15: Rack Type-III**

| SN. | Features/ Specification                                                                                                                                                                                                                                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <b>Generic Requirements</b>                                                                                                                                                                                                                                                                                                                                                              |
| 1.  | <p>This document contains the generic requirement of SMPS based 48V DC power system (DCPS) having modular rectifier modules.</p> <p>IP55 outdoor fan cooled cabinet equipped with DC power system and Li-ion battery.</p> <p>Cabinet inside space should be 30U ~ 32U, out of which 24U space is reserved for customer equipment and balance space is for DCPS &amp; Li-ion battery.</p> |
| 2.  | DCPS shall be designed with 1-phase AC input. Ultimate system capacity shall be 50A @48Vdc (including N+1 redundancy).                                                                                                                                                                                                                                                                   |
| 3.  | Lithium Ion battery rating should be 40AH. It should have 19" mounting in the rack.                                                                                                                                                                                                                                                                                                      |
| 4.  | Fan on/off in outdoor cabinet should be based upon cabinet inside temperature. On / Off setting should be settable through DCPS controller.                                                                                                                                                                                                                                              |
| 5.  | A single controller module without any manual intervention shall centrally control all rectifier modules of the DCPS. The controller module shall be modular and hot-pluggable. The system modules shall continue to operate and deliver output even if the controller module fails or stops communication with the rectifier(s).                                                        |
| 6.  | The system shall have provision of auto load sharing between installed modules.                                                                                                                                                                                                                                                                                                          |

| SN. | Features/ Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | The sharing shall be within $\pm 10\%$ of average current per rectifier module in the unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7.  | The chassis shall be manufactured from GI Sheet of minimum 1.2mm. Structure of cabinet should have enough strength to hold the weight of DCPS components and battery. The finished chassis shall be powder coated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 8.  | All cables used for internal wiring shall be of Heat Resistant Flame Retardant (HRFR) Type. All cables shall be PVC insulated cables.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|     | <b><u>System Characteristics</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9.  | <b><u>Input Specification.</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| a)  | Input Source:- AC supply 1 ph. 3 wire<br>Nominal Voltage (L-N) $230V \pm 30\%$ , 45Hz to 55Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| b)  | <b>Surge protection:-</b><br>It should be mounted inside the DCPS<br>Class C surge protection device<br>Specifications of the device is given as below:- <ul style="list-style-type: none"> <li>• Device should be compatible for 3phase 4 wire system</li> <li>• Nominal discharge current (8/20 <math>\mu</math>S) (<math>I_n</math>) = 20KA</li> <li>• Maximum discharge current (8/20 <math>\mu</math>S) (<math>I_{max}</math>) = 40KA</li> <li>• Voltage protection level <math>\leq 1.5KV</math>(L-N) &amp; <math>\leq 1.5KV</math> (N-PE)</li> <li>• Operating status/Fault indication – Green / red</li> <li>• Alarm contact</li> </ul> Standard IEC 61643<br>SPD must have been tested and certified by any of the IEC EE-CB / KEMA/ VDE/ UL approved laboratory. |
| 10. | <b><u>Output Specification. (DC Output).</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| a)  | Nominal system voltage - 48V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| b)  | Operating voltage range - 42 - 58 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| c)  | Default Voltage - 53.5V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| d)  | Output ultimate capacity – 50A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|     | <b><u>Alarms indication</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 11. | Following Visual alarms shall be available on controller LCDs:-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| a)  | <b><u>Alarm</u></b> <ul style="list-style-type: none"> <li>i) Output Voltage High (High &gt; 56V, should be settable)</li> <li>ii) Rectifier fail</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| SN. | Features/ Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <ul style="list-style-type: none"> <li>iii) Mains fail</li> <li>iv) System Over Load</li> <li>v) Mains “ON” battery Discharge</li> <li>vi) Low Battery Voltage (Low &lt;46V)</li> <li>vii) Battery Low voltage disconnect</li> <li>viii) SPD Fail</li> </ul> <p>Following potential free contacts are required:-</p> <ul style="list-style-type: none"> <li>1. Mains fail</li> <li>2. Low Battery voltage</li> <li>3. Rectifier fail</li> </ul>                                        |
| b)  | <p><b><u>Digital Meters/ Display Units.</u></b> There shall be provision to monitor the following parameters through digital meters or digital display units:-</p> <ul style="list-style-type: none"> <li>i) Input AC Voltage</li> <li>ii) Output DC Voltage</li> <li>iii) Output DC load Current</li> <li>iv) Battery Current</li> <li>v) Mains Run Hrs</li> <li>vi) Battery Run Hrs</li> <li>vii) Rectifier Energy</li> <li>viii) Battery Energy</li> <li>ix) Load Energy</li> </ul> |
|     | <b><u>System Controller Features.</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 12. | Microcontroller based DCPS controller with coloured touch display.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 13. | Controller should have dual dc input supply, one from rectifier common output bus & other from battery connected to the same system                                                                                                                                                                                                                                                                                                                                                    |
| 14. | Integrated PLC (Programmable Logic Controller) functions to enhance flexibility in making logics                                                                                                                                                                                                                                                                                                                                                                                       |
| 15. | Remote and local SW and configuration update.                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 16. | Easy maintenance by pluggable architecture and MicroSD card slot provision to enable automatic backup                                                                                                                                                                                                                                                                                                                                                                                  |
| 17. | Local Monitoring with LAN / WEB browser with configurable access rights, login control and user profiles.                                                                                                                                                                                                                                                                                                                                                                              |
| 18. | Remote Monitoring via Ethernet port over TCP IP Modbus protocol and                                                                                                                                                                                                                                                                                                                                                                                                                    |

| SN. | Features/ Specification                                                                                                                                                                                      |                                         |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
|     | additionally controller should have provision for SNMP V1, V2 & V3, Syslog, RS232, RS485, IPV4/IPV6, MQTT via LAN.                                                                                           |                                         |
| 19. | The Controller of SMPS have wide range of battery charging current limit and suitable for both Li-ion battery and VRLA battery charging.                                                                     |                                         |
| 20. | Controller should support minimum USB/Ethernet for PC interface for programming/reconfiguration of the parameters through laptop.                                                                            |                                         |
| 21. | The controller of SMPS can store last 10,000 events (minimum) including major alarms etc. The same shall be downloaded in excel format.                                                                      |                                         |
| 22. | The controller should be able to log min./max/avg. values of parameters like DC voltage, DC load current, Battery current, AC input voltage etc. It should be able to log various run hrs & energy counters. |                                         |
| 23. | <b>DCPS manufacturing facility certification requirement</b>                                                                                                                                                 | ISO 9001, ISO14001, OHSAS 45001, TL9000 |

**SOR-16:** Installation, Testing and Commissioning of SOR-15.

**SOR-17: Rack Type-IV**

| S N. | Features/ Specification                                                                                                                                                                                                                                                                                                                           |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>Generic Requirements</b>                                                                                                                                                                                                                                                                                                                       |
| 1.   | This document contains the generic requirement of SMPS based 48V DC power system (DCPS) having modular rectifier modules.<br>IP20 Indoor cabinet equipped with DC power system and Li-ion battery.<br>Cabinet inside space should be 15U. Out of 15U, 7U space is reserved for customer equipment and balance space is for DCPS & Li-ion battery. |
| 2.   | Cabinet should be wall mount and should have sufficient strength to carry DCPS, 1no. of Li-ion battery (capacity given) and approx. 20KG of customer equipment.                                                                                                                                                                                   |
| 3.   | DCPS shall be designed with 1-phase AC input. Ultimate system capacity shall be 1700W @48Vdc (including N+1 redundancy).                                                                                                                                                                                                                          |
| 4.   | Lithium Ion battery rating should be 20AH. It should have 19" mounting in the rack.                                                                                                                                                                                                                                                               |
| 5.   | A single controller module without any manual intervention shall centrally control all rectifier modules of the DCPS. The controller module shall be modular and hot-pluggable.                                                                                                                                                                   |

| S N. | Features/ Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | The system modules shall continue to operate and deliver output even if the controller module fails or stops communication with the rectifier(s).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6.   | The system shall have provision of auto load sharing between installed modules. The sharing shall be within $\pm 10\%$ of average current per rectifier module in the unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7.   | The chassis shall be manufactured from GI Sheet of minimum 1.2mm. Structure of cabinet should have enough strength to hold the weight of DCPS components and battery. The finished chassis shall be powder coated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 8.   | All cables used for internal wiring shall be of Heat Resistant Flame Retardant (HRFR) Type. All cables shall be PVC insulated cables.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|      | <b><u>System Characteristics</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9.   | <b><u>Input Specification.</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| a)   | Input source:- AC supply 1 ph. 3 wire<br>Nominal Voltage (L-N) $230V \pm 30\%$ , 45Hz to 55Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| b)   | <b>Surge Protection: -</b><br>It should be mounted inside the DCPS<br>Class C surge protection device<br>Specifications of the device is given as below:- <ul style="list-style-type: none"> <li>• Device should be compatible for 3phase 4 wire system</li> <li>• Nominal discharge current (8/20 <math>\mu</math>S) (<math>I_n</math>) = 20KA</li> <li>• Maximum discharge current (8/20 <math>\mu</math>S) (<math>I_{max}</math>) = 40KA</li> <li>• Voltage protection level <math>\leq 1.5KV(L-N)</math> &amp; <math>\leq 1.5KV(N-PE)</math></li> <li>• Operating status/Fault indication – Green / red</li> <li>• Alarm contact</li> </ul> Standard IEC 61643<br>SPD must have been tested and certified by any of the IEC EE-CB / KEMA/ VDE/ UL approved laboratory. |
| 10.  | <b><u>Output Specification. (DC Output).</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| a)   | Nominal system voltage - 48V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| b)   | Operating voltage range - 42 - 58 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| c)   | Default Voltage - 53.5V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| d)   | Output ultimate capacity – 1700W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|      | <b><u>Alarms indication</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 11.  | Following Visual alarms shall be available on controller LCDs:-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| S N. | Features/ Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a)   | <p><b><u>Alarm</u></b></p> <ul style="list-style-type: none"> <li>i) Output Voltage High (High &gt; 56V, should be settable)</li> <li>ii) Rectifier fail</li> <li>iii) Mains fail</li> <li>iv) System Over Load</li> <li>v) Mains “ON” battery Discharge</li> <li>vi) Low Battery Voltage (Low &lt; 46V)</li> <li>vii) Battery Low voltage disconnect</li> <li>viii) SPD Fail</li> </ul> <p>Following potential free contacts are required:-</p> <ul style="list-style-type: none"> <li>1. Mains fail</li> <li>2. Low Battery voltage</li> <li>3. Rectifier fail</li> </ul> |
| b)   | <p><b><u>Digital Meters/ Display Units.</u></b> There shall be provision to monitor the following parameters through digital meters or digital display units:-</p> <ul style="list-style-type: none"> <li>i) Input AC Voltage</li> <li>ii) Output DC Voltage</li> <li>iii) Output DC load Current</li> <li>iv) Battery Current</li> <li>v) Mains Run Hrs</li> <li>vi) Battery Run Hrs</li> <li>vii) Rectifier Energy</li> <li>viii) Battery Energy</li> <li>ix) Load Energy</li> </ul>                                                                                      |
|      | <p><b><u>System Controller Features.</u></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 12.  | Microcontroller based DCPS controller with coloured touch display.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 13.  | Controller should have dual dc input supply, one from rectifier common output bus & other from battery connected to the same system                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 14   | Integrated PLC (Programmable Logic Controller) functions to enhance flexibility in making logics                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15.  | Remote and local SW and configuration update.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 16.  | Easy maintenance by pluggable architecture and MicroSD card slot provision to enable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| S N. | Features/ Specification                                                                                                                                                                                      |                                         |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
|      | automatic backup                                                                                                                                                                                             |                                         |
| 17.  | Local Monitoring with LAN / WEB browser with configurable access rights, login control and user profiles.                                                                                                    |                                         |
| 18.  | Remote Monitoring via Ethernet port over TCP IP Modbus protocol and additionally controller should have provision for SNMP V1,V2 & V3, Syslog, RS232, RS485 , IPV4/IPV6, MQTT via LAN.                       |                                         |
| 19.  | The Controller of SMPS have wide range of battery charging current limit and suitable for both Li-ion battery and VRLA battery charging.                                                                     |                                         |
| 20.  | Controller should support minimum USB/Ethernet for PC interface for programming/reconfiguration of the parameters through laptop.                                                                            |                                         |
| 21.  | The controller of SMPS can store last 10,000 events (minimum) including major alarms etc. The same shall be downloaded in excel format.                                                                      |                                         |
| 22.  | The controller should be able to log min./max/avg. values of parameters like DC voltage, DC load current, Battery current, AC input voltage etc. It should be able to log various run hrs & energy counters. |                                         |
| 23.  | <b>DCPS manufacturing facility certification requirement</b>                                                                                                                                                 | ISO 9001, ISO14001, OHSAS 45001, TL9000 |

**SOR-18:** Installation, Testing and Commissioning of SOR-17.

**SOR-19: GI Pipe Type-I**

Supply of GI Pipe (25 mm Dia – 3.2 mm thick) as per IS-1239, Pt-1, medium grade.

**SOR-20:** Laying/Fixing/Clamping of SOR-19.

**SOR-21: GI Pipe Type-II**

Supply of GI Pipe (38 mm Dia – 3.2 mm thick) as per IS-1239, Pt-1, medium grade.

**SOR-22:** Laying/Fixing/Clamping of SOR-21.

**SOR-23: Flexible GI Pipe 25 mm**

Supply of 25mm PVC Flexible Pipe.

**SOR-24: PVC Flexible Pipe 32 mm**

Supply of 32mm PVC Flexible Pipe.

**SOR-25:** Laying/Fixing/Clamping of SOR-24.

**SOR-26: PVC Conduit Pipe 32 mm**

Supply of 32mm PVC conduit pipe (ISI mark).

**SOR-27:** Laying/Fixing/Clamping of SOR-26.

**SOR-28: HDPE Duct**

i. Supply of 40 mm dia HDPE pipe as per TEC specs No.TEC/GR/FA/CDS-008/04/AUG-19 with latest amendment. The colour of HDPE duct will be orange. Colour of the HDPE duct, inner lubricating material and strength shall be guaranteed for 20 years.

ii. **Packing and Markings:-** The duct supplied should have the following identification marking and other details as per TEC Specification: -  
The length of the duct should be 1000 +/- 50 meter.  
The colour of the duct should be orange. The marking on the HDPE duct shall be provided at every meter as per detail given below: -

# RAILTEL CABLE DUCT # NAME OF THE FIRM  
# PLBE HDPE DUCT 40/33 MM # ABCD & WXYZ  
# DATE MONTH YEAR # EFGH

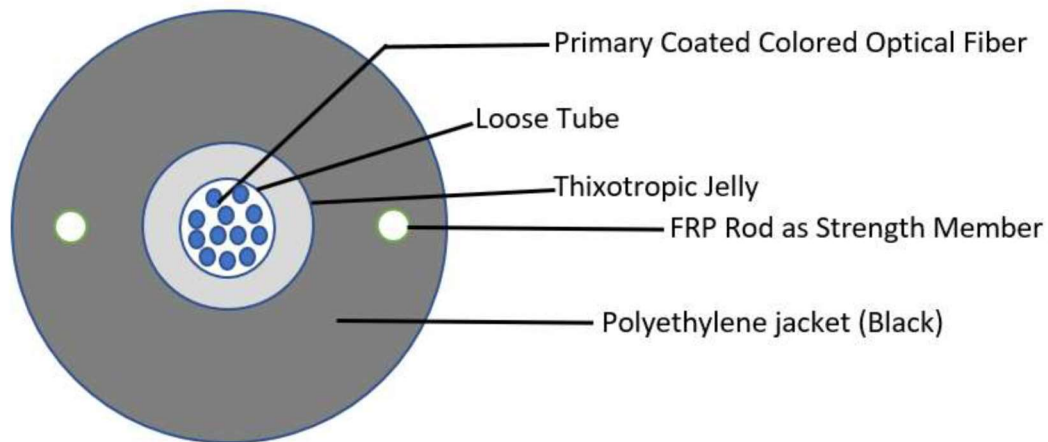
**SOR-29:** Laying/Fixing/Clamping of SOR-28.

**SOR-30: ADSS OFC-24F**

As per TSEC Specification No TEC/GR/TX-OFC-022/02/MAR-17 with latest amendments.

**SOR-31:** Blowing/Pulling of SOR-30.

**SOR-32: OFC 12F Unarmoured**



Specification for 12F Fiber (G-652 D) Single mode Fiber Optic Cable

Attenuation of Cabled Fiber:

At 1310nm :  $\leq 0.40$  dB/KM

At 1550nm :  $\leq 0.25$ dB/KM

Construction: Primary Coated Fiber : Single Mode (As per G-652)

Type : Uni-tube

Tube filling compound : Thixotropic Gel

Loose Tube : PBTP

Jacket : Black HDPE with Anti termite

Peripheral Strength Member : Fiber Reinforced Plastic FRP (Non-Metallic)- 2 Nos -(0.8 +/- 0.1mm)

Cable Diameter : 9mm

Drum Length

Drum Length : 2 KMs +/- 10%.

Tolerance : Total Quantity can vary 5% of order quantity.

OFC length in Drum : 5% of the total order quantity may vary with drum length of 2 KMs +/- 25%.

Total

**SOR-33:** Blowing/Pulling of SOR-32.

**SOR-34: FDMS 24F (SC-APC Type)**

It should be confirming to RDSO Specifications no. RDSO/SPN/TC/37/2020 or latest.

**SOR-35:** Installation, Testing and Commissioning of SOR-34.

**SOR-36: FDMS 12F (SC-APC Type)**

It should be confirming to RDSO Specifications no. RDSO/SPN/TC/37/2020 or latest.

**SOR-37:** Installation, Testing and Commissioning of SOR-36.

**SOR-38: 24F Joint Closure**

The Joint Enclosure for SOR-18 should be confirming to TEC no. TEC/GR/TX/OJC-002/03/APR-2010 or latest with all amendments. TEC Specification Document to be submitted by OEM/OEM authorized Seller:

A. For OEM Bidders: Along the Bid, OEM should submit valid "Technical Specification Evaluation Certificate" for Specification no. TEC/GR/TX/OJC-002/03/ APR-2010 or latest amendments if any issued by Competent/Authorized Government Organization i.e. BSNL in favor of OEM.

B. For OEM authorized Seller bidders: Along the Bid, OEM authorized Seller should submit valid "Technical Specification Evaluation Certificate" for Specification no. TEC/GR/TX/OJC-002/03/ APR-2010 or latest amendments if any issued by Competent/Authorized Government Organization i.e. BSNL in favor of OEM who provides Manufacturer Authorization Form (MAF) as per annexure-IV of ATC to Seller.

**SOR-39: Electrical Wire**

Supply of PVC insulated 3 core 4 Sq. mm (1.1 KV grade) outdoor strengthened Copper Cable for AC supply distribution (as per BIS/ISI standards).

**SOR-40:** Blowing/Pulling of SOR-28.

**SOR-41: MCB**

MCB should be branded make complying IS/IEC 60898-1 standard.

**SOR-42: Electricity Meter**

ISI Certified, 1 Phase, 5-30A, 2 Wire (Copper), 240V, 50Hz, 3200imp/kWh. Class 1.0 High Accuracy.

**SOR-43: Patch cord Type-I - SC/APC-LC/PC-5 mtr,**

**SOR 44: Patch cord Type-II – SC/APC-LC/PC, 10mtr,**

The Patch cords for SOR-35 to SOR-36 should be confirming to TEC NO.: TEC/GR/TX OFJ-01/05/NOV-09 with latest amendment No. TEC/T/OFC-OFJ/155/2013. However, the Patch cords should have the following:

- i) Operating Temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .
- ii) Insertion Loss:
  - a) Insertion Loss of complete patch cord including adapter when tested from each direction in all conditions of operations:  $\leq 0.3$  dB
  - b) Insertion Loss of Adaptors:  $\leq 0.1$  dB
- iii) Return Loss for each connector of patch cord:
  - a) Type-I SC-APC:  $\geq 65$  dB
  - b) Type-II LC:  $\geq 50$  dB
- iv) The length and type of connector of each Patch Cord: As per SOR.
- v) The patchcord with connectors and adaptors shall conform to the TEC Specification No. TEC/GR/TX/OFJ-01/05 NOV-09 with amendment No. TEC/T/OFC-OFJ/155/2013 (latest).
- v) Connector Body:
  - a) FC-PC: Ni plated brass body (Ni plating shall be as per BIS Standards)
  - b) SC-PC & SC-APC: Engineering thermoplastic (Glass filled PBT: Polybutylene Terephthalate)
  - c) LC: PEI (Polyetherimide)/ PPS (Polyphenylene Sulphide)
- vii) Color of connector body:
  - a) FC-PC connector: Ni plated Brass
  - b) SC-PC connector: Blue
  - c) SC-APC connector: Green
  - d) LC connector: Blue
- viii) Radius of curvature:
  - a) FC-PC: 10 to 25 mm
  - b) SC-PC: 10 to 25 mm
  - c) SC-APC: 5 to 12 mm
  - d) LC: 10 to 25 mm
- ix) Minimum bending radius of the cable:

- a) Loaded: 50 mm
- b) Unloaded: 30 mm

**SOR 45: SIP Phone**

| SN. | Description                                                   |
|-----|---------------------------------------------------------------|
| 1   | Minimum 128x64 pixel graphical LCD with back-light or higher. |
| 2   | 2 SIP accounts or higher.                                     |
| 3   | Dual-port Gigabit Ethernet, POE Support                       |
| 4   | Full-duplex speakerphone.                                     |
| 5   | Redial, call return, auto answer.                             |
| 6   | Call forward, call waiting, call transfer.                    |
| 7   | Local 3-way conferencing or higher.                           |
| 8   | Busy Lamp Field (BLF)                                         |
| 9   | Message Waiting Indicator (MWI)                               |
| 10  | SIP v1 (RFC2543), v2 (RFC3261) or equivalent.                 |
| 11  | IPV4/IPV6                                                     |
| 12  | NAT transverse: STUN mode/Secure methods like SBC or VPN.     |
| 13  | Proxy mode and peer-to-peer SIP link mode (optional)          |
| 14  | Power over Ethernet (IEEE802.3af)                             |

**OFFER LETTER**

**Annexure-II**

Joint General Manager/NTP,  
Northern Region, RailTel  
6th Floor, 3rd Block,  
Delhi Technology Park,  
Shastri Park, New Delhi,  
Delhi-110053

Ref:- Tender No.....Dated: xx.xx.2023

It is hereby confirmed that we have understood the terms and conditions of the Tender, have thoroughly examined the specifications, are aware of the nature of the goods & services required and our offer is to supply goods & services strictly in accordance with the requirements, terms & conditions of this Tender. We agree to abide by the terms and conditions of the tender if the contract is awarded to us.

2) We hereby offer to supply the goods and services detailed above or such portions thereof as you specify in the purchase order at the price quoted and agree to hold this offer open for acceptance for a period of 90 days from the date of opening of the bid.

3) Online payment vide transaction No. \_\_\_\_\_ dated \_\_\_\_\_ for Rs. \_\_\_\_\_ Lacs in favor of RailTel Corporation of India Ltd, towards EMD has been paid through the details as mentioned in tender notice/ tender document. The full value of Earnest Money shall stand forfeited without prejudice to any other rights or remedies if, I/We withdraw or modify the offer within validity period or do not deposit the security deposit (Performance Bank Guarantee) within **30 days** after issue of Purchase Order.

SIGNATURE OF SUPPLIER (S)

Date:

CONTRACTOR (S) ADDRESS

SIGNATURE OF WITNESS:

- 1.
- 2.

**PROFORMA FOR PERFORMANCE BANK GUARANTEE  
PERFORMANCE BANK GUARANTEE BOND**

(On Stamp Paper of Rs one hundred)  
(To be used by approved Scheduled Banks)

1. In consideration of the RailTel Corporation of India Limited., 6th Floor, 3<sup>rd</sup> Block, Delhi-IT-Park, Shastri Park, New Delhi-110053 (Herein after called RailTel) having ..... agreed ..... to ..... exempt .....(Hereinafter called “the said Contractor(s)”) from the demand, under the terms and conditions of an Agreement No.....dated.....made between.....and..... for (hereinafter called “ the said Agreement”) of security deposit for the due fulfillment by the said Contractor (s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. ....(Rs ..... only). We ..... (indicate the name of the Bank) hereinafter referred to as “the Bank”) at the request of ..... Contractor(s) do hereby undertake to pay the RailTel an amount not exceeding Rs. .... against any loss or damage caused to or suffered or would be caused to or suffered by the RailTel by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.
2. We , ..... Bank and our local branch at New Delhi (indicate detail address of local New Delhi branch with code no.) do hereby undertake to pay the amounts due and payable under this Guarantee without any demur, merely on demand from the RailTel stating that the amount is claimed is due by way of loss or damage caused to or would be caused to or suffered by the RailTel by reason of breach by the said Contractor(s) of any of terms or conditions contained in the said Agreement or by reason of the Contractor(s) failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs . .....
3. We, ..... bank undertake to pay to the RailTel any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) / Tenderer(s) in any suit or proceedings pending before any court or Tribunal relating thereto our liability under this present being, absolute and unequivocal. The payment so made by us under this Bond shall be a valid discharge of our liability for payment there under and the Contractor(s) / Tenderer(s) shall have no claim against us for making such payment.
4. We, ..... Bank further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the RailTel under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till RailTel certifies that the terms and conditions of the said Agreement have been fully and properly

carried out by the said Contractor(s) and accordingly discharges this Guarantee. Unless a demand or claim under the Guarantee is made on us in writing on or before the ..... We shall be discharged from all liability under this Guarantee thereafter.

5. We,..... (indicate the name of Bank) further agree with the RailTel that the RailTel shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the Agreement or to extend time of to postpone for any time or from time to time any of the powers exercisable by the RailTel against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension to the said Contractor(s) or for any forbearance, act or omission on the part of RailTel or any indulgence by the RailTel to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have affect of so relieving us.

This Guarantee will not be discharged due to the change in the Constitution of the Bank or the Contractor(s) / Tenderer(s).

We, the ..... Bank further agree that this guarantee shall be invokable at our place of business at ...../New Delhi (indicate detailed address of local New Delhi Branch with code no.). The branch at New delhi is being advised accordingly.

(indicate the name of Bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the RailTel in writing.

**Dated the day of       ,2023**

for .....  
(indicate the name of the Bank)

**Witness:**

1.     Signature  
      Name
2.     Signature  
      Name

**Manufacturer Authorization form (MAF)**

Joint General Manager/NTP,  
RailTel Corporation of India Ltd.  
6th Floor, 3rd Block,  
Delhi Technology Park, Shastri Park,  
Delhi – 110053.

Date: \_\_\_\_\_

**Subject: Manufacturer Authorization form (MAF) to M/s ..... for .....**

**Ref: Tender No.....dated.....**

Dear Sir,

We, M/s....., are established and reputed manufacturer and service provider of .....(Product details), having our registered office at .....

We hereby authorize M/s ..... (bidder name), Office ..... to participate in bid and subsequently upon award of the bid to execute the **“Procurement of Routers, Racks, SFPs and other Misc. Items through GeM”** of our range of products against your above said bid.

We further extend our warranty for three years for our range of products offered by M/s ..... against the above-said bid.

Thanking you,  
Best regards,

**Authorised Signatory**

**FORMAT FOR AFFIDAVIT TO BE UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS**

(To be executed in presence of Public notary on non-judicial stamp paper of the value of Rs.100/-. The stamp paper has to be in the name of the tenderer)\*\*

I.....(Name and designation)\*\* appointed as the attorney/authorized signatory of the tenderer (including its constituents),  
M/s. \_\_\_\_\_ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of

as per the tender No. \_\_\_\_\_ of (-----Railway), do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

- (i) I/We the tenderer (s), am/are signing this document after carefully reading the contents.
- (ii) I/we the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
- (iii) I/We hereby declare that I/We have downloaded the tender documents from electronic-tender portal. I/We have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenderers, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.
- (iv) I/We declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
- (v) **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted alongwith the offer and same shall be binding upon me/us.**
- (vi) **I/We declare that the information and documents submitted alongwith the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents submitted by us.**
- (vii) I/We undersigned that if the certificates regarding eligibility criteria submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender EMD besides banning of business for five year on entire IR. Further, I/we (*insert name of the tenderer*)\*\* \_\_\_\_\_ and all my/our constituents understand that my/our offer shall be summarily rejected.
- (viii) I/we also understand that if the certificates submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, alongwith forfeiture of EMD/SD and Performance

Guarantee besides any other action provided in the contract including banning of business for five year on entire IR.

**DEPONENT  
SEAL AND SIGNATURE  
OF THE TENDERER**

**VERIFICATION**

I/We above named tenderer do hereby solemnly affirm and verify that the contents of my/our above affidavit are true and correct. Nothing has been concealed and no part of it is false.

**DEPONENT  
SEAL AND SIGNATURE  
OF THE TENDERER**

Place:

Dated:

\*\* The contents in Italics are only for guidance purpose. Details as appropriate, are to be filled in suitably by tenderer. Attestation before Magistrate/Notary Public.

**PROFORMA FOR THE LONG-TERM MAINTENANCE SUPPORT  
(To be signed by the OEM)**

To,  
Joint General Manager/NTP,  
RailTel Corporation of India Ltd.  
6th Floor, 3rd Block,  
Delhi Technology Park, Shastri Park,  
Delhi – 110053.

**Applicable for OEM directly participating in the tender**

I / We ..... hereby confirm that we have read specifications & tender conditions of RailTel Tender No. ....and accept that the requirement of Long Term Maintenance Support as per Clause 16 of ITB shall be met **by us directly or through our subsidiary in India** as per rates quoted in the Price Bid. I / We shall provide services as per terms and conditions pertaining to Long Term Maintenance Support of tender document.

Or

**Applicable when Authorized Distributor/Partner of OEM is bidding in the tender**

I / We ..... hereby confirm that we have read specifications & tender conditions of RailTel Tender No. ....and accept that the requirement of Long Term Maintenance Support as per Clause 16 of ITB shall be met **by Authorized Distributor/Partner of OEM. However, if Authorized Distributor/Partner fails to fulfil the support obligation due to any un-foreseen circumstances, the same shall be provided by us directly or through our subsidiary in India for the mentioned/remaining period at the quoted prices by the bidder. I/We have gone through the requirement mentioned in the Tender Document and shall provide services as per terms and conditions** pertaining to Long Term Maintenance Support of tender document.

(Signature of OEM Authorized Officer)  
Seal

**Signature of witness:**

1. ....
2. ....

**Note: Please Strike out whichever is not applicable.**

**GUIDLINES REGARDING PROVISION FOR PROCUREMENT FROM A BIDDER  
WHICH SHARES A LAND BORDER WITH INDIA**

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority [The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT)].

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Order means: -

- a. An entity incorporated, established or registered in such a country; or
- b. A subsidiary of an entity incorporated, established or registered in such a country; or
- c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
- d. An entity whose beneficial owner is situated in such a country; or
- e. An Indian (or other) agent of such an entity; or
- f. A natural person who is a citizen of such a country; or
- g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

IV. The beneficial owner for the purpose of (III) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. Explanation-

- a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;
- b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
  3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
  4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
  5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
- VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

**Certificate to be given by the Tenderer:**

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that I am not from such a country or, if from such a country, I have been registered with the Competent Authority. I hereby certify that I fulfill all requirements in this regard and I am eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

**Certificate to be given by Tenderer for Works involving possibility of sub-contracting:**

"I 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; I certify that I am not from such a country or, if from such a country, I have been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that I fulfill all requirements in this regard and I am eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

**PROFORMA FOR “NIL DEVIATION COMPLIANCE UNDERTAKING**  
(To be signed by the Bidder)

**To,**

**Joint General Manager/NTP,  
RailTel Corporation of India Limited  
6th Floor, IIIrd Block,  
Delhi Technology Park, Shastri Park,  
New Delhi-110053**

**Tender Reference No.:**

**Sub:** NIL Deviation Compliance

Over and above all our earlier conformations and submissions as per your requirements of the tender, we confirm that,

1. All SOR item proposed in scope supplies are compliant to the technical specifications of the equipment as mentioned in the Annexure-I of ITB Document.
2. We will also ensure our unconditional compliance of all the terms and conditions as mentioned in the Tender document including all corrigenda.
3. List of deviations (Partial Compliance and Non-compliance) from terms and conditions as mentioned in the Tender document including all corrigenda, if any, is enclosed as Annexure with this form. We understand that any partial compliance or non-compliance, may result in **REJECTION** of our bid.

Seal and signature of the bidder

Place:

Date:

(This letter should be on the letterhead of the bidder duly signed by an authorized signatory)

**Detailed standard conditions applicable for the Annual Maintenance Contract****1.0 Introduction**

This document contains the standard conditions applicable for the Annual Maintenance Contract between RailTel and the Contractor. Contractor is defined as the company whose products/equipment's have been deployed over the RailTel telecommunication network and the warranty of these equipment's has expired or going to be expire shortly. All the equipment's/ cards/ modules given in the Items of SOR will be covered under this contract. This Annual Maintenance Contract will cover up the provision of remote services to be provided by the contractor for proper working of Network created through the contractor's equipment's. This document will also cover up the Repair and Return services for the rectification of defective modules/cards/parts etc which are the key tools in use for uninterrupted traffic. It also includes the Key performance parameter which will decide the outcome of the contractor within reasonable time frame along with the provision of penalties. This Annual Maintenance Contract will cover the following services:

- **Technical Support service.**
- **Repair and Return Service.**
- **Software Updates.**

**2.0 Basic Definitions and terminology Used:-**

**RailTel:** RailTel Corporation of India Limited having its registered and Corporate office office at Plate-A, 6th Floor, Office Tower-2, NBCC Building, East Kidwai Nagar, New Delhi-110023.

**Contractor:** Contractor means firm/company whom equipment's are deployed over the Telecommunication Network of RailTel.

**TSC:** Technical Support Center created by the Contractor for 2<sup>nd</sup> level support.

**TEC:** Telecom Excellence Center created by the contractor for 3<sup>rd</sup> level support.

**WC:** Welcome Center of contractor through which the RailTel may interact with contractor.

**AR:** Assistance Request created by WC of contractor for a specific request of RailTel which will be used for all references until its closure and also for future correspondence.

**Maintained Products:** Details of equipment's with location wise deployment and serial identification numbers to be incorporated in a statement jointly signed by RailTel and Contractor, which will be covered under AMC contract.

## Severity Levels:

Severity Levels are defined as the condition of the system when RailTel submits an Assistance Request (AR). There are three severity levels for reported problems. Severity levels are defined as follows:

**“Critical” (also known as Severity Level 1, SL1):** The system is inoperative and RailTel’s inability to use the product has a critical effect on RailTel’s operations. This condition is generally characterized by complete system failure and requires immediate correction.

**“Major” (also known as Severity Level 2, SL2):** The system is partially inoperative but still usable by RailTel. The inoperative portion of the product severely restricts RailTel’s operations, but has a less critical effect than a severity level 1 condition.

**“Minor” (also known as Severity Level 3, SL3):** The system is usable by RailTel, with little or limited impact to the function of the system. This condition is not critical and does not severely restrict overall RailTel operations.

RailTel shall inform the severity based on above definitions, at the time of opening of AR with Contractor’s TSC. If TSC feels to disagree on the severity, may discuss with RailTel on correction of severity. Where parties disagree on the classification of a particular reported problem, RailTel and Contractor’s technical contacts will discuss the classification in good faith to reach a mutually acceptable classification. In the event, the parties are unable to reach agreement on the classification, the reported problem shall be classified at the discretion of RailTel.

## 2.1 Key Performance Indicators (KPIs):

The key performance indicators (KPI) established by contractor and RailTel, are dependent on the severity level of the request as reported by RailTel to the TSC through telephone. Contractor’s KPIs extend to Maintained Products running on a currently supported software version release only. These are KPIs which will decide the penalties to be imposed on contractor if he fails to achieve the fixed parameter for both remote services and Repair & Return services.

**“Response Time”** (also known as Specialist Call-back) means the time period from when RailTel first notifies the Contractor’s welcome center of a reported problem to when an contractor’s expert attempts to contact RailTel via telephone or preferred contact method as defined when submitting the request.

**“Restore Time”** (also known as Remote Neutralization) means a measure of the length of time from when contractor is contacted and an event is determined to be loss of service and/or functionality affecting, to the time when contractor provides the means to return a system to operational status. This will be applicable only for services impacting cases. Travel time of field’s engineers or TSC engineers and spare arrangement times will be excluded in this.

**Resolve Time** (Also known as Final Resolution Time) means a measure of the length of time from when RailTel first notifies the contractor’s welcome center to the time when a solution to address the issue is made available to RailTel. This may or may not occur simultaneously with Restore Time.

## Patch Releases/Maintenance Releases:-

“Patch Release” means a software release that contains minor modifications to address a specific problem and help restore a system. A Patch Release may also be known as “Craft Release”.

“Maintenance Release” means a software release that contains modifications intended to resolve problems that prevent products from performing up to the manufacturer’s technical specification. Typically they are comprised of a collection of Patch Releases. Maintenance Release may also be known as an “Update Release” or a “Point Release”.

### **3.0 Technical Support Service:-**

During this AMC period, whenever needed, RailTel may contact the Contractor’s Support center (WC) through a dedicated phone no. or e-mail address or Web for every issue or request. The Welcome Center of the Contractor (WC) will be available 24 hours a day and 365 days of the year. Welcome Centre creates the Assistance Request (AR) in the database and this AR will be used for all future correspondence /references and it will route to either for Repair or Return services or to Technical support center (TSCs) for remote assistance. These level 2 services provided through Technical support center may escalate to Technical Experts centre or to OEM dedicated technical support centers (for OEM support for hardware and /or software portion of the products).

The Welcome centre of contractor (WC) keeps track of the assistance request (AR) or part request until closure.

### **3.1 Contractor’s responsibilities:**

Contractor shall login RailTel Network in support of product related questions troubleshooting assistance, diagnostic procedures, and Patch & Maintenance Releases, as are made available, to restore and resolve network troubles. The following services will be provided:

3.1.1 Troubleshoot network problems via phone, virtual private network, or modem connection down to Maintained product component level, or sufficiently to the maintained products as the root cause.

3.1.2 Provide technical advice and guidance via telephone or email by Contractor’s product specialists located in their Technical Support Centers (TSC). Upon request from RailTel, RailTel will receive information, advice and assistance for the Maintained Products.

3.1.3 Provide Patch & Maintenance Releases for Maintained Products, as provided in accordance with the applicable product software support policy. For selected products noted on Maintained Products Contractor will remotely install software fixes, patches, and updates that may be made available.

3.1.4 For Severity Level Critical (Severity 1) and Major (Severity 2) will restore Maintained Products to operational status by identifying defective hardware components or providing software and/or procedural workarounds, where feasible. All software workarounds will be licensed subject to the same terms, restrictions, and limitations as contained in the licenses under which the software was acquired.

3.1.5 Not Used.

3.1.6 Not Used.

### 3.1.7 **Software Update:**

RailTel will be extended the benefits of software updates made by OEM on the installed systems on existing release from time to time to improve performance. If required to restore or rectification of severe problems all the software up-gradation, re-installation will be done by contractor during the period of AMC.

## 3.2 **RailTel Responsibility:-**

When reporting an AR, RailTel shall include Severity Level of problem and output of any diagnostic, printed logs, already performed to help reproduce the conditions under which the trouble occurred. Identify site ID or contact number, submitter name & location, callback telephone number and/or email address, system name and location, processor location, type and serial number, and alternate contact.

3.2.1 RailTel will notify contractor in writing immediately of any change in the employment or authorization status of any personnel having authorized access to the Web site.

3.2.2 RailTel will provide remote access to Contractor's TSC to access their network, either through VPN, ISDN or Team viewer.

3.2.3 RailTel will perform first level diagnostics before handing over the ticket to the Contractor. RailTel will share all network layouts, link details etc which may be needed by Contractor to help troubleshooting the issue.

3.2.4 RailTel will provide all necessary documents for repair of cards.

3.2.5 RailTel will provide all necessary technical field support in the form of field technical staff equipped with necessary equipment's etc. to give remote access to Contractor.

## 4.0 **Repair and Return Services**

### 4.1 **Repair**

#### 4.1.1 **Contractor's Responsibility: -**

- The Contractor will take- over the defective cards/SFPs from NOC/CNOC where

equipment is installed and hand-over the repaired card at the same location. The following activities will be performed by the contractor:

- After receiving a defective part request through Welcome Centre (dedicated phone line or e-mail), the defective part will be taken over by the contractor from NOC/site where equipment is installed. All the documentation including identification number (Serial number) will be provided by RailTel.
- There will be initial one time activity of all existing faulty cards being repaired by Contractor before commencement of the AMC. AMC will cover only equipment's which are in working condition.
- **Delivery Period:** The received defective part will be got repaired by the contractor within 30 days from the date of receiving and will be installed/handed over to RailTel authorized representative at NOC. The contractor will also give probable reason for repeated failure of cards/ modules.

**Uninterrupted Network:** For smooth and uninterrupted traffic during the repair being carried out by the contractor.

1. RailTel will use its own spare card in the first instance.
2. If contractor fails to return the repaired card within stipulated time of 30 days from the date of receipt then the OK (good conditioned) cards/SFPs/parts etc will be provided by the contractor for the subsequent in this period free of cost till replacement with the repaired card.
3. All transportation, freight and insurance charges will be borne by the contractor
4. Contractor will keep the record of repair on each defective part/cards/SFP with serial numbers (unique identification) particulars.

#### **4.1.2 RailTel's Responsibility**

RailTel will hand over the defective card/SFP/Parts/etc. to the contractor's authorized representative at NOC/site along with the following relevant information & documentation.

- Identification/serial number and location of use.
- Fault report document duly filled-in in a format as per requirements of Contractor.
- All relevant documentation including failure description, diagnostic tests results.
- Adequate packing material to protect against reasonable risk of damages.
- Provide all necessary government authorization and documentation necessary to facilitate custom clearance processing.

- Perform a physical check test on the repaired parts.

## 4.2 Return

If any part goes beyond repair due to Contractor at the time of repair being carried out, this is to be communicated to RailTel and after agreed upon, it will be labelled as “unworkable”. If it will be required to deploy a new part on that location that will be provided by the contractor to RailTel free of cost. To achieve this, contractor is required to always keep adequate spares with it during the period of AMC. However, this excludes damaged, spoiled, rusted or misused parts. Any such parts will be not-repairable and no replacements shall be provided by contractor. RailTel will have to purchase fresh spares in case the cards are non repairable due to these reasons.

## 5.0 Services Level Agreement Values (SLA):

As described above, if the contractor fails to provide the Technical Support Services and Repair services within the reasonable time, the following KPIs will be used.

### 5.1 Technical Support Services KPIs & SLA:

| Severity Levels/KPIS | Critical | Major | Minor |
|----------------------|----------|-------|-------|
| Respond              | Hr       | Hr    | Hr    |
| Restore              | Hr       | E     | E     |

**\*BE-Best Effort**

## 5.2 Repair and Return Services

**If the contractor fails to return the card with 30 days, the following penalties will be imposed:**

| Equipment                   | Duration of repair                                            | Deduction/Penalties                     |
|-----------------------------|---------------------------------------------------------------|-----------------------------------------|
| All Modules and accessories | More than 30 days and upto 40 days (from the date of receipt) | 10% of the cost of affected part/module |
| All Modules and accessories | More than 40 days and upto 50 days (from the date of receipt) | 25% of the cost of affected part/module |
| All Modules and accessories | More than 50 days and upto 60 days (from the date of receipt) | 75% of the cost of affected part/module |
| All Modules and accessories | More than 60 days (from the date of receipt)                  | Full cost of affected part/module       |

## 6.0 General Conditions:

### 6.1 Period of AMC:

This Annual Maintenance Contract will be valid for a period of 5 years from the date of issue of LOA/PO for AMC. This period (i.e. 5 years) may be extended further with mutual consent of RailTel and Contractor.

RailTel at its discretion is free to change the location of the equipment's installed during the currency of AMC and the contractor shall carry out the AMC with same commercial terms.

## **6.2 Performance Bank Guarantee:-**

The contractor is required to submit a Performance Bank Guarantee (PBG) within 30 days from the date of issue of LOA for AMC @ 3% of the total AMC cost of five years valid for a period 4 months beyond the AMC period of 5 years from the date of issue of LOA or will be kept as per Government of India guidelines applicable at the time of issue of LOA/PO for AMC. The Proforma for PBG is given in Form No. 1 of tender document. If the AMC period got extended, the PBG will also be extended accordingly.

The performance Bank Guarantee will bear no interest.

## **6.3 Prices and Taxes:-**

- The prices for the services shall be in INR which will be the currency of account invoicing and payment.
- If in respect of the provision of services, Contractor has to pay the additional admissible taxes, the same will be get reimbursed after receiving the documentary proof by RailTel.
- Price will not include the cost of any financing (if any).
- The Octroi/entry tax shall be paid extra as per actual on production of proof of payment/document.

## **6.4 Payment Terms:-**

AMC charges shall be paid on quarterly basis by the respective Regional General Managers/ Executive Director of the concerned Region OR CNOC/NTP after successful completion of maintenance within 30 days from the date of invoicing accompanied with Invoice, Monthly trouble ticket report, Monthly repair report subject to any deductions or recovery (which the RailTel may be entitled to make under contract) through RTGS. Monthly reports will be shared with RailTel regularly. Format will mutually decided by RailTel and Contractor.

## **6.5 Execution of contract**

The Regional General Managers/ Executive Directors of respective regions or his nominated representatives OR CNOC/NTP will be responsible for the execution of the contract under their respective jurisdiction. Certificate regarding proper execution of the AMC along with proposed deductions/penalties with reasons thereof shall be prepared for every billing cycle (quarterly) for arranging payment to the contractor.

### **7.6.6 Tenderers Address**

Tenderer shall state in the tender his postal address fully and clearly. Any communication sent to the Tenderers by post at his said address shall be deemed to have reached the tenderer duly & timely, notwithstanding the fact the communication could not reach the tenderer at all or in time for whatever reason. Important documents shall be sent by Registered post.

## **6.7 Law governing the contract.**

The contract shall be governed by the law for the time being in force in the Republic of India. Compliance to regulations and bye-laws-The contractor shall conform to the provision of any statute relating to the works and regulations and bye-laws of any local authority and of any water and lighting companies or undertakings, with whose system the work is proposed to be connected and shall before making any variation from the drawings or the specifications that may be necessitated by so confirming give to the Engineer notice specifying the variation proposed to be made and the reason for making the variation and shall not carry out such variation until he has received instructions from the Engineer in respect thereof. The Contractor shall be bound to give all notices required by statute, regulation or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

## **6.8 Force Majeure clause:-**

If at any time, during the continuance of this contract, the performance, in whole or part, by either party, of any obligation under this contract shall be prevented or delayed by reason of any war, hostility, act of the public enemy, Civil Commotion, Sabotage, Fires, Floods, Earth quakes, explosions, strikes, epidemics, quarantine restrictions, lockouts, any statute, statutory rules/regulation, order of requisitions issued by any Government Department of Competent Authority or acts of God (here-in-after referred to as event) then provided notice of the happening of any such event is given by either party to the other within twenty one days from the date of occurrence thereof, neither party shall, by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damage against the other in respect of such non- performance or delay in performance, and the obligations under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, Provided further that if the performance in whole or part of any obligation under this contract of prevented or delayed by reason of any such event beyond a period as mutually agreed to by the RailTel and the Contractor after any event or 60 days in the absence of such an agreement whichever is more, either party may at its option to terminate the contract provided also that if the contract is so terminated under this clause the RailTel may at the time of such termination take over from the Contractor at prices as provided for in the contract, all works executed or works under execution.

## **6.9 Illegal Gratification:**

Any bribe, commission, gift or advantage given, promised or offered by or on behalf to the contractor or his partner, agent or servant or anyone on his behalf to any officer or employees of the RailTel, or to any person on his behalf in relation to obtaining or the execution of this or any other contract with the RailTel shall, in addition or any criminal liability which he may incur, subject the contractor to the rescission of the contract and all other contracts with the RailTel and to the payment of any loss or damage resulting from such decision and

the RailTel shall be entitled to deduct the amounts so payable from any moneys due to the Contractor (s) under this contract or any other contracts with the RailTel.

The contractor shall not lend or borrow from or have or enter into any monetary dealings or transactions either directly or indirectly with any employee of the RailTel and if he shall do so, the RailTel shall be entitled forthwith to rescind the contract and all other contracts with the RailTel. Any question or dispute as to the commission or any shall offence or compensation payable to the RailTel under this clause shall be settled by the Regional General Manager of RailTel, in such a manner as shall consider fit and sufficient and his decision shall be final and conclusive. In the event of rescission of the contract under this clause, the contractor will not be paid any compensation whatsoever except payment for the work done up to date of rescission.

## **6.10 LABOUR**

**Wages to Labour-** The contractor shall be responsible to ensure compliance with the provisions of the Minimum Wages Act, 1948 (hereinafter referred to as the “said Act”) and the Rules made there-under in respect of any employees directly or through petty contractors or sub contractors employed by him on road construction or in building operations or in stone breaking or stone crushing for the purpose of carrying out this contract. If in compliance with the terms of the contract, the contractor supplied any labour to be used wholly or partly under the direct orders and control of the RailTel whether in connection with any work being executed by the contractor or otherwise for the purpose of the RailTel such labour shall, for the purpose of the clause, still be deemed to be persons employed by the contractor. If any moneys shall as a result of any claim or application made under the said Act be directed to be paid by the RailTel, such moneys shall be deemed to be moneys payable to the RailTel by the Contractor and on failure by the contractor to repay any moneys paid by it as aforesaid with seven days after the same shall have been demanded, the RailTel shall be entitled to recover the same form any moneys due or accruing to the contractor under this or any other contractor with the RailTel.

### **6.10.1 Apprentices Act**

The contractor shall be responsible to ensure compliance with the provisions of the Apprentices Act 1961 and the Rules and Orders issued the re-under from time to time in respect of apprentices directly through petty contractors or sub-contractors employed by him for purpose of carrying out the contract. If the Contractor directly or through petty contractor or sub-contractors fails to do so, his failure will be breach of the contract and the RailTel may, in its discretion, rescind the contract. The Contractor shall also be liable for any pecuniary liability arising on account of any violation of the provisions of the Act.

### **6.10.2 Provisions of Payments of Wages Act**

The Contractor shall comply with the provisions of the payment of Wages Act, 1936 and the rules made there under in respect of all employees directly or through petty contractors or sub-contractors employed by him in the works. If in compliance with the terms of the contract, the contractor directly or through petty contractors or sub- contractors shall supply any labour to be used wholly or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of the Engineer such labour shall nevertheless be deemed to comprise persons employed by the contractor, and any moneys which may be ordered to be paid by the Engineers shall be deemed to be moneys payable by the Engineer on moneys due to the contractor in terms of the contractor (whether under this contract or any other contract all moneys paid or payable by the RailTel by way of compensation of aforesaid or for costs of expenses in connection with any claim thereto and the decision of the Engineer upon any question arising out of the effect or force of this clause shall be final and binding upon the contractor.

### **6.10.3 Provision of Contract Labour (Regulation and Abolition) Act 1970**

1. The contractor shall comply with the provision of the Contract Labour (Regulation and Abolition) Act 1970 and the Contract Labour (Regulation and Abolition) Act, Central Rules 1971 as modified from time to time, whenever applicable and shall also indemnify the RailTel from and against any claims under the aforesaid Act and the Rules.
2. The contractor shall obtain a valid license under the aforesaid Act as modified from time to time before the commencement of the work and continue to have a valid license until the completion of the work. Any failure to fulfil this requirement shall attract the penal provision of the Contract arising out of the resultant non-execution of the work.
3. The contractor shall pay to the labour employed by him directly or through sub- contractors the wages as per provisions of the aforesaid Act and the Rules wherever applicable. The Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour indirectly engaged on the work including any engaged by his sub contractors in connection with the said work, as if the labour had been immediately employed by him.
4. In respect of all labour directly or indirectly employed in the work for performance of the contractor's part of the contract the contractor shall comply with or cause to be complied with the provisions of the aforesaid Act and the Rules wherever applicable.
5. In every case in which, by virtue of the provisions of the aforesaid Act or the Rules, the RailTel is obliged to pay any amount of wages to a workmen employed by the contractor or his sub-contractor in execution of the work or to incur any expenditure in providing welfare and health amenities required to be provided under the aforesaid Act and the Rules or to incur any expenditure in providing welfare and health amenities required to be provided under the aforesaid Act the Rules or to incur any expenditure on account of the contingent liability of the RailTel due to contractor's failure to fulfil his statutory obligations under the aforesaid Act or the Rules the RailTel will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred, and without prejudice to the rights of the RailTel under section 20, sub section (2) and section 2 sub-section (4) of the aforesaid Act, the RailTel shall be at liberty to recover such amount or part thereof by deducting it from the security deposit and/or from any sum due by the RailTel to the contractor whether under the contract or otherwise. The RailTel shall not be bound to contest any claim made against it under sub section (1) of section 20 and sub section (4) of section 21 of the aforesaid Act except on the written request of the contractor and upon his giving to the RailTel full security for all costs for which the RailTel might become liable in contesting such claim. The decision of the RailTel regarding the amount actually recoverable from the contractor as stated above shall be final and binding on the contractor.

### **6.10.4 Reporting of Accidents to Labor**

The contractor shall be responsible for the safety of all employees directly or through petty contractors or sub-contractors employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or the Engineer's representative and shall make every arrangement to render all possible assistance.

### **6.10.5 Provisions of Workmen's Compensation Act**

In every case, in which by virtue of the provision of section 12 sub section (1) of the Workmen's Compensation Act, 1923, RailTel is obliged to pay compensation to workman directly or through the petty contractor employed by the contractor or sub- contractor, in executing the work, RailTel will recover from the contractor the amount of the compensation so paid, and without prejudice to the right of RailTel under section 12 sub section (2) of the said Act. RailTel shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by RailTel to the Contractor whether under these conditions or otherwise, RailTel shall not be bound to contest any claim made against it under Section 12, Sub Section (1) of the said Act except on the written request of the contractor and upon his giving to RailTel full security for the all costs for which RailTel might become liable in consequence of contesting such claim.

#### **6.11 Determination of Contract**

**Right of RailTel to determine the contract:** The RailTel shall be entitled to determine and terminate the contract at any time, should in the RailTel's opinion, the cessation of the work becomes necessary owing to paucity of funds or from any other cause whatever, in which case the value of approved materials at site and of work done to date by the Contractor will be paid for in full at the rate specified in the contract. Notice in writing from the RailTel of such determination and the reasons thereof shall be conclusive evidence thereof.

**Payment on determination of contract:** Should the contract be determined under sub clause (1) of this clause and the Contractor claims payment for expenditure incurred by him in the expectation of completing the whole of the work, the RailTel shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfactions of the Engineer. The RailTel's decision on the necessity and property of such expenditure shall be final and conclusive.

The contractor shall have no claim to any payment of compensation of otherwise, however on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of determination of contract.

#### **6.12 TERMINATION OF CONTRACT OWING TO DEFAULT OF CONTRACTOR:**

The purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default, sent to the Tenderer, terminate this contract in whole or in part.

- a) If the tenderer fails to deliver any or all of the goods within the time period(s) specified in the contract.
- b) If the tenderer fails to perform any other obligation(s) under the contract; and
- c) If the tenderer, in either of the above circumstance(s) does not remedy his failure within a period of 30 days (or such longer period as the Purchaser may authorize in writing) after receipt of the default notice from the Purchaser.

#### **6.13 RIGHT OF RAILTEL AFTER TERMINATION OF CONTRACT OWING TO DEFAULT OF CONTRACTOR:**

- a) The contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advances on account of or with a view to the execution of the works or the performance of the contract and contractor shall not be entitled to recover or be paid any sum for any works thereto not actually performed under the contract, unless or until the Engineer shall have certified the performance of such work and the value payable in respect thereof and the Contractor shall only be entitled to be paid the value so certified.

b) The Engineer or Engineer's Representative shall be entitled to take possession of any materials, tools, implements, machinery or buildings on the works or on the property on which these are being or ought to have been executed, and to retain the employ the same in further execution of the works without the contractor being entitled to any compensation for the use and employment thereof or for wear and tear or destruction thereof.

c) The Engineer shall, as soon as may be practicable after removal of the contractor fix and determine expert or by or after reference to the parties or after such investigation or enquiries as he may consider fit to make or institute and shall certify what amount (if any) has at the time of termination of the contract been reasonably earned by or would reasonably accrue to the Contractor in respect of the work then actually done by him under the contract what was the value of any unused or partially use materials, any constructional plants and any temporary works upon the site. The legitimate amount due to the contractor after making necessary deductions and certified by the Engineer should be released expeditiously.

#### **6.14 SETTLEMENT OF DISPUTE AND ARBITRATION:-**

- Any dispute or difference whatsoever arising between the parties out of relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by a sole arbitrator in accordance with provisions contained in Arbitration and Conciliation Act, 1996 as amended and the award made in pursuance thereof shall be binding on the parties. The venue of such arbitration or proceedings thereof shall be New Delhi.
- All arbitration proceedings shall be conducted in English. Resources against any Arbitral award so rendered may be entered into court having jurisdiction or application may be made to such court for the order of enforcement as the case may be.
- The arbitral tribunal shall consist of the sole Arbitrator if the value of claim is upto Rs. 10 lakhs. The arbitrator will be appointed by the Managing Director of RailTel Corporation of India Ltd. If the value of claim or amount under dispute is more than Rs. 10 lakhs, the matter shall be referred to the adjudication of arbitral council. Managing Director/RailTel shall furnish a panel of three names to the contractor, out of which the contractor will recommend one name to be his nominee and then Managing Director/RailTel shall appoint out the panel, one name as RailTel's nominee and these two arbitrators with mutual consent appoint a third arbitrator who shall act as deciding. The award of sole arbitrator or Arbitral council, as the case may be, shall be final and binding on both the parties, i.e. contractor and RailTel Corporation of India Ltd.
- Each of the parties agree that no withstanding that the matter may be referred to Arbitrator as provided therein, the parties shall nevertheless pending the resolution of the controversy or disagreement continue to fulfill their obligation under this agreement so far as they are reasonably able to do so.

**CHECK LIST (To be Filled up & uploaded)**

**List of Documents to be Submitted (Online):**

| SN  | Have you submitted the following documents?                                                                                                                                             | Submitted /Complied or Not | Page No./ref No. of Offer |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|
| 1.  | Offer letter as per Annexure-II & as per clause no. 20(i) of ITB.                                                                                                                       |                            |                           |
| 2.  | EMD Submission details as per clause no. 8 of ITB.                                                                                                                                      |                            |                           |
| 3.  | BOQ of offered equipment as per clause no. 20(iii) of ITB.                                                                                                                              |                            |                           |
| 4.  | Clause wise compliance along with all mentioned documents/annexures for all clauses of GeM Bid and ATC documents as per clause no. 20(iv) of ITB.                                       |                            |                           |
| 5.  | Data Sheet of offered equipment as per clause no. 20(v) of ITB.                                                                                                                         |                            |                           |
| 6.  | Financial (Certified copies of audited balance sheets/annual reports of last three preceding financial years) and Technical Eligibility Criteria documents as per clause no. 12 of ITB. |                            |                           |
| 7.  | Technical Compliance of all Specification of items as per GeM Bid and ATC documents as per clause no. 20(vii) of ITB.                                                                   |                            |                           |
| 8.  | Certificate from the End user against the Eligibility criteria for OEM as per para 11 of ITB.                                                                                           |                            |                           |
| 9.  | Proof of document required against Eligibility criteria of OEM and Bidder vide para 11 & 12 respectively.                                                                               |                            |                           |
| 10. | Long Term Maintenance Support Proforma as per Annexure-VI & as per clause no. 16 of ITB.                                                                                                |                            |                           |
| 11. | MAF/OEM Authorization as per para 12.3 and Annexure-IV of ITB.                                                                                                                          |                            |                           |
| 12. | Notarized affidavit on a non-judicial stamp paper as per Annexure-V & as per clause no. 18 of ITB.                                                                                      |                            |                           |
| 13. | Certificate as per Annexure-VII & as per clause no. 20(xiii) of ITB.                                                                                                                    |                            |                           |
| 14. | Nil Deviation as per Proforma attached in Annexure-VIII & as per clause no. 20(xiv) of ITB.                                                                                             |                            |                           |
| 15. | Power of Attorney as per clause no. 19 of ITB.                                                                                                                                          |                            |                           |

**(END OF TENDER DOCUMENT)**

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