रेलटेलकार्पोरेशनऑफइंडियालिमिटेड (आरसीआईएल)

RailTel Corporation of India Limited (RCIL)

"रेलटेल नेटवर्क (आईपी-एमपीएलएस और डीडब्ल्यूडीएम) पर ओएसएस समाधान की आपूर्ति, डिजाइन, स्थापना, परीक्षण, कमीशनिंग और एकीकरण"

"Supply, Design, Installation, Testing, Commissioning, and Integration of OSS solution at RailTel Network (IP-MPLS & DWDM)"

इलेक्ट्रॉनिक निरीक्षण प्रलेख

Electronic Tender Document

खुलीनिविदा (दो पैकेट- रिवर्स नीलामी)

Open Tender (Single Stage Two Packet-Reverse Auction)

रेलटेल / टेंडर / ओटी / सीओ / एनटीपी / 2023-24/ ओएसएस /008

E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/OSS/008

OPEN E-TENDER NOTICE

E-Tender No. - E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/OSS/008, Dated 10-11-2023.

RailTel Corporation of India Ltd. (RailTel) invites E-Tenders in Single Stage Two Packet (Part I –Credential/Techno commercial Bid and Part II - Price Bid) for "Supply, Design, Installation, Testing, Commissioning and Integration of OSS solution at RailTel Network (IP-MPLS & DWDM)".

The details are as under: -

1.	Closing date for Submission of E-Bids	Up to 15:00 hrs of 15-12-2023 (online)
2.	Date of opening of E-Bids	Up to 15:30 hrs. of 15-12-2023 (online)
3.	Earnest Money Deposit (EMD)	₹ 50,00,000/- to be made in favour of RailTel Corporation of India Ltd. online through e-nivida Portal.
4.	Cost of Tender Document	₹ 11,800/- (including GST) to be made in favour of RailTel Corporation of India Ltd. online through e-nivida Portal.
5.	Last date for submission of queries – Bidder/OEMs	Till 21-11-2023
6.	Pre-Bid Meeting	23-11-2023 at 15:30 Hrs
7.	Place of Opening of Tender	Corporate Office, RailTel, Plate-A, 6th Floor, Office Block-2, East Kidwai Nagar, New Delhi-110023

Note: Tender Notice and link for Tender Document are available on RailTel's website, CPP portal and e-Tendering portal https://RailTel.enivida.com/ for download. Tender notice will also be published in newspaper. For online bid submission the bidder will have to necessarily download an official online copy of the tender documents from enivida- portal. All future Information viz. corrigendum/addendum/amendments etc. for this Tender shall be posted on the RailTel's website, CPP portal and e-Tendering Portal only. Printed copy of Tender document will not be sold from RailTel office. Bid will be submitted online on enivida portal only.

The bidder shall bear all costs associated with the preparation, submission/participation in the bid. RailTel in no way will be responsible or liable for these costs regardless of the conduct or outcome of the bidding process.

This tender is covered under Integrity Pact Program of RailTel, and bidders are required to sign the Integrity Pact and submit the same to RailTel along with the bids. Tender received without signed copy of the Integrity Pact document shall be liable to be REJECTED.

(Himanshu Kumar)
GM/NTP/CO
on behalf of
RailTel Corporation of India Ltd.

खुली ई-निविदा सूचना

ई-निविदा सं. रेलटेल/निविदा/ओटी/सीओ/एनटीपी/2023-24/ ओएसएस/008, दिनांक – 10-11-2023

रेलटेल कॉर्पोरेशन ऑफ इंडिया लिमिटेड (रेलटेल) "रेलटेल नेटवर्क (आईपी-एमपीएलएस और डीडब्ल्यूडीएम) पर ओएसएस समाधान की आपूर्ति, डिजाइन, स्थापना, परीक्षण, कमीशनिंग और एकीकरण" के लिए सिंगल स्टेज टू पैकेट (भाग 1 - क्रेडेंशियल / तकनीकी वाणिज्यिक बोली और भाग 2 - मूल्य बोली) ई-निविदाएं आमंत्रित करता है।

विवरण इस प्रकार हैं: -

क)	ई-बोलियां जमा करने की अंतिम तिथि	दि. 15-12-2023 को15:00बजे तक (ऑनलाइन)
ख)	ई-बोलियां खोलने की तिथि	दि. 15-12-2023 को15:30बजे तक (ऑनलाइन)
ग)	बयाना धनजमा (ईएमडी)	₹ 50,00,000/- (जीएसटी सहित)
घ)	निविदा दस्तावेज़ की लागत	रु. 11,800 (जीएसटी सहित)
ड़)	बोलीदाता/OEMs को अपने प्रश्नों को प्रस्तुत करने की अंतिम तिथि	Till 21-11-2023
च)	प्री-बिड मीटिंग	23-11-2023 at 15:30 Hrs
छ)	निविदा खोलने का स्थान	कॉर्पोरेट कार्यालय, रेलटेल, प्लेट-ए, छठा तल, कार्यालय ब्लॉक-2, पूर्वी किदवई नगर, नई दिल्ली-110023

नोट: निविदा सूचना और निविदा दस्तावेज के लिए लिंक रेलटेल की वेबसाइट, सीपीपी पोर्टल और ई-टेंडरिंग पोर्टल https://RailTel.enivida.com/ डाउनलोड के लिए उपलब्ध हैं। निविदा सूचना समाचार पत्र में भी प्रकाशित की जाएगी। ऑनलाइन बोली जमा करने के लिए बोलीदाता को आईआरईपीएस-पोर्टल से निविदा दस्तावेजों की एक आधिकारिक ऑनलाइन प्रति डाउनलोड करनी होगी। इस निविदा के लिए भविष्य की सभी जानकारी जैसे शुद्धिपत्र/परिशिष्ट/संशोधन आदि केवल रेलटेल की वेबसाइट, सीपीपी पोर्टल और ई-टेंडरिंग पोर्टल पर ही पोस्ट की जाएगी। निविदा दस्तावेज की मुद्रित प्रति रेलटेल कार्यालय से नहीं बेची जाएगी। बोली केवल enivida पोर्टल पर ऑनलाइन जमा की जाएगी।

बोलीदाता बोली को तैयार करने, प्रस्तुत करने/उसमें भागीदारी से संबंधित सभी लागतों को वहन करेगा। बोली प्रक्रिया के संचालन या परिणाम की परवाह किए बिना रेलटेल किसी भी तरह से इन लागतों के लिए जिम्मेदार या उत्तरदायी नहीं होगा।

यह निविदा रेलटेल के इंटीग्रिटी पैक्ट प्रोग्राम के तहत कवर की गई है और बोलीदाताओं को इंटीग्रिटी पैक्ट पर हस्ताक्षर करने और बोली के साथ रेलटेल को प्रस्तुत करना आवश्यक है।इंटीग्रिटी पैक्ट दस्तावेज की हस्ताक्षरित प्रति के बिना प्राप्त होने वाली निविदा को अस्वीकार कर दिया जाएगा।

(हिमांशु कुमार)
महाप्रबंधक/एनटीपी/सीओ
रेलटेल कॉर्पोरेशन ऑफ इंडिया लि.
के लिए और की ओर से

TABLE OF CONTENT

CHAPTER-1

OFFER LETTER

RailTel Corporation of India Ltd.,
6th Floor, Plate-A, Office Block-2,
East Kidwai Nagar, New Delhi-110023

1. I/We _____ have read the various conditions detailed in tender documents attached here to and hereby agree to ABIDE BY THE SAID CONDITIONS. I/We also agree to keep this offer open for acceptance for a period of 180 days from the date of submission and in default thereof, I/We will be liable for forfeiture of my/our Earnest Money. I/We offer to do the work at the rates quoted in the attached schedules and hereby bind myself/ourselves to complete the work of subject tender within timeline mentioned in Clause 4.A.4 of Chapter-4 i.e. 30 months from date of issue of letter of acceptance (LOA). I/We also hereby agree to abide by the Various Conditions of Tender/Contract and to carry out the supplies/services according to the Specifications for items/materials and works laid down by the RailTel.

2. A sum of ₹ 50,00,000/- submitted online on RailTel enivida portal is herewith forwarded as "Earnest Money". 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 PBG (Performance Bank Guarantee) as mentioned in Clause 4.A.6 i.e. within 30 days after issue of LOA,

   or

   I/We do not execute the contract agreement within 15 days after receipt of notice issued by the RailTel that such documents are ready,

   or

   I/We do not commence the work within 15 days after receipt of orders to that effect.

   Until a formal agreement is prepared and executed the acceptance of this tender document shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the "Letter of Acceptance" of my/our offer for this work.

SIGNATURE OF CONTRACTOR (S)

Date

SIGNATURE OF WITNESS CONTRACTOR (S) ADDRESS

CHAPTER- 2

SCHEDULE OF REQUIREMENT (SOR)

SCHEDULE A

SOR	Item Description	Unit	Qty	Unit Rate (In Rs)	GST@ 18% (In Rs)	Unit Rate (including GST) (in Rs.)	Total Cost (Including GST) (in Rs.)
1.1	Supply, design, installation, commissioning, integration, Training, and testing of OSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy and etc as per technical specifications/scope defined in Chaper-3 & 8 for **Phase-1**.	Lot	1				
1.2	Supply, design, installation, commissioning, integration, Training and testing of OSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy as per technical specifications/scope defined in Chaper-3 & 8 for **Phase-2**.	Lot	1				
1.3	Supply, design, installation, commissioning, integration, Training and testing of OSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy as per technical specifications/scope defined in Chaper-3 & 8 for **Phase-3**.	Lot	1				
	Total Cost (In Rs) for Item 1.1 +1.2 + 1.3 for SCHEDULE A						

SCHEDULE B

SN	SOR Item	Unit	Qty	Unit Rate (In Rs)	GST@ 18% (In Rs)	Unit Rate (including GST) (in Rs.)	Total Cost (Including GST) (in Rs.)
2.1	AMC for Item mentioned in Schedule-A above.	Year	5				
2.2	Man-days required for further customization of OSS Solution and with associate module/software after PAC as per scope defined in clause no. 3.A.1.16 of Chapter-3	Cost perMan-day	400				
	Total Cost (In Rs) for Item 2.1 +2.2 for SCHEDULE B						
	Grand Total Cost (In Rs) SCHEDULE A+ SCHEDULE B						

Annexure-A

Tax Breakup for SCHEDULE-A

SOR	Description	Total Qty	Basic Unit Price (exclusive of all levies and charges)	Pkg & Forwarding Charges		Freight & Insurance Charges		CGST/ SGST/ IGST/ UTGST etc.		Price Per Unit (all inclusive) for delivery at destination (4+6+8+10)	
				%	Amt	%	Amt	%	Amt	Amt (In Rs.)	In word
1	2	3	4	5	6	7	8	9	10	11	12
SOR-1.1											
SOR-1.2											
SOR-1.3											
Grand Total											

Note:	
a.	Before quoting, please read the Technical Specification as mentioned in Chapter-8 of Tender document and Clause 4.A.3 of Tender document for Schedule-B. Offered solution having any deviation as mentioned in Chapter-8 & 3 of Tender Document shall be SUMMARILY REJECTED.
b.	Unit rates quoted against each SOR Items above should be CIP destination inclusive of basic rate, including GST, freight, insurance, Inspection/Audit charges and any other charges or cost quoted by the tenderer. The materials as per SOR are required to be delivered within the delivery period as indicated in Bid Data Sheet (BDS, Chapter 5, Section-I) to the sites as mentioned in tender or decided by the authorized representative of RailTel.
c.	Schedule – 'B' - Item no. 1: Bidder shall be paid @ 10% (minimum) of overall cost (excluding Taxes and Duties) of Schedule (A) per annum towards Long Term Maintenance Support after completion of warranty period, to undertake maintenance, repairs and replacements of all type of equipment/module/ card/assembly/subassembly and update/upgrade of software released during this period and /or which may fail in the system after the warranty. For more details, please refer to Clause no. 4.A.3 Chapter-4 (Section-I) of this document.
d.	Bidder has to quote single make for OSS application as defined in the Tender (Technical requirement of Chapter-8). Against eligibility requirement (Point 3 of Clause 4.A.14), OEMs are allowed to meet their eligibility criteria through single or multiple Supply Orders/POs and Satisfactory working certificates in the name of OEMs or their System integrators issued by Government/PSU/Telecom Service Provider/Public Listed company having average annual turnover of Rs 500 Cr in last 3 financial years. However, make & model of hardware/software should be clearly mentioned in such certificates.
e.	a) The offered solution as per SOR are required to be delivered within the delivery period as indicated in Bid Data Sheet (BDS, Chapter-5). However, RailTel reserves the right to change these sites as per the requirement without any additional financial implication to RailTel. b) It shall be the responsibility of the selected bidder to transport the equipment to site for Design, Installation, Testing, Commissioning and Integration of the offered Hardware and Software. c) Design, Installation, Testing, Commissioning & Integration of the offered Hardware and Software OEM's authorized Engineers.
f.	Bidder must validate all the quantities quoted in their technical solution proposed supported by calculations, datasheets, and design documents as same would be required for the technical evaluation of the offer. Bidder would be responsible for ensuring the complete system is operational and meeting the requirements as mentioned in the tender document. Bidder should submit OEM vetted Bill of Materials for offered solution as per Chapter-8. However, if at any stage during contract validity period {as mentioned in clause 3.A.6 of Chapter-3 (Section-I)}, it is found that the system performance is not compliant with the functional requirements and specifications given in the tender document, the bidder shall be liable/obliged to supply additional hardware/systems required to meet the functional requirements and specifications mentioned in the tender document at no additional cost to the purchaser. RailTel decision in this context will be final.

g.	Any license fee required to be paid for hardware & software during the life cycle of the equipment shall be included in the rate quoted by the tenderer. There shall be no post contractual liability of license fee on RailTel for hardware & software supplied by tenderer.
h.	Non-conformities between Figures and Words Sometimes, non-conformities/errors are also observed in responsive tenders between the quoted prices in figures and in words. This situation normally does not arise in case of e-Procurement. This should be taken care of in the manner indicated below: 1. If, in the price structure quoted for the required goods, there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly. 2. If there is an error in a total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and the total shall be corrected; and If there is a discrepancy between words and figures, the amount in words shall prevail.
i.	It is mandatory for Tenderer to quote for all items of the schedule. Any bid not having quotes for all the items of the schedule will not be considered.
j.	Tenderer Should submit the soft copy (Word/Excel/PDFs format) of offer. Bill of Material (BOM) must be uploaded in PDF as well as in Excel format.
k.	The Bidders are required to meet all eligibility criteria including Proof of Concept (POC)/Demonstration mentioned in this tender document. Financial bid of only those bidders who have successfully completed POC/Demonstration and those who are technical eligible, will be opened. eRA will be conducted among the eligible bidders as per time schedule given by RailTel. LOA will be issued to the lowest acceptable bid, after eRA.
l.	The supply of items shall be done in a phased manner strictly in line with the progress of the work as per Clause 4.A.4 of Chapter-4. A successful bidder is required to propose project progress and planning of supply of related material in consultation with the RailTel. Bidder shall submit the Supply and Inspection plan along with destination(s) for delivery to RailTel for approval. After approval of Supply and Inspection plan by RailTel, the bidder will arrange for supply and inspection of material as per approved plans and payment of items in Schedule-A shall be released as per approved supply plan.
m.	Along with the Server, bidder is required to propose necessary hardware/software required for remote management of Servers like IPMI Port with KVM over LAN or equivalent. Remote management functionalities include remote OS/Software updation/installation, reboot, shutdown etc.
n.	Detailed BOM of each SOR line item supplied under the contract shall be submitted along with the bid and the same shall be duly vetted by the respective OEMs. The Bill of Material (BOM) shall be prepared for each item of Schedule of Requirement (SOR). This Bill of Material will be called "Detailed itemized Bill of Material for Schedule of Requirement" and will be prepared according to Note given under SOR. Technical Bid - Bidder(s) shall upload the complete un-priced copy (with make & model and Local Content in percentage) SOR along with the Breakup of individual itemized un-priced BOM for each item (as per Format given below) should also be submitted with the Technical Bid for evaluation. The technical bid submitted should not include prices, if found so, the technical bid will be REJECTED. Financial Bid - Bidder(s) shall upload the complete priced copy of each Schedule (cost of each sub-assembly, card, module, Licenses, supervision of I&C charges, Training,

<table>
<tr><td></td><td>Support Engineers support upto issuance of PAC, during warranty period and during AMC period etc.), which should be exact replica of unpriced detailed BOM(s) submitted with technical bid. SOR along with the Breakup of individual itemized priced BOM for each item (as per Format-I given below) should also be submitted with the Financial Bid for evaluation. The Financial Bid submitted without itemized priced BOM for mandatory items may be liable to be REJECTED.

Note: This priced copy submitted in the financial bid should be the replica of the un-priced copy submitted in the technical bid for evaluation.

Detailed Un-Priced/Priced BOM is required to be submitted by the Bidders for all the Items which can be divided into logical units, and which may be required by RailTel after installation phase (as given in Format-I below). Some of the parts of the SOR items may be required by RailTel for Augmentation of OSS System. For SOR Items, which can't be divided into logical separate units for preparing detailed priced/un-priced BOM, only SOR price may be mentioned.</td></tr>
<tr><td>o.</td><td>Proof of Concept/Customer Demonstration

All Bidders offering their based solution are required to conduct POC/Demonstration immediately after bid opening time as per Clause 4.A.47 of Chapter-4A (Section-I).

After receiving details, contact details of RailTel or its authorized representative will be shared for conducting the POC/ Demonstration through email.

POC/Demonstration should be completed within 45 Days from the date of opening of bid. In case, bidder fails to demonstrate all the parameters of POC/ Demonstration successfully in first attempt, bidder shall demonstrate remaining parameters within 7 days of first attempt. Please note that maximum 2 attempts will be given to demonstrate all the functional parameters as mentioned in Annexure-I of Chapter-7. In case bidder fails either to arrange POC/Demonstration or to meet any functional requirement given in Annexure-I of Chapter-7 within given timeline, RailTel reserves the right to REJECT their technical bid.</td></tr>
<tr><td>p.</td><td>Evaluation of bids will be done based on Total cost (Schedule ‘A’ and Schedule ‘B’). After completion of evaluation process, Purchase Orders will be issued in favour of the selected bidder(s). Bidder has to submit the PBG as mentioned in the clause no. 4.A.6.</td></tr>
<tr><td>q.</td><td>It is bidders’ responsibility to replace of all consumable items supplied by the contractor (at no additional cost to RailTel) during Maintenance supervision, warranty, and AMC period.</td></tr>
<tr><td>r.</td><td>If any brand / products are found un-suitable as per requirement of Tender, Bidder can replace the product with better products during contract period with approval of RailTel, meeting the tender requirements, without any change in commercial bid.</td></tr>
<tr><td>s.</td><td>Bidder(s) shall upload the complete SOR along with the price Breakup of individual itemized BOM for EACH ITEM (as per Format given below) along with the financial bid. The Financial Bid submitted without itemized priced BOM may be liable to be rejected.
The Format of “Bill of Material for Schedule of Requirement” is as below:
<table>
<tr><th>SN</th><th>Item</th><th>Unit</th><th>Qty</th><th>Unit cost</th><th>Total Cost</th><th>Phases</th><th>Sch- A</th><th>Sch- B</th></tr>
<tr><td>1</td><td>(to be provided by bidder)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
</table>

	2	(to be provided by bidder)							
	-	-							

Information to Bidder for Compliance:

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.
2. The Tenderer/bidder should be an Original Equipment Manufacturer (OEM) or authorized representative of OEM as specified in clause No 4.A.14.2 of Tender.
3. OEM should have a registered office in India to provide sales and 24x7 support in India. The certificate of incorporation to this effect should be submitted.
4. The equipment offered should have complete data sheets and detailed description on OEM's web site.
5. The bidder shall submit the detailed BOM of the equipment offered duly verified and certified by the OEM. The detailed BOM shall indicate quantities of various modules/sub modules/cards/Licenses required for each equipment.
6. Bidder should provide OEM Professional Services up to the issuance of PAC as mentioned in Clause 3.B.5 of Tender document.

Detailed Bill of Material (BOM) including OEM make & model and License (if any) format against each Supply Items (Schedule-A) and AMC Item (Schedule-B) (Format-I)

FORMAT -I					
S.No.	**Description**	**Make & Model**	**Quantity-Phase 1**	**Quantity-Phase 2**	**Quantity-Phase 3**
1	Fault Management system as per specifications.				
2	Performance management system as per specifications				
3	Unified Inventory management system as per specifications.				
4	Order fulfilment system as per specifications				
5	SDN Controllers of IP-MPLS as per specifications.				
6	Device Management For legacy device as per specifications				

7	Application performance management system as per specifications.				
8	SDN Controller of DWDM as per specifications				
9	Customer portal solution as per specifications.				
10	Business Process Automation as per specifications.				
11	Server for the application in Production Environment, DR and Pre-production as per specifications.				
12	Storage for Main DC & DR as per specifications				
13	SAN Switch as per specifications				
14	Backup solution as per specifications				
15	Managed Switches as per specifications				
16	Third Party Software (OS and Database) as per specifications.				
17	Training as per Tender requirement.				
18	Manpower as per Tender requirement.				
19	Software Adaptors SDN Controllers, Device management (Legacy devices) & OSS with Integration with Multivendor EMSs/devices as per specifications.				

Note –

1. The item description in the above format for BOM is indicative only and Bidder is required to submit the detailed BOM covering all local & important components of their offered solution.

2. Above mentioned Total of Schedule-A and Schedule-B should match with the quoted Schedule-A and Schedule-B Rates in the SOR.

3. Local Content Breakup should be submitted along with the financial bid.

Schedule- C Local Content Breakup						
S. N	**Item Description**	**Unit**	**Qty**	**Unit Cost (all inclusive) (In Rs)**	**Total Cost (all inclusive)(In Rs)**	**Local Content Value (In Rs.)**
3.1	Supply, design, installation, integration, Training and testing of OSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy as per technical specifications/scope defined in Chaper-3 & 8 for Phase-1.	Lot	1			
3.2	Supply, design, installation, integration , Training and testing of OSS&BSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy as per technical specifications/scope defined in Chaper-3 & 8 for Phase-2.	Lot	1			
3.3	Supply, design, installation, integration, Training and testing of OSS&BSS along with associate module/software/Hardware like SDN Controllers, Device management for Legacy as per technical specifications/scope defined in Chaper-3 & 8 for Phase-3.	Lot	1			
	Total Cost (In Rs) for Item 3.1 +3.2 + 3.3 for SCHEDULE C					

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CHAPTER-3

A. SCOPE OF WORK AND TECHNICAL REQUIREMENTS

3.A.1 Introduction

3.A.1.1 About RailTel

RailTel is having MPLS based broadband telecom long haul network with next generation MPLS Network systems. The desired network should accommodate the growing demand for bandwidth, while maintaining compatibility, quality and enhanced flexibility to transport and route all traffic types like Internet Protocol (IP) data, Voice, Video, Tele-presence etc.

The technical specification given in this part describes functional as well as performance requirement of the proposed MPLS routers.

3.A.1.2 Overview of the Scope of Work

RailTel intends to implement a Centralized Operational Support System (OSS) with the strategic objectives of increased productivity, resolution efficiency and thus Customer Satisfaction. The proposed OSS shall integrate the Network Elements (NEs)/ EMSs/NMSs of the existing DWDM/ Network and future network expansions including new Transmission Technologies like ASON, OTN etc. The proposed OSS shall also have a provision to integrate RailTel's IP/MLS Network and other related systems like Order Management System, Billing System, Asset Management System etc to achieve the objective of a National Network Operation Centre (NOC). This NOC is proposed to be located at New Delhi, India with a Disaster Recovery (DR) site at Hyderabad, India. The scope of the tender includes implementation of an OSS solution which will consist of a Unified Network Management System (UNMS) which will interface with the Element Management Systems (EMSs) of the disparate layers of the RailTel Network. The OSS solution along with the UNMS will provide management functions such as Network Inventory management, Service Fulfilment, Network Configuration and Service Assurance.

The offered system shall be provisioned/hosted on Primary Data Centre (DC) site at Gurgaon and a Disaster recovery (DR) site Secundrabad.
The offered System shall manage existing SDN and non-SDN Network Elements (NEs) / Element Management System (EMS) of Transmission, IP Data Network as well as ability to support future NEs/EMSs based on the specifications. The current RailTel network consists of:

Transmission network - DWDM/OTN, MPLS enabled L2/L3 devices.

Schedule of Supply on both the Data Centre (DC) and Disaster Recovery (DR) sites includes at following modules.

1. Fault Management System
2. Performance management System
3. Work force and Work Order Management System [Usage of existing WFM System]
4. Dashboard and Reporting System
5. Customer Portal

The offered System shall comply with all relevant recommendations and latest documents of the ISO, ANSI, ITU-T, ETSI, IEEE and TMF [as applicable]

Key Objectives of OSS Solution

RailTel is on the path of Modernization of the operations to improve efficiency with better automation. To achieve the same, Tools and solutions are sought for:

1. Inventory discovery for E2E Topology
2. E2E Assurance and Topology based Correlation, SIA, RCA
    a. Fault and Performance Management of SDN [IP/MPLS] Enabled devices, Network Elements, Passive SIM based devices being supported via their Respective EMSs
    b. Fault and Performance Management of Legacy & Legacy Devices Network Elements
3. Catalog Driven Service Fulfilment, Orchestration and Order Management
4. Reporting and Dashboarding
5. Integration with following existing ecosystem to enable automated operations, as possible:
    a. Trouble Ticket Tool
    b. ERP Tool as BSS's COM layer

1. RailTel believes that these need to be phased to ensure iterative and Agile process-based implementation, seeking ROI from each phase.

2. The high-level activities and phase distribution envisaged are as follows -

1. Provide the point of integration across multi-vendor, multi technology network equipment and Element Management Systems/ Element Management Systems.
2. Provide an Active Inventory Model of the Network in graphical database.
3. Provide Graphical representation of topology of nodes and links in multi-dimensional (technology & administrative) and multi layered representation. Provide creation of resource inventory of physical and logical network components.
4. Provide detection of unplanned changes in the network and reconciliation of network with inventory data.
5. Provide facility for end-to-end feasibility, Design and Activation of bandwidth centrally.
    a. This will enable various use cases that are offered today as well as futuristic use cases.
    b. It is expected that the solution will enable the use cases via SDN [IP/MPLS] NE's EMS or Legacy Devices/Legacy NE's EMS layer to keep the integrations towards OSS layer minimal.
6. Enable fast fault resolution and reduced restoration times through accurate fault localization and notifications to the appropriate repair centres.
7. Enable Root Cause Analysis/Service Impact Analysis/-
8. Provide Auto Trouble Ticket assignment to respective NOC/Field Support Teams based on correlated Event and Alarm based on parent child relationships.
9. Provide accurate, near-real-time service- and network-status information.
10. Provide Management Information Reports on Capacity Utilization, Service Quality etc
11. Be an aid to the automation of existing and future operational and business processes.
12. Be the key enabler for a centralized operations centre.
13. Provides Software development Kit (SDK) for future provisioning framework modification/creation and also for adaptation for inventory, Fault Management, Performance Management.

3.A.1.3 Essential parameters of OSS solution -

3.A.1.3.1. Integrated Solution

The seamless integrated platform consisting of incident/problem management, change management, knowledge management, and workforce management capability should be provided for use by personnel to include Service Desk Staff, NOC User, and Field Staff. Importantly, the platform should be highly flexible for configuration of workflows, automation, and information

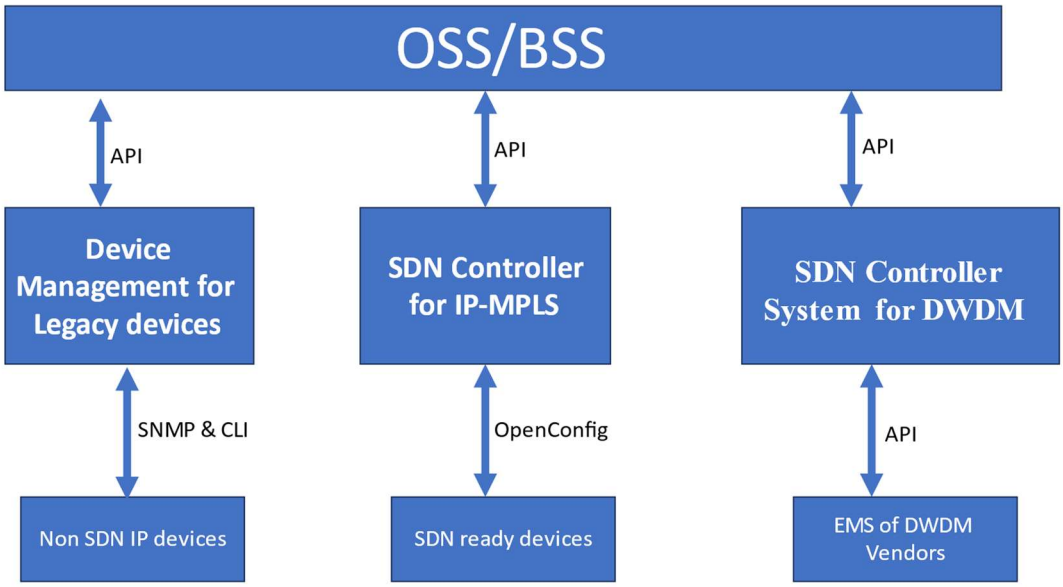
retrieval from external inventory in order to effectively cope with operational processes and environment.

Inevitably, all management platforms must be integrated together in order to deliver the complete solution and accomplish the overall requirements; therefore, the efficient integration is extremely vital. Subsequently, all interfaces and integrations included in the OSS solution must abide by the requirement given below:-

1. All integration methodologies implemented in the solution must be a common and industry-wide standard (e.g. SOAP, CORBA for interfaces and CSV, XML for data structures etc). A proprietary interface protocol and data structure (e.g. Binary etc) is not acceptable unless a tool to convert them to a standard one is offered and validated.
2. Bidder shall design the system based on the interface requirement as enumerated above. In case any other interface is required, Bidder shall have to clearly mention and provide the same to meet complete integration requirement of various modules.
3. The solution should Support of TMF API standards for fulfilment inventory & assurance (e.g. 641, 645, 633, 638, 639, 621)
4. Bidder should provide Software Development Kit (SDK) to customization/create workflows/model/adaptors/others

3.A.1.3.2 EMS/NMS Integration

Proposed OSS solution should be able to integrate with all NMSs, EMSs and Nes (20000 NON SDN, 2000 SDN Enabled , 5000 DWDM nodes) that are being deployed as part of the various network layers and components of RailTel Network. The solution shall enable authorized operators to “drill-through” from the OSS solution so as to start a session with lower-layer EMSs as part of Inventory Management Module, Discovery Module or for detailed fault analysis and restoration work as part of the Assurance function.



It shall be transparent to the RailTel that such a session has been started via the OSS solution. For example, the screen layouts and functions of the EMS to which the RailTel is connected shall be the same as though a direct connection were being used.

The OSS provisioning functions, so the system should have the ability to broaden the command set. Bidder should describe in their responses the scope of the commands that their OSS is capable of sending to EMSs and network elements, particularly with regard to supporting provisioning functionality solution communications mechanisms shall be open enough that the system will be able to communicate in the future with any EMS that Purchaser chooses to use with relatively little duplication of effort put into creating the initial EMS interfaces.

OSS should also support:

3.A.1.3.3 Integration with Existing Ecosystems

Integration with Existing Ecosystem: RailTel does have current eco-system that will be part of overall solution. The components include –

1. Existing ERP System (Oracle).
2. Existing Trouble Ticket System [HPSM]
3. Existing Work Force Management Tool [WFM Tool]
4. GIS System.

It is required for new solution components of OSS to integrate with the above Ecosystem for Complete E2E Automation

3.A.1.3.4 Dimensioning Details

Dimensioning Details for OSS	
Legacy Devices	20,000
SDN [IP/MPLS] Devices	2,000
Optical Devices	DWDM 5000
Raw	7 days
Hourly	30 days
Daily	365 days
Raw Events	30 days
Events Per Day	10 million
Nr. Of month Historical Events	30 days
Backup	Yes
Daily Provisioning request	1000
Peak Orders in an Hour	100
Polling Interval	5/15/30/60 Mins
PM Counters	54 million Counters per Hr.
HA	Yes (For Critical Application)
DR	Yes
Services	5. OSS Solution shall support following services to be provisioned - IP/MPLS [SDN Domain]: a) L2 VPN b) L2 VLAN c) L3 VPN d) Multicast e) VPLS f) Internet 6. Legacy: a) L2 VLAN configuration 7. Optical a) P2P DWDM [1G/10G/100G] b) P2P DWDM with protection 8. OSS shall perform following operations for above services -

	a) Create service. b) Modify service. c) Upgrade service d) Downgrade service e) Terminate service. f) Delete service.

For details regarding the existing inventory for sizing of the solution, refer the existing inventory details at Annexure-II of Chapter-7.

3.A.1.3.5 Hardware Requirements

1. As per OSS solution architecture, all the OSS applications/modules shall be running on physical/virtual servers, which will be provided by the bidder as a part of this tender. Bidder shall ensure that use of soft partition / hard partitions shall not have adverse effect on system's availability and performance as specified in the tender document. For overhead if any, on computing resource due to soft partition/hard partitions, the bidder shall compensate for the same by providing extra compute resource per partition.

2. Minimum Hardware requirement has been mentioned below, however bidder needs to provision the Hardware and software requirement as per the solution proposed, any additional requirement for the solution will be provided by the bidder. Detailed Hardware specifications have been mentioned in the tender.

3. Bidder must consider given environments for solution deployment – DC/Production, Pre-Production, and DR. Pre production must be of actual replica of production environment in terms of software features.

4. System performance is expected to be within the response times as mentioned below for a closed room LAN environment. The bidder is expected to size the hardware as per these response times. The bidder is expected to calculate and provide the sizing with respect to these response times. With 95% users loaded on the system the target response times are as given below:

    a. Menu navigation of OSS System <2seconds
    b. Screen opening of OSS <3 seconds.
    c. Look up response from DB tables <6 seconds.
    d. Screen navigation <3 seconds

e. Transaction commitment <3 seconds
f. Simple & Medium Query <12 seconds
g. Simple & Medium Report generation <30 seconds

5. Bidder is responsible to prove above mentioned response time from the above installed hardware and applications at the time of system testing and user acceptance testing. Successful results from the above test would be the part of final acceptance report and RailTel would release remaining hardware payment as mentioned in payment terms. If Bidder fails to satisfy above criteria and tests, Bidder would have to procure and install additional hardware to satisfy the above-mentioned requirements. The cost arising out of procurement, installation and configuration of any additional hardware would be incurred by Bidder with no additional liability on RailTel.
6. Bidder should enter into back-to-back warranty/AMC agreement with Hardware/Software OEM for the relevant period mentioned in the tender document and share the same with RailTel at time of PAC (Phasewise).
7. The Vendors need to consider vertical and horizontal scalability as the suggested hardware needs to scale based on the volumes, on the same hardware with additional processors, memory etc.
8. The average CPU and RAM utilization of the environment must not go beyond 65%.
9. If servers are virtualized, bidder shall provide virtualization software license for full capacity of the server, allowing for hosting multiple virtual machines (VMs) as well as virtual logical partitions on the server. The bidder shall provide clustering software with appropriate licenses.

3.A.1.3.6 Database-

1. For various application envisaged in this Bid document, Bidder shall provide multiple databases or a database capable of multiple workloads / data-models including Graphical DB, Time Series, Relation Database, In-memory to manage different types of data collected in the network and meet different user requirements. Bidder shall provide the commercially supported or open-source (vendor supported) database. If an open-source database is used, the required support (security patches, upgrade, software bug fixes, error handling) shall be provided by the bidder.

1. The database shall work in failover mode over distributed mode across multiple servers and in cluster mode.
2. The solution MUST be able to push Fault Management and Performance Management data to open-source (vendor supported) or commercially supported databases platform for online and offline analytics using BI/Analytics tools. The technology should be based on open source to

avoid vendor lock-in. The open-source (vendor supported) or commercially supported database platform should be commercially supported.

3. The database platform should enable any workload on an active-everywhere, zero-downtime platform with zero lock-in and global scale. It should be built on the foundation of Apache Cassandra or equivalent with additional operational reliability, monitoring and security layer hardened that supports more workload types from graph to search and analytics and improves user productivity with Kubernetes and APIs.
4. The persistence layer for storing performance metrics information is required to be horizontally scalable to accommodate retained data volume and workload increase as use of the platform grows.
5. The database should scale to multiple data centres with an ability to seamlessly scale up to 100 nodes in a single cluster without downtime.
6. When scaling by adding servers, no re-sharding on the user side should be necessary and should automatically be done transparently on the database side.
7. The persistence layer also shall be a masterless peer-to-peer distributed database that is multi-logical-datacentre-enabled in an active-active manner for high availability without a single point of failure as well as for workload segregation for cases where different workloads may be applied to the persistence layer.
8. The data in the persistence layer shall also be able to be accessible from as well as passed on to external processing functions such as querying, reporting, analytics, indexing.
9. The persistence layer shall be agnostic of the platform which may be bare metal, virtual machine on bare metal or cloud environment, or other environments for containerized deployment.
10. The database should be able to be deployed on generally available commodity hardware.
11. The database should allow for active/active reads and writes across multiple geo-separated data centres.
12. The database should be capable of allowing near-real-time replication of data within and across data centres to provide redundancy to support availability.
13. The database should be capable of providing automated node/availability zone failover across multiple geo-separated data centres.
14. Bulk data loading and integrated stream processing shall be available to ensure data portability
15. The database should include built-in rich indexing of data
16. The database should be capable of supporting multiple Data Models to develop using all styles of NoSQL data models including key-value, wide-column, document and Graph.

17. The database shall have the ability to store and query (full-text search, faceting, and geospatial search) existing tables in the database in a relationship or graph oriented way
18. The database shall allow exploration of data relationships fast and at scale with a built in graph-optimized engine
19. The database shall have facilities to reduce the learning curve for getting productive through the abstraction of database-specific concepts by supporting popular API options such as REST, GraphQL, gRPC, and schemaless JSON out of the Box.
20. The vendor should provide tools to seamlessly migrate to a separate deployment when needed with zero-down time capability.
21. The database shall natively support TTL (time-to-live) of data so that it can be purged after a specified period of time.

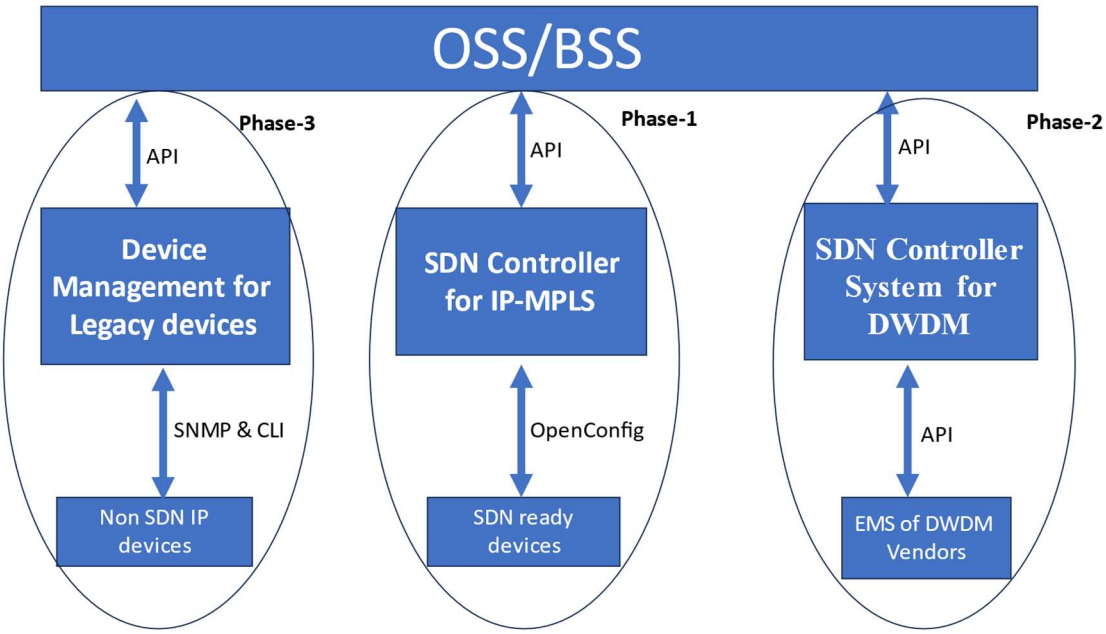
3.A.1.4 OSS Solution Implementation Phases

The Project Phases are as follows-

Category	Phases	Functionality	Objective
Assurance	Phase 1 – SDN [IP/MPLS]	E2E Inventory Discovery for IP/MPLS Elements via SDN Controller/EMS	In this phase the objective would be to Introduce futuristic Scalable Framework, to assure the SDN Network [IP/MPLS].
		Fault Management, Performance Management	
		Discovered Topology based correlation and RCA based Action	
		Integration with TT System	
	Phase 2 – Optical Network	E2E Inventory Discovery for Optical Elements via SDN Controller & EMS	
		Fault Management, Performance Management	
		Discovered Topology based correlation and RCA based Action	
	Phase 3 – Legacy Network & OSS DR	Integration of Legacy Network & Legacy Devices Elements via a common Mediation layer	In this phase the framework that was introduced in earlier phases will be used to integrate the legacy NEs for Assurance purpose.
		Fault Management, Performance Management	

		DR Deployment	DR for Assurance Module will be implemented in Phase 3
FulFillment	Overlapping Items for Phase 1, Phase 2 and Phase 3 Captured in Assurance for each phases [E.g., Fulfillment support for IP/MPLS in Phase 1]		In this common phase the framework for next generation Assurance OSS will be expanded to include Fulfillment part as well.
		Integration with BSS, WFM System	Integration with External Ecosystems
		Catalog driven Service Fulfillment Stack	This will utilize existing discovered topology for service fulfillment i.e, Catalog based provisioning and activation
		Order Management and E2E Workflow based Orchestration	Workflow based orchestration will be used for E2E Provisioning and activation with multiple touchpoints.
			This functionality will be achieved via the Integration with the Domain Controller/EMS and mediation in case of Legacy Devices
		Fulfillment DR Deployment	DR for Fulfilment will be implemented in Phase 3
	Phase 3 – Customer Portal	Portal for RailTel's Customers	To have a Unified portal for Dashboarding and reporting purpose
			RailTel needs to provide portal to its customer on which it can provide value added services to them
			Following value added services should be provided
			Inventory List assigned to the specific customer
			Aggregated Inventory Health status
			All tickets logged by customer with ticket details and status
			Invoices
			Payment History

			Detailed Inventory Status using Link Status and Bandwidth usage
			Netflow stats, telemetry stats
			Critical Alarms, Fault Management and Performance data
			Geo maps
			Application Health
			Device configuration data for each node
			Reporting dashboard



3.A.1.5 Deleted

3.A.1.6 Site Preparation

3.A.1.6.1 RailTel' s Responsibility

Following shall be done by RailTel: -

1. Sufficient Space in Rack for housing of equipment.
2. Extending Earthing of value less than 1ohm required
3. Power supply required to be extended to equipment.

3.A.1.7 Bidder's Responsibility

3.A.1.7.1 It shall be the responsibility of Bidder to transport the equipment (as mentioned in SOR, Chapter-2) to site for the Design, Installation, Testing, Commissioning and Integration with existing Transmission network. OEM Professional Support is required till network stabilizes i.e. till issuance of Phase-I , Phase-II , Phase III and PAC.

3.A.1.7.2 Requirement of power supply, Rack space and load shall be advised by the contractor for each type of equipment/ Site for tendered capacity and Ultimate capacity.

3.A.1.7.3 The Bidder will be responsible for Integration of complete work for this tender including the System design of Network, Installation, Testing and Commissioning.

3.A.1.7.4 Bidder will provide OEM Professional Support till issuance of Phase-I , Phase-II ,Phase III Provisional Acceptance Certificate. This OEM professional Support will help to stabilize the OSS and associate software applications and will successfully complete the acceptance as defined in clause 3.B.5 of the Tender document.

3.A.1.7.5 Maintenance of Equipment's during Design, Installation, Testing, Commissioning and Integration, Implementation, maintenance supervision period, warranty period & AMC period as per terms & conditions of Tender and its corrigendum.

3.A.1.8 Design, Installation, Testing, Commissioning and Integration, Trial Run and Com missioning of System

The bidder shall be fully responsible for Quality Assurance of OSS & other OSS elements and supervision of following: -

(a) Design and Installation of the above said equipment/ items as per System design.
(b) Integration with existing Network/system
(c) Testing of the Network/System as specified in the document.
(d) Trial run of the Network/system
(e) Commissioning of Network/system

3.A.1.9 Training of Purchaser's Personnel and Change Management

Training on the proposed solution and network operation shall be provided by the Tenderer as per details given in Chapter-3-E and the tender document.

To provide professional training and development services at each stage of the project viz. Design, Installation, Testing, Commissioning, Integration, Operation and Maintenance including AMC period.

The successful bidder shall provide hands on training and online training with detailed course material on the installed equipment and software covering at least the following as per the schedule given by RailTel during complete project duration:

Configuration and their operation of supplied equipment /solution under the project.

1. Installation & Monitoring of Software Applications including alerts.
2. Trouble shooting and preventive maintenance.
3. Training on operation of all installed application modules.

These personnel shall work with the Bidder technical team staff to gain confidence and to get expertise during the execution stage of the project. The training content to be designed and delivered by successful bidder at successful bidder's own cost. All equipment used for training shall be identical to those quoted and supplied for site installation in hardware and software versions.

Timelines for Training and Development are as follows:

SN	Deliverable	Timeline in Months (M) (D= Date of award of LoA)
	Phase-1	
1	Completion of training on OSS, SDN Controller for IP-MPLS and other proposed systems of Phase-1 including training on SDK of all proposed system. ---20 Man Week	D + 6M
	Phase-2	
2	Completion of training on OSS, SDN Controller for DWDM and other proposed systems of Phase-2 including training on SDK of all proposed system---20 Man Week	D + 15M
	Phase-3	
3	Completion of training on OSS, Device management and other proposed systems of Phase-3 including training on SDK of all proposed system. ----- 20 Man Week	D + 25M
4	Continuous training and retraining during installation, warranty & AMC phase --10 Man Week.	One refresher training per year when required by RailTel.

Sets of training manual in two hard copies & two soft copies containing details of technical specification, Design, Installation, Testing, Commissioning, Integration, troubleshooting & maintenance schedule etc. shall be supplied by the bidder.

The bidder shall update the course material of manuals in case there are any changes owing to revision/modifications in equipment/system specifications.

3.A.1.10 Final Commissioning

The OSS System shall be considered to be commissioned only after successful completion of the issuance of Phase-I, Phase-II, Phase-III PAC and issuance of Final Acceptance Certificate (FAC).Any item of Tenderer's goods/services not specifically mentioned but considered essential for completion/commissioning of the work in all respects shall be deemed to be included in the scope of work. Any additional item, if required for completion of work, shall be required to be supplied by the bidder free of cost.

3.A.1.11 General System Guidelines

1. Bidder shall be responsible for the successful completion of the project.
2. Purchaser/Engineer reserves the right to modify, revise, and alter the specifications of equipment system prior to acceptance of any offer.
3. If during the course of execution of the work any discrepancy or inconsistency, error or omission in any of the provisions of the contract is discovered, the same shall be referred to the Purchaser/Engineer who shall give his decision in the matter and issue instructions directing the manner in which the work is to be carried out. The decision of the Purchaser/Engineer shall be final and conclusive, and the bidder shall carry out the work in accordance thereof.

3.A.1.12 Technical Response

The technical response shall be fully comprehensive and detailed and will include detailed guaranteed specifications of the equipment and systems to be supplied. Marginal performance shall not be accepted.

3.A.1.13 Features and Capabilities of Equipment

The specifications defined under Chapter-8 contain the necessary requirements of RailTel with regard to the features and capabilities of the equipment to be offered by the bidders. These will be carefully studied and commented upon by the bidder. These should not be treated as maximum specifications.

3.A.1.14 Compliance to Technical Requirements

3.A.1.14.1 In the offer, the bidder shall include NIL deviation certificate (Form No. 6 of Chapter-6) statement for compliance of terms and conditions mentioned in the tender document.

In case of any deviation from terms and conditions mentioned in the tender document, the bidder may include item-wise statement for partially complied/non complied clauses as Annexure with NIL Deviation statement as per details given below:

1. "PARTIALLY COMPLIANT," if systems and functions offered meet the tender requirement partially. The bidder shall state the reason why the offer is partially compliant. However, if the bidder is able to fulfil the specified requirement later, the time schedule for this shall be stated. In such cases, the bidder shall clearly mention the extent to which other requirements or specifications are affected.

2. "NON-COMPLIANT," if systems and functions cannot meet the requirements. The bidder shall also state the reasons for it.

3. In addition to the above-mentioned compliance statements, wherever statement is given for some numerical parameter specified in tender, then bidder shall state the actual numerical value of specification as met by the offered systems/equipment.

4. In case of partially compliant or non-compliant bid, RailTel reserves the rights to REJECT the bid without assigning any reason.

3.A.1.14.2 **NIL or Unclear Statements**

In case of nil or unclear statements for compliance of any specified requirement, RailTel will interpret that particular requirement as being "NON-COMPLIANT."

3.A.1.14.3 **Detailed Technical Information**

The bidder shall include in his proposal the detailed technical information, drawings and functional descriptions of the offered equipment to support the Compliance to Router Technical Specifications as in Chapter-8 of this tender document.

3.A.1.15 Supply of Software

Bidders should give undertaking that all the licenses of Firmware and Software of the offered OSS solutions and associate items under this Tender would be registered in favour of M/s RailTel Corporation of India Limited (Form no. 8, Point no. F).

3.A.1.16 DEVELOPMENT CHANGES SUPPORT.

After PAC, there may be requirement of development changes in OSS and other system during the contract period. Expected number of man days which will be required to complete the development activities during each year of support is given below. Bidder has to quote man days charges for support. The number of man days given below is approximate and can increase or decrease based on the requirement.

Software development support	400 man-days

Scope of work for development change support has to be out of scope of usual onsite and offsite managed support activities. This should be agreed by RailTel OSS Team.

1. Development work would include change request, customization, and new report development over. This would also include any future integration efforts due to future implementation of CRM or any other telecom related application.

2. The procedure for approval of development cost would be followed as mentioned below: -

    a. RailTel would intimate the requirement via email, letter to SI team.
    b. SI team will raise the Change request process.
    c. Discussions may happen between RailTel and SI in understanding the requirements SI would be required to submit the effort estimations required to meet the requirements.
    d. RailTel OSS core team would jointly verify the effort estimations, SI may be asked for the presentation for justifying the effort estimations submitted by SI, if required.
    e. After obtaining the approval from in-charge of work, SI team will be communicated through approval letter. RailTel may reject the effort estimations and SI may be asked for new effort estimations if rejected.
    f. The approved effort estimations would be deducted from total man days after the completion of the work.
    g. Payment will be released after acceptance of work by OSS team.

3.A.1.17 PROPOSED TEAM STRUCTURE.

The Bidder/OEM shall propose a team that would be involved in the entire project life cycle (implementation) if the project is awarded to them. All resources deploy

in RailTel should have B.E/B.Tech/MCA/MSc. The minimum expected experience, certifications etc. are detailed below.

1. **Project Manager:** At least 10 years total experience including 6 years of OSS/NMS/EMS implementation experience.

2. **Solution Architect:** At least 10 years total experience and involved in at least 2 successful full life cycle implementation(s) of OSS including at least 1 implementation in the telecom service process industry.

3. **Technical Architect for Hardware:** At least 10 years total experience and should have been involved in installation of hardware and operating system, database and configuration, system maintenance, installation of Telecom/DC application system for at least 4 successful implementations.

4. **Technical Consultant(s): 4 Nos,** at least 3 years total experience in field of software development/System administration.

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CHAPTER-3

B. INSPECTION, DESIGN, INSTALLATION, TESTING, COMMISSIONING, AND INTEGRATION

3.B.1 TESTS AND MEASUREMENTS

All equipment shall be subjected to tests as per technical specification and requirement specified in Chapter-8, at manufacturer facility/premises and a test report for each equipment duly signed by the testing authority and accepted by suitable authority shall be submitted along with the equipment.

3.B.1.1 **Test Categories (This should be for all the items to be inspected by RailTel)**

i) The following tests shall be conducted for acceptance of the equipment and the system before final acceptance of the system. Waiver of Part or whole of type tests can be considered if proof of having done the tests by independent body or PTT authority is submitted.

1.0 Pre-commissioning test (after installation) for total integrated system.
2.0 Site Acceptance Testing (SAT)
3.0 Trial Run

ii) These tests shall be carried out on all equipment supplied by tenderer including those supplied by sub-vendors, if any. Tenderer shall arrange all necessary test instruments, manpower, test-gear, accessories etc.

iii) Bidder shall arrange all necessary test instruments, manpower, test-gear, accessories etc.

iv) All technical personnel assigned by the bidder shall be fully conversant with the system specifications and requirements. They shall have the specific capability to make the system operative quickly and efficiently and shall not interfere or be interfered by other concurrent testing, construction and commissioning activities in progress. They shall also have the capability to incorporate any minor modifications/suggestions put forward by purchaser /Engineer.

v) Test Plan: The Contractor shall submit to Purchaser 'Test Plans' well in advance of commencement of actual testing in each of the above mentioned test categories.

3.B.1.2 The plans shall include:

1) System/Equipment functional and performance description (in short) and Tests to be conducted and purpose of test.

2) Test procedures (including time schedule for the tests) and identification of test inputs details and desired test results

3) Test Report:

The observations and test results obtained during various tests conducted shall be compiled and documented to produce Test Reports by bidder. The Test Reports shall

be given for each equipment/item and system as a whole. The report shall contain the following information to a minimum:

i) Test results

ii) Comparison of test results and anticipated (as per specifications) test result as given in test plans and reasons for deviations, if any.

iii) The data furnished shall prove convincingly that

a. The system meets the Guaranteed Performance objectives
b. Mechanical and Electrical limits were not exceeded.
c. Failure profile of the equipment during the tests is well within the specified limits

vi) Failure of Equipment/Cards/Components:

Till the system is accepted by the Purchaser, a log of each and every failure of equipment/cards/components shall be maintained. It shall give the date and time of failure, description of failed equipment, circuit, module, equipment designation, effect of failure of equipment on the system/equipment, cause of failure, date and time of repair, mean time to repair etc. Repair/modification done at any point of time at one site, shall be carried out by bidder at all the sites. Detailed documentation for the same shall be submitted to Purchaser for future reference.

If the malfunction and/or failures of a unit/module/sub-system/equipment repeat during the test, the test shall be terminated and bidder shall replace the necessary equipment or module to correct the deficiency. Thereafter, the tests shall commence all over again from the start.

If after the replacement the equipment still fails to meet the specification, bidder shall replace the equipment with a new one and tests shall begin all over again. If a unit/ subsystem/module have failed during the test, the test shall be suspended and restarted all over again only after the bidder has placed the equipment back into acceptable operation. Purchaser's approval shall be obtained for any allowable logical time required to replace the failed equipment/unit/module/sub-system.

vii) Readjustments

No adjustments shall be made to any equipment during the acceptance tests. If satisfactory test results cannot be obtained unless readjustments are made, bidder shall carry out only those readjustment needed to ready the equipment/system for continuance of tests. A log of all such adjustments shall be kept giving date and time, equipment, module, circuit, adjustments, reasons, test result before and after adjustment etc. Fresh acceptance tests shall be conducted after the readjustments have been completed.

3.B.2. System Integration Testing

Functional and performance test should be conducted for the complete system/ all major equipment constituting the system (including the equipment supplied by sub-

vendors, as applicable) simulating the complete network with appropriate network elements. All the functions of software shall be demonstrated in totality (as per requirements/specifications of this document including management of MPLS equipment in respective sections). All equipment shall be connected using the same cables (interfaces/components) as will be used during final installation so that the system can be tested in its final configuration. This testing shall be conducted at the manufacturing facility of the main equipment.

3.B.3 Deleted

3.B.4. Installation

After successful completion of Inspection, equipment shall be sent to site for installation. Equipment without factory acceptance/inspection certificates shall not be acceptable at site.

Prior to installation, all equipment shall be checked for completeness as per the specifications of equipment required for a particular Site/Location. Installation shall be carried out in accordance with the installation manuals and approved installation drawings & site plan in the best workmanship. Installation will be done Bidder under supervision of OEM Professional Service Engineer and under supervision of RailTel authorized representative at respective locations.

Bidder shall bring all installation tools, accessories, special tools, test gears, spare parts etc. at his own cost as required for the successful completion of the job.

If during Design, Installation, Testing, Commissioning and Integration of the bidder any repairs are undertaken, the maintenance spares supplied with equipment shall not be used for the repair. Bidder shall arrange his own spare parts for such activities till such time the system has been finally accepted by the Purchaser. A detailed report & log of all such repairs shall be made available by the bidder to Purchaser/Engineer and shall include cause of faults and repair details, within 2 weeks of fault occurrence.

A detailed time schedule for these activities shall be submitted by bidder to Purchaser/Engineer to enable their representatives to be associated with the job.

Bidder shall supply all installation materials required for proper installation of the equipment. These shall include but not be limited to, all connectors, interbay and inter equipment cables, power supply cables and connectors, power distribution boxes, anchoring bolts, nuts, screws, washers, main distribution frames, audio distribution frames, voice frequency cables, junction boxes etc.

The installation of equipment shall be done by the Bidder along with the OEM authorized representative in such a manner so as to ensure neat and clean appearance in accordance with approved installation document drawings. All inter bay, power supply and other cables shall be routed through wall mounted cable trays. No cable shall be visible. All through wall openings, trenches etc. shall be properly sealed to prevent the entry of rodents, insects and foreign materials.

3.B.5. Provisional Acceptance Certificate (PAC)

General

Acceptance tests shall be carried out to verify the system as per specification and functioning of the installed system as an integral part of the RailTel Network.

The Bidder shall submit detail list of the acceptance test procedures for provisional acceptance testing and final acceptance testing. Test procedure shall also include module wise testing and integration testing processes and interworking/interface/signalling management & configuration testing with network elements, EMS and external systems etc.

Phase wise acceptance criteria (minimum) has been mentioned in the document –

A. Phase 1: IP MPLS

1. Discovery of Network Elements via SDN Controller/EMS

Description	
This test case will verify the basic discovery of the active Multi-vendor Network Equipment to be modelled into the system- Service Topology, Network Topology, Discovery (On-demand, Scheduled)	Result

2. Catalog driven service provisioning/fulfilment via SDN controller/EMS

Description	
Demonstration of fulfilment process via catalog consideration.	Result
Expected Results	PASS/FAIL
1. Services Catalog definition for workflow [provisioning & activation] execution	

3. Fallout Management [Skip/Retry/Rollback]

Description	
Demonstration of fallout mechanism due to some issue in the execution of fulfilment workflow	Result
Expected Results	PASS/FAIL
1. Fallout task to be triggered in case of failure at targeted system.	

4. **Provisioning of a Point-to-Point L2VPN Service via SDN Controller/EMS**

Description

This testcase will demonstrate provisioning of L2VPN service between two sites via SDN Controller/EMS. The Indicative Steps may include – 1. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 2. SOM will validate and orchestrate the received service order. 3. Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory. 4. Execution of commands on the EMS/Domain Controller post required port identification. 5. Success response received from EMS/Domain Controller 6. Order Completed and success response send to ERP/BSS System	Result
Expected Results	PASS/FAIL
1. Service configured on the identified ports/Sites.	

5. Provisioning of L3VPN Service [Multicast] via SDN Controller/EMS

Description	
This testcase will demonstrate provisioning of a L3VPN Service [multicast] via SDN Controller/EMS. The Indicative Steps may include – 2. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 3. SOM will validate and orchestrate the received service order. 4. Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory. 5. Execution of commands on the EMS/Domain Controller post required port identification. 6. Success response received from EMS/Domain Controller 7. Order Completed and success response send to ERP/BSS System	Result
Expected Results	PASS/FAIL
1. Service configured on the identified ports/Sites.	

6. Provisioning of VPLS Service via SDN Controller/EMS

Description	
This testcase will demonstrate provisioning of a VPLS Service via SDN Controller/EMS. The Indicative Steps may include – 2. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 3. SOM will validate and orchestrate the received service order. 4. Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory.	Result

5. Execution of commands on the EMS/Domain Controller post required port identification. 6. Success response received from EMS/Domain Controller 7. Order Completed and success response send to ERP/BSS System	
Expected Results	PASS/FAIL
8. Service configured on the identified ports/Sites.	

7. Provisioning of Internet Service via SDN Controller/EMS.

Description	
This testcase will demonstrate provisioning of an Internet Service via SDN Controller/EMS. The Indicative Steps may include – 1. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 2. SOM will validate and orchestrate the received service order. 3. Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory. 4. Execution of commands on the EMS/Domain Controller post required port identification. 5. Success response received from EMS/Domain Controller 6. Order Completed and success response send to ERP/BSS System	Result
Expected Results	PASS/FAIL
9. Service configured on the identified ports/Sites.	

8. Monitoring/Viewing of Alarms/Events & Performance data in UI of Assurance [Data Collection to OSS (Performance & Fault)) systems periodically]

Description	
This testcase shall demonstrate the alarms/PM data coming from underlying Network elements [via SDN Controllers] are visible in GUI	Result
Expected Results	PASS/FAIL
1. Alarms and PM data is visible.	

9. Topology based correlation -Root Cause analysis Analysis for IP-MPLS.

Description	
Topology based alarm correlation leading to Root cause analysis	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity 2. RCA ticket will be raised along with the impacted entity details.	

10. Automated Trouble Ticket Lifecycle Management for IP-MPLS.

Description	
To ensure that all the alarms generated by the network are properly handled internally in Assurance module and open tickets in the Trouble Ticketing System correctly	Result
Expected Results	PASS/FAIL
1. Demonstrating Trouble ticket raised to external system based on fault received. 2. Automatic closure of trouble ticket basis the alarm clearance received from network.	

11. Demonstration SDN Controller of IP-MPLS

Description	
SDN controller should connect with the network on standard protocols like PCEP/BGP-LS/Netconf be able to show following use cases on LSR routers: Bi-directional LSP creation (Dynamic & ERO) based on RSVP. Bi-directional LSP creation (Dynamic & ERO) based on SR. Secondary LSP creation over the diverse paths Bandwidth reservation on each LSP SLA based automatic LSP switchover for dynamic paths. Router Alarms. Performance of LSPs& Links. Telemetry Data	Result
Expected Results	PASS/FAIL
1. Above parameters shall be monitored through SDN Controller	

12. Alarm Inhibition/filtering/grouping.

Description	
Demonstration of ability to filter Alarms, grouping them and in case of known issue [Maintenance], alarms are Inhibited.	Result
Expected Results	PASS/FAIL
1. UI based Alarm Filter 2. Select the Node ID to be filtered. 3. No ticket should be generated in spite of a network alarm on that node.	

B. Phase 2—DWDM Network

1. Discovery of Network Elements via SDN Controller/EMS/Mediation

Description

This test case will verify the basic discovery of the active N/W Equipment to be modelled into the system- Service Topology, Network Topology, Discovery (On-demand, Scheduled)	Result

2. Catalog driven service provisioning/fulfilment via SDN controller/EMS/Mediation

Description	
Demonstration of fulfilment process via Catalog consideration.	Result
Expected Results	PASS/FAIL
1. Services Catalog definition for workflow [provisioning & activation] execution	

3. Topology based correlation -Root Cause analysis/Service Impact Analysis for DWDM Network

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis for a optical service	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity 2. RCA ticket will be raised along with the impacted entity details. 3. Service Impacting tickets will be raised in case both the paths have gone down, with the impacted service along with impacted entity.	

4. Service Impact Alarm Imposition on the impacting node in topology for DWDM Network

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis and Service impact alarm imposition on the impacting entity of a optical service	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity in E2E service 2. Service Impacting alarm propagated to Logical Inventory module with the impacted entity details. 3. Service Impacting Alarm imposition (Alarm severity-highest severity alarm) on the node on topology	

5. Automated Trouble Ticket Lifecycle Management for DWDM Network

Description	
To ensure that all the alarms generated by the network are properly handled internally in Assurance module and open tickets in the Trouble Ticketing System correctly	Result
Expected Results	PASS/FAIL
1. Demonstrating Trouble ticket raised to external system based on fault received.	

2.	Automatic closure of trouble ticket basis the alarm clearance received from network.	

6. DWDM Service Creation/Monitoring through SDN Controller.

Description
SDN controller should connect with the network on standard protocols be able to show following use cases on Optical Network in Multivendor environment. 1. Creation of L0/L1 Services over DWDM Optical Line system using third party Transponders. 2. To verify the physical connectivity of transponders to line system ahead of provisioning, as well as to automate transmit power settings for transponders based on the power acceptance windows of OLS, assuring proper optical signal equalization throughout the path. 3. It should reconcile the line system information with the transponder view, support optical network and services visualization in a single pane of glass, and inventory and monitor all involved network resources and services, from power levels to status and alarms, across all equipment platforms. 4. NMS shall provide end to end view preserving all the details specific to topology, connectivity, and service level information.

		Result
Expected Results		PASS/FAIL
Above parameters shall be monitored/provisioned through SDN Controller		
Comments		
Duration	30min	

7. Point to Point service provisioning from OSS.

Description	
This testcase will demonstrate provisioning of L1 connect Service via SDN Controller/EMS/Mediation. The Indicative Steps may include – 1. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 2. SOM will validate and orchestrate the received service order. 3. Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory. 4. Execution of commands on the EMS/Domain Controller/Mediation post required port identification. 5. Success response received from EMS/Domain Controller/ Mediation	Result

Order Completed and success response send to ERP/BSS System	
Expected Results	PASS/FAIL
1. Demonstrating Trouble ticket raised to external system based on fault received. 2. Automatic closure of trouble ticket basis the alarm clearance received from network.	

C. Phase 3:

1. Discovery of Network Elements via device management for Legacy devices.

Description	
This test case will verify the basic discovery of the active N/W Equipment to be modelled into the system- Service Topology, Network Topology, Discovery (On-demand, Scheduled)	Result

2. Service provisioning/fulfilment via device management for Legacy devices.

Description	
Demonstration of fulfilment process.	Result
Expected Results	PASS/FAIL
1. Services Catalog definition for workflow [provisioning & activation] execution	

3. Topology based correlation -Root Cause analysis Legacy devices.

Description	
Topology based alarm correlation leading to Root cause analysis for service.	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity 2. RCA ticket will be raised along with the impacted entity details.	

4. Alarm Inhibition/filtering/grouping for Legacy devices.

Description	
Demonstration of ability to filter Alarms, grouping them and in case of known issue [Maintenance], alarms are Inhibited.	Result
Expected Results	PASS/FAIL
1. Alarm Filter 2. Select the Node ID to be filtered. 3. No ticket should be generated in spite of a network alarm on that node.	

5. Provisioning of VLAN Service via Device management of legacy device.

Description

This testcase will demonstrate provisioning of a VLAN Service via device management. The Indicative Steps may include – 1. From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. 2. SOM will validate and orchestrate the received service order. 3. Feasibility checks for required resources (Channel, Bandwidth, port etc..) against inventory. 4. Execution of commands on the EMS/Domain Controller post required port identification. 5. Success response received from EMS/Domain Controller 6. Order Completed and success response send to ERP/BSS System	Result
Expected Results	PASS/FAIL
3. Service configured on the identified ports/Sites.	

6. Automated mail notifications to the desired mail group via fulfilment

Description	
This test case will demonstrate sending of mail notification for any process stage on conditional basis w.r.t Fulfilment process/stages.	Result
Expected Results	PASS/FAIL
1. Email is sent to individuals/email group at the defined process stage.	

7. Demonstration of out of box reports offered in OSS module.

Description	
This test case will demonstrate the reports available from OSS module.	Result
Expected Results	PASS/FAIL
1. PM Reports 2. FM reports 3. Order reports 4. Inventory reports	

8. Demonstration of available SDKs for the offered OSS module along with Product manual walk-thru

Description	
This test case will demonstrate the SDKs offered as part of solution modules and deployed in lab/customer premises.	Result
Expected Results	PASS/FAIL
SDK deployed are demonstrated. The SDK include – 5. Assurance SDK to enable new adaptations. 6. Fulfilment SDK to enable new adaptations or definition of new workflows.	

7. Inventory SDK – to enable new service inventory model definition. 8. Product Manuals/documentations walk thru	

9. Monitoring/Viewing of Alarms/Events & Performance data in UI of Assurance [Data Collection to OSS (PM, FM)) systems periodically]

Description	
This testcase shall demonstrate the alarms/PM data coming from underlying legacy Network elements [via EMS/Mediation] are visible in GUI	Result
Expected Results	PASS/FAIL
1. Alarms and PM data is visible.	

10. Customer Portal

Description	
Customer Portal shall demonstrate following: 1. Service Portal should provide a dashboard to the end users showing the latest status of all the tickets / service requests registered by them. 2. Service availability and billing related information on Portal 3. Customer Service Interfaces utilization on Portal 4. SLA 5. Latency, Packet drop and Jitter information related to customer on Portal. 6. Status of Service.	Result
Expected Results	PASS/FAIL
2. Details are visible on customer portal.	

Note:

1. If required, RailTel may add more test cases during acceptance tests of PAC of different phases as per technical requirement and specifications mentioned in Tender.
2. After signing of PAC (Provisional Acceptance Certificate), Phase wise (as mentioned in Clause 4.A.4) Provisional Acceptance Certificate (PAC) shall be signed by CNOC In-charge of RailTel through its concerned ED/GGM/GM. PAC will not be held back for want of minor deficiencies not affecting the functioning of the solution. Deficiencies, if any, pointed at the time of issuance of PAC, will be rectified by the contractor within one month. System shall be considered commissioned after issue of PAC.

3.B.6 Final Acceptance Certificate (FAC)

The final acceptance of the works completed shall take effect after successful completion of Phase I PACs, Phase II PACs & Phase III PACs and trial run (within 3 months) of whole system provided in any case that the contractor has complied fully with his obligations in respect of each item under the contract. The Final Acceptance Certificate against the contract shall be issued by CNOC In-charge of RailTel through its concerned ED/GGM/GM. Notwithstanding the issue of Final Acceptance Certificate the contractor and the purchaser shall remain liable for fulfilment of any obligation incurred under the provision of the contract prior to the issue of Final Acceptance Certificate which remains unperformed at the time such certificate is issued and for determining the nature and extent of such obligation the contract shall be deemed to remain in force between the parties hereto.

Any item of Tenderer's goods/services not specifically mentioned but considered essential for completion/commissioning of the work in all respects shall be deemed to be included in the scope of work. The tenderer may bring out any additional requirement and quote the price for the same as per the relevant SOR item, otherwise, it shall be required to be supplied by the tenderer free of cost.

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CHAPTER-3

C. TRAINING, VENDOR DATA REQUIREMENT, DOCUMENTATION, AND DESIGN GUIDELINES

3.C.1 SCOPE OF TRAINING

Tenderer shall train 60 (Man Weeks) personnel of RailTel/Engineer in all aspects of the system. Training will be provided by OEM/OEM authorized training partner.

Tenderer shall also train 10 (Man Weeks) personnel of RailTel/Engineer in all aspects of the system for One refresher training per year when required by RailTel.

It shall be explicitly understood that Purchaser's/Engineer's personnel shall be fully associated during Engineering, Design, Installation, Testing, Commissioning and Integration activities and this opportunity shall be taken by Tenderer to impart on the job training in addition to the above training course.

The training course shall be designed to train the trainees in all aspects of System engineering, equipment operation, installation and functional details, theory of operation of system, trouble shooting and familiarization with the system at component level. All equipment used for training shall be identical to those quoted and supplied for site installation in hardware and software versions.

Tenderer shall provide comprehensive documentation in hard copy as well as soft copy, course material (for train the trainer program), manuals, literature etc. as required for proper training of personnel at his own cost. Consolidated and comprehensive documentation shall be available to each participant. After the completion of course, all such materials shall become the property of the PURCHASER. Tenderer shall update the course material of manuals in case there are any changes owing to revision/modifications in equipment/system specifications.

Tenderer shall, prior to start of training, send complete training program including details of each course, duration, subject matter etc. The Purchaser/Engineer reserves their right to suggest any additions/deletions in the program, which shall be incorporated by the Tenderer at no additional cost.

3.C.2 Timelines for Training and Development:

SN	Deliverable	Timeline in Months (M) (D= Date of award of LoA)
	Phase-1	
1	Completion of training on OSS, SDN Controller for IP-MPLS and other proposed systems of Phase-1 including training on SDK of all proposed system. ---20 Man Week	D + 6M
	Phase-2	
2	Completion of training on OSS, SDN Controller for DWDM and other proposed systems of Phase-2 including training on SDK of all proposed system---20 Man Week	D + 15M
	Phase-3	

3	Completion of training on OSS, Device management and other proposed systems of Phase-3 including training on SDK of all proposed system. ----- 20 Man Week	D + 25M
4	Continuous training and retraining during installation, warranty & AMC phase ------- 10 Man Week	One refresher training per year when required by RailTel.

3.C.3 BIDDER DATA REQUIREMENT AND DOCUMENTATION

Documentation shall be supplied in hard as well as soft copy for the system. Minimum 2 sets of full documents shall be supplied by the tenderer in hard copy. All documents and manuals shall be in English language only.

The following documents for the complete system shall be supplied and approved by Purchaser/Engineer in order to understand and use the system:

- System description, System configuration diagram & Connectivity diagram.
- Detail technical manual of the system.
- User manual of the system.
- Equipment interconnection diagram including details of various interfaces, signalling protocols used at each stage.
- Layout of equipment and space requirements.
- Installation manual including installation procedure and commissioning.
- Supervisory configuration, alarm list, operator interface etc.

- Maintenance manual of the system containing:

1. Preventive maintenance procedures.

2. Trouble shooting/repairs procedures including failure analysis shall provide exhaustive information about repairs including but not limited to removal, reinsertion of components and cards, repairs, adjustments, tuning, calibration, tools required for a particular operation, test points, including turn-around time for repair and the details of the maintenance support service centre to be furnished in the bid and all other maintenance related details.

3. Expansion possibilities of the system without causing deterioration in the system performance.

4. Any other data, document not specifically mentioned, but required for the satisfactory testing, installation and commissioning, operation and maintenance of the system shall be provided.

5. Documents to be supplied after trial runs but before System commissioning (Acceptance of the System by Purchaser/Engineer).

3.C.4 : Deleted

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CHAPTER 4

A. COMMERCIAL TERMS & CONDITIONS

4.A.1 Offer letter and Validity of offer

4.A.1.1 The bidder shall complete the offer letter (Chapter-1, Section-I) and the Price Schedule(Chapter-2, Section-I) furnished in the tender documents, indicating the goods to be supplied, description of the goods, associated technical literature, quantity and prices etc.

4.A.1.2 The offer should remain valid for a minimum period from the date of opening of tender including the date of opening as indicated in Bid Data Sheet (BDS) Chapter-5, Section-I.

4.A.2 Warranty

4.A.2.1 The warranty would be valid for a period as indicated in Bid Data Sheet (BDS) Chapter-5, Section-I. 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 equipment 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.

4.A.2.2 If it becomes necessary for the contractor to replace or renew any defective portion/portions of the supplies under this clause, the provisions of the clause shall apply to the portion/portions of the equipment so replaced or renewed or until the end of the above mentioned period in BDS of Chapter-5. If any defect is not remedied within a time mentioned in the Clause 4.A.2.4.5 and action will be taken as mentioned in the Clause 4.A.2.4.5, the Purchaser may proceed to do the work at the contractor's cost, but without prejudice to any other rights which the Purchaser may have against the contractor in respect of such defects.

4.A.2.3 Replacement under warranty clause shall be made by the contractor free of all charges at site including freight, insurance and other incidental charges.

4.A.2.4 **Warranty Support**

4.A.2.4.1 Material for repair during Warranty Period shall be handed over/taken over by contractors engineer at respective site or mutually agreed RailTel PoP location/Station.

4.A.2.4.2 During the warranty period, the contractor shall be responsible to the extent expressed in this clause for any defects that may develop under the conditions provided for by the contract and under proper use, arising from faulty materials, design or workmanship in the plant, or from faulty execution of the work by the contractor but not otherwise and shall remedy such defects at his own cost when

called upon to do so by the Purchaser Engineer who shall state in writing in what respect the portion is faulty.

4.A.2.4.3 Deleted

4.A.2.4.4 Bidder should provide one OEM certified Support Engineers at CNOC after supply of Phase-I Hardware and Software.

4.A.2.4.5 **Replacement Services during Warranty and AMC Period**

4.A.2.4.5.1 Bidder's Responsibility:

- The Bidder will provide the replacement of all Faulty equipment/cards/optics/other accessories on Next Business Day (NBD) support. To ensure the same, Bidder has to show the NBD support on the OEM portal or OEM certification that all equipment purchased are under NBD support and TAC Support under Severity Level-1. Warranty & AMC Support shall include complete Hardware and Software offered under this Tender. The same will be verified by RailTel or its authorized representative.
- Bidder will also provide the update/upgrade of all the software supplied under this contract including TAC Support.
- After receiving a defective part request from RailTel through Welcome Centre (dedicated phone line or e-mail), the defective part will be taken over by the contractor from each of the RailTel POP location.
- Before issuance of PAC, it is the responsibility of the Bidder to warrant all the equipment's backed up by OEM.
- Delivery Period: The replacement for defective part will be arranged by the contractor on next business day support at the Fault site/location and the faulty equipment/cards/accessories will be handed over to him. The penalties mentioned in below will be applicable for not replacing the faulty part within 4 (four) working days. The contractor will also give probable reason for repeated failure of cards/ modules.

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

  1. All transportation, freight and insurance charges will be borne by the contractor.

  2. Contractor will keep the record of repair on each defective part/cards/SFP/Optics/Battery/Charger/ACs/Timer with serial numbers (unique identification) particulars.

- If the Bidder fails to replace Hardware card/Part within 04 Working days, the following penalties will be imposed:

Equipment	Duration of repair (Working Days)	Deduction/Penalties
All Modules and accessories	More than 04 days and up to 10 days	2% of the cost of affected part/module
All Modules and accessories	More than 10 days and up to 15 days	10% of the cost of affected part/module
All Modules and accessories	More than 15 days and up to 30 days	25% of the cost of affected part/module
All Modules and accessories	More than 30 days	100% of the cost of affected part/module

- If the Bidder fails to provide Software support within 4 hours after intimation by CNOC, the following penalties will be imposed:

Software	Duration of repair (Working Days)	Deduction/Penalties
All Modules and accessories	More than 04 hour and up to 24 hours	0.1% of the cost of AMC.
All Modules and accessories	More than 24 hour and up to 48 hours	0.2% of the cost of AMC.
All Modules and accessories	More than 48 hour and up to 72 hours	0.5% of the cost of AMC.
All Modules and accessories	More than 72 hours	2 % of the cost of AMC.

Note:

1. In event of that bidder fails on both service SLA and replacement services the maximum aggregate penalties would be limited to equipment cost.
2. OEM should provide facility to RailTel for direct fault case open on TAC Support in case of emergency.
3. Penalties will be calculated on quarterly (3 month) basis and maximum penalties will be 10% of the cost of AMC per year.

4.A.2.4.5.2 RailTel's Responsibility

RailTel will hand over the defective Card//SFP/Parts/etc. to the contractor's authorized representative at each fault location/RailTel PoP Location along with the following relevant information & documentation.

A. Identification/serial number and location of use.
B. Fault report document duly filled-in in a format as per requirements of Contractor.
C. All relevant documentation including failure description, diagnostic tests results.
D. Adequate packing material to protect against reasonable risk of damages.
E. Perform a physical check test on the repaired parts.

4.A.2.5 Deleted

4.A.3 Long Term Maintenance Support (AMC)

4.A.3.1 Bidder 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 given solution. supplied against this contract. RailTel should extend the benefits of software update/up-grades made by Bidder on the system from time to time to improve performance. During this period the scope of work as mentioned in Clause 3.A.1.4 (Chapter-3, Section-I) & its subclauses will be applicable. This includes provision manpower support engineers at CNOC.

4.A.3.2 Bidder shall be paid @ 10% (minimum) + Applicable Taxes of overall Cost of Schedule (A) (excluding Taxes and Duties) per annum towards Long Term Maintenance Support after completion of warranty period, to undertake maintenance, repairs and replacements of all type of equipment/module/ card/assembly/subassembly and update/upgrade of software released during this period and /or which may fail in the system after the warranty. Taxes will be as per actual at the time of execution of the AMC i.e., issue of AMC's LOA.

If the bidder quotes a higher base rate for AMC, he will be paid at his quoted rate per annum. Total AMC cost for five years will be taken for evaluation purpose. AMC would have to be valid for minimum period of 5 years after completion of warranty. This period of 5 Years may be extended further with mutual consent of RailTel and Bidder/OEM.

In case a bidder quotes AMC rates lower than 10% and if the bidder wins the contract, his cost against supply items will be reduced by differential (w.r.t. 10%) of AMC rates & bidder will be paid accordingly against the cost of supply. AMC charges to him, however, will be paid only @ 10% per annum.

4.A.3.3 Separate LOA for AMC shall be issued by RailTel, and separate LOA shall be signed with the Bidder after completion of warranty period. A fresh Bank Guarantee valid for a period of 4 months beyond the completion of AMC of five years from the date of issue of LOA for AMC shall be required to be submitted by OEM/Tenderer for due fulfilment of long-term maintenance support obligation.

Value of PBG will be @10% of the total value of LOA for AMC of five years or as per Government of India guidelines applicable at the time of issue of LOA for AMC. This PBG of AMC shall be submitted by the bidder within 30 days from the date of issue of LOA for the AMC. In case bidder does not submit the PBG in the stipulated time period, RailTel may encash the PBG given with the original LOA.

4.A.3.4 Quarterly payment for AMC Charges as per the Service Level Agreement (SLA) at the end of every quarter would be made by RailTel after successful completion of AMC Services of that quarter and on the certificate furnished by CNOC In-charge RailTel through its concerned ED/GGM/GM.

Note: The acceptance of the above clause is mandatory and specific acceptance from OEM is required to be enclosed as per Form no.3 (Chapter-6, Section-I). Any deviation, which is not acceptable to RailTel, will lead to REJECTION of the bid summarily.

4.A.4 Phase-wise Delivery/Implementation timelines

4.A.4.1 Milestones for Design, Supply, Installation, Testing, Commissioning, and Integration from the date of issue of Letter of Acceptance (LOA) is tabulated as under.

Phase	**Completion Target**	**Deliverable**	**Timeline in Months (M) (D= Date of issue of LOA)**
Phase-1	SDN [IP/MPLS]	E2E Inventory Discovery for IP/MPLS Elements via SDN Controller/EMS	D+12 M =T1 T1=delivery timeline for Phase-1.
		Fault Management, Performance Management	
		Discovered Topology based correlation and RCA based Action & Integration with TT System	
Phase-2	Optical Network	E2E Inventory Discovery for Optical Elements via SDN Controller/EMS	T1+8 M= T2 T2=delivery timeline for Phase-2.
		Fault Management, Performance Management & Discovered Topology based correlation and RCA based Action	
Phase-3	Phase 3 – Legacy Network & OSS DR	Integration of Legacy Network & Legacy Devices Elements via a common Mediation layer Fault Management, Performance Management	T2+10 M =T3 T3=delivery timeline for Phase-3.
		DR Deployment	

		Catalog driven Service Fulfillment Stack, Order Management and E2E Workflow based Orchestration	
		Portal for RailTel's Customers	

All timeline calculations are from the date of issue of LOA. Bidders need to share their detailed project plan as per the schedule mentioned above. Time is essence of the contract, and all timelines should be strictly followed. Bidders are required to plan all activities in such a manner that the project is completed within the above prescribed timeline and to carry out activities in parallel to the extent possible.

4.A.4.2 Spares (if required) shall be supplied by bidder to RailTel with no additional cost to RailTel.

4.A.4.3 Bidder in all cases is required to adhere to the project timelines and the project plan shared. In case of delay in implementation and/or on the basis on inability to adhere to the functional and operational requirements of the System as stated in this Tender, RailTel will be within its right to take measures as detailed in Terms and Conditions of the Contract.

4.A.4.4 RailTel Region's Details:

SN	Region/Head Office	Address
1	Northern Region/ New Delhi	PED 6th Floor, IIIrd Block, Delhi Technology Park, Shastri Park, New Delhi-110053 Fax: +91-11-22185978 Tel: +91-11-22185933 Email: vijaylaxmi@railtelindia.com
2	Eastern Region/ Kolkata	PED 3rd floor, Chatterjee International Centre, 33A, Jawaharlal Nehru Road, Kolkata - 700071 Fax: +91-33-44041499, Tel: +91-33-44041499, Email: suresh@railtelindia.com
3	Southern Region/ Secunderabad	PED 2nd Floor, B-Block, Rail Nilayam, Secunderabad-500071. Fax: +91-40-27820682, Tel: +91-40-27821134 Email: kmr@railtelindia.com
4	Western Region/ Mumbai	PED Western Railway Microwave Complex, Senapati Bapat Marg, Mahalaxmi,

		Mumbai-400013 Fax: +91-22-24923913, Tel: +91-22-24923907, Email: vinod.agarwal@railtelindia.com

4.A.4.5 Project Preparation

4.A.4.5.1 The successful bidder shall submit a detailed implementation plan as per the project deliverables timelines with the technical bid and before the commencement of the project.

4.A.4.6 Design and approval phase

4.A.4.6.1 The successful bidder shall conduct a detailed study of functional and technical requirements of the material to \\work to make the required system configuration and design modifications to its solution if required in order to achieve the desired functionality. However, the same must be tested, accepted and approved by RailTel/Railways.

4.A.4.6.2 Deleted

4.A.4.7 Installation, Testing, Commissioning and Integration with Existing Infra

4.A.4.7.1 Installation and commissioning of software, hardware and equipment as per terms and condition of the tender.

4.A.4.7.2 Carry out all the customization/configuration activities as identified during Design phase by RailTel/Railway.

4.A.4.7.3 RailTel/Railways reserves the right to seek customization to meet its requirements.

4.A.5 Payment Terms

Note: It may be noted that bidder is permitted to quote only in Indian Rupees. Accordingly, all payments will be made in Indian Rupees only.

4.A.5.1 **Payment Terms for Hardware, Software, and service Items (except AMC):**

S.N.	Phases (Milestones)	Payment
1	Phase-1	**A. 50% value of Hardware & Software supplied under phase-1 against LOA/PO subject to the maximum 16% of total contract value of SCHEDULE A of SOR (whichever is lesser) would be made on receipt of material by the consignee (at site /the stores, to be decided by RailTel) duly inspected and on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:** 1. Invoice. 2. Delivery Challan. 3. Contractor's certificate of dispatch /Packing list.

		4. Factory Test Report for Hardware items. 5. Purchaser's Inspection certificate. 6. Consignee receipt. 7. Insurance certificate. 8. A certificate duly signed by the firm certifying that equipment/ materials being delivered are new and conform to technical specification. 9. Undertaking for fall clause. 10. Performance Bank Guarantee **B. 40% value of Hardware & Software supplied under phase-1 against LOA/PO subject to the maximum 12% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC) and on submission of following documents on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:** 1. Signed Provisional Acceptance Certificate of respective phases (PAC). 2. Warranty certificate (as defined in Clause 4.A.2) from OEM for sup-plied Hardware and software. **C. 100% of Services value under phase-1 against LOA/PO subject to the maximum 8% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC).** **D. Balance payment of value of Phase-1 of the LOA/PO on issue of Final Acceptance Certificate (FAC) and on submission of following documents –** 1. Signed Final Acceptance Certificate (FAC). 2. Monthly Fault and Replacement Report for Supplied Hardware. 3. Deductions, if any against SLA, non-availability of Manpower, Replacement services etc. 4. No dues certificate certifying that there is no pending issue left. 5. Certificate stating that work relating to complete project has been done successfully as per terms and conditions of Tender. 6. All above documents should be duly certified by CNOC In-charge.
2	Phase-2	**A. 50% value of Hardware & Software supplied under phase-2 against LOA/PO subject to the maximum 12% of total contract value of SCHEDULE A of SOR (whichever is lesser) would be made on receipt of material by the consignee (at site /the stores, to be decided by RailTel) duly**

		inspected and on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract: 1. Invoice. 2. Delivery Challan. 3. Contractor's certificate of dispatch /Packing list. 4. Factory Test Report for Hardware items. 5. Purchaser's Inspection certificate. 6. Consignee receipt. 7. Insurance certificate. 8. A certificate duly signed by the firm certifying that equipment/ materials being delivered are new and conform to technical specification. 9. Undertaking for fall clause. 10. Signed Provisional Acceptance Certificate of phases-1 (PAC). **B. 40% value of Hardware & Software supplied under phase-2 against LOA/PO subject to the maximum 9% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC) and on submission of following documents on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:** 1. Signed Provisional Acceptance Certificate of respective phases (PAC). 2. Warranty certificate (as defined in Clause 4.A.2) from OEM for sup-plied Hardware and software. **C. 100% of Services value under phase-2 against LOA/PO subject to the maximum 6% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC).** **D. Balance payment of value of Phase-2 of the LOA/PO on issue of Final Acceptance Certificate (FAC) and on submission of following documents –** 1. Signed Final Acceptance Certificate (FAC). 2. Monthly Fault and Replacement Report for Supplied Hardware. 3. Deductions, if any against SLA, non-availability of Manpower, Replacement services etc. 4. No dues certificate certifying that there is no pending issue left. 5. Certificate stating that work relating to complete project has been done successfully as per terms and conditions of Tender.

		6. All above documents should be duly certified by CNOC In-charge.
3	Phase-3	**A. 50% value of Hardware & Software supplied under phase-3 against LOA/PO subject to the maximum 12% of total contract value of SCHEDULE A of SOR (whichever is lesser) would be made on receipt of material by the consignee (at site /the stores, to be decided by RailTel) duly inspected and on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:** 1. Invoice. 2. Delivery Challan. 3. Contractor's certificate of dispatch /Packing list. 4. Factory Test Report for Hardware items. 5. Purchaser's Inspection certificate. 6. Consignee receipt. 7. Insurance certificate. 8. A certificate duly signed by the firm certifying that equipment/ materials being delivered are new and conform to technical specification. 9. Undertaking for fall clause. 10. Signed Provisional Acceptance Certificate of phases-1 & 2 (PAC). **B. 40% value of Hardware & Software supplied under phase-3 against LOA/PO subject to the maximum 9% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC) and on submission of following documents on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:** 11. Signed Provisional Acceptance Certificate of respective phases (PAC). 12. Warranty certificate (as defined in Clause 4.A.2) from OEM for sup-plied Hardware and software. **C. 100% of Services value under phase-3 against LOA/PO subject to the maximum 6% of total contract value of SCHEDULE A of SOR (whichever is lesser) on issue of Provisional Acceptance Certificate (PAC).** **D. Balance payment of value of Phase-3 of the LOA/PO on issue of Final Acceptance Certificate (FAC) and on submission of following documents –** 1. Signed Final Acceptance Certificate (FAC).

		2. Monthly Fault and Replacement Report for Supplied Hardware. 3. Deductions, if any against SLA, non-availability of Manpower, Replacement services etc. 4. No dues certificate certifying that there is no pending issue left. 5. Certificate stating that work relating to complete project has been done successfully as per terms and conditions of Tender. 6. All above documents should be duly certified by CNOC In-charge.

Note: Next phase payment will be made only after issuance of Provisional Acceptance Certificate (PAC) previous phase.

4.A.5.2 **Payment of Services (Long Term Maintenance/AMC)**

4.A.5.2.1 Payment of SOR Item towards "AMC/Long term maintenance Support" would be paid on quarterly basis by RailTel CNOC after successful completion of maintenance support of that quarter on submission of the following documents subject to any deductions or recovery which RailTel may be entitled to make under the contract:

- Quarterly Invoice.
- Monthly trouble ticket Report
- Monthly Fault and Replacement Report
- Month wise Attendance sheet of Support Engineers
- One Year Warranty certificate (Minimum from OEM for supplied Hardware. One year Warranty would be checked at the beginning of first quarter billing of each year.
- Deductions, if any against service SLA and Replacement services.
- All above documents should be duly certified by CNOC In-charge.

4.A.5.2.2 Accounting unit/Bill passing unit for SOR items is by CNOC In-charge RailTel through its concerned ED/GGM/GM. All Bills shall be submitted to CNOC In-charge RailTel through its concerned ED/GGM/GM for certifying & verification and forwarded to the Finance Department of RailTel for releasing the payment.

4.A.5.2.3 Monthly reports will be shared with RailTel regularly. Format will be mutually decided by RailTel and Bidder.

4.A.5.3 All the invoices raised by the bidder will be raised in the name of M/s RailTel Corporation of India Limited and corresponding payments will be made by CNOC In-charge RailTel through its concerned ED/GGM/GM.

4.A.5.4 The breakup of taxes has to be furnished and same should be reflected in the bills so that input GST credit can be availed by RailTel (RCIL).

4.A.5.5 All invoices will be raised by the contractor state-wise as per clause 4.A.7.

4.A.6 Performance Bank Guarantee (PBG)

4.A.6.1 The successful bidder has to furnish security deposit in the form of Performance Bank guarantee @10% for issued PO/ LOA value, the same should be submitted within 30 days of issue of LOA/PO, 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. This PBG should be from a Scheduled Bank and should cover warranty period plus four months for lodging the claim. The performance Bank Guarantee will be discharged by the Purchaser after completion of the supplier's performance obligations including any warranty obligations under the contract. PBG claim period should be valid till 1 year after PBG Validity.

4.A.6.2 The earnest money shall be released on submission of PBG. The Performa for PBG is given in Chapter 6, Form No. 1.

4.A.6.3 The Performance Bank Guarantee (security deposit) will bear no interest.

4.A.6.4 This PBG would be released after satisfactory completion of contract including warranty period plus 4 months. This PBG would be released after satisfactory completion of contract including warranty period and only after submission of PBG towards AMC as per clause 4.A.3.3 of this Chapter. In case of any extension of the project, the PBG shall be extended for the extended period plus 4 months.

4.A.6.5 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.

4.A.7 Taxes & Duties

The price quoted in the offer should be firm, fixed indicating the breakup and inclusive of all taxes & duties like import, custom, antidumping, CGST, SGST, IGST, UTGST etc. The Offer should be inclusive of packing, forwarding, freight upto destination, insurance charges.

4.A.7.1 Tenderer shall quote all-inclusive rates, but there shall be break up of basic price and all type of applicable taxes such as SGST/CGST/IGST/UT GST along with respective HSN/SAC Code under GST Law (Including tax under reverse charges payable by the recipient).

4.A.7.2 Bidder shall issue valid tax invoice to RailTel for availing proper credit of CGST/SGST/IGST/UTGST in case of award of Contract. GST will not be reimbursed in the absence of valid tax invoice. The GST will be paid to the successful bidder only when it will be reflected on GST Portal otherwise Basic Invoice amount will be paid after necessary statutory deductions.

4.A.7.3 For all the taxable supplies made by the Bidder, the Bidder shall furnish all the details of such taxable supplies in the relevant returns to be filed under GST Act.

4.A.7.4 If the Bidder fails to comply with any of the above, the Bidder shall pay to purchaser any expense, interest, penalty as applicable under the GST Act.

4.A.7.5 In case of incorrect reporting of the supply made by the Bidder in the relevant return, leading to disallowance of input credit to purchaser, the Bidder shall be liable to pay applicable interest under the GST Act to the credit of purchaser. The same provisions shall be applicable in case of debit/credit notes.

4.A.7.6 Wherever the law makes it statutory for the Purchaser to deduct any amount towards GST at sources, the same will be deducted and remitted to the concerned authority.

4.A.7.7 In regard to works contract, the tenderer should have registration no. of GST in respective state where work is to be executed and shall furnish GST registration certificate on award of LOA.

4.A.7.8 The imposition of any new tax and/or increase/ in the aforesaid taxes, duties levies, after the last stipulated date for the receipt of tender including extensions if any and the bidder there upon necessarily and properly pays such taxes/levies/cess, the bidder shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of RailTel attributable to delay in execution of work within the control of bidder. The bidder shall, within a period of 30 days of the imposition of any such tax or levy or cess, give a written notice thereof to RailTel that the same is given pursuant to this condition, together with all necessary information including details of input credit relating thereto. In the event of non-payment/default in payment of any of the above taxes, RailTel reserves the right to with-hold the dues/payments of bidder and make payment to state/Central Government authorities as may be applicable. However, if the rates are reduced after the last stipulated date for receipt of tender, bidder has to pass on the benefits to RailTel.

4.A.7.9 In-case of Imported equipment

Anti-Dumping duty if applicable on the equipment proposed to be supplied by OEM/Tenderer as per extant instructions of Ministry of Commerce/Finance Government of India, has to be borne by the tenderer and shall be deducted from the amount payable to the bidder at the time of making payment to the firm, if this duty amount is paid to Custom Authority by RailTel.

4.A.8 Service Level Agreement (SLA) and Penalties after issuance of PAC

4.A.8.1 The purpose of this Service Level Agreement (SLAs) is to define the level of service to be provided by the successful bidder to RailTel for the AMC period. The successful bidder has to comply with all SLAs defined below to ensure adherence to project timelines, quality and availability of associated Hardware/Software supplied under this Tender. Non-compliance of SLAs will lead to penalties as defined in subsequent sections.

Penalties shall not be levied on the successful bidder in the following cases: -

a) Non-compliance of SLAs has been solely due to reasons (acceptable to RailTel) beyond the control of the successful bidder and
b) There's a Force Majeure event affecting the SLA which is beyond the control of the successful bidder.

4.A.8.3 Definitions

For the purposes of this SLA, the definitions and terms are specified in the contract along with the following terms shall have the meanings set forth below:

3. "Uptime" shall mean the time period for the specified services / components with the specified technical service standards are available to the user department. Uptime, in percentage, of any component (Non-IT& IT) will be calculated as: Uptime = {1-[(Downtime) / (Total Time – Planned Downtime)]} * 100

4. "Downtime/ Non-Availability" shall mean the time period for which the specified services / components with specified technical and service standards are not available to the user department and excludes downtime owing to Force Majeure & Reasons beyond control of the bidder. For items being monitored/reported by EMS, downtime/non-availability will be reckoned from the time failure has been reported by EMS. For other item not being monitored/informed by EMS (to be provided by RailTel), down time/non-availability will be reckoned from the time contractor or his representative has been informed by the means of Telephone/mobile, fax, email or any other method at the address as specified by the contractor (whichever is earlier). The bidder shall specify the details of a) Telephone no. for calling, b) Fax no., c) Mobile no. for calling & SMS, d) e-mail id, e) postal address for correspondence. Non-availability of back-up/stand-by system shall also be counted for down-time calculation.

5. "Incident" refers to any event / abnormalities in the functioning of the MPLS System specified as part of the Scope of Work of the Bidder that may lead to disruption in normal operations of the MPLS System.

6. "Helpdesk Support" shall mean the OEM Certified L-2 Support Engineer at CNOC which shall handle Fault reporting, Trouble Ticketing and related enquiries during this contract.

7. "Resolution Time" shall mean the time taken (after the incident has been reported at the helpdesk or EMS), in resolving (diagnosing, troubleshooting and fixing) the incident by making the service/component available to the user department.

4.A.8.4 Planned Downtime

Any planned application / System downtime would not be included in the calculation of application / System availability. However, the Successful Bidder should take at least 10 days prior approval from RailTel in writing for the planned outage, which should not be for more than 30 minutes, would be in lean period (non-movement period) and limited to max. 4 outages in a year. The bidder would ensure that the activities under the planned downtime are started only after getting the approval from the authorized representative of RailTel. In case activities are carried out without approval, the time period shall be considered as downtime under SLA.

4.A.8.5 Measurement of SLA

The SLA metrics specifies performance parameters as baseline performance, lower performance and breach conditions. All component wise SLA calculations will be done on monthly basis and penalties will be recovered on quarterly basis during AMC

period. Payment to the successful bidder will be linked to the compliance with the SLA metrics.

For period pertaining to Pre-Implementation SLA- Please refer to Liquidated damages Clause at 4.A.11.

Note: Period for SLA calculation: Monthly

4.A.8.6 Penalty

Penalty table includes penalty that would be levied on the successful bidder on non-achievement of SLAs defined above. Slabs have been created for each SLA and penalty would be imposed on bidder as per the SLA achievement/non-achievement for the period under consideration. System downtime/Non availability will be calculated as per monitoring mechanism defined in SLA matrix.

Annual Maintenance Charges shall be paid on quarterly basis at the end of the quarter, subject to the deduction for the down time mentioned below.
SLAs will be monitored and reported through SDN Controller on monthly basis to RailTel by the 5th working day of each month.
Penalties shall be calculated and is to be deducted from the Annual Maintenance Charges on quarterly basis. Overall penalty in a quarter shall not exceed 15% of the due amount of the quarterly AMC work executed by the Bidder.

Penalty after issuance of PAC

SN	Penalty Description	
1	Availability of Software application procured in this Tender.	Penalty to be charged on a quarterly basis of annual cost of AMC.
	Above or equal to 99.95%	No penalty
	Below 99.95% to more than or equal to 99%	5%
	Less than 99%	10%
3	Availability of support Engineers at CNOC	Penalty to be charged on a quarterly basis
	Equal to 100%	No penalty
	Below 100% to more than or equal to 95%	2%
	Less than 95%	5%
4	Log and Response to issue raised (within 24 working hours)	Penalty to be paid on a quarterly basis
	Above or equal to 99%	No penalty
	Below 99% to more than or equal to 98%	5%
	Less than 98%	10%

In case of frequent SLA breaches, RailTel reserve the right to forfeit the PBG submitted by the bidder.

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

Technical Support Services

Hardware servers/storage/Switches/Software up time should be 99.99 % for redundant system and 99.95% for non-redundant System excluding the dependencies on account of RailTel and unforeseen circumstances. If the Bidder fail to achieve uptime as mentioned, the following penalties will be imposed.It will be calculated on quarterly (3 month) basis and maximum penalties will be 10% of the cost of Equipment (Hardware & Software) per year.

Service type Parameter	Service Level	Penalties
For redundant system	>= 99.99%	NIL
	Between 99.99% and 99%	0.2% of the cost of Equipment
	Between 99% and 98%	2% of the cost of Equipment
	Between 98% and 97%	4% of the cost of Equipment
	Between 97% to 95%	6% of the cost of Equipment
	< 95%	10% of the cost of Equipment
Non redundant system	>= 99.95%	NIL
	Between 99.95% and 99%	0.2% of the cost of Equipment
	Between 99% and 98%	2% of the cost of Equipment
	Between 98% and 97%	4% of the cost of Equipment
	Between 97% to 95%	6% of the cost of Equipment
	< 95%	10% of the cost of Equipment

For period pertaining to Pre-Implementation SLA- Please refer to Liquidated damages Clause at 4.A.11.

4.A.8.7 Dedicated Support Engineers

To enforce fulfilment of support objectives, contractor shall provide qualified Support Engineers at RailTel CNOC during the working day over the period of this contract.

(a) Responsibility Matrix of appointed Support Engineers for OSS and associate modules/software's/Hardware:

1. Assisting in Network Monitoring and Surveillance
2. Assisting in Fault Management
3. Network Performance Management
4. Routine & Preventive Maintenance of in-scope OSS Elements
5. Configuration Changes
6. Back-up/Disaster Recovery
7. On call support for Field operations to support.
8. Secure components
9. Prepare Monthly fault logs.
10. Assisting in raising AR
11. Any other duty assigned by CNOC In-charge.

(b) General Terms and Conditions Applicable for dedicated NOC Support

1. The selection of the EngineerS will be done by Contractor jointly with RailTel. RailTel will nominate their officer/s for interviewing the candidates.
2. The above support offerings will be 5 days a week as per RailTel business hours from Monday to Friday.
3. Normally the services of the engineers will be available during the above mentioned office hours, however in case of emergency the engineer will be available any time either on telephone or in NOC on call basis. Subsequent compensatory offs will be given to the engineer to avoid overloading of engineer.
4. The bidder shall arrange the suitable replacement in case the assigned Engineers goes on leave or is unavailable due to any other reason to ensure uninterrupted support services.
5. The Engineers must be equipped with all necessary facilities/equipment such as Laptop, mobile telephone, data card, Internet connection; conveyance accommodation etc.
6. The prices quoted in SOR do not include any travel/boarding & lodging expenses outside of the working headquarter (decided by RailTel).
7. In case of requirements from contractor to log in to the system remotely, RailTel would provide adequate data communications facilities, remote access, telephone and modem connections, all in accordance with RailTel's Security policies and procedures, as may be necessary for the proper performance of contractor's obligations.
8. In case of unsatisfactory service, the Engineer will be withdrawn and replaced by a suitable one with a clear notice of 15 days.
9. For proposed OSS solution at RailTel locations, bidder shall keep required minimum engineers i.e., for Hardware and Software for 5 Days (General Office Timing) in RailTel CNOC after Supply, design, Installation, Commissioning & Testing of OSS, during Warranty and Long-term Maintenance (AMC) period. The engineers will generate monthly/quarterly reports of the failures and health of the equipment is generated from the system and submitted to the Purchaser. Additional manpower, if considered necessary shall be provided by contractor to stabilize the OSS System.

In addition to the above penalty for breach of the SLA parameters, No payment for the month would be made for all service under a Section, where the down time observed for more than 20% of the installed solution.

In case of frequent SLA breaches, RailTel reserve the right to forfeit the PBG submitted by the bidder.

4.A.9 Deleted

4.A.10 Insurance

4.A.10.1 The Contractor shall take out and keep in force a policy or policies of insurance against all liabilities of the Contractor or the Purchaser at common law or under any statute in respect of accidents to persons who shall be employed by the contractor in or around the site for the purpose of carrying out the works on the site. The Contractor shall also take out and keep in force a policy or policies of Insurance against all recognized risks to their offices and depots. Such insurance shall in all respects be to the approval of the Purchaser.

4.A.10.1.1 The Contractor shall take out and keep in force a policy or policies of insurance from the date, the delivery of material starts (including the transit portion) against all liabilities of the Contractor or the Purchaser. The contractor shall take out and keep in force a Policy or policies of Insurance for all materials covered in schedule of requirement irrespective of whether used up in the portion of work already done or kept for the use in the balance portion of the work until such material are provisionally handed over to RailTel. The goods will be issued by purchaser to supplier and risk of goods shall remain with supplier until the issue of PAC by RailTel (RCIL). Insurance policy has to be kept valid by the contractor till issue of PAC by RailTel (RCIL).

4.A.10.2 The Contractor should also insure the stores brought to site, against risks in consequence of war and invasion, as required under the Emergency Risk (Goods) Insurance Act in force from time to time.

4.A.10.3 It may be noted that the beneficiary of the insurance policy should be RailTel (RCIL) or the policies should be pledged in favor of RailTel(RCIL). The contractor shall keep the policy/policies current till the equipment are installed and commissioned on the site. It may also be noted that in the event of contractor's failure to keep the policy current and alive, renewal of policy will be done by purchaser for which the cost of the premium plus 20% of premium shall be recovered from the contractor.

4.A.11 Liquidated Damages

The timely delivery is the essence of this tender. Liquidated damages will be applicable at the rate of half percent per week or part thereof for undelivered portion of SOR subject to a maximum of 10% of the cost of Purchase order/LOA for any reason whatsoever attributed to failure of bidder. RailTel will have the right to cancel the order, place order on alternative source besides levying the liquidated damages as above.

4.A.12 Transportation

4.A.12.1 The rates quoted should be CIP destination. The destination shall be defined Station/POP/designated place of RailTel in the proposed sections which shall be indicated by RailTel's representative.

4.A.12.2 It shall be the responsibility of Bidder to transport the equipment to site for the Installation & Commissioning. Materials not installed / not to be installed at one location need to be shipped from that location to another location by the bidder as may be decided by CNOC. All transportation cost to be borne by the bidder.

4.A.13 Statutory Deduction

These will be made at source as per the rules prevalent in the area of work.

4.A.14 Qualification Criteria

Qualifying criteria under this clause lays down minimum acceptable qualifications in various areas to ensure that qualified bidder has necessary experience, technical expertise, equipment and financial and human resources to successfully complete the project. Bids from bidder not meeting these qualification criteria may liable to be REJECTED. Bids from the consortia of tenderers and Joint Ventures meeting the below defined Qualification criteria would also be considered for award of work.

In case a bidder has submitted the CA certificate or statutory auditor certificate against eligibility clause, contact details of CA or statutory auditor along with UDIN No. shall be mandatorily mentioned.

4.A.14.1 Eligibility Criteria Requirements for Bidders:

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
(a)	EMD	The responding bidder should have deposited EMD on enivida Portal account (as mentioned in BDS, Chapter-5).	Scanned copy of EMD submitted on enivida portal to be submitted along with the bid.
(b)	Legal Entity	The bidder should be a Company registered in India under the Companies Act (India) with their registered office in India should have been operating for the last three years. Note: 1. In case of Consortium, requirement shall be met by the lead bidder. However, Certificate of Incorporation / Registration should be submitted by all Consortium partners. 2. In case of JV, requirement shall be met as per Clause 4.A.15.14.14.	1. Certificate of Incorporation / Registration 2. Memorandum of Association (MoA) Bidder as JV – as defined in Clause 4.A.15.14.14 of Tender document.
(c)	Financial Capability	The bidder should have a minimum cumulative turnover as mentioned in BDS (Chapter-5, Section-I) from the operations in the last three financial years plus current year up to the date of opening of tender. Note: 1. In case of Consortium, Lead bidder should meet the	Bidders should be provided. 1. CA certificate supported by Audited Balance Sheets / annual reports as documentary evidence. In the case of photocopy of Audited Balance Sheet/P&L, the same should be certified by Chartered Accountant as true copy.

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
		eligibility criteria as defined in Clause 4.A.15. 2. In case of JV, requirement to be met as per Clause no. 4.A.15.14.16 of Tender document. For Start-ups (recognized by Department of Industrial policy and promotion, Ministry of Commerce and Industry) minimum cumulative turnover as mentioned in BDS (Chapter-5, Section-I) is required.	2. For the current year, the Statutory Auditor's certificate for turnover of the current year up to the date of bid opening for which Balance Sheet/P&L may not be available. Contact details of CA/Statutory Auditor along with UDIN No. shall be mandatorily mentioned on copy of certified Balance sheet/ Certificate.
(d)	Technical Capability-1	The Bidder must have successfully completed or substantially 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 as mentioned in BDS (Chapter-5, Section-I), or Two similar works# each costing not less than the amount as mentioned in BDS (Chapter-5, Section-I), or One similar work# each costing not less than the amount as mentioned in BDS (Chapter-5, Section-I). For Start-ups (recognized by Department of Industrial policy and promotion, Ministry of Commerce and Industry),the bidder should have completed in last three financial years plus current year upto the date of opening of tender : Single order of similar work# for an amount as mentioned in BDS (Chapter-5, Section-I) OR	(i) Completion certificates from the User Organizations along with PO Copies are required to be submitted. In case of composite work purchase orders, bidder shall submit CA certificate certifying the actual amount pertaining to similar work definition as mentioned in the clause. (ii) Past Experience Form as per Form No.13 of Chapter-6 (Section-I). (The set of document(s) submitted should clearly certify eligibility criteria and should be verifiable from the user/customer).

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
		Two orders of similar work# for an amount as mentioned in BDS (Chapter-5, Section-I) OR Three orders of similar work# for an amount as mentioned in BDS (Chapter-5, Section-I) Note: 1. In case of Consortium, Lead bidder should meet the eligibility criteria as defined in Clause 4.A.15. 2. In case of JV, requirement to be met as per Clause no. 4.A.15.14.15 of Tender document. Completed work means, work should be physically completed or substantially completed. In addition to project value for single work order, Annual Maintenance Contract (AMC) amount for the completed period as on date of opening will also be counted in the value of completed work. Substantial completion shall be based on 80 (eighty) per cent (value wise) or more works completed under the contract. For contracts under which the applicant participated as a joint venture member or sub-contractor, only the applicant's share, by value, shall be considered to meet this requirement. For arriving at cost of similar work, the value of work executed shall be brought to current costing level by enhancing the actual value of work at simple rate of seven percent per annum, calculated from the date of completion to the date of Bid opening. # Similar Work:	

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
		Works completion of Supply, Installation, Testing and Commissioning of a project in the field of Data Centre/Software deployment/Telecom for any Government department or Public Sector Units or public listed companies (as per note below). Note: Work experience certificate issued by Public listed company having average annual turnover of Rs 500 Cr 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.	
(e)	Undertaking to be Submitted by the Bidder	The bidder (in case of consortium/JV, all members) should not have been black listed currently by Central Govt./State Govt./CPSU in India or anywhere globally by Government for security reasons.	Point-A of Form no. 8 (Chapter-6) - To be signed by the Bidder (in case of consortium/JV, all members on their respective letter heads).
(f)	Bidder Type	1. The bidder should be an OEM or a System Integrator authorized by OEMs for supply, implementation and maintenance support under warranty/AMC. Point-A of form no. 8 and Form No. 3 (to be signed by Bidder as well as OEM). 2. Hardware and Software supplied by OEM should not have any malicious code (Point-C of form no. 8).	1. Point-A of Form no. 7 and Form no. 3 of Chapter-6 – (i) OEM undertaking for MAF/Authorization Letter (Point-A of form no. 7, Chapter-6). (ii) Form no. 3 (Chapter-6) – Bidder as well as OEM undertaking for Long Term Maintenance Support. 2. Point-C of Form no. 8 (Chapter-6) – Bidder undertaking for no Malicious Code.

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
(g)	Financial Capability.	As per clause no. 3 (b) of the PPP-MII Order dated 16.09.2020, only bidders offering minimum 20% of local content of supply portion of their offered bid (Class-I Local suppliers/bidders-minimum 50% LC and Class-II Local Suppliers/bidders-minimum 20% LC as per PPP-MII Order) are eligible to participate in this tender. Bid of bidders offering less than 20% local content of supply portion of their offered bid will be SUMMARILY REJECTED.	Form no. 9 (Chapter-6) - Certificate by statutory auditor or cost auditor of the company. Contact details of Statutory auditor or cost auditor along with UDIN No. shall be mandatorily mentioned.
(h)	Technical Manpower	The Bidder must have on its roll at least 75 technically qualified professionals in providing the /IT Infrastructure maintenance services as on bid submission date. Out of the 75 following technical manpower must be on its role. Minimum 15 resources should be B.E/B. Tech/ MCA with OEM certifications either on 1. Server technology - 5 out of 15 2. Cyber/IT Security- 2 out of 15 3. Cloud Technology or Storage solutions- 2 out of 15 4. System software – 2 out of 15 5. At least One Project management professional with PMP certification – 1 out of 15 6. At least 3 professionals with ITIL V3 certifications - 3 out of 15	Certificate from Bidder's Head of HR Department for the 75 number of Technically Qualified professionals employed by the company in the following format. HR certificate on company's letterhead stating the points with employee Name, Qualification, Certification to be submitted along with copy of the relevant certificate. RailTel may check the validity and authenticity of the certificates.
(i)	Technical Capability-Certifications	The bidder must have following Certificate at the time of bidding, ii. ISO 9001:2015 iii. ISO 20000-1: 2018 or latest iv. ISO 27001: 2013 or latest v. CMMI Level 5 or above	Copy of Valid Certificate to be submitted.
(j)	Technical Capability-2	Bidder has successfully commissioned and working satisfactorily of OSS/SDN-Controller/U-NMS/NMS/EMS/Network	End user certificate successfully commissioned and working satisfactorily certificate.

SN	Basic Requirement	Eligibility Criteria Requirements	Supporting Document Required
		monitoring System for IP/MPLS/DWDM/Switch Network with 2700 Nodes (during last 07 (seven) years, ending last day of month previous to the one in which tender is invited) in any Government. department or Public Sector Units or public listed companies. Note: Work experience certificate issued by Public listed company. having average annual turnover of Rs 500 Cr 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	
(k)	Bidder Entity for Telecom service provider/ISP/ NLD.	The Bidder or their promoters having equity stake or operating partnership in bidder, should not be holding valid License for Telecom service provider/ISP/ NLD, Services License of Government of India for Telecom Operation.	• Undertaking to be submitted by the Bidder

Note:

1. In case a contract is started prior to 07 (seven) years, ending last day of month previous to the one in which tender is invited, but completed in last 07 (seven) years, ending last day of month previous to the one in which tender is invited, the completed work shall be considered for fulfillment of credentials.

2. If a contract is physically completed and completion certificate to this extent is issued by the concerned organization but final bill is pending, such contract shall be considered for fulfillment of credentials.

3. If a part or a component of contract is completed but the overall scope of contract is not completed, this work shall not be considered for fulfillment of technical credentials even if the cost of part completed work/component is more than required for fulfillment of credentials.

4. In case a contract is considered similar in nature for fulfillment of technical credentials, the overall cost of that work including Price Variation Clause (PVC) amount if any shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility.

5. The value of final bill including PVC amount-if paid, or otherwise in case final bill is pending the contract cost in last approved variation statement plus PVC amount paid or cumulative amount paid up to last on-account bill including PVC amount and statutory deductions whichever is less, shall be considered as the completion cost of contract.

6. In case of newly formed partnership firm, the credentials of individual partners from previous propriety firm(s) or dissolved previous partnership firm(s) or split previous partnership firm(s), shall be considered only to the extent of their share in previous entity on the date of dissolution / split and their share in newly formed partnership firm. For example, a partner A had 30% share in previous entity and his share in present partnership firm is 20%. In the present tender under consideration, the credentials of partner A will be considered to the extent of 0.3*0.2*value of the work done in the previous entity. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.

7. In case of existing partnership firm, if any one or more partners quit the partnership firm, the credentials of remaining partnership firm shall be re-worked out i.e., the quitting partner(s) shall take away his credentials to the extent of his share on the date of quitting the partnership firm (e.g. in a partnership firm of partners A, B & C having share 30%, 30% & 40% respectively and credentials of Rs 10 crore; in case partner C quits the firm, the credentials of this partnership firm shall remain as Rs 6 crore). For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.

8. In case of existing partnership firm if any other partner(s) joins the firm, the credentials of partnership firm shall get enhanced to the extent of credentials of newly added partner(s) on the same principles as mentioned in item 6 above. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deeds, dissolution/splitting deeds and proof of surrender of PAN No.(s) in case of dissolution of partnership firm etc.

9. Any partner in a partnership firm cannot use or claim his credentials in any other firm without leaving the partnership firm i.e., In a partnership firm of A&B partners, A or B partner cannot use credentials of partnership firm of A&B partners in any other partnership firm or propriety firm without leaving partnership firm of A&B partners.

10. In case a partner in a partnership firm is replaced due to succession as per succession law, the proportion of credentials of the previous partner will be passed on to the successor.

11. If the percentage share among partners of a partnership firm is changed, but the partners remain the same, the credentials of the firm before such modification in the share will continue to be considered for the firm as it is without any change in their value. Further, in case a partner of partnership firm retires without taking away any credentials from the firm, the credentials of partnership firm shall remain the same as it is without any change in their value.

12. In a partnership firm "AB" of A & B partners, in case A also works as propriety firm "P" or partner in some other partnership firm "AX", credentials of A in propriety firm "P" or in other partnership firm "AX" earned after the date of becoming a partner of the firm AB shall not be added in partnership firm AB.

13. In case a tenderer is LLP, the credentials of the tenderer shall be worked out on above lines similar to a partnership firm.

14. In case company A is merged with company B, then company B would get the credentials of company A also.

4.A.14.2 **Eligibility Criteria Requirements for OEM's**:

OEMs of Server Hardware, OSS and SDN Controller whose products are proposed to be used in this Tender should meet the following criteria–

SN	Eligibility Criteria Requirements	Supporting Document Required
1.	The offered solution by the OEM from the same OEM should have: A. Satisfactorily working for at least 12 months (during last 3 FY and current FY) as on date of opening of tender, in India or Abroad in Government /PSUs/Telecom Service Providers/Public Listed Company. B. OEM of OSS shall have installed and commissioned Operation Support System (OSS)/Umbrella NMS consisting of IP-MPLS and DWDM Network, which should have been in satisfactory operation for at least 12 months (during last 3 FY and current FY) as on date of opening of tender in India or Abroad in Government/ PSUs/Telecom Service Providers /Public Listed Company. Following key functionalities should have been implemented as	**End User** (Government /PSUs/Telecom Service Providers/Public Listed Company in India or Abroad) Satisfactory Working certificate for at least 12 months (during last 3 FY and current FY) as on date of opening of tender clearly mentioning the make & model number of the offered Hardware/Software. Public case study is also acceptable against END User certificate.

SN	Eligibility Criteria Requirements	Supporting Document Required
	a single integrated in the network from same OEM: 1. Fault Management 2. Performance Management 3. Inventory, Discovery, and Reconciliation 4. Provisioning, and Activation 5.Catalog driven service fulfilment. C. OEM of OSS shall have experience in deploying OSS/Umbrella NMS solution during last 3 FY and current FY with at least two (2) Service Providers out of which one at least in India. Work experience certificate issued by Public listed company having average annual turnover of Rs 500 Cr and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange or any global 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.	
2	A. OEM of SDN Controller of IP-MPLS shall have installed and commissioned SDN Controller which should have been in satisfactory operation for at least 12 months (during last 3 FY and current FY) as on date of opening of tender in India or Abroad in Government/ PSUs/Telecom Service Providers /Public Listed Company. Following key functionalities should have been implemented as a single integrated in the network from same OEM:	**End User** (Government /PSUs/Telecom Service Providers/Public Listed Company in India or Abroad) Satisfactory Working certificate for at least 12 months (during last 3 FY and current FY) as on date of opening of tender clearly mentioning the make & model number of the offered Hardware/Software. Public case study is also acceptable against END User certificate.

SN	Eligibility Criteria Requirements	Supporting Document Required
	1 Multivendor (At least two IP-MPLS OEM). 2. Telemetry 3. Netconf 4. PCEP/BGP-LS 5.Fault & Performance Management 6. Inventory & Discovery 7. Service Provisioning in Multivendor environment B. OEM of SDN Controller of DWDM shall have installed and commissioned SDN Controller which should have been in satisfactory operation for at least 12 months (during last 3 FY and current FY) as on date of opening of tender in India or Abroad in Government/ PSUs/Telecom Service Providers /Public Listed Company. Following key functionalities should have been implemented as a single integrated in the network from same OEM: 1 Multivendor (At least two DWDM OEM). 2. OpenConfig 3.Fault & Performance Management 4. Inventory & Discovery 5. Service Provisioning in Multivendor environment C. OEM of SDN Controllers of IP-MPLS and DWDM shall have experience in deploying OSS/Umbrella NMS solution during last 3 FY and current FY with at least two (2) Service Providers in India or Abroad.	
3	OEM should have supplied the hardware/software offered or hardware/software of the same series/family of minimum value {as mentioned in BDS (Chapter-5, Section-I)} during last preceding 3	OEM should submit self-certificate with proper contact detail of clients along with PO reference and amount supplied (Details of purchaser Organization - Firm Name, Firm Address, Name of Contact person, Designation, Telephone Number, Fax, Official mail id etc.) of offered Hardware &

SN	Eligibility Criteria Requirements	Supporting Document Required
	financial years (i.e., current year and three previous financial years) as on opening date of bid to Government/PSUs/Telecom Service Providers/Public Listed Company in India or Abroad. Work experience certificate issued by Public listed company having average annual turnover of Rs 500 Cr and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange or any global 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. Note: (a) For Start-ups (recognized by Department of Industrial policy and promotion, Ministry of Commerce and Industry) only 1/3 of value as mentioned above is required. (b) OEM is allowed to submit multiple PO reference and amount supplied certificate of cumulative amount (as mentioned in BDS, Chapter-5, Section-I) for meeting the above mentioned criteria.	Software in the Tender in current year and three previous financial years. OEM self-certificate is required in case the supplied equipment's Hardware & Software are of same series/family or its immediate predecessor. RailTel reserves the right to verify PO reference and amount supplied from Purchaser Organization. POs issued in the name of System Integrator are also acceptable. For required amount {as mentioned in BDS (Chapter-5, Section-I)}, single or multiple POs in favour of OEM's System Integrators are also acceptable.
4.	OEM should have supplied the hardware/software offered or hardware/software of minimum value {as mentioned in BDS (Chapter-5, Section-I)} during last preceding 3 financial years (i.e., current year and three previous financial years) as on opening date of bid to Government/PSUs/Telecom Service Providers/Public Listed Company in India or Abroad.	OEM should submit self-certificate with proper contact detail of clients along with PO reference and amount supplied (Details of purchaser Organization - Firm Name, Firm Address, Name of Contact person, Designation, Telephone Number, Fax, Official mail id etc.) of offered Hardware & Software in the Tender in current year and three previous financial years. OEM self-certificate is required in case the supplied equipment's Hardware & Software are of same series/family or its immediate predecessor.

SN	Eligibility Criteria Requirements	Supporting Document Required
	Work experience certificate issued by Public listed company having average annual turnover of Rs 500 Cr and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange or any global 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. Note: (a) For Start-ups (recognized by Department of Industrial policy and promotion, Ministry of Commerce and Industry) only 1/3 of value as mentioned above is required. (b) OEM is allowed to submit multiple PO reference and amount supplied certificate of cumulative amount (as mentioned in BDS, Chapter-5, Section-I) for meeting the above-mentioned criteria.	RailTel reserves the right to verify PO reference and amount supplied from Purchaser Organization. POs issued in the name of System Integrator are also acceptable. For required amount {as mentioned in BDS (Chapter-5, Section-I)}, single or multiple POs in favour of OEM's System Integrators are also acceptable.
5.	Undertaking by OEM on their respective letter Heads - **1.** Server Hardware OEM should have proven facilities for Engineering, manufacture, assembly, integration, testing and basic facilities with respect to space, Engineering, Personnel, Test equipment, Manufacture, Training, Logistic 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 centre facilities in India also **(Point-B of form no. 7).**	**Point- B, C, D & E of Form no. 7 (Chapter-6)**.

SN	Eligibility Criteria Requirements	Supporting Document Required
	2. OEM should not have been black-listed currently by Central Govt./State Govt./CPSU in India or anywhere globally by Government for security reasons **(Point-C of form no. 7).** 3. Hardware and Software supplied by OEM should not have any malicious code **(Point-D of form no. 7).** 4. Offered Software of SDN controller and OSS are having End of Life (EOL) more than 10 years and End of Sale (EOS) more than 4 years from the date of opening of this Tender **(Point-E of form no. 7).**	
6	OEM Vetted Bill of Material (BOM)	**Certificate from OEM for Bill of Material (BOM)**
7	OEM Vetted Clause wise compliance of technical requirement and specifications.	**Certificate from OEM for Clause wise compliance of technical requirement and specifications.**

4.A.14.3 **Eligibility Credentials and Verification**

4.A.14.3.1 The bidder is required to submit purchase order and satisfactory working/implementation certificate issued by the user/customer. Purchase orders without relevant organization's confirmation through a credential letter will not be considered as implementation certificate from the client.

4.A.14.3.2 For client credentials where NDA has been signed, the bidder may submit the corresponding NDA document along with a self-declaration confirming the requirements of the eligibility criteria for which the NDA is being submitted.

4.A.14.3.3 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 (including documents submitted by OEMs) are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as Form no. 4 (Chapter-6, Section-I). NON-SUBMISSION OF AN AFFIDAVIT BY THE BIDDER SHALL RESULT IN SUMMARY 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 there under.

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

4.A.14.3.4 For International project if the original client certificate and other documents are in language other than English than a translated copy duly confirmed by Indian embassy/ One of the board of directors of the lead bidder/ consortium member shall be submitted along with bid document.

4.A.14.3.5 In the event of Foreign Original Equipment Manufacturer (OEM), it's Indian Subsidiary fully authorized for bidding on behalf of OEM is allowed to participate with the experience and financial credential of parent company with specific authorization for doing so from the OEM. The specific authorization addressed to RailTel should be submitted by the bidder.

4.A.14.4 RailTel Reserves the right:

a) To verify, if so desired, the correctness of documentary evidence furnished by the bidder.

(ii) To verify the successful operation and performance of qualifying projects and bidder shall arrange permission for the same.

(iii) To carry out capability assessment of the bidder(s) including referral to in-house information.

(iv) RailTel shall not be responsible for any delay in the receipt of tenders and reserves the right to ACCEPT/REJECT any or all tenders without assigning any reason. To ask the clarification and supporting documents in respect to submitted eligibility documents.

4.A.15 Consortium Bids

4.A.15.1 In view of nature of work, it is anticipated that some of the intending tenderers will pool their resources and experience to form consortia. Consortium bids are permitted with each consortium of tenderers allowed to have at maximum three members, the consortia of tenderers must clearly define the lead bidder of the consortia along with its roles and responsibilities.

4.A.15.2 The Lead bidder should meet the eligibility criteria. In their own interest the tenderers, who form such consortia, are advised to investigate capabilities, availability of resources, experienced personnel, financial soundness, past experience and concurrent engagements of Constituting partners.

4.A.15.3 Consortia of tenderers, if any, must clearly define role/scope of store/work of each partner/member. Further the legal agreement for a consortium must accompany the bid

and should clearly define the leader of such a consortium who will be the contractor and will be responsible for timely completion of work as also during execution of work, if awarded, coordinate with Purchaser on behalf of the consortium, receive payments for the works executed and be liable for due performance of the contract in all respect.

4.A.15.4 Qualification documents, details etc. must however, be provided by Lead member firm complete in all respects strictly in requisite proforma.

4.A.15.5 A consortium formed will not be subject to alteration with regard to change in constituting firms and/or reorientation of roles. Any changes, if proposed by consortium to take advantage of certain developments during evaluation stage will render the bid liable to be REJECTED. As all details are required to be furnished along with the bids and will be critically examined during evaluation of bids, it is imperative that such details should have been thoroughly examined as a safeguard against a possible disqualification of bids on these grounds.

4.A.15.6 All partners of the consortium shall be jointly and severally liable to RailTel for the execution of the entire contract in accordance with its terms.

4.A.15.7 Deleted.

4.A.15.8 For evaluation purposes, Exchange rate applicable on the date of technical bid opening (T.T. selling Exchange rate of State Bank of India applicable on the date technical bid opening) will be considered.

4.A.15.9 Release of payments in foreign exchange for imported items to foreign companies as A consortium partner, shall be on request of lead bidder along with bill.

4.A.15.10 Consortium shall not have more than three members and each consortium member shall have minimum 20% contribution in the work. A Consortium must submit a Power of Attorney by the other member of the Consortium in favor of the Lead Member. This is also to be enshrined in Memorandum of Agreement signed by the Consortium Members and submitted along with the bid. Members of consortium should sign every sheet of price bid as a token of acceptance of all quoted prices by members, failing which the offer will liable to be REJECTED.

4.A.15.11 An individual bidder or a member of Consortium cannot be a member of another Consortium or a JV partner and participate in this tender.

4.A.15.12 Firms should submit the affidavit (as per Form no. 10 of Chapter-6, Section-I) & Consortium Agreement (As per Form no. 12 of Chapter-6, Section-I) along with the bid/offer.

4.A.15.13 Each consortium member shall make equal contribution towards the total PBG amount to be submitted along with acceptance of LOA.

4.A.15.14 Conditions for Participation of Joint Venture (JV) Firms

4.A.15.14.1 Separate identity/name shall be given to the Joint Venture.

4.A.15.14.2 Number of members in a JV shall not be more than five. One of the members of the JV shall be its Lead Member who shall have a majority (at least 51%) share of interest

in the JV. The other members shall have a share of not less than 10% each in case of JV with more than three members. In case of JV with foreign member(s), the Lead Member has to be an Indian firm/company with a minimum share of 51%.

4.A.15.14.3 A member of JV shall not be permitted to participate either in individual capacity or as a member of another JV in the same tender.

4.A.15.14.4 The tender form shall be purchased and submitted only in the name of the JV and not in the name of any constituent member. The tender form can however be submitted by JV or any of its constituent member or any person authorized by JV through Power of Attorney to submit tender.

4.A.15.14.5 Earnest Money Deposit (EMD) shall be submitted by JV or authorized person of JV as mentioned in tender document

4.A.15.14.6 A copy of Memorandum of Understanding (MoU) duly executed by the JV members on a stamp paper, shall be submitted by the JV along with the tender. The complete details of the members of the JV, their share and responsibility in the JV etc. particularly with reference to financial, technical and other obligations shall be furnished in the MoU (Form No. 11 of Chapter-6).

4.A.15.14.7 Once the tender is submitted, the MoU shall not be modified / altered / terminated during the validity of the tender. In case the tenderer fails to observe/comply with this stipulation, the full Earnest Money Deposit (EMD) shall be liable to be forfeited.

4.A.15.14.8 Approval for change of constitution of JV shall be at the sole discretion of the RailTel. The constitution of the JV shall not be allowed to be modified after submission of the tender bid by the JV, except when modification becomes inevitable due to succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by JV after change of composition. However, the Lead Member shall continue to be the Lead Member of the JV. Failure to observe this requirement would render the offer invalid.

4.A.15.14.8 Similarly, after the contract is awarded, the constitution of JV shall not be allowed to be altered during the currency of contract except when modification become inevitable due to succession laws etc. and minimum eligibility criteria should not get vitiated. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract conditions.

4.A.15.14.10 On award of contract to a JV, a single Performance Guarantee shall be submitted by the JV as per tender conditions. All the Guarantees like Performance Guarantee, Bank Guarantee for Mobilization Advance, Machinery Advance etc. shall be accepted only in the name of the JV and no splitting of guarantees amongst the members of the JV shall be permitted.

4.A.15.14.11 On issue of LOA (Letter of Acceptance), the JV entity to whom the work has been awarded, with the same shareholding pattern as was declared in the MOU/JV Agreement submitted along with the tender, shall be got registered before the Registrar of the Companies under 'The Companies Act -2013' (in case of Company) or before the Registrar/Sub-Registrar under the 'The Indian Partnership Act, 1932' (in case of Partnership Firm) or under 'The LLP Act 2008' (in case of LLP). A separate PAN shall be obtained for this entity. The documents pertaining to this entity including its PAN

shall be furnished to the RailTel before signing the contract agreement for the contract. In case the tenderer fails to observe/comply with this stipulation within 60 days of issue of LOA, contract is liable to be terminated. In case contract is terminated, RailTel shall be entitled to forfeit the full amount of the Earnest Money Deposit and other dues payable to the Contractor under this contract. The entity so registered, in the registered documents, shall have, inter-alia, following Clauses:

a) Joint And Several Liability - Members of the entity to which the contract is awarded, shall be jointly and severally liable to the RailTel for execution of the project in accordance with General and Special Conditions of Contract. The members of the entity shall also be liable jointly and severally for the loss, damages caused to the RailTel during the course of execution of the contract or due to non-execution of the contract or part thereof.

b) Duration of the Registered Entity - It shall be valid during the entire currency of the contract including the period of extension, if any and the maintenance period after the work is completed.

c) Governing Laws - The Registered Entity shall in all respect be governed by and interpreted in accordance with Indian Laws.

4.A.15.14.12 Authorized Member - Joint Venture members in the JV MoU shall authorize one of the members on behalf of the Joint Venture to deal with the tender, sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/contract. All notices/correspondences with respect to the contract would be sent only to this authorized member of the JV.

4.A.15.14.13 No member of the Joint Venture shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other members and that of the RailTel in respect of the said tender/contract.

4.A.15.14.14 Documents to be enclosed by the JV along with the tender:

a) In case one or more of the members of the JV is/are partnership firm(s), following documents shall be submitted:

i) A notarized copy of the Partnership Deed,

ii) A copy of consent of all the partners or individual authorized by partnership firm, to enter into the Joint Venture Agreement on a stamp paper,

iii) A notarized or registered copy of Power of Attorney in favour of the individual to sign the MOU/JV Agreement on behalf of the partnership firm and create liability against the firm.

b) In case one or more members is/are HUF, the following documents shall be enclosed:

i) A copy of notarized affidavit on Stamp Paper declaring that he who is signing the affidavit on behalf of HUF is in the position of “Karta” of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.

c) In case one or more members of the JV is/are companies, the following documents shall be submitted:

i) A copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement,

ii) The copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company

iii) A copy of Certificate of Incorporation

iv) A copy of Authorization/copy of Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender, sign MOU/JV Agreement on behalf of the company and create liability against the company

d) All the Members of JV shall certify that they are not blacklisted or debarred by RailTel or Railways or any other Ministry / Department of the Govt. of India from participation in tenders/contract on the date of opening of bids either in their individual capacity or as a member of the JV in which they were/are members.

e) All other documents in terms of explanatory notes in clause 4.A.15.14 above.

f) Credentials & Qualifying Criteria: Technical, financial eligibility and Bid capacity of the JV shall be adjudged based on satisfactory fulfilment of the following criteria:

4.A.15.14.15 Technical Eligibility Criteria (‘a’ or ‘b’ mentioned hereunder):

1. Deleted

(b) For Contracts with composite components

(i) The technical eligibility for major component of contract as per para 4.A.14.1 above, shall be satisfied by either the ‘JV in its own name & style’ or ‘any member of JV having min 26% share’ and technical eligibility for other components of contract as per para 5.4.1 above, shall be satisfied by either the ‘JV in its own name & style’ or ‘any member of the JV’. Each other member of JV shall have technical capacity of minimum 10% of the cost of any component of contract. i.e., each JV member must have satisfactorily completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 10% of cost of any component of contract.

(Note for Clause 4.A.15.14.15:

(a) The Major component of the contract for this purpose shall be the component of contract having highest value. In cases where value of two or more component of contract is same, any one work can be classified as Major component of contract.

(b) Value of a completed contract done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the

purpose of satisfying his/her compliance to the above mentioned technical eligibility criteria in the tender under consideration).

4.A.15.14.16 Financial Eligibility Criteria

The JV shall satisfy the requirement of "Financial Eligibility" mentioned at para 4.A.14.1 above. The "financial capacity" of the lead partner of JV shall not be less than 51% of the financial eligibility criteria mentioned at para 4.A.15.14.2 above.

The arithmetic sum of individual "financial capacity" of all the members shall be taken as JV's "financial capacity" to satisfy this requirement.

(Note: Contractual payment received by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying compliance of the above mentioned financial eligibility criteria in the tender under consideration).

4.A.15.14.17 Participation of Partnership Firms in contracts:

i) The Partnership Firms participating in the tender should be legally valid under the provisions of the Indian Partnership Act.

i) The partnership firm should have been in existence or should have been formed prior to submission of tender. Partnership firm should have either been registered with the Registrar or the partnership deed should have been notarized prior to date of tender opening as per the Indian Partnership Act.

ii) Separate identity / name should be given to the partnership firm. The partnership firm should have PAN / TAN number in its own name and PAN / TAN number in the name of any of the constituent partners shall not be considered. The valid constituents of the firm shall be called partners.

iii) Once the tender has been submitted, the constitution of the firm shall not normally be allowed to be modified / altered / terminated during the validity of the tender as well as the currency of the contract except when modification becomes inevitable due to succession laws etc., in which case prior permission should be taken from RailTel and in any case the minimum eligibility criteria should not get vitiated. The re-constitution of firm in such cases should be followed by a notary certified Supplementary Deed. The approval for change of constitution of the firm, in any case, shall be at the sole discretion of the RailTel and the tenderer shall have no claims what-so-ever. Any change in the constitution of Partnership firm after opening of tender shall be with the consent of all partners and with the signatures of all partners as that in the Partnership Deed. Failure to observe this requirement shall render the offer invalid and full EMD shall be forfeited.

If any Partner/s withdraws from the firm after opening of the tender and before the award of the contract, the offer shall be REJECTED and EMD of the tenderer will be forfeited. If any new partner joins the firm after opening of tender but prior to award of contract, his / her credentials shall not qualify for consideration towards eligibility criteria either individually or in proportion to his share in the previous firm. In case the tenderer fails to inform RailTel beforehand about any such changes / modification in

the constitution which is inevitable due to succession laws etc. and the contract is awarded to such firm, then it will be considered a breach of the contract conditions liable for determination of the contract under Clause 62 of General Conditions of Contract of Indian Railways.

iv) A partner of the firm shall not be permitted to participate either in his individual capacity or as a partner of any other firm in the same tender.

v) The tender form shall be submitted only in the name of partnership firm. The EMD shall be deposited by partnership firm through e-payment gateway or as mentioned in tender document. The EMD submitted in the name of any individual partner or in the name of authorized partner(s) shall not be considered.

vi) One or more of the partners of the firm or any other person (s) shall be designated as the authorized person (s) on behalf of the firm, who will be authorized by all the partners to act on behalf of the firm through a "Power of Attorney", specially authorizing him / them to submit & sign the tender, sign the agreement, receive payment, witness measurements, sign measurement books, make correspondences, compromise / settle / relinquish any claim (s) preferred by the firm, sign "No Claim Certificate", refer all or any dispute to arbitration and to take similar such action in respect of the said tender / contract. Such "Power of Attorney" shall be notarized / registered and submitted along with the tender.

vii) On issue of Letter of Acceptance (LOA) to the partnership firm, all the guarantees like Performance Guarantee, Guarantee for various Advances to the Contractor shall be submitted only in the name of the partnership firm and no splitting of guarantees among the partners shall be acceptable.

viii) On issue of Letter of Acceptance (LOA), contract agreement with partnership firm shall be executed in the name of the firm only and not in the name of any individual partner.

ix) In case the Letter of Acceptance (LOA) is issued to a partnership firm, the following undertakings shall be furnished by all the partners through a notarized affidavit, before signing of contract agreement.

Joint and several liabilities:

The partners of the firm to which the Letter of Acceptance (LOA) is issued, shall be jointly and severally liable to the RailTel for execution of the contract in accordance with General and Special Conditions of the Contract. The partners shall also be liable jointly and severally for the loss, damages caused to the RailTel during the course of execution of the contract or due to non-execution of the contract or part thereof.

Duration of the partnership deed and partnership firm agreement:

The partnership deed/partnership firm agreement shall normally not be modified/altered/ terminated during the currency of contract and the maintenance period after the work is completed as contemplated in the conditions of the contract. Any change carried out by partners in the constitution of the firm without permission of RailTel, shall constitute a breach of the contract, liable for determination of the contract under Clause 62 of the General Conditions of Contract.

Governing laws: The partnership firm agreement shall in all respect be governed by and interpreted in accordance with the Indian laws.

No partner of the firm shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other partner/s and that of the RailTel.

x) The tenderer shall clearly specify that the tender is submitted on behalf of a partnership firm. The following documents shall be submitted by the partnership firm, with the tender:

A notarized copy of partnership deed: A notarized or registered copy of Power of Attorney in favour of the individual to tender for the work, sign the agreement etc. and create liability against the firm.

(i) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by RailTel or Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of opening of bids, either in their individual capacity or in any firm in which they were / are partners. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause 62 of the General Conditions of Contract.

(ii) All other documents in terms of explanatory notes in clause 4.A.14.1 above.

xi) Evaluation of eligibility of a partnership firm:

Technical and financial eligibility of the firm shall be adjudged based on satisfactory fulfilment of the eligibility criteria laid down in Clause 4.A.14.1 above.

4.A.15.15 Foreign Exchange & Custom Clearance

Deleted

4.A.16 System Performance Guarantee

4.A.16.1. The Bidder shall give unqualified and unconditional guarantee that when the equipment/material supplied by him is installed and commissioned at site, it shall achieve the desired objective and that in the event of performance of the system when installed not complying with the end objective or with the specifications, he shall further strengthen the system to realize the end objectives with full compliance of the specifications contained in these documents and inform RailTel. No additional payment will be made to the contractor for supply of any additional goods and service required in this regard.

4.A.16.2. This certificate in the Performa given in Chapter-6(Section-I) Form No. 2, shall accompany the final offer. Absence of this certificate which will form part of the agreement shall DISQUALIFY the bidder automatically.

4.A.16.3 The OEM has also to give unqualified and unconditional guarantee that when the Hardware/Software supplied by him is installed and commissioned at site, it shall

achieve the desired objective mentioned in the Tender document. The certificate in the Performa given in Chapter-6(Section-I) Form No. 2.

4.A.17 Evaluation of Offer

4.A.17.1 During evaluation of offer, if required RailTel may ask clarification from the bidder.

4.A.17.2 Additional features offered by the bidder, over and above the ones asked for in the tender documents, shall not be considered for evaluation of bids.

4.A.17.3 The bidder should make available the offered products, if desired during technical evaluation of offered equipment for testing and benchmarking at any testing facility approved by RailTel.

4.A.17.4 The bidders should quote for all items & the offer will be evaluated in totality (read with clause 4.A.3.2). The bidders should indicate brand name, type/model number of the products offered. Optional items (if any) will not be considered for evaluation of offers. The equipment and software should be supplied as per Technical Specifications given in Chapter-8.

4.A.17.5 Inter se position of the offers will be determined on total cost which will include basic rate, custom duty, CGST, SGST, IGST, UTGST, freight, insurance and any other charge or cost quoted by the tenderer, including GST payable, on reverse charge by RailTel.

4.A.17.6 POC/ Demonstration will be conducted for all the eligible bidders as mentioned in Annexure-III of Chapter-7.

4.A.17.6 After opening of Price Bid, Reverse Auction (RA) will be applicable as per clause 4.B.9.1.1 of tender document.

4.A.17.7 Eligible Bidders who have fulfilled the eligibility criteria as detailed in Clause 4.A.45 and are within 20% of L1 price, will be added to the list of bidders eligible for eRA.

4.A.17.8 Further after eRA, if reduced price of PMA bidder(s) is within 20% of revised L1 price received after eRA, PMA bidder(s) will be considered for award of work under PMA in terms of Clause 4.A.45 of tender document.

4.A.17.9 Deleted

4.A.17.10 All Contract management including payment will be done by the by CNOC In-charge RailTel through its concerned ED/GGM/GM.

4.A.18 Security Considerations & Security Agreement

4.A.18.1 Deleted

4.A.18.2 The directives issued from time to time by the Department of Telecommunications (DoT), Ministry of Communications and IT or any other Ministry of Govt. of India on security considerations shall be applicable to the present tender.

4.A.18.3 Deleted

4.A.18.4 In case any security breach is found in the system at any stage, the contract shall be terminated and PBG shall be forfeited and the banning/blacklisting of the bidder and the concerned OEM will be initiated.

4.A.18.5 Deleted.

4.A.18.6 Additional guidelines issued by Ministry of Finance through OM no. 6/18/2019-PPD dated 23.07.2020.

4.A.18.6.1 Relevant guidelines have been given below and in case of contradiction with any condition of this tender document, guidelines issued by Ministry of Finance vide above mentioned OM (including any addendum/corrigendum issued by MoF and any other relevant guidelines pertaining to the subject issued by GoI) shall prevail:

(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.

(ii) "Bidder" (including the term 'tendered', 'consultant', 'service provider' or 'OEM' in certain contexts) means any person or firm or company, including any member of a consortium, 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:

i) An entity incorporated, established or registered in such a country; or
ii) A subsidiary of an entity incorporated, established or registered in such a country; or
iii) An entity substantially controlled through entities incorporated, established or registered in such a country; or
iv) An entity whose beneficial owner is situated in such a country; or
v) An Indian (or other) agent of such an entity; or
vi) A natural person who is a citizen of such a country; or
vii) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

(iv) Subcontractor for the purpose of this order means:
i) An entity engaged by the bidder for execution of work or part of work; or
ii) An entity engaged by any Subcontractor for execution of work or part of work; or
iii) An entity engaged by OEM for supply of part of material used in manufacturing of supplied item under this Project.

(v) The beneficial owner for the purpose of (iii) above will be as under:

i. 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-

"Controlling ownership interest" means ownership of or entitlement to more than twenty-five percent of shares or capital or profits of the company;

"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;

ii. In case of a partnership firm, the beneficial owner is the natural persons(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:

iii. 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;

iv. 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;

v. 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.

(vi) An agent is a person employed to do any act for another, or to represent another in dealings with third person.

(vii) 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 Competent Authority i.e., DPIIT.

4.A.18.6.2 Undertaking regarding such clause need to submit in the format given below:

i. Certificate to be provided by the bidder as mentioned in Form no. 8 of Chapter-6 on their letter heads.

ii. Certificate to be provided by the OEMs as mentioned in Form no. 7 of Chapter-6 on their letter heads.

4.A.18.6.3 The said instructions will not apply to the bidders from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Govt. Of India is engaged in development projects. Updated list of countries to which line of credit have been extended or in which development projects are undertaken are given in the website of the Ministry of external affairs.

4.A.18.6.4 Any discrepancy between above mentioned clauses and guidelines issued from Public Procurement Division of Department of Expenditure under Ministry of Finance vide letter no. F. No. 6/18/2019-PPD dt. 23.07.2020, later will be applicable.

4.A.19 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 Bid Data Sheet (BDS) Chapter-5(Section-I) 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.

4.A.20 Purchaser's Right to accept any offer / Bid and to REJECT any or all offer/ Bid

4.A.20.1 The Purchaser reserves the right to ACCEPT or REJECT any offer / bid, and to annul the bidding process and REJECT all offers / bids, at any time prior to award of order without assigning any reason whatsoever and without thereby incurring any liability to the affected bidder or bidders on the grounds for the Purchaser's action.

4.A.21 Annulment of Award

Failure of the successful bidder to comply with the requirement of various clauses of tender document shall constitute sufficient ground for the annulment of the award and forfeiture of EMD in which event the Purchaser may make the award to any other bidder at the discretion of the Purchaser or call for new offers/ bids.

4.A.22 Earnest Money Deposit (EMD)/Bid Security

4.A.22.1 The tenderer (or lead bidder in case of Consortium/JV) shall furnish amount mentioned in Bid Data Sheet (BDS) Chapter 5 as Earnest Money Deposit (EMD)/Bid Security online though enivida tendering Portal only.

4.A.22.2 The EMD may be forfeited if a bidder withdraws or amends its/his tender or impairs or derogates from the tender in any respect within the period of validity of the tender or in the case of a successful bidder, if the bidder fails to accept the Purchase order/LOA or fails to furnish performance bank guarantee (security deposit) in accordance with clause 4.A.6.

4.A.22.3 Offers not accompanied with EMD shall be summarily rejected.

4.A.22.4 EMD of the unsuccessful bidder will be returned as promptly as possible but not later than 30 days after the expiry of the period of offer / bid validity prescribed by the Purchaser.

4.A.22.5 The successful bidder's EMD will be refunded upon the bidder's acceptance of the purchase order/LOA satisfactorily and furnishing the performance bank guarantee in accordance with clause 4.A.6.

4.A.22.6 Earnest Money will bear no interest.

4.A.23 For Micro and Small Enterprises (MSEs)

Being a works Tender, no exemption (for Tender fee and submission of EMD) is available for MSEs in this Tender.

4.A.24 Rate Contract--Deleted

4.A.25 Offer/ Bid Prices

4.A.25.1 The bidder shall give the prices indicating all levies and taxes, packing forwarding, freight and insurance etc. The basic unit price and all other components of the price need to be individually indicated against the goods it proposes to supply under the tender document as per schedule given in Chapter-2 (Section-I). The price shall be quoted in Indian Rupees only.

4.A.25.2 The break-up of price of each item of SOR in terms of basic Unit price, GST/CGST/IGST, Freight, Custom Duty, Forwarding, Packing, Insurance and any other Levies/charges already paid or payable by the bidder shall be quoted in the SOR Chapter-2(Section-I). Bidder has to quote all-inclusive rates (with tax break-up).

4.A.26 NIL Deviation Compliance

4.A.26.1 Bidder is required to submit the "NIL Deviation compliance undertaking" for all the terms and conditions of tender including all corrigenda shall be enclosed with the offer as per proforma given in Form no. 6 (Chapter-6, Section-I).

4.A.27 Inspection

4.A.27.1 Inspection of all the items have to be done by RailTel as under:

4.A.27.2 Pre-shipment / pre-dispatch inspection shall be carried out at manufacturer's / bidder's works by RailTel's authorized representative. At least part of the material should be offered for inspection within 30 days of issue of confirmed LOA. Traveling, lodging & boarding expenses of RailTel's representative shall be borne by RailTel but necessary facilities to carry out tests/witness inspection shall be provided by the manufacturer/ bidder, free of cost.

4.A.27.3 Along with inspection call, the Bidder/manufacturer shall submit details of test procedures, test programme, test parameters together with permitted values, etc., and their Quality Assurance Plan.

4.A.27.4 In case material fails during inspection, the fresh lot of material shall be offered without any extra cost, by the manufacturer/bidder. In such a case, total cost of re-inspection including travel, lodging & boarding of the inspecting officials shall be to manufacturer's/ bidder's account.

4.A.28 Force Majeure

4.A.28.1 If during the Agreement, the performance in whole or in part, by either party, of any obligation under this is prevented or delayed, by reason beyond the control of the parties including war, hostility, acts of the public enemy, civic commotion, sabotage, Act of State or direction from Statutory Authority, explosion, epidemic, quarantine restriction, strikes and lockouts (as are not limited to the establishments and facilities of the parties), fire, floods, earthquakes, natural calamities or any act of GOD (hereinafter referred to as EVENTS), provided notice of happenings of any such EVENT is given by the affected party to the other, within twenty one (21) days from

date of occurrence thereof, neither party shall have any such claims for damages against the other, in respect of such non-performance or delay in performance. Provided service under this Agreement shall be resumed as soon as practicable, after such EVENT comes to an end or ceases to exist.

4.A.28.2 In the event of a Force Majeure, the affected party will be excused from performance during the existence of the Force Majeure. When a Force Majeure occurs, the affected party after notifying the other party will attempt to mitigate the effect of the Force Majeure as much as possible. If such delaying cause shall continue for more than thirty (30) days from the date of the notice stated above, the party injured by the inability of the other to perform shall have the right, upon written notice of thirty (30) days to the other party, to terminate this Agreement. Neither party shall be liable for any breach, claims, damages against the other, in respect of non-performance or delay in performance as a result of Force Majeure leading to such termination.

4.A.29 Settlement of Disputes/Arbitration

(i) Any dispute or difference whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by arbitration in accordance with the 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 at New-Delhi.

(ii) All arbitration proceedings shall be conducted in English. Recourse against any arbitral award so rendered maybe entered into court having jurisdiction or application may be made to such court for the order of enforcement as the case may be.

(iii) The Arbitral Tribunal shall consist of the Sole Arbitrator appointed by CMD/RailTel Corporation of India Limited, if the value of claim is up to Rs. 10 lakhs. If the value of the claim or amount under dispute is more than Rs. 10 Lakhs, the matter shall be referred to the adjudication of arbitral council. Chairman Managing Director (CMD) of RailTel Corporation shall furnish a panel of three names to the contractor, out of which, contractor will recommend one name to be his nominee and then CMD/RailTel shall appoint one name as RailTel's nominee and these two arbitrators with mutual consent shall appoint a third arbitrator who shall act as the deciding arbitrator in terms of Arbitration and Conciliation Act. The award of the sole arbitrator or the Arbitral council, as the case may be, shall be final and binding on both the parties. Each of the parties agree that notwithstanding that the matter may be referred to Arbitrator as provided herein, 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.

4.A.30 Governing Laws

The LOA shall be interpreted in accordance with the laws of India. The courts at New Delhi shall have exclusive jurisdiction to entertain and try all matters arising out of this contract.

4.A.30.1 Indemnity by Contractors

The Contract shall indemnify and save harmless the RailTel from and against all actions, suit proceedings, losses, costs, damages, charges, claims, and demands of every nature and description brought or recovered against the RailTel by reason of any act or omission of the Contractor, his agents or employees, in the execution of the works or in his guarding of the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

4.A.31 Termination for Default

4.A.31.1 The purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default, sent to the bidder, terminate this contract in whole or in part.

a) If the bidder fails to deliver any or all of the goods within the time period(s) specified in the contract.
b) If the bidder fails to perform any other obligation(s) under the contract; and
c) If the bidder, 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.

4.A.32 Risk & Cost

If the contractor fails to deliver the equipment or honour the contractual commitment within the period fixed for such delivery in the contract, the Purchaser may terminate the LOA/contract in whole or in part, the Purchaser may proceed to purchase, upon such terms and in such manner as it deems appropriate, goods similar to those undelivered at no risk and cost to contractor. However, Performance Bank Guarantee shall be encashed. The failed bidder shall not be permitted to take part in the tender for balance work.

The Maximum Liability of bidder to any Loss/Damages to RailTel including Liquidity Damages and Performance Guarantee shall be limited to 100% of Value of contract.

4.A.33 Termination for Insolvency

The purchaser may at any time terminate the LOA by giving written notice to the bidder, without compensation to the bidder, if the bidder becomes bankrupt or otherwise insolvent as declared by the competent court provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

4.A.34 Rates During Negotiation

The purchaser may call the successful bidder for the negotiation for reducing the rates. During negotiation the bidder/s shall not increase his/their quoted rates including payment terms in case the RailTel negotiates for reduction of rates. Such negotiations shall not amount to cancellation or withdrawal of the original offer and the rates originally quoted will be binding on the bidder/s.

4.A.35 Pre-Bid Clarification Requests

It is solicited that the written queries/ clarifications may be sent to the RailTel's office latest by date as indicated in the Bid Data sheet (BDS, Chapter-5, (Section-I) through e-mail in (Excel format) as mentioned in BDS (Chapter-5). All relevant clarifications sought will be addressed during the pre-bid meeting scheduled as per BDS(Chapter-5). The clarification should be submitted in the below given format:

SN	Page No	Chapter No.	Tender Clause No.	Point number of Clause, if any	Bidders Query	Justification/Reason
1						
2						

4.A.36 Submission of Offer (Online Tendering)

4.A.36.1 All offers in the prescribed forms should be submitted before the time and date fixed for the receipt of the offers.

4.A.36.2 In case the schedule of requirement quoted by tenderer is incomplete with reference to tender document, the offer is liable to be REJECTED.

4.A.36.3 ATTESTAION OF ALTERATION: No scribbling is permissible in the tender documents. Tender containing erasures and alterations in the tender documents are liable to be REJECTED. Any correction made by the tenderer/ tenderers in his/their entries must be signed (not initialized) by him/them.

4.A.36.4 The tenderer shall submit his bid online using the e-Procurement Portal https://railtel.enivida.com/. For detailed instructions please refer to enivida Portal.

4.A.36.5 The offer shall be submitted in two packet. Both Bids, Credential Bid (Techno-Commercial Bid) & Price Bid shall be submitted online using the e-Procurement Portal https://railtel.enivida.com.The bid shall consist of following documents as mentioned in Checklist of Chapter-9.

4.A.37 Constitution of Firm and power of Attorney

4.A.37.1 Any individual(s) signing the tender or other documents connected therewith should specify whether he is signing: -

a) As sole proprietor of the concern or as attorney of the sole Proprietor.

b) As a partner or partners of the firm.

(c) As a Director, Manager or Secretary in the case of Limited Company duly authorized by a resolution passed by the Board of Directors or in pursuance of the authority conferred by Memorandum of Association.

4.A.37.2 In the case of a firm not registered under the Indian Partnership Act, all the partners or the attorney duly authorized by all of them should sign the tender and all other connected documents. The original Power of Attorney or other documents empowering the individual or individuals to sign should be furnished to the Purchaser for verification, if required.

4.A.37.3 The RailTel will not be bound by Power of Attorney granted by the bidder or by the changes in the composition of the firm made subsequent to the execution of the contract agreement.

4.A.37.4 In case where the Power of Attorney partnership deed has not been executed in English, the true and authenticated copies of the translation of the same by Advocate, authorized translators of Courts and Licensed Petition Writers should be supplied by the Contractor(s) while tendering for the work.

4.A.37.5 Power of attorney in favour of the signatory duly authorizing the signatory. Original copy is need to be submitted by the successful bidder before issuance of LOA.

4.A.38 Opening of Tender

4.A.38.1 Bidder's Credential Bid (Part-I) will be opened on specified date & time as mentioned in BDS Chapter-5(Section-I) of the tender.

4.A.38.2 After scrutinizing Credential Bid, "Price Bid (Part- II)" will be opened on a time and date to be informed separately to those bidders who qualify in "Credential Bid (Part-I)" as per qualifying criteria laid down in Clause 4.A.14of this Chapter-4 (Section-I).

4.A.38.3 Price Bid (part-II) envelopes of those bidders who are not found to meet tender conditions will not be opened.

4.A.39 Non-Transferability & Non-Refundability

The tender documents are not transferable. The cost of tender paper, if any, is not refundable.

4.A.40 Errors, Omissions & Discrepancies

The Contractor(s) shall not take any advantage of any misinterpretation of the conditions due to typing or any other error and if in doubt, shall bring it to the notice of the purchaser without delay. In case of any contradiction only the printed rules, and books should be followed and no claim for the misinterpretation shall be entertained.

4.A.41 Wrong Information by bidder

If the Bidder/s deliberately gives/give wrong information in his/their tender which creates/create circumstances for the acceptance of his/their tender, the RailTel(RCIL) reserves the right to REJECT such bidder at any stage.

4.A.42 Limitation of Liability:

Provided the following does not exclude or limit any liabilities of either party in ways not permitted by applicable law:

4.A.42.1 The Supplier shall not be liable to the Purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss

of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and

4.A.42.2 The aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Supplier to indemnify the Purchaser with respect to intellectual property rights infringement.

4.A.43 Mandatory Updation of Labour Data on Railway's Shramikkalyan Portal

4.A.43.1 Contractor is to abide by the provisions of Payment of Wages Act & act in terms of clause 54 and 55 of Indian Railways General Condition of Contract. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyam.indianrailways.gov.in'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/updation of Portal shall be done as under:

I. Contractor shall apply for onetime registration of his company/firm etc in the Shramik kalyam portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration on the portal within 7 days of receipt of such request.

II. Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all LoAs issued in his favour.

III. The contractor once registered on the portal, shall provide details of his Letter of Acceptance (LoA)/Contract Agreements on shramik kalyan portal within 15 days of issue of any LoA for approval of concerned engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.

IV. After approval of LoA, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramik kalyam portal on monthly basis.

V. It shall be mandatory upon the contractor to ensure correct and prompt uploading of all salient of engaged contractual labour& payments made thereof after each wage period.

4.A.43.2 While processing payment of any 'On Account bill' or 'Final bill' or release of 'Advances' or Performance Guarantee/Security deposit', contractor shall submit a certificate to the Engineer or Engineer's representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway's Shramik kalyam portal at 'shramikkalyam.indianrailways.gov.in' till Month Year."

4.A.44 Integrity Pact Program

RailTel has adopted Integrity Pact Program and for implementation thereof all tenders relating to procurement of OFC, quad cable, prefab shelters, electronic equipment and its installation and/or commissioning etc and other item(s) or activity/activities

proposed to be carried out or required by the Company for the value exceeding Rs. 15 crores at a time including for repair and maintenance of cable/network and any other items required for special works assigned to RailTel will be covered under the Integrity Pact Program and the Bidders are required to sign the IP document and submit the same to RailTel before or along with the bids.

1. Only those Bidders who have purchased the tender document and signed the IP document can send their grievances, if any, to the Independent External Monitors (IEMs) through the nodal officer, i.e.GM/NTP, RailTel.

   Name of IEMs and contact details:

   1. Shri. Vinit Kumar Jayaswal, E-Mail: gkvinit@gmail.com
   2. Shri. Punati Sridhar, E-mail: poonatis@gmail.com

   Name & contact details of Nodal Officer (IP) in RailTel:

   GM/NTP
   RailTel Corporation of India Ltd
   6th Floor, Office Block Tower-2,
   NBCC Complex, East Kidwai Nagar,
   New Delhi-110023
   E-Mail: himanshu@railtelindia.com

2. If the order, with total value equal to or more than the threshold value, is split to more than one Bidder and even if the value of PO placed on any/each Bidder(s) is less than the threshold value, IP document having been signed by the Bidders at bid stage itself, the Pact shall continue to be applicable.

3. Bidder of Indian origin shall submit the Integrity Pact (in 2 copies) on a non-judicial stamp paper of Rs. 100/- duly signed by the person signing the bid. If the bidder is a partnership or a consortium, the Integrity Pact shall be signed by all the partners or consortium members.

4. Bidder of foreign origin may submit the Integrity Pact on its company's letterhead, duly signed by the person signing the bid.

5. The 'Integrity Pact' shall be submitted online by all the Bidders duly signed in all pages along with the Bid. Tender received online without signed copy of the Integrity Pact document along with the technical bid documents will be liable to be REJECTED. Proforma for signing the Integrity Pact is available in Chapter-6 (Section-I) of this tender document (Form No. 5). Original copies are needed to be submitted by the successful bidder before issuance of LOA as per Clause 4.B.3, Point (b) of Chapter-4B.

6. One copy of the Integrity Pact shall be retained by RailTel and the 2nd copy will be issued to the representative of the bidders before issuance of LOA to the successful bidder. If the Bidders representative is not present during the issuance of LOA, the 2nd copy shall be sent to the bidder by post/courier.

7. The Integrity Pact is applicable in this tender vide CVC circular no. 10/05/09 dated 18.05.09 and revised guideline of CVC circular no. 015/VGL/091 dated 13.01.17 or the latest updated from time to time shall be followed.

4.A.45 Preference to Domestic Manufacturers

The provisions of the revised "Public Procurement (Preference to Make in India), Order 2017", dated 16.09.2020 (and subsequent amendments, if any, till opening of the tender) by Department of Industrial Policy and Promotion, GoI shall apply to this tender to the extent feasible. The criteria for Capability (verifiable evidence that they have manufacturing capability to manufacture the specified quantity and supply the same with in stipulated time period), Equipment and Manufacturing facilities as well as net worth under the financial standing eligibility criteria shall be applicable to local suppliers also.

Bidders seeking Purchase preference for this tender shall submit the documents/ declarations etc. as per latest DIPP guidelines and the applicable/associated latest letters if any till date of opening of the bid.

The necessary documentation for items being declared to be Local shall be as per the stipulated guidelines as laid down in above mentioned policy letters and to be signed by the Bidder's Statutory Auditor/Cost Auditor as per Form no. 9 (Chapter-6).

4.A.45.1 As per clause no. 3 (b) of the PPP-MII Order dated 16.09.2020, only bidders offering minimum 20% of local content of supply portion of their offered bid (Class-I Local suppliers/bidders - minimum 50% LC and Class-II Local Suppliers/bidders- minimum 20% LC as per PPP-MII Order) are eligible to participate in this tender. Bid of bidders offering less than 20% local content of supply portion of their offered bid will be SUMMARILY REJECTED.

As per DPIIT's OM dated 4th March 2021, services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC/CMC etc. can't be claimed as local value addition.

Calculation of Offered Local Content of Supply Items

Local Content of offered bid for multiple supply items of Schedule-A (say "X1", "X2" and "X3") by a bidder shall be calculated as per the formulae given below –

Local content = {(Sale price of "X1" - Value of imported content in "X1") + (Sale price of "X2" - Value of imported content in "X2") + (Sale price of "X3" - Value of imported content in "X3")} * 100/ (Sale price of "X1" + Sale price of "X2" + Sale price of "X3").

4.A.45.2 The margin of purchase preference shall be 20% and shall be given to 'Class-I local suppliers/bidders. 'Margin of purchase preference' means the maximum extent to which the price quoted by a Class-I local suppliers/bidders may be above the L1 (Class-II local suppliers/bidders) for the purpose of purchase preference.

4.A.45.3 Since value of procurement under this tender is more than ₹ 10 Cr, Class-I & Class-II local suppliers/bidders are required to provide a certificate (with UDIN number) from the statutory auditor or cost auditor of the company giving percentage of local content of all scheduled supply items. In the certificate, Local content shall be calculated as per the formulae given in Clause 4.A.45.1 above. Certificate as per Form no. - 9

(Chapter-6) issued by statutory auditor or cost auditor of the company on their letter head to be submitted along with the technical bid.

These undertaking/certificate shall not mention any unit price or total amount quoted by the bidder. Any mention of price or quoted amount will lead to SUMMARILY REJECTION of the bid. In case of non-submission of above-mentioned undertaking/certificate with technical bid documents, RailTel reserves the right to reject the bid.

4.A.45.4 In price bid, the bidder shall submit price Break-up of "Local Content" and "Imported Content" for each SOR item issued by statutory auditor or cost auditor of the company on their letter head (with UDIN No.) as per DPIIT's PMI Policy and its clarifications and same shall be uploaded by the bidders along with their price bid in the e-procurement portal.

4.A.45.5 If after opening of price bid, lowest bid is of Class-II local supplier/bidder the eligible (techno-commercially qualified) Class-I local supplier(s)/bidder(s) shall be granted a purchase preference of 20% i.e., where their evaluated price bid is within 20% of the evaluated lowest price bid of Class-II local supplier/bidder. Such eligible Class-I local bidders, to whom purchase preference of 20% has been granted, will be allowed to participate in eRA irrespective of the selection criteria for eRA mentioned in Clause no. 4.B.9.1.6.

However, if after opening of price bid, lowest bid is of Class-I Bidder then bidders for eRA will be selected as selection criteria mentioned in Clause no. 4.B.9.1.6. After completion of eRA process, RailTel's reserve the right to negotiate price with the eligible lowest bidder.

4.A.45.6 After completion of e-RA process as detailed in Clause 4.B.9.1.12, if L1 is a Class-I bidder then the contract will be awarded to L1. If L1 is a Class-II bidder then only those Class-I bidders, whose bids after completion of e-RA are within 20% of the Class-II L1's bid, would be allowed an opportunity to match L1's bid as detailed in Para 3A(c) of DPIIT's PMI Policy dated 16-09-2021. All the such eligible Class-I bidders shall be asked to submit their confirmation to match their price in sealed envelopes as per PMI Policy. Envelopes of the bidders shall be opened and award for the complete tender shall be made to the lowest evaluated TA/CA (Techno-Commercial Acceptable) bidder among the eligible Class-I bidders. In case the lowest eligible Class-I bidder fails to match L1 price, the offer of next eligible Class-I bidder in sealed envelope will be checked and so on. In case none of the eligible Class-I bidders matches the Class-II bidder's L1 bid, complete contract will be awarded to the Class-II bidder holding L1 price.

4.A.45.7 For the purpose of this policy, all terms used vide aforesaid policy shall be governed by the definitions specified in Para 2 of the policy document notified by DIPP vide letter No. P-45021/2/2017-B.E.-II dated 16.09.2020.

4.A.45.8 The successful bidder shall be obliged to fulfil the requirements of quality and delivery time in accordance with the provisions of the Purchase order/contract.

4.A.45.10 Sanctions

4.A.45.10.1 RailTel shall impose sanction of bidder/successful bidder for not fulfilling LC in accordance with the value mentioned in certificate of LC.

4.A.45.10.2 The sanctions may be in the form of written warning, financial penalty and blacklisting.

4.A.45.10.3 If the bidder does not fulfil the obligation after the expiration of the period specified in such warning. RailTel shall initiate action for blacklisting such bidder/successful bidder.

4.A.46 The Network for customers

The MPLS Network is being provided primarily to meet the requirements of RailTel, Government Customers, Ministry of Railways. Accordingly, the MPLS network shall take into consideration the National Security requirements and National Security aspects.

4.A.47 Proof of Concept (POC)/Demonstration

4.A.47.1 All Bidders offering their Solutions are required to conduct POC/Demonstration immediately after bid opening time (as mentioned in BDS). Bidders must ensure that make and model of Hardware & Software used in POC/Demonstration should be same as offered in their submitted bids. Please note that no deviation in terms of Make & Model offered in Tender will be permitted. In case of any deviation found in make and model in Hardware and Software offered for POC/Demonstration, bidder's bid will be technically disqualified. Details of Functional requirement are mentioned in Annexure-III of Chapter-7 (Section-I).

4.A.47.2 Before start of functional verification by RailTel or its authorized representative, bidders will install their OSS Solutions (as offered in their technical bid) at CNOC or at Demonstration Locations. Bidder will offer its installation for checking by RailTel or its authorized representative, after submission of details as per Table-1 of Annexure-III of Chapter-7. During POC stage (In case of POC), room where POC equipment's have been installed by Bidder will remain under the custody of RailTel or its authorized representative till completion of POC.

4.A.47.3 Bidder shall offer its complete solution as per list of Hardware/Software mentioned in Table-1 of Annexure-III of Chapter-7 for functional requirement by RailTel or its authorized representative at location specified by RailTel. All expenses for the POC/ Demonstration (including transportation and testing charges, if any) will be borne by the bidder.

4.A.47.4 POC/Demonstration should be completed within 45 Days from the date of opening of bid. In case, bidder fails to demonstrate all the parameters of POC/Demonstration successfully in first attempt, bidder shall demonstrate remaining parameters of POC/ Demonstration within 7 days of first attempt. Please note that maximum 2 attempts will be given to demonstrate all the functional parameters during POC/Demonstration stage as mentioned in Annexure-I of Chapter-7.

In case bidder fails either to arrange POC/Demonstration or to meet any functional requirement given in Annexure-I of Chapter-7 within given timeline, RailTel reserves

the right to REJECT their bid. Extension of POC time period will be given only in exceptional cases beyond the control of bidder.

4.A.47.5 RailTel or its authorized representative, OEM Professional Service Engineer and authorized representative of Bidder are required to jointly signed the Annexure-I of Chapter-7 for completion of POC/demonstration. In case of refusal to sign the jointly report by bidder or OEM Professional Service Engineer, copy of report signed by RailTel or its authorized representative will be sent to the bidder for information only. Final POC/Demonstration report for each bidder will be submitted to RailTel for further evaluation of Tender bids.

4.A.47.6 Deleted

4.A.47.7 Any additional Hardware/Software required for conducting POC/Demonstration shall be arranged by the bidder without any cost to the RailTel. RailTel shall provide only rack space and power supply for POC.

4.A.47.8 Financial bids will be opened for those bidders who have successfully completed the POC/Demonstration and are also eligible as per tender eligibility criteria.

4.A.48 Make in India

The bidder may set up his manufacturing unit in India to the extent possible through a subsidiary or under license or through transfer of technology to any local manufacturer permitted by the purchaser. The bidder may indicate such tie ups for manufacturing in India if an arrangement is already in place.

The provisions of the Public Procurement (Preference to Make in India) Order 2017 dated June 15, 2017 (including revision issued on and 16.09.2020 subsequent amendments issued till opening of tender, if any) by Department of Industrial Policy and Promotion, GoI shall apply to this tender to the extent feasible. The eligibility criteria as mentioned in clause 4.A.14.2 shall be applicable to local manufacturers/OEMs also.

4.A.49 Contract Agreement

On completion of the selection process, RailTel will enter into a contract agreement (Form no. 14, Chapter-6) with the selected bidder(s). The contract entered with RailTel would be operated by RailTel. The Contract Agreement shall be entered by RailTel only after submission of valid Performance Guarantee by the successful bidder. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender. In such cases the RailTel may determine that such tenderer has abandoned the contract and there upon his tender and acceptance thereof shall be treated as cancelled and the RailTel shall be entitled to forfeit the full amount of the Earnest Money Deposit and other dues payable to the Contractor under this contract. The failed Contractor shall be debarred from participating in the re-tender for that work.

The following documents would form part of the agreement between RailTel & the successful bidder: -

i. This tender document and all the issued addendum/ corrigendum.

ii. The bidder's proposal in response to this tender and clarifications made in course of evaluation, including all Appendixes and supporting documents.

iii. The implementation plan identifying the tasks to be completed, approved supply plan, the assigned responsibilities and the scheduled completion dates.

iv. Copy of Signed LOA along with the copy of the PBG document.

4.A.50 Damage to Railway/RailTel Property or Private Life and Property: The Contractor shall be responsible for all risk to the work and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway/RailTel or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway/RailTel, although all reasonable and proper precautions may have been taken by the Contractor. In case the Railway/RailTel shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of the Workmen's Compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the Contractor; the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway/RailTel may incur in reference thereto, shall be charged to the Contractor. The Railway/RailTel shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the Contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid; any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expenses shall not be called in question by the Contractor.

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SECTION-I
CHAPTER-4

B. E-TENDERING INSTRUCTIONS TO THE BIDDERS

4.B.0 INSTRUCTIONS FOR ONLINE BID SUBMISSION:

Following are the instruction for online bid submission as per the term and conditions:

The bidders are required to submit soft copies of their bids electronically on the e-tender Portal, using valid Class 3 Digital Signature Certificates. The instructions given

below are meant to assist the bidders in registering on the e-tender Portal and submitting their bid online on the e-tendering portal as per uploaded bid. Prepare their bids in accordance with the requirements and submitting their bids online on the e-tender Portal.

More information useful for submitting online bids on the e-tender Portal may be obtained at: https://RailTel.enivida.com.

4.B.1 REGISTRATION:

4.B.1.1 Bidders are required to enroll on the e-Procurement Portal (URL: https://RailTel.enivida.com) by clicking on the link "Online bidder Registration" on the e-tender Portal by paying requisite Registration fee as mentioned on the e-portal (ApproxRs.2360/-) Per vendor/per year.

4.B.1.2 As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

4.B.1.3 Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication with the bidder.

4.B.1.4 Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate(Only Class III Certificates with signing + encryption key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.

4.B.1.5 Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.

4.B.1.6 Bidder then logs in to the site through the secured log-in by entering their user ID /password and the password of the DSC /e-Token.

4.B.1.7 The scanned copies of all original documents should be uploaded in pdf format on portal https://RailTel.enivida.com.

4.B.1.8 After completion of registration payment, you need to send your acknowledgement copy on our help desk e-mail id ewizardhelpdesk@gmail.comforactivation of your account

4.B.2 SEARCHING FOR TENDER DOCUMENTS

4.B.2.1 There are various search options built in the RailTel Corporation of India Limited e-tender Portal, to facilitate bidders to search active tenders by several parameters.

4.B.2.2 Once the bidders have selected the tenders they are interested, they can pay the processing fee as mentioned on the e-portal (Including GST) (NOT REFUNDABLE) by net-banking / Debit / Credit card. After that respective contractor/Vendor may download the required documents / tender schedules, Bid documents etc. Once you pay both fee tenders will be moved to the respective 'requested' Tab. This would enable the e- tender Portal to intimate the bidders through SMS / e-mail in case there

is any corrigendum issued to the tender document.

4.B.3 PREPARATION OF BIDS

4.B.3.1 Bidder should take into account any corrigendum published on the tender document before submitting their bids.

4.B.3.2 Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid.

4.B.3.3 Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF formats. Bid Original documents may be scanned with 100 dpi with coloured option which helps in reducing size of the scanned document.

4.B.3.4 To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Documents" available to them to upload such documents.

4.B.3.5 These documents may be directly submitted from the "My Documents" area while submitting a bid and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

4.B.4 SUBMISSION OF BIDS

4.B.4.1 Bidder should log into the website well in advance for the submission of the bid so that it gets uploaded well in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to any issues.

4.B.4.2 The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document as a token of acceptance of the terms and conditions laid down by RailTel.

4.B.4.3 Bidder has to select the payment option as "Online Payment" to pay the tender fee / EMD as applicable and enter details of the instrument.

4.B.4.4 Bidder should submit the EMD online as per the instructions specified in the tender document. In case of non-submission of EMD amount (where applicable) online, the uploaded bid will be summarily rejected.

4.B.4.5 Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white Colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.

4.B.4.6 The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

4.B.4.7 All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

4.B.4.8 The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

4.B.4.9 Upon the successful and timely submission of bid click "Complete" (i.e. after Clicking "Submit" in the portal), the portal will give a successful Tender submission acknowledgement & a bid summary will be displayed with the unique id and date & time of submission of the bid with all other relevant details.

4.B.4.10 The tender summary has to be printed and kept as an acknowledgement of the submission of the tender. This acknowledgement may be used as an entry pass for any bid opening meetings.

4.B.5 ASSISTANCE TO BIDDERS:

4.B.5.1 Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

4.B.5.2 Any queries relating to the process of online bid submission or queries relating to e-tender Portal in general may be directed to the 24x7 Helpdesk Support.

4.B.5.3 Please feel free to contact RailTel E-Nivida Helpdesk (as given below) for any query related to e-tendering.

a. Helpdesk landline No: 011-49606060
b. Mr. Amrendra (9355030628)
c. Mr. Birendra Kumar (09205898228

RailTel Contact-I (for general Information)
Himanshu Kumar: GM/NTP
Telephone 0124-2714000
E-mail ID: himanshu@railtelindia.com

RailTel Contact-II (for general Information)
Deepti Chauhan: Sr. DGM/NTP
Telephone 0124-2714000
E-mail ID: deeptichauhan@railtelindia.com

4.B.6 BID RELATED INFORMATION FOR THIS TENDER

The entire bid-submission would be online on RailTel E-Nivida Portal.

Broad outline of submissions are as follows:

i. Submission of Bid Security/ Earnest Money Deposit (EMD)
ii. Submission of digitally signed copy of Tender Documents/Addenda
iii. Two Packet
iv. Online response to Terms & Conditions of Tender.
v. (Optional) Online Submission of modification, substitution bids for technical or financial parts, or withdrawal bid.

NOTE: Bidder must ensure that the bid must be successfully submitted online as per instructions of RailTel E-Nivida Portal.

4.B.7 ONLINE SUBMISSIONS:

The bidder is required to submit all the relevant documents online only with the following documents.

1. EMD submission as per details mentioned in tender notice.

2. Tender Cost submission as per details mentioned in tender notice.

3. Power of attorney to be submitted online in accordance with Clause – 34, Chapter 4 Original copy is needed to be submitted by the successful bidder before issuance of LOA.

4. In case bidder happens to be an MSE bidder, the documentary evidence for same shall be submitted on line.

4.B.8 SUBMISSION OF ELIGIBILITY CRITERIA RELATED DOCUMENTS:

Eligibility criteria related documents as applicable shall also be scanned and submitted "ONLINE"

NOTE: In case of internet related problem at a bidder's end, especially during 'critical events' such as a short period before bid-submission deadline, during online public tender opening event, during e-auction, it is the bidder's responsibility to have backup internet connections.

In case there is a problem at the e-procurement/ e-auction service provider's end (in the server, leased line, etc.) due to which all the bidders face a problem during critical events, and this is brought to the notice of RailTel by the bidders in time, then RailTel will promptly reschedule the affected event(s).

4.B.9 INSTRUCTIONS FOR TENDER DOCUMENT TO THE BIDDERS:

The RailTel Tenders are published on www.RailTelindia.com and on RAILTEL E-

NIVIDA Portal https://RailTel.enivida.com/.

NOTE: For online bid submission the bidder will have to necessarily download an official online copy of the tender documents from RAILTEL E-NIVIDA portal, and this should be done well before the deadline for bid-submission.

4.B.10 SUBMISSION OF OFFERS AND FILLING OF TENDER:

This e-tender should be duly submitted online using the e-Procurement Portal https://railtel.enivida.com/. For detailed instructions please refer to RAILTEL E-NIVIDA Portal.

4.B.11 ATTENDANCE OF REPRESENTATIVES FOR TENDER OPENING:

Representatives of bidders desirous to attend the tender opening can do so on production of a proper letter of authority from the respective firm, failing which they may not be allowed to attend the tender opening. Authorized representatives of those firms who have submitted the tender documents alone shall be allowed to attend the tender opening.

4.B.12 E- REVERSE AUCTION:

The procurement in this tender will be done on reverse auction. The procedure for the reverse auction will be as per e-Portal which is briefly summarized as under:

4.B.12.1 Bids are required to be submitted through e-portal only.

4.B.12.2 In addition to the instructions given above, the bids shall be processed through One/Two Stage Reverse Auction method, to be implemented through E-NIVIDA portal. Two packets system shall be followed for the 1st stage of reverse auction, which means that Techno-commercial bid will be opened first; and after deciding the suitability or otherwise of the technical bids, the financial bids of only those firms which are found to be suitable shall be opened. In the beginning of the subsequent years, only financial offers followed by reverse auction through e-portal shall be applied.

4.B.12.3 The financial bid of those firms whose technical bids have been found to be suitable shall be opened on or after scheduled date and time. The financial tabulation statement shall be generated immediately thereafter and can be viewed by the participating bidders by logging into e-portal account.

4.B.12.4 After opening the financial bids, the tendering department shall schedule the start of reverse auction. The tenderers who are eligible for the participation in the reverse auction process can view by logging into their e-portal account.

4.B.12.5 The lowest Initial Price Offer (L1 offer price) as submitted by the technically qualified bidders during the financial evaluation stage shall constitute the base price for starting the reverse auction. The base price shall be notified to the bidder.

4.B.12.6 Date and time of start of RA will be informed by e-portal website/RailTel Website.

4.B.12.7 Selection of vendors for RA shall be as under:

4.B.12.7.1 Deleted.

4.B.12.7.2 If the number of tenderers qualified are 3 to 6, only 3 tenderers shall be eligible for participating in RA.

4.B.12.7.3 If the number of tenderers qualified are more than 6, only 50% of tenderers shall be eligible for RA (rounded off to next higher integer).

4.B.12.7.4 The bids disallowed from participating in the RA shall be the highest bidder(s). In case the highest bidders quote the same rate, the initial price offer received last as per time log of e-portal, shall be removed first, on the principle of last in first out, by e-portal system itself.

Initial Cooling Off period shall be 2 hours.
Auto Extension Period shall be 20 minutes.
Minimum Decrement in percentage shall be 0.1% of Lowest Bid (in figures, rounded off to nearest 1000).

4.B.12.8 Once the reverse auction process is closed the lowest rate received in the reverse auction/financial offer will be evaluated. RailTel reserves the right to hold negotiation with the bidder who becomes L1 after the completion of Reverse Auction process. RailTel also reserves the right not to consider the lowest bid received in the reverse auction/financial bid process.

4.B.12.9 In case of no participation in RA process by any bidder, the base value of RA process will be considered for commercial bid assessment.

4.B.12.10 Bidders shall not be allowed to withdraw their last offer.

4.B.12.11 RailTel may discharge the tender at any stage without assigning any reason.

4.B.12.12 Bidders may please note that Bidding close Date/Time gets extended automatically every time an offer is received against the tender during a time interval equivalent to Cooling Off prior to the closing date and time. For example: If the Closing Time of RA is 13:00 Hrs and the Cooling Off period is 30 Minutes, if two offers are received between 12:30 Hrs and 13:00 Hrs, let's say at 12:40 Hrs and 12:55 Hrs, the Closing Time shall be extended by 30 Minutes from the time of submission of the last bid i.e. up to 13:25 Hrs.

Note: In case, If the number of tenderers qualified for award of contract is less than 3, RA shall be conducted between technically eligible bidders.

4.B.12.13 Minimum admissible bid value will be last bid value minus minimum decrement as specified by the tendering authority before starting of reverse auction. Starting point for reverse auction shall be lowest Initial Price Bid of the tenderer eligible for award of contract.

4.B.12.14 RA will start minimum 72 Hours after intimation by RailTel/ENIVIDA online. All the selected bidders will be receive email from RailTel/ENIVIDA. RA will start at 10 Hrs (only) (excluding Gazetted Holidays).

4.B.13 Award of Contracts

Financial Evaluation Reverse Auction (e-RA):

After the evaluation of technical proposals, the financial bids (initial price offer) of those firms whose technical bids meet eligibility criteria shall be categorized as qualified for the purpose of Reverse Auction (e-RA). These financial bids shall be opened on the scheduled date and time (as per procedure explained in the e-portal User Manual for vendors – Two Stage Reverse Auction Goods & Services Module). The e-RA procedure has been implemented through e-Portal and as per guidelines issued by Ministry of Railways Letter No. 2017/Trans/01/Policy/Pt-S Dated 28.03.2018. As per the procedure a minimum of three bids are mandatory for conduct of e-RA. In case the numbers of qualified bids are less than three, the L-1 would be decided on the initial price offer quoted by the bidder by e-portal. In case of more than three qualified bidders, the e-RA as explained in the manual mentioned above will be implemented. After the end of e-RA, L-1, L-2 and so on stand identified.

Note:
After completion of eRA, rates of L-1 bidder shall be reduced proportionately among all SOR items based on reduction achieved during eRA.

4.B.14 Addenda / Corrigenda:

Addenda / Corrigenda to the tender documents may be issued by RailTel prior to the date of opening of the tenders, to clarify or reflect modifications in the contract terms and conditions or in the design. Such addendum/corrigendum shall be available on E-NIVIDA e-Procurement Portal, RailTel website and CPP portal. Bidders who are unable or unwilling to bring their tenders to conform to the requirements of the RailTel are liable to be REJECTED.

4.B.15 Ambiguity/ Pre- Bid Clarification Requests:

If there is any ambiguity or doubt as to the meaning of any of the tender clauses/ conditions or if any additional information required, the matter should immediately be referred to the RailTel in writing through emails to RailTel Contacts defined under Para 4.B.3. The format to be used for seeking clarification is mentioned in Clause 4.A.35.

4.B.16 Compulsory Compliance Conformations by all Participating Bidders

4.B.16.1 The instructions given in the tender document are binding on the bidder and submission of the tender shall imply unconditional acceptance of all the Terms & conditions by the bidder.

4.B.16.2 Each and every page of submitted tender document including documentation shall be serially numbered & indexed. Bidders shall enclose relevant documents in their bid document to support their claims of experience/ eligibility/compliance meeting criteria mentioned under different clauses of the tender.

4.B.16.3 In case some false information is submitted by any bidder in support of experience, performance certificate, financial turnover, etc., then the bidder tender shall be REJECTED and EMD will be forfeited.

4.B.16.4 RailTel shall be sole judge in the matter of short-listing bidders at all stages of the tender and the decision of RailTel shall be final and binding on the bidders.

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SECTION-I
CHAPTER- 5
BID DATA SHEET (BDS)

The section consists of provisions that are specific to various Clauses of the tender document {Chapter-1, Chapter 3, Chapter 4(A) & Chapter-4(B), Chapter-6 of Section-I}.

Clause	Description
	Scope of Work Supply, Design, Installation, Testing, Commissioning and Integration of OSS solution at RailTel Network (IP-MPLS & DWDM).
Clause 4.A.1, Chapter-4-A, (Section-I)	Validity of offer 180 Days
Clause 4.A.2, Chapter-4-A, (Section-I)	Warranty of material from date of Provisional Acceptance Certificate (Phase-wise) up to issuance of Final Acceptance Certificate (FAC) is the responsibility of the Bidder backed up by respective OEM.
Clause 4.A.4, Chapter-4-A, (Section-I)	Delivery/Implementation Timelines Refer Clause 4.A.4 of Chapter-4
Clause 4.A.5.2.2, Chapter-4-A, (Section-I)	Billing Address: CNOC In-charge Shastri Park, 6th floor, IIIrd Block, Delhi Technological Park, Shastri park, NewDelhi-110053
Clause 4.A.6, Chapter-4-A, (Section-I)	Performance Bank Guarantee Equivalent to 10% of the total value of the LoA issued. For more details, please refer Clause 4.A.6 of Chapter-4.
Clause 4.A.14.1, Chapter-4-A, (Section-I)	Eligibility Criteria Requirements for Bidders **Point-3 - Financial Eligibility –** ₹ 1,43,70,00,000/- **For Start-ups –** ₹ 47,90,00,000 Point-4 – Technical Capability-1 1. One similar works each costing not less than the amount equal to ₹ 57,48,00,000/- 2. Two similar works each costing not less than the amount equal to ₹ 38,32,00,000/- 3. Three similar works each costing not less than the amount equal to ₹ 28,74,00,000/-.

	For Start-ups 4. One similar works each costing not less than the amount equal to ₹ 19,16,00,000/- 5. Two similar works each costing not less than the amount equal to ₹ 12,77,00,000/- 6. Three similar works each costing not less than the amount equal to ₹ 9,58,00,000/-
Clause 4.A.14.2-Point-3 , Chapter-4-A, (Section-I)	Eligibility Criteria Requirements for OEMs ₹ 33,53,00,000/-
Clause 4.A.19, Chapter-4-A, (Section-I)	Purchaser's Right to Vary Quantities (A) Up to maximum extent of +/- 50% subject to following condition i. Up to +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.
Offer Letter (Chapter-1) & Clause 4.A.22, (Section-I)	Earnest Money Deposit (EMD) – To be deposited online on RailTel ENIVIDA Portal only ₹ 50,00,000/-
Clause 4.A.35, Chapter-4-A, (Section-I)	Pre- Bid Clarification Requests (Online) Last date of Submission of Clarification Date: 21-11-2023 Online Pre-bid Conference date Date: 23-11-2023 Time: 15:30 hours Online Meeting link: Link for Online Pre- Bid Meeting will be shared by RailTel on its website at least two days before the due date of Online Pre-Bid meeting.
	The Bidder/OEM who is attending the pre-bid conference should send their Pre-bid queries and Contact number along with company details to email id's as mentioned in clause **4.B.5.1** at least two days before the due date of Online Pre-Bid meeting.
Clause 4.A.36, Chapter-4-A, (Section-I)	Last Date of Submission of Offer (Online) Date: 11-12-2023

	Time: 15:00 hours Date of Opening of Tender (Online) Date: 11-12-2023 Time: 15:30 hours
Clause 4.B.5.3, Chapter-4-B, (Section-I)	RailTel Contact-II (for general Information) Deepti Chauhan: Sr. DGM/NTP Telephone 0124-2714000 E-mail ID: deeptichauhan@railtelindia.com RailTel Contact-I (for general Information) Himanshu Kumar: GM/NTP Telephone 0124-2714000 E-mail ID: himanshu@railtelindia.com
Regional Address Chapter-1, Chapter-6,	RailTel Corporation of India Limited Corporate Office, Plate-A, 6th Floor, Office Block Tower-2, East Kidwai Nagar, New Delhi-110023

Note:

1. If the details given in BDS contradict with referred clause in the detailed tender document, the details in BDS will have overriding priority over the referred clause in the tender document.

2. In the tender document, RailTel and Indian Railways have been used at various places. It can be interchangeably used wherever required for various purposes of contract management purposes, as may be decided / intimated by the contract managing authority, i.e., RailTel.

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CHAPTER- 6 -FORM (S)/PROFORMA (S)

FORM NO. 1 - PROFORMA FOR "PERFORMANCE BANK GUARANTEE BOND (PBG)"

(On Stamp Paper of Rs one hundred)

(To be used by approved Scheduled Banks)

1. In consideration of the RailTel Corporation of India Limited, having its registered office at (as mentioned in BDS, Chapter-5) (Herein after called RailTel) having agreed to exempt ……(Hereinafter called "the said Contractor(s)") from the demand, under the terms and conditions of an Purchase Order No.……dated……made between……and…….. for (hereinafter called " the said Agreement") of security deposit for the due fulfilment 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 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.

6. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following bank details –

IFSC CODE	RATN0000100
BANK NAME	RBL BANK
BRANCH NAME	Hauz Khas Branch, New Delhi
CITY NAME	Delhi
ADDRESS	Hauz Khas Branch, New Delhi
DISTRICT	Delhi
STATE	Delhi
BG ENABLED	Yes

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

(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

FORM NO. 2 - PROFORMA FOR "SYSTEMPERFORMANCE GUARANTEE"

(On Stamp Paper of Rs. One Hundred)
(To be signed by the Bidder as well as the OEM's)

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.

E Tender No. - RailTel/Tender/OT/CO/NTP/2023-24/MPLS/007

Applicable for Bidder/OEM(s) directly participating in the tender

Dear Sir,

I / We ……. hereby guarantee that the design on the basis of which we have submitted our tender no. …… has been carefully made to conform to the end objectives in the tender documents and to technical specification therein. We further guarantee that in the event of the performance of the system, when installed, not complying with the end objectives or with the specifications contained in the tender documents, we shall provide further inputs to enable the RailTel to realize the end objectives contained in these documents without any additional payment for any additional equipment which may be required in this regard. We further guarantee that all the expenses for providing the additional inputs under the System Guarantee will be borne by us. We further guarantee that these additional inputs will be provided by us to make the system workable within 1 month from the date on which this guarantee is invoked by the Purchaser. The guarantee is valid for a period of one year from the date of commissioning of the system.

(Signature of Firm's Authorized Officer)

Seal

Signature of witness:

i. ……

ii. …….

Or

Applicable for OEM(s)

I / We ……. hereby guarantee that the design on the basis of which we have submitted our tender no. …… has been carefully made to conform to the end objectives in the tender documents and to technical specification therein related to OEM's scope. We

further guarantee that in the event of the performance of the system, when installed, not complying with the end objectives or with the specifications contained in the tender documents as per OEM's scope, we shall provide further inputs to enable the RailTel to realize the end objectives contained in these documents without any additional payment for any additional equipment which may be required in this regard. We further guarantee that all the expenses for providing the additional inputs under the System Guarantee will be borne by us. We further guarantee that these additional inputs will be provided by us to make the system workable within 1 month from the date on which this guarantee is invoked by the Purchaser. The guarantee is valid for a period of one year from the date of commissioning of the system.

(Signature of OEM's Authorized Officer)

Seal

Signature of witness:

iii. ……

iv. …….

FORM NO. 3 - PROFORMA FOR "LONG TERM MAINTENANCE SUPPORT"
(To be signed by the Bidder as well as the OEM's)

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.

E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/MPLS/007

Applicable for Bidder/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 4.A.3 of Chapter-4(Section-I),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 for Authorized Distributor/Partner of OEM

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 4.A.3 of Chapter-4(Section-I) 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/partner 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 Firm's Authorized Officer)

Seal

Signature of witness:

v. ……

vi. …….

Note: Please Strike out whichever is not applicable.

FORM NO. 4 -PROFORMA FOR AFFIDAVIT TO BE UPLOADED BY TENDERER ALONG WITH THE TENDER DOCUMENTS

(To be signed by the Bidder)

(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 (-------RailTel Region), do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

a) I/We the tenderer (s), am/are signing this document after carefully reading the contents.

b) I/we the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.

c) 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.

d) 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.

e) I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.

f) I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents submitted by us.

g) 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 in RailTel. Further, I/we (insert name of the tenderer) ** _____ and all my/our constituents understand that my/our offer shall be Summarily REJECTED.

~~h)~~ I/we also understand that if the certificates submitted by us or by OEM's of the offered Hardware/Software 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, along with forfeiture of SD and Performance Guarantee besides any other action provided in the contract including banning of business for five year on entire RailTel.

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.

FORM NO. 5 - PROFORMA FOR "SIGNING THE INTEGRITY PACT"
(To be signed by the Bidder)

RailTel Corporation of India Limited, hereinafter referred to as "The Principal".

AND

……., hereinafter referred to as "The Bidder/ Contractor"

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for ……The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and /or Contractor(s).

In order to achieve these goals, the Principal will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b. The Principal will during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2- Commitments of the Bidder(s) / Contractor(s)

1. The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

- The Bidder(s)/contractor(s) will not, directly or through any other persons or firm, offer promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage during tender process or during the execution of the contract.

- The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices,

specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

• The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s) /Contractors will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

• The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the bidder(s)/contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers' as annexed and marked as Annexure A.

• The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3: Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings". Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annex-"B".

Section 4: Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to be terminated the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti-corruption approach or with any other public sector enterprise in India that could justify his exclusion from the tender process.

2. If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process for action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6: Equal treatment of all Bidders / Contractors/Subcontractors.

1. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

2. The Principal will enter into agreements with identical conditions as this one with all bidders, contractors and subcontractors.

3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7: Criminal charges against violation by Bidder(s) / Contractor(s) / Sub contractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or ofan employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8: Independent External Monitor / Monitors

1. The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, RailTel.

3. The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s)/Subcontractor(s) with confidentiality.

4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

6. The Monitor will submit a written report to the CMD, RailTel within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

7. Monitor shall be entitled to compensation on the same terms as being extended to provided to Independent Directors on the RailTel Board.

8. If the Monitor has reported to the CMD, RailTel, a substantiated suspicion of an offence under relevant IPC/PC Act, and the CMD, RailTel has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

9. The word 'Monitor' would include both singular and plural.

Section 9: Pact Duration

This pact begins when both parties have legally signed it. It expires for the Contractor 10 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made / lodged by either party during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by CMD of RailTel.

Section 10: Other Provisions

1. This agreement is subject to Indian Law, Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi.

2. Changes and supplements as well as termination notices need to be made in writing.

3. If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(For & on behalf of the Principal)
(Office Seal)

(For & On behalf of Bidder/Contractor)
(Office Seal)

Place ——————————

Date ——————————
Witness 1:
Annexure-A of INTEGRITY PACT

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

1.0 There shall be compulsory registration of agents for all global (Open) Tender and Limited Tender. An agent who is not registered with RailTel Units shall apply for registration in the prescribed Application-Form.

1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/ Original certificate of the principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/retainer-ship being paid by the principal to the agent before the placement of order by RailTel.

1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.

2.0 DISCLOSURE OF PARTICULARS OF AGENTS/ REPRESENTATIVES IN INDIA, IF ANY.

2.1 Tenderers of Foreign nationality shall furnish the following details in their offer:

2.1.1 The name and address of the agents/representatives in India, if any and the extent of authorization and authority given to commit the Principals. In case the agent/representative be a foreign Company, it shall be confirmed whether it is real substantial Company and details of the same shall be furnished.

2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/representatives in India.

2.1.3 Confirmation of the Tenderer that the commission/ remuneration if any, payable to his agents/ representatives in India, may be paid by RAILTEL in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:

2.2.1 The name and address of the foreign principals indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/representatives.

2.2.2 The amount of commission /remuneration included in the price(s) quoted by the tenderer for himself.

2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by RAILTEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.

2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.

2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to REJECTION or in the event of a contract materializing, the same liable to termination by RAILTEL. Besides this there would be a penalty of banning business dealings with RAILTEL or damage or payment of a named sum.

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Annexure-B of INTEGRITY PACT

GUIDELINES ON BANNING OF BUSINESS DEALINGS

CONTENTS

1. Introduction

1.1 RailTel Corporation of India Ltd (RAILTEL), being a Public Sector Enterprise, under the administrative control of the Ministry of Railways and therefore being an authority deemed to be 'the state' within the meaning of Article 12 of Constitution of India, has to ensure preservation of rights enshrined in Chapter III of the Constitution. RAILTEL has also to safeguard its commercial interests. RAILTEL deals with Agencies, who have a very high degree of integrity, commitments and sincerity towards the work undertaken. It is not in the interest of RAILTEL to deal with Agencies who commit deception, fraud or other misconduct in the execution of contracts awarded / orders issued to them. In order to ensure compliance with the constitutional mandate, it is incumbent on RAILTEL to observe principles of natural justice before banning the business dealings with any Agency.

1.2 Since banning of business dealings involves civil consequences for an Agency concerned, it is incumbent that adequate opportunity of hearing is provided and the explanation, if tendered, is considered before passing any order in this regard keeping in view the facts and circumstances of the case.

2. Scope

2.1 The General Conditions of Contract (GCC) of RAILTEL generally provide that RAILTEL reserves its rights to remove from list of approved suppliers/ contractors or

to ban business dealings if any Agency has been found to have committed misconduct and also to suspend business dealings pending investigation. If such provision does not exist in any GCC, the same may be incorporated.

2.2 Similarly, in case of sale of material there is a clause to deal with the Agencies/ customers/ buyers, who indulge in lifting of material in unauthorized manner. If such a stipulation does not exist in any Sale Order, the same may be incorporated.

2.3 However, absence of such a clause does not in any way restrict the right of Company (RAILTEL) to take action / decision under these guidelines in appropriate cases.

2.4 The procedure of (i) Removal of Agency from the List of approved suppliers/ contractors; (ii) Suspension and (iii) Banning of Business Dealing with Agencies, has been laid down in these guidelines.

2.5 These guidelines apply to Corporate Office, all Regions and Subsidiaries of RAILTEL.

2.6 It is clarified that these guidelines do not deal with the decision of the Management to avoid entertaining any particular Agency due to its poor / inadequate performance or for any other reason.

2.7 The banning shall be with prospective effect, i.e., future business dealings.

3. Definitions

In these Guidelines, unless the context otherwise requires:

i) 'Party / Contractor / Supplier / Purchaser / Customer' shall mean and include a public limited company or a private limited company, a firm whether registered or not, an individual, a cooperative society or an association or a group of persons engaged in any commerce, trade, industry, etc. 'Party / Contractor / Supplier / Purchaser / Customer' in the context of these guidelines is indicated as 'Agency'.

ii) 'Inter-connected Agency' shall mean two or more companies having any of the following features:

a) If one is a subsidiary of the other;

b) If the Director(s), Partner(s), Manager(s) or Representative(s) are common;

c) If management is common;

d) If one owns or controls the other in any manner;

iii) 'Competent Authority' and 'Appellate Authority' shall mean the following:

a) For Company (entire RAILTEL) wide Banning: The Director shall be the 'Competent Authority' for the purpose of these guidelines. CMD, RAILTEL shall be the 'Appellate Authority' in respect of such cases except banning of business dealings with Foreign Suppliers of imported items.

b) For banning of business dealings with Foreign Suppliers of imported items, RAILTEL Directors Committee (RDC) shall be the 'Competent Authority'. The Appeal against the Order passed by RDC, shall lie with CMD, as First Appellate Authority.

c) In case the foreign supplier is not satisfied by the decision of the First Appellate Authority, it may approach Railway Board as Second Appellate Authority.

d) For RailTel Regions only: Any officer not below the rank of General Manager appointed or nominated by the Executive Director of concerned Region shall be the 'Competent Authority' for the purpose of these guidelines. The Executive Director of the concerned Region shall be the 'Appellate Authority' in all such cases.

e) For Corporate Office only: For procurement of items / award of contracts, to meet the requirement of Corporate Office only, Concerned Group General Manager / General Manager shall be the 'Competent Authority' and concerned Director shall be the 'Appellate Authority'.

f) CMD, RAILTEL shall have overall power to take suo-moto action on any information available or received by him and pass such order(s) as he may think appropriate, including modifying the order(s) passed by any authority under these guidelines.

iv) 'Investigating Department' shall mean any Department or Unit investigating into the conduct of the Agency and shall include the Vigilance Department, Central Bureau of Investigation, the State Police or any other department set up by the Central or State Government having powers to investigate.

v) 'List of approved Agencies - Parties / Contractors / Suppliers/ Purchaser/ Customers' shall mean and include list of approved /registered Agencies - Parties/ Contractors / Suppliers / Purchasers / Customers, etc.

(i) Initiation of Banning / Suspension

Action for banning / suspension of business dealings with any Agency should be initiated by the department having business dealings with them after noticing the irregularities or misconduct on their part. Besides the concerned department, Vigilance Department of each Region / Unit/ Corporate Office may also be competent to initiate such action.

(ii) Suspension of Business Dealings

5.1 If the conduct of any Agency dealing with RAILTEL is under investigation by any department (except Foreign Suppliers of imported items), the Competent Authority may consider whether the allegations under investigation are of a serious nature and whether pending investigation, it would be advisable to continue business dealing with the Agency. If the Competent Authority, after consideration of the matter including the recommendation of the Investigating Department, if any, decides that it would not be in the interest to continue business dealings pending investigation, it may suspend business dealings with the Agency. The order to this effect may indicate a brief of the charges under investigation. If it is decided that inter-connected Agencies would also come within the ambit of the order of suspension, the same should be specifically stated in the order. The order of suspension would operate for a period not more than six months and may be communicated to the Agency as also to Investigating Department.

The Investigating Department may ensure that their investigation is completed and whole process of final order is over within such period.

5.2 The order of suspension shall be communicated to all the departmental heads within the unit/ region/ Corporate Office as the case may be. During the period of suspension, no business dealing may be held with the agency.

5.3 As far as possible, the existing contract(s) with the Agency may continue unless the Competent Authority, having regard to the circumstances of the case, decides otherwise.

5.4 If the gravity of the misconduct under investigation is very serious and it would not be in the interest of RAILTEL, as a whole, to deal with such an Agency pending investigation, the Competent Authority may send his recommendation to Chief Vigilance Officer (CVO), RAILTEL Corporate Office alongwith the material available. If Corporate Office considers that depending upon the gravity of the misconduct, it would not be desirable for all the units/ regions of RAILTEL to have any dealings with the Agency concerned, an order suspending business dealings may be issued to all the units/ Regions / Corporate Office by the Competent Authority of the Corporate Office, copy of which may be endorsed to the Agency and all concerned. Such an order would operate for a period of six months from the date of issue.

5.5 For suspension of business dealings with Foreign Suppliers of imported items, following shall be the procedure:

i) Suspension of the foreign suppliers shall apply throughout the Company/ Regions including Subsidiaries.

ii) Based on the complaint forwarded by ED / GGM / GM or received directly by Corporate Vigilance, if gravity of the misconduct under investigation is found serious and it is felt that it would not be in the interest of RAILTEL to continue to deal with such agency, pending investigation, Corporate Vigilance may send such recommendation on the matter to Executive Director / GGM / GM, to place it before a Committee consisting of the following:

1. ED / GGM/ GM (viz. Representative of Corporate Finance).
2. ED / GGM/ GM (viz. Representative of Department concerned with procurement of imported items)- Convener of the Committee.
3. ED / GGM/ GM (to be nominated on case to case basis).
4. ED / GGM/ GM ((viz. Representative of Corporate Law).

The committee shall expeditiously examine the report and give its comments / recommendations within twenty one days of receipt of the reference by ED/ GGM/ GM.

iii) The comments / recommendations of the Committee shall then be placed by ED/GGM/GM, before RAILTEL Directors' Committee (RDC) constituted for import of items. If RDC opines that it is a fit case for suspension, RDC may pass necessary orders which shall be communicated to the foreign supplier by the ED/GGM/GM.

5.6 If the Agency concerned asks for detailed reasons of suspension, the Agency may be informed that its conduct is under investigation. It is not necessary to enter into correspondence or argument with the Agency at this stage.

5.7 It is not necessary to give any show-cause notice or personal hearing to the Agency before issuing the order of suspension. However, if investigations are not complete in six months time, the Competent Authority may extend the period of suspension by another three months, during which period the investigations must be completed.

6. Ground on which Banning of Business Dealings can be initiated

6.1 If the security consideration, including questions of loyalty of the Agency to the State, so warrants;

6.2 If the Director / Owner of the Agency, proprietor or partner of the firm, is convicted by a Court of Law for offences involving moral turpitude in relation to its business dealings with the Government or any other public sector enterprises or RAILTEL, during the last five years;

6.3 If there is strong justification for believing that the Directors, Proprietors, Partners, owner of the Agency have been guilty of malpractices such as bribery, corruption, fraud, substitution of tenders, interpolations, etc;

6.4 If the Agency continuously refuses to return / refund the dues of RAILTEL without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or Court of Law;

6.5 If the Agency employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offence;

6.6 If business dealings with the Agency have been banned by the Govt. or any other public sector enterprise;

6.7 If the Agency has resorted to Corrupt, fraudulent practices including misrepresentation of facts;

6.8 If the Agency uses intimidation/ threatening or brings undue outside pressure on the Company (RAILTEL) or its official in acceptance/ performances of the job under the contract;

6.9 If the Agency indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;

6.10 Willful indulgence by the Agency in supplying sub-standard material irrespective of whether pre-dispatch inspection was carried out by Company (RAILTEL) or not;

6.11 Based on the findings of title investigation report of CBI / Police against the Agency for malafide/ unlawful acts or improper conduct on his part in matters relating to the Company (RAILTEL) or even otherwise;

6.12 Established litigant nature of the Agency to derive undue benefit;

6.13 Continued poor performance of the Agency in several contracts;

6.14 If the Agency misuses the premises or facilities of the Company (RAILTEL), forcefully occupies tampers or damages the Company's properties including land, water resources, etc.

(Note: The examples given above are only illustrative and not exhaustive. The Competent Authority may decide to ban business dealing for any good and sufficient reason).

7. Banning of Business Dealings

7.1 Normally, a decision to ban business dealings with any Agency should apply throughout the Company including subsidiaries. However, the Competent Authority of the Region/ Unit except Corporate Office can impose such ban Region-wise only if in the particular case banning of business dealings by respective Region/ Unit will serve the purpose and achieve its objective and banning throughout the Company is not required in view of the local conditions and impact of the misconduct/ default to beyond the Region/ Unit. Any ban imposed by Corporate Office shall be applicable across all Regions/ Units of the Company including Subsidiaries.

7.2 For Company-wide banning, the proposal should be sent by ED of the Region/ Unit to the CVO/RailTel setting out the facts of the case and the justification of the action proposed along with all the relevant papers and documents except for banging of business dealings with Foreign Suppliers of imported items.

The Corporate Vigilance shall process the proposal of the concerned Region/ Unit for a prima-facie view in the matter by the Competent Authority nominated for Company-wide banning.

The CVO shall get feedback about that agency from all other Regions/ Units. Based on this feedback, a prima-facie decision for banning / or otherwise shall be taken by the Competent Authority.

If the prima-facie decision for Company-wide banning has been taken, the Corporate Vigilance shall issue a show-cause notice to the agency conveying why it should not be banned throughout RAILTEL.

After considering the reply of the Agency and other circumstances and facts of the case, a final decision for Company-wide banning shall be taken by the competent Authority.

7.3 There will be a Standing Committee in each Region/ Unit to be appointed by Chief Executive Officer for processing the cases of "Banning of Business Dealings" except for banning of business dealings with foreign suppliers. However, for procurement of items/ award of contracts, to meet the requirement of Corporate Office only, the committee shall be consisting of General Manager/ Dy. General Manager each from Operations, Finance, Law & Project. Member from Project shall be the convener of the committee. The functions of the committee shall, inter-alia include:

(i) To study the report of the investigating Agency and decide if a prima-facie case for Company-wide / Region wise banning exists, if not, send back the case to the Competent Authority.

(ii) To recommend for issue of show-cause notice to the Agency by the concerned department.

(iii) To examine the reply to show-cause notice and call the Agency for personal hearing, if required.

(iv) To submit final recommendation to the Competent Authority for banning or otherwise.

7.4 If the Competent Authority is prima-facie of view that action for banning business dealings with the Agency is called for, a show- cause notice may be issued to the Agency and an enquiry held accordingly.

7.5 Procedure for Banning of Business Dealings with Foreign Suppliers of imported items.

i) Banning of the agencies, shall apply throughout the Company including subsidiaries.

ii) Based on the complaint forwarded by Executive Director or received directly by Corporate Vigilance, an investigation shall be carried out by Corporate Vigilance. After investigation, depending upon the gravity of the misconduct, Corporate Vigilance may send their report to Executive Director/ GGM/ GM, to be placed before a Committee consisting of the following:

1. ED / GGM/ GM (viz. Representative of Corporate Finance).

2. ED / GGM/ GM (viz. Representative of Department concerned with procurement of imported items)- Convener of the Committee.

3. ED / GGM/ GM (to be nominated on case to case basis).

4. ED / GGM/ GM ((viz. Representative of Corporate Law).

The Committee shall examine the report and give its comments/ recommendations within 21 days of receipt of the reference by ED.

iii) The comments/recommendations of the Committee shall be placed by ED/ GGM/ GM before RAILTEL Directors' Committee (RDC) constituted for import of foreign items. If RDC opines that it is a fit case for initiating banning action, it will direct ED/ GGM/ GM to issue show-cause notice to the agency for replying within a reasonable period.

iv) On receipt of the reply or on expiry of the stipulated period, the case shall be submitted by ED to RDC for consideration & decision.

v) The decision of the RDC shall be communicated to the agency by ED/GGM/GM concerned.

8. Removal from List of Approved Agencies –Suppliers/ Contractors, etc.

8.1 If the Competent Authority decides that the charge against the Agency is of a minor nature, it may issue a show-cause notice as to why the name of the Agency should not be removed from the list of approved Agencies - Suppliers / Contractors, etc.

8.2 The effect of such an order would be that the Agency would not be disqualified from competing in Open Tender Enquiries but LTE (Limited Tender Enquiry) may not be given to the Agency concerned.

8.3 Past performance of the Agency may be taken into account while processing for approval of the Competent Authority for awarding the contract.

9. Show-cause Notice

9.1 In case where the Competent Authority decides that action against an Agency is called for, a show-cause notice has to be issued to the Agency. Statement containing the imputation of misconduct or misbehavior may be appended to the show-cause notice and the Agency should be asked to submit within 15 days a written statement in its defence.

9.2 If the Agency requests for inspection of any relevant document in possession of RAILTEL, necessary facility for inspection of documents may he provided.

9.3 The Competent Authority may consider and pass all appropriate speaking order:

a) Forex one rating the Agency if the charges are not established.

b) For removing the Agency from the list of approved Suppliers/ Contactors, etc.

c) For banning the business dealing with the Agency.

9.4 If it decides to ban business dealings, the period for which the ban would be operative may be mentioned. The order may also mention that the ban would extend to the interconnected Agencies of the Agency.

10. Appeal against the Decision of the Competent Authority

10.1 The agency may file an appeal against the order of the Competent Authority banning business dealing, etc. The appeal shall lie to Appellate Authority. Such an appeal shall be preferred within one month from the date of receipt of the order banning business dealing, etc.

10.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority.

A. Review of the Decision by the Competent Authority

Any petition / application filed by the Agency concerning the review of the banning order passed originally by Chief Executive / Competent Authority under the existing guidelines either before or after filing of appeal before the Appellate Authority or after disposal of appeal by the Appellate Authority, the review petition can be decided by the Chief Executive / Competent Authority upon disclosure of new facts / circumstances or subsequent development necessitating such review. The Competent

Authority may refer the same petition to the Standing Committee for examination and recommendation.

B. Circulation of the names of Agencies with whom Business Dealings have been banned

12.1 Depending upon the gravity of misconduct established, the Competent Authority of the Corporate Office may circulate the names of Agency with whom business dealings have been banned, to the Government Departments, other Public Sector Enterprises, etc. for such action as they deem appropriate.

12.2 If Government Departments or a Public Sector Enterprise requests for more information about the Agency with whom business dealings have been banned, a copy of the report of the Inquiring authority together with a copy of the order of the Competent Authority / Appellate Authority may be supplied.

12.3 If business dealings with any Agency have been banned by the Central or State Government or any other Public Sector Enterprise, RAILTEL may, without any further enquiry or investigation, issue an order banning business dealing with the Agency and its interconnected Agencies.

12.4 Based on the above, Regions / Units may formulate their own procedure for implementation of the guidelines.

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FORM NO. 6 - PROFORMA FOR "NIL DEVIATION COMPLIANCE UNDERTAKING"
(To be signed by the Bidder)

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.

E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/MPLS/007

Sub: NIL Deviation Compliance

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

5 All proposed in scope supplies are compliant to the technical specifications of the equipment as mentioned in the Chapter-3 & 8 of Tender document.

6 We hereby certify that the hardware and software mentioned in our technical solution and Bill of Material (BOM) are complete.

7 We confirm that there is no requirement of any other hardware and software to fulfill requirements as per scope against the Tender. If any additional hardware and software is required to meet in scope requirements, then it would be procured by us at no extra cost to RailTel.

8 We will also ensure our unconditional compliance of all the terms and conditions as mentioned in the Tender document including all corrigenda and TEC specifications.

9 List of deviations (Partial Compliance and Non-compliance) from terms and conditions as mentioned in the Tender document including all corrigenda and TEC specifications, 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)

FORM NO. 7 – OEM'S UNDERTAKING ON LETTER HEAD FOR MAF, PROVEN FACILITY, BLACKLISTING, MALICIOUS CODE, IPR & RESTRICTION ON COMPANIES FROM LAND BORDER SHARING COUNTRIES WITH INDIA
(To be signed by the OEM)

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.
Tender Reference No.

Sub: OEM Undertaking

Dear Sir,

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

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

   We hereby authorize M/s …….. (OEM Name), Office ……. to participate in bid and subsequently upon award of the bid to execute the supply and Installation & Commissioning of our range of products against your above said bid.

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

2. I/We undertake/Certify that

   "I/We have proven facilities at ..…….. (Complete Address along with Pin Code) for Engineering, manufacture, assembly, integration, testing and basic facilities with respect to space, Engineering, Personnel, Test equipment, Manufacture, Training, Logistic 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, we have training, repair and service center facilities in India at ……(Complete Address along with Pin Code) also."

3. I/We have not been black-listed or debarred currently by Central Govt./State Govt./CPSU in India or anywhere globally by Government for security reasons either in Individual capacity or as a member of partnership firm/LLP/JV/Society/Trust.

4. I/We Certify that,

1. All proposed hardware and software components in scope of supplies when shipped by _____, does not contain embedded malicious code that would activate procedures to:-

a. Inhibit the desired and designed function of the equipment.
b. Cause physical damage to the user or equipment during the exploitation.
c. Tap information resident or transient in the equipment/networks.

2. I/We, _____ will be considered to be in breach in case physical damage or malfunctioning is caused due to activation of any such malicious code in embedded software and thus be liable to repair, replace or refund the price of the infected software if reported (or, upon request, return) to the party supplying the software to Customer, if different than _____

3. Security breach or damages to system, if any, so caused by any embedded malicious code or otherwise, due to the act of either OEM or bidder or both, the OEM as well as the bidder would be considered liable jointly or severally and shall be banned for conducting any business with RailTel. Also the present contract, may liable to be terminated by the purchaser.

5. I/We have read the clause regarding restrictions on procurement from a OEMs of a country which shares a land border with India; I certify that I/We is/are not from such a country or, if from such a country, has been registered with the Competent Authority, I/We hereby certify that I/We fulfils all requirements in this regard and is eligible to be considered.

6. I/We have offered Hardware and Software having End of Life (EOL) more than 10 years and End of Sale (EOS) more than 4 years from the date of opening of this Tender.

Place:
Date: Seal and signature of the authorized representative of OEM
Name and Designation of the authorized representative of OEM

FORM NO. 8 – BIDDER'S UNDERTAKING ON LETTER HEAD FOR BLACKLISTING, MALICIOUS CODE, SITE INSPECTION & RESTRICTION ON COMPANIES ON LAND BORDER SHARING COUNTRIES WITH INDIA.
(To be signed by the Bidder)

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.

E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/MPLS/007

Sub: Bidder Undertaking

Dear Sir,

I / We …….hereby certify that

(i) I/We have not been black-listed or debarred currently by Central Govt./State Govt./CPSU in India or anywhere globally by Government for security reasons either in Individual capacity or as a member of partnership firm/LLP/JV/Society/Trust.

(ii) All the Hardware and Software, offered in our bid documents, are as per Technical specifications mentioned in Chapter-8 of the above referred tender document.

(iii) I/We Certify that,

i. All proposed hardware and software components in scope of supplies when shipped by _____, does not contain embedded malicious code that would activate procedures to:-

a. Inhibit the desired and designed function of the equipment.
b. Cause physical damage to the user or equipment during the exploitation.
c. Tap information resident or transient in the equipment/networks.

ii. I/We, _____ will be considered to be in breach in case physical damage or malfunctioning is caused due to activation of any such malicious code in embedded software and thus be liable to repair, replace or refund the price of the infected software if reported (or, upon request, return) to the party supplying the software to Customer, if different than _____

iii. Security breach or damages to system, if any, so caused by any embedded malicious code or otherwise, due to the act of either OEM or bidder or both, the OEM as well as the bidder would be considered liable jointly or severally and shall be banned for conducting any business with RailTel. Also the present contract, may liable to be terminated by the purchaser.

(iv) Before submitting a tender, I/We deemed to have satisfied myself by actual inspection of the sites and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates enters in the tender forms are adequate and all inclusive.

(v) I/We 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/We certify that I/We is/are not from such a country or, if from such a country, has 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/We fulfils all requirements in this regard and is eligible to be considered.

(vi) I/We certify that all the licenses of Firmware and Software of the offered MPLS solution under this Tender would be registered in favor of M/s RCIL.

Seal and signature of the authorized representative of Bidder

Name and Designation of the authorized representative of Bidder

Place:
Date:

FORM NO. 9 -CERTIFICATE FROM BIDDER'S COST/STATUTORY AUDITOR

To

RailTel Corporation of India Limited,
CO Office, East Kidwai Nagar,
New Delhi-110023.

E-Tender No. RailTel/Tender/OT/CO/NTP/2023-24/MPLS/007

Sub: Calculation of Local Content of Supply Items as per formulae given in Tender Clause no. 4.A.45.1

1. I/We_____ the statutory auditor/cost auditor of M/s.__ (name of the bidder) hereby certify that M/s_____ (name of bidder) are offering_____% Local Content against the supply item of the Project Work under this tender in accordance with DPIIT's PMI Policy & it's clarifications/guidelines vide offer No._____ dated___ against RAILTEL tender No._____.

2. I/We certify that Local Content Calculation for Supply items in the offered bid has been done as per the formulae given in Tender Clause no. 4.A.45.1.

To be signed by Authorized signature of Bidder's Statutory Auditor/Cost Auditor
Name and Designation of the authorized representative of Bidder's Statutory Auditor/Cost Auditor

UDIN No. -

FORM NO. -10 –ANNEXUREAFFIDAVIT BY EACH CONSORTIUM/JV MEMBER (ON STAMP PAPER)

(To be given separately by each Consortium/Joint Venture member of the Bidder on Stamp Paper of appropriate value)

I, _ S/o , Resident of _ ,
, the [insert designation] of the [insert name of single bidder / Consortium/Joint Venture member if Consortium/Joint Venture] do solemnly affirm and state as follows:

A. I say that I am the authorized signatory of [insert name of company/Consortium/Joint Venture member] (hereinafter referred to as "Bidder/Consortium/Joint Venture Member") and I am duly authorized by the Board of Directors of the Bidder/Consortium/Joint Venture Member to swear and depose this Affidavit on behalf of the Bidder/Consortium/Joint Venture Member.

B. I say that I have submitted information with respect to our eligibility for RailTel Corporation of India Ltd. (hereinafter referred to as "RCIL") (NAME OF WORK) (hereinafter referred to as 'Project') Tender document and I further state that all the said information submitted by us is accurate, true and correct and is based on our records available with us.

C. I say that, we hereby also authorize and request any bank, authority, person or firm to furnish any information, which may be requested by RCIL to verify our credentials / information provided by us under this tender and as may be deemed necessary by RCIL.

D. I say that if at any point of time including the extension period, in case RCIL requests any further/additional information regarding our financial and/or technical capabilities, or any other relevant information, we shall promptly and immediately make available such information accurately and correctly to the satisfaction of RCIL.

E. I say that, we fully acknowledge and understand that furnishing of any false or misleading information by us in our Tender shall entitle us to be disqualified from the tendering process for the said Project. The costs and risks for such disqualification shall be entirely borne by us.

F. I state that all the terms and conditions of the Tender document has been duly complied with.

DEPONENT

VERIFICATION

I, the above-named deponent, do very that the contents of paragraphs 1 to 6 of this affidavit are true and correct to my own knowledge. No part of it is false and nothing material has been concealed. Verified at , on this day of .

DEPONENT

FORM NO. -11 - JOINT VENTURE AGREEMENT/MEMORANDUM OF AGREEMENT

(On Stamp Paper of Rs fifty)

This Joint Venture Agreement/Memorandum of Agreement is executed at (place)on this _____ day of _____, 2020.

BETWEEN

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ acting through its Managing Director, _____ duly authorized by a resolution of the Board of Directors dated ____ (hereinafter referred to as the 'LEAD MEMBER' which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the ONE Part;

AND

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ and Office at _____, acting through its Joint President, _____, duly authorized by a resolution of the Board of Directors dated _____ (hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the 'OTHER PART'

AND

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ and Office at _____, acting through its Joint President, _____, duly authorized by a resolution of the Board of Directors dated _____ (hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the 'OTHER PART'

Whereas RailTel Corporation of India Ltd. (hereinafter referred to as 'RCIL') has invited tenders for the "(NAME OF WORK)" in terms of the tender documents issued for the said purpose and the eligibility conditions required that the applicants bidding for the same should meet the conditions stipulated by RCIL for participating in the bid by the Joint Venture for handling the project for which the tender has been floated by RCIL.

AND WHEREAS in terms of the bid documents both the parties jointly satisfy the eligibility criteria laid down for a bidder for participating in the bid process by forming a Joint Venture between themselves.

AND WHEREAS both the parties hereto have discussed and agreed to form a Joint Venture for participating in the aforesaid bid and have decided to reduce the agreed terms to writing.

NOW THIS JOINT VENTURE AGREEMENT/Memorandum of Agreement hereby WITNESSES:

1. That in the premises contained herein the Lead Member and the Participant Member having decided to pool their technical know-how, working experiences and financial resources, have formed themselves into a Joint Venture to participate in the tender process

for "(NAME OF WORK)" in terms of the tender invited by RailTel Corporation of India Ltd., (RCIL).

2. That the members of the Joint Venture have represented and assured each other that they shall abide by and be bound by the terms and conditions stipulated by RCIL for awarding the tender to the Joint Venture so that the Joint Venture may take up the aforesaid "(NAME OF WORK)" in case the Joint Venture turns out to be the successful bidder in the bid being invited by RCIL for the said purpose.

3. That the members of the Joint Venture have satisfied themselves that by pooling their technical know-how and technical and financial resources, the Joint Venture fulfills the prequalification/ eligibility criteria stipulated for a bidder, to participate in the bid for the said tender process for "(NAME OF WORK)"

4. That the Joint Venture have agreed to nominate any one of_____, _____ and _____ as the common representative who shall be authorized to represent the Joint Venture for all intents and purposes for dealing with the Government and for submitting the bid as well as doing all other acts and things necessary for submission of bid documents such as Tender Application Form etc., Mandatory Information, Financial Bid. Etc., and such other documents as may be necessary for this purpose.

5. That the share-holding of the members of the Joint Venture for this specified purpose shall be as follows:
(i) The Lead Member shall have _____ per cent (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.
(ii) The Participant Member shall have _____ (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.
(iii) The Participant Member shall have _____ (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.

6. That in order to fulfill the requirement of the tender process and also keep an altogether separate legal entity of the Joint Venture, the Members of the Joint Venture undertake to provide their own nominees as share-holders to the extent of their respective share-holding for the purpose of formation of a Special Purpose Company (SPC) through which the Joint Venture proposes to undertake the _____ of RCIL.

7. That if any change in the membership of the Joint Venture be required to be made by the members of the Joint Venture, the same shall be done with the consent of RCIL subject to the conditions as may be stipulated by them in this regard.

8. That in case to meet the requirements of bid documents or any other stipulations of RCIL, it becomes necessary to execute and record any other documents amongst the members of the Joint Venture, they undertake to do the needful and to participate in the same for the purpose of the said project.

9. That it is clarified by and between the members of the Joint Venture that execution to this Joint Venture Agreement/Memorandum of Agreement by the members of the Joint Venture does not constitute any type of partnership for the purposes of provisions of the Indian Partnership Act and that the members of the Joint Venture shall otherwise be free to carry on their independent business or commercial activities for their own respective benefits under their own respective names and styles. This Joint Venture Agreement is limited in its operation to the specified project.

10 That the Members of the Joint Venture undertake to specify their respective roles and responsibilities for the purposes of implementation of this Joint Venture Agreement and the said project if awarded to the Joint Venture in the Memorandum & Articles of Association of the proposed Special Purpose Company to be got incorporated by the Joint Venture Members to meet the requirements and stipulations of RCIL.

IN FAITH AND TESTIMONY WHEREOF, THE PARTIES HERETO HAVE SIGNED THESE PRESENTS ON THE DATE, MONTHS AND YEAR FIRST ABOVE WRITTEN.

1. (_____) Managing Director (_____) For (Name of company)	2. (_____) Managing Director (_____) For (Name of company)	3. (_____) Managing Director (_____) For (Name of company)

WITNESSES:
1. _____
2. _____

Enclosure:
Board resolution of each of the Joint Venture Members authorizing:
(i) Execution of the Joint Venture Agreement, and
(ii) Appointing the authorized signatory for such purpose.

FORM NO. -12 - CONSORTIUM AGREEMENT /MEMORANDUM OF AGREEMENT (On Stamp Paper of appropriate value)

This Consortium Agreement is executed at on this _ day of ____.

BETWEEN

M/s..... , a Company incorporated under the Companies Act, 1956 and having its Registered Office at acting through its Managing Director, duly authorized by a resolution of the Board of Directors dated (hereinafter referred to as the „LEAD MEMBER" which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the ONE Part;

AND

M/s ....., a Company having its Office at and Office at .....
acting through its Joint President/ MD/..., , duly authorized by a resolution of the Board of Directors dated _ (hereinafter referred to as the ("Participant member") which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the OTHER PART"

AND

M/s. . . . .. , a Company having its Office at and Office at .....
, acting through its Joint President/ MD/.., , duly authorized by a resolution of the Board of Directors dated (hereinafter referred to as the ("Participant member") which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the OTHER PART"

Whereas RailTel Corporation of India Ltd. (hereinafter referred to as „RCIL") has invite tenders for the "(NAME OF WORK)" in terms of the tender documents issued for the said purpose and the eligibility conditions required that the applicants bidding for the same should meet the conditions stipulated by RCIL for participating in the bid by the Consortium for handling the project for which the tender has been floated by RCIL.

AND WHEREAS in terms of the bid documents the parties jointly satisfy the eligibility criteria laid down for a bidder for participating in the bid process by forming a Consortium between themselves.

AND WHEREAS the parties hereto have discussed and agreed to form a Consortium for participating in the aforesaid bid and have decided to reduce the agreed terms to writing.

NOW THIS CONSORTIUM Agreement hereby WITNESSES:

i. That in the premises contained herein the Lead Member and the Participant Member having decided to pool their technical know-how, working experiences and financial resources, have formed themselves into a Consortium to participate in the tender process for "(NAME OF WORK)" in terms of the tender invited by RailTel Corporation of India Ltd., (RCIL).

ii. That the members of the Consortium have represented and assured each other that they shall abide by and be bound by the terms and conditions stipulated by RCIL for awarding the tender to the Consortium so that the Consortium may take up the aforesaid "(NAME OF WORK)" in case the Consortium turns out to be the successful bidder in the bid being invited by RCIL for the said purpose.

iii. That the members of the Consortium have satisfied themselves that by pooling their technical know-how and technical and financial resources, the Consortium fulfills the prequalification/ eligibility criteria stipulated for a bidder, to participate in the bid for the said tender process for "(NAME OF WORK)"

iv. That the Consortium have agreed to nominate any one of , and as the common representative who shall be authorized to represent the Consortium for all intents and purposes for dealing with the Government and for submitting the bid as well as doing all other acts and things necessary for submission of bid documents such as Tender Application Form etc., Mandatory Information, Financial Bid. Etc., and such other documents as may be necessary for this purpose.

v. That if any change in the membership of the Consortium be required to be made by the members of the Consortium, the same shall be done with the consent of RCIL subject to the conditions as may be stipulated by them in this regard.

vi. That in case to meet the requirements of bid documents or any other stipulations of RCIL, it becomes necessary to execute and record any other documents amongst the members of the Consortium, they undertake to do the needful and to participate in the same for the purpose of the said project.

vii. That it is clarified by and between the members of the Consortium that execution to this Consortium Agreement by the members of the Consortium does not constitute any type of partnership for the purposes of provisions of the Indian Partnership Act and that the members of the Consortium shall otherwise be free to carry on their independent business or commercial activities for their own respective benefits under their own respective names and styles. This Consortium Agreement is limited in its operation to the specified project.

viii. That the Members of the Consortium undertake to specify their respective roles and responsibilities for the purposes of implementation of this Consortium Agreement and the said project, if awarded to the Consortium, to meet the requirements and stipulations of RCIL.

ix. The consortium formed will not be subject to alteration with regard to change in constituting firms and/or reorientation of roles. Any changes, if proposed by Consortium to take

advantage of certain developments during evaluation stage will render the bid liable to be REJECTED.

x. All partners of the consortium shall be jointly and severally liable to RailTel for the execution of the entire contract in accordance with its terms.

xi. Each Consortium member has minimum 20% contribution in the work and role/scope of each member is enclosed.

xii. Power of Attorney by all members of the Consortium in favor of the Lead Member is also enclosed.

IN FAITH AND TESTIMONY WHEREOF, THE PARTIES HERETO HAVE SIGNED THESE PRESENTS ON THE DATE, MONTHS AND YEAR FIRST ABOVE WRITTEN

1. ( )	2. ( )	3. ( )
Managing Director	Managing Director	Managing Director
For (Name of company)	For (Name of company)	For (Name of company)

WITNESSES:

1.

2.

Enclosure:

Board resolution of each of the Consortium Members authorizing:

(i) Execution of the Consortium Agreement, and

(ii) Appointing the authorized signatory for such purpose.

****

FORM NO. 13 - PAST EXPERIENCE FORM

	Item	Details
a)	General Information	
	Customer Name	
	Details of Contact Person	
	Name	
	Designation	
	Email	
	Mailing Address	
	Phone	
	Fax	
b)	General Information	
	Name of the Project	
	Government/Private/PSU/Others please specify	
	Start Date and End Date of PO/LOA	
	Current Status (Completed/Work in Progress)	
	Contract Tenure	
	Geographical Coverage (No. of locations the project covers)	
c)	Size of the Project	
	Order Value of the project	
	Capital Expenditure involved	
	Cost of services provided by the bidder	
	Cost of services provided by the partners if involved	
	No of Network Devices implemented (if applicable)	
	No of Network Devices managed (if applicable)	
	Please Provide customer certificate/Work order for executed Scope	
d)	Brief description of scope of Project	
	Highlights of the Key Result Areas expected and achieved	
	List of modules and sub-modules implemented	
	Narrative description of Project including technology deployed	
	Description of actual services provided by your firm	

Certification: I, the undersigned, certify that these data correctly describe the Projects implemented by our Company.

(Signature)
(Name of Authorized Signatory)
(Designation)
(Date)
(Name and address of the bidder)
(Company Seal)

Form No. 14 - CONTRACT AGREEMENT

(CA No. ……)

This AGREEMENT is made at <Location of RO Office> on this day of _____ two thousand and twenty one by and between RailTel Corporation of India Limited (A Govt. of India Undertaking) having its Registered & Regional office at Plat-A, 6th Floor, Office Block-II, East Kidwai Nagar, New Delhi-110023, acting in the premises through RGM/ED or his authorized representative (hereinafter referred to as 'RailTel', which expression should unless repugnant to the context or meaning thereof include its successors and permitted assigns) of the one part;

And _____having its registered office at ---------- acting in the premises through……. (hereafter referred to as "Contractor", which expression should unless repugnant to the context or meaning thereof include its successor and permitted assigns) of the other part.

Whereas in response to a call for Tender by RailTel for the work of "……..……..." for RailTel Corporation of India Limited as per tender papers at Annexure 'A' read with Corrigendum…….. issued by RailTel hereto, the Contractor has submitted offer letter as per Annexure 'B' hereto

AND WHEREAS the said Tender of the Contractor has been accepted for the work of "…… ……" for RailTel Corporation of India Limited as per copy of Letter of Acceptance of Tender No. _____dated_____ complete with enclosures at the accepted rates and agreed deviations from tender papers as per Annexure-C hereto at contract value of Rs._____(Rupees _____ Only) duly accepted by the contractor.

Now this agreement witnesses that in consideration of the premises and the payment to be made by the Purchaser (RailTel) to the Contractor provided for herein, the Contractor shall supply all equipment and materials and execute and perform all works for which the said Tender of the Contractor has been accepted strictly according to the various provisions in Annexure 'B' and 'C' hereto and upon such supply, execute and performance to the satisfaction of the purchaser (RailTel) and the purchaser (RailTel) shall pay to the Contractor at the rates accepted as per the said Annexure 'C' and in terms of the provisions therein.

IN WITNESS whereof both the parties have hereunto set and subscribed their respective hands and/or seals on the day and year respectively mentioned against their respective signatures.

Signed and delivered by Shri _____ for and on behalf of RailTel Corporation of India Ltd.

The contract within named in the presence of:

1. Signatures

Date
Name in Block Capitals
Address:

2. Signatures
Date
Name in Block Capitals
Address:

Signed and delivered by Shri. _____ for and on behalf of _____

The contractor within named in the presence of :

1. Signatures
Date
Name in Block Capitals
Address:

2. Signature
Date
Name in Block Capitals
Address:

Annexure 'A' : Tender Document No……. with Corrigendum(s), if any.
Annexure 'B' : Contractor's offer letter.
Annexure 'C' : Letter of Acceptance No…….. with all enclosures.
Annexure 'D' : Copy of Performance Bank Guarantee (PBG)

Chapter – 7 Annexure-I - Proof of Concept (POC)/ Demonstration

1. Date of Testing:
2. Bidder Name:
3. OEM Name:

Note: All Bidders should submit output logs of the above-mentioned tests immediately after completion POC to RailTel and these outputs logs should be singed jointly by all three representatives.

As a part of tender evaluation, its required from all the participating OEMs to demonstrate their assurance and Fulfilment Module capabilities. POC/Demonstration will be done for Multi-vendor IP/Optical network. The identified location for demonstration is Lab/Customer implementation or on-premises PoC.

OEMs are expected to demonstrate/Execute the testcases in either environment [Lab/ Customer Deployment] for Multivendor Network Elements.

RailTel will provide only following for Demonstration/PoC:

If Demonstration/PoC is done in RailTel network

1.1.1 Space in Rack & power
1.1.2 EMS details to connect.
1.1.3 Network [IT support] for accessibility
1.1.4 Support in accessibility debugging.

If Demonstration/PoC is done in OEM Lab/Customer Environment

1.1.5 RailTel Personal availability for verification of testcases

Test cases to Demonstrate.

1. Inventory

a. Discovery of Network Elements via EMS

Description	
This test case will verify the basic discovery of the active N/W Equipment to be modelled into the system- Service Topology, Network Topology, Discovery (On-demand, Scheduled)	Result
Expected Results	PASS/FAIL
Active Network Equipment are discovered, and inventory is updated	

b. Delete an Entity from network via EMS, discovered in earlier by single value e.g. Port Name

Description	
This test is to delete an entity that was discovered. Delete a port in network which was already discovered in active inventory system via port Name.	Result
Expected Results	PASS/FAIL
1. Batch should get triggered. 2. Delete the entity that was discovered earlier	

2. Assurance

a. Topology based correlation -Root Cause analysis/Service Impact Analysis

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis	Result
Expected Results	PASS/FAIL
3. Identification of Impacting entity 4. RCA ticket will be raised along with the impacted entity details. 5. Service Impacting tickets will be raised incase both the paths have gone down, with the impacted service along with impacted entity.	

b. Service Impact Alarm Imposition on the impacting node in topology

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis and Service impact alarm imposition on the impacting entity	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity. 2. Service Impacting alarm propagated to Logical Inventory module with the impacted entity details. 3. Service Impacting Alarm imposition (Alarm severity-highest severity alarm) on the node on topology	

c. Automated Trouble Ticket Lifecycle Management

Description	
To ensure that all the alarms generated by the network are properly handled internally in Assurance module and open tickets in the Trouble Ticketing System correctly	Result
Expected Results	PASS/FAIL
3. Demonstrating Trouble ticket raised to external system based on fault received. 4. Automatic closure of trouble ticket basis the alarm clearance received from network.	

d. UI based Alarm Inhibition/filtering/grouping.

Description	
Demonstration of ability to filter Alarms, grouping them and in case of known issue [Maintenance], alarms are Inhibited.	Result
Expected Results	PASS/FAIL
1. UI based Alarm Filter 2. Select the Node ID to be filtered. 3. No ticket should be generated inspite of a network alarm on that node.	

3. Fulfilment

a. Catalog driven service provisioning/fulfilment

Description	
Demonstration of fulfilment process via catalog consideration.	Result
Expected Results	PASS/FAIL
3. Services Catalog definition for workflow [provisioning & activation] execution	

b. Fallout Management [Skip/Retry/Rollback]

Description	
Demonstration of fallout mechanism due to some issue in the execution of fulfilment workflow	Result
Expected Results	PASS/FAIL
1. Fallout task to be triggered incase of failure at targeted system.	

c. Zero touch provisioning [Simulated or GUI steps walkthrough in case of Customer environment]

Description	
This test case will verify that Automated Fulfilment Processes available The Steps to be demonstrated may include –	Result

• From ERP/BSS System, Request Order for new services received in SOM Layer of Fulfilment module. • SOM will validate and orchestrate the received service order. • Feasibility check for required resources (Channel, Bandwidth, port etc..) against inventory. • Execution of commands on the EMS/Domain Controller post required port identification. • Success response received from EMS/Domain Controller • Order Completed and success response send to ERP/BSS System	
Expected Results	PASS/FAIL
1. Service configured on the identified ports. 2. Inventory Updated. 3. ZTP Workflow Completed	

d. Automated mail notifications to the desired mail group via fulfilment

Description	
This test case will demonstrate sending of mail notification for any process stage on conditional basis w.r.t Fulfilment process/stages.	Result
Expected Results	PASS/FAIL
3. Email is sent to individuals/email group at the defined process stage.	

4. General

a. Demonstration of available SDKs for the offered OSS module along with Product manual walk-thru

Description	
This test case will demonstrate the SDKs offered as part of solution modules and deployed in lab/customer premises.	Result
Expected Results	PASS/FAIL
SDK deployed are demonstrated. The SDK include – - Assurance SDK to enable new adaptations. - Fulfilment SDK to enable new adaptations or definition of new workflows. - Inventory SDK – to enable new service inventory model definition. - Product Manuals/documentations walk thru	

b. Demonstration of out of box reports offered in OSS module.

Description	
This test case will demonstrate the reports available from OSS module.	Result
Expected Results	PASS/FAIL
- PM Reports - FM reports - Order reports - Inventory reports	

c. Demonstration of Common services & resource inventory across OSS module

Description	
This test case will demonstrate the discovered network topology is common entity between both Fulfilment and Assurance module	Result
Expected Results	PASS/FAIL
- GUI walk-thru to showcase discovered network entities (Physical/logical) being used for both fulfilment (provisioning/Activation) and Assurance.	

5. SDN Controller: IP-MPLS

a. Provisioning of MPLS Services.

Description	
Following services to be provision in multivendor environment. L3VPN L2VPN Multicast Internet	
	Result
Expected Results	PASS/FAIL
Test case will showcase the end-to-end connectivity between different POPs for above mentioned services.	
Comments	
Duration	30min

b. LSP Creation

Description	
SDN controller should connect with the network on standard protocols like PCEP/BGP-LS/Netconf be able to show following use cases on LSR routers: Bi-directional LSP creation (Dynamic & ERO) based on RSVP Bi-directional LSP creation (Dynamic & ERO) based on SR Secondary LSP creation over the diverse paths Bandwidth reservation on each LSP SLA based automatic LSP switchover for dynamic paths. Router Alarms. Performance of LSPs& Links. Telemetry Data	
	Result
Expected Results	PASS/FAIL
Above parameters shall be monitored through SDN Controller	
Comments	
Duration	30min

6. SDN Controller: DWDM

a. Coherent Optics/Transponder Performance monitoring.

Description	
Coherent Optics should be able to provide performance monitoring parameters such as: OSNR Tx/Rx Power threshold crossing Bit Error Rate	
	Result
Expected Results	PASS/FAIL
Above mentioned parameters shall be monitored through SDN controller	
Comments	
Duration	10min

b. DWDM Service Creation/Monitoring.

Description	
SDN controller should connect with the network on standard protocols be able to show following use cases on Optical Network in Multivendor environment. 1. Creation of L0/L1 Services over DWDM Optical Line system using third party Transponders. 2. To verify the physical connectivity of transponders to line system ahead of provisioning, as well as to automate transmit power settings for transponders based on the power acceptance windows of OLS, assuring proper optical signal equalization throughout the path. 3. It should reconcile the line system information with the transponder view, support optical network and services visualization in a single pane of glass, and inventory and monitor all involved network resources and services, from power levels to status and alarms, across all equipment platforms. 4. NMS shall provide end to end view preserving all the details specific to topology, connectivity, and service level information.	
	Result
Expected Results	PASS/FAIL
Above parameters shall be monitored/provisioned through SDN Controller	
Comments	
Duration	30min

c. Discovery of Network Elements via SDN Controller

Description	
This test case will verify the basic discovery of the active N/W Equipment to be modelled into the system- Service Topology, Network Topology, Discovery.	Result

d. Topology based correlation -Root Cause analysis/Service Impact Analysis

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis for a optical service	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity 2. RCA ticket will be raised along with the impacted entity details. 3. Service Impacting tickets will be raised in case both the paths have gone down, with the impacted service along with impacted entity.	

e. Service Impact Alarm Imposition on the impacting node in topology

Description	
Topology based alarm correlation leading to Service Impact Analysis and Root cause analysis and Service impact alarm imposition on the impacting entity of a optical service	Result
Expected Results	PASS/FAIL
1. Identification of Impacting entity in E2E optical service 2. Service Impacting alarm propagated to Logical Inventory module with the impacted entity details. 3. Service Impacting Alarm imposition (Alarm severity-highest severity alarm) on the node on topology	

Name: **Name:** **Name:**

RailTel Representative(s) **OEM Representative(s)** **Bidder Representative(s)**

Annexure-II

SN	Equipment Type	Router OEM	Router Model	Version	BNG Version	SDN Ready
1	Router	JUNIPER	MX 960	21.4R3	20.2R3	Yes
2	Router	JUNIPER	MX 480	21.4R3	20.2R3	Yes
3	Router	JUNIPER	MX 80	21.2R3	20.2R3	Yes
4	Router	JUNIPER	MX 204	20.2R3	20.2R3	Yes
5	Router	JUNIPER	MX 104	21.2R3	20.2R3	Yes
6	Router	JUNIPER	MX 5	21.2R3	20.2R3	Yes
7	Router	JUNIPER	ACX 1100	21.2R3		No
8	Router	JUNIPER	ACX 2200	21.2R3		No
9	Router	JUNIPER	ACX 4000	20.2R3		No
10	Router	JUNIPER	ACX 710	21.4R3		Yes

11	Router	JUNIPER	ACX7024	22.4R3-EVO		Yes
12	Router	JUNIPER	ACX7100-48L	22.4R3-EVO		Yes
13	Router	CISCO	C920	17.5		No
14	Router	CISCO	N540-28Z4C-SYS-D	7.7.21		Yes
15	Router	CISCO	N540X-6Z18G-SYS-D	7.7.21		Yes
16	Router	CISCO	NCS 5504	7.8.2		Yes
17	Router	NOKIA	NCS 7750-SR7	TiMOS-C-22.10.R3		Yes
18	Router	NOKIA	N7750-SR1	TiMOS-C-22.10.R4		Yes
19	Router	EDGCORE & IP Infusion	EC_AS7716-24SC	IP Infusion -6.0.2		Yes
20	Switch	D Link	DGS-3000-28XS	4.18.B014		NO
21	Switch	D Link	DGS-3000-28L	4.18.B014		NO
22	Switch	D Link	DGS-3000-28SC	5.10.B003		NO
23	Switch	D Link	DGS-3000-28X	4.18.B014		NO
24	Switch	D Link	DGS-1210-28ME	10-04-B060		NO
25	Switch	D Link	DGS-3120-24SC	4.00.015		NO
26	Switch	D Link	DGS-F1210-10MP	2.2.0D		NO
27	Switch	D Link	DGS-F2800-10P	2.2.0D_12		NO
28	Switch	D Link	DXS-3610-54S	2.25.018		NO
29	Switch	D Link	DES-1210-28	10-04-B060		NO
30	Switch	D Link	DES-3200-28	V4.05.004		NO
31	Switch	D Link	DXS-3630-52TC	2.25.018		NO
32	Switch	Edge Core	ECS-2100-10P	1.2.24		NO
33	Switch	Edge Core	ECS-3510-28T	1.5.1.18		NO
34	Switch	Edge Core	ECS-4100-12PH	1.2.36.191		NO
35	Switch	Edge Core	ECS-4120-28F	V1.2.2.33		NO
36	Switch	Edge Core	ECS-4120-28Fv2			NO
37	Switch	Edge Core	ECS-4810-12MP2	1.2.0.7		NO
38	Switch	Edge Core	ES350MA	1.5.1.18		NO
39	Switch	Edge Core	ES3528MV2-DC	1.5.2.8-DC		NO
40	Switch	Juniper	EX-2300	21.4R3-SX		NO
41	Switch	Juniper	EX-3300	15.1R7-S12		NO
42	Switch	Juniper	EX-3400	21.4R3-SX		NO
43	Switch	Juniper	EX-4200	15.1R7-SX		NO
44	Switch	Juniper	EX-4300	21.4R3-SX		NO
45	Switch	Techroute	S2928FI	5.3.18		NO
46	Switch	Techroute	S2928F-C	5.3.18		NO
47	Switch	Anda	GLS77008P2F	V1.0.2807-l2-16		NO
48	Switch	Anda	BD-2928E	2.2.0F-101868		NO
49	Switch	Huawei	S-5700-28P-LI-24-DC	V200R007c00SPC500		NO
50	Switch	Cisco	C3560CX	15.2(3)E3		NO
51	Switch	Watchdog	WD-GS-1608C40	2.2.0F		NO
52	Switch	Watchdog	WD-GS-24G4Q28	2.2.0F		NO

53	DWDM	Tejas(100G)	TJ1600	REL_10_0_2_a71_15, Sat Jan 21 09:02:55 2023		NO
54	DWDM	Tejas(10G)	TJ 3500	REL_9_0_2_a17_8, Sun Sep 13 19:32:33 2015		NO
55	DWDM	ADVA	FSP 3000R7	Rel. 21.5.1		NO
56	DWDM	Coriant	HIT 7300	5.50 50.04.00		NO
57	DWDM	ECI	OPT 9603	9.6R03.00/376911		NO
58	DWDM	Ciena	6500	REL 1261Z.EK		NO
59	DWDM	ADVA	SH3	REL 4.5.2		NO
60	DWDM	ADVA	SH4	REL 4.5.2		NO

****

CHAPTER-8

8.1 General Conditions

8.1.1 It may kindly be noted that 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.

8.1.2 All Offered software's shall be of proven performance in (at least two) Government department or Public Sector Units or Telecom service provider or public listed companies in India or outside India. Relevant document clearly mentioning the functionality deployed in support of the same shall be submitted (like Customer satisfactory performance certificate /Public Case Study etc).

8.1.3 During Technical evaluation, RailTel shall asked of POC/ Demonstration for offered equipment. Interoperability test with existing Network will also conduct during POC/ Demonstration. POC/ Demonstration may be exempted in case Offered Equipment or similar/higher capacity equipment of same OS is running in RailTel Network (In that case bidder/OEM request for exemption may be provided). For exemption of POC/ Demonstration, RailTel decision will be final. Bidder should arrange material for POC/ Demonstration as per Annexure-III. POC should be completed within 45 days after intimation to bidder. In case of Bidder failed to complete POC/ Demonstration successfully, in that case offered equipment will be technical disqualified.

8.1.4 Server/Storage OEMs should be having valid ISO 9000 & ISO 14000 certification.

8.1.5 Bidder/OEM should provide professional OEM support services for integration of equipment with existing System.

8.1.6 OEMs should have their spare depots in India and location & address for same need to be submitted.

8.1.7 Tender specific authorization from the OEM is required for the bidder to participate in the bid (Point-1, Form no. 7 of Chapter-6).

8.1.8 OEMs should support Firmware up gradation till the OEM announces End of Life (EoL). Hardware and Software offered by OEM should have End of Life (EOL) less than 8 years from the date of Supply. End of Sale (EOS) of offered Hardware and Software should not be less than 4 years from the date of Supply.

8.1.9 OEMs should have 24*7 TAC support in India. Relevant document in support of the same shall be submitted.

8.1.10 Bidder/OEMs should guarantee that the systems delivered to the RailTel are brand new, including all components. All hardware must be supplied with their original and complete printed documentation. Line-by-line compliance of the technical conditions should be submitted by the bidder and vetted by respective OEMs on their letter head duly signed by Authorized signatory.

8.1.11 HLD and LLD shall be vetted by OEM professional services engineers and Network shall also be implement in supervision of OEM professional services engineers Technical Requirement and Specification.

9.2 Detailed Technical Specification of OSS Solution

8.2.1 Service Fulfilment

8.2.1.1 Service Order Management

1. The product MUST support the implementation of semi-automated user-driven processes via a combination of core features, configuration and customisation employing core API and bespoke code.
2. The product MUST support the implementation of fully automated processes via a combination of core features, configuration and customisation employing core API and bespoke code.
3. The product MUST support the automation of fallout handling for lights out processes.
4. The SOM application MUST support catalogue-driven fulfilment flows and/or custom defined fulfilment flows.
5. The SOM application SHOULD be fully integrated out of the box with service catalog application.
6. The SOM application SHOULD be fully integrated out of the box with Inventory application.
7. The SOM application MUST support SID compliant interfaces to decompose the product orders into service orders and subsequently the service orders into resource order requests.
8. The SOM application MUST be able to manage the dependencies, delivery constraints and the sequencing of the order tasks for the service order based on the service definitions in the Service catalog application or the custom defined ones.
9. The SOM application MUST support service decomposition for both automatically executed or human driven (manual) tasks
10. SOM application MUST provide object-oriented or component-oriented configuration that enables reusability of workflows, interfaces, provisioning logics.
11. All service orders created MUST be able to reference the Service catalog decompositions of the related service order.
12. The SOM application MUST be able to distribute each service order request to several P.S. (Activation) to process the order.

13. The SOM application MUST be able to derive a task execution plan for each order. This plan MUST support task execution dependencies (Finish-to-Start, Finish-To-Finish, Start-To-Start (allows parallel execution etc.), critical path calculation, expected completed date, not later than finish date etc.)
14. The SOM application SHOULD support a UI that keeps track of general statistics (status, processing time per task, etc.) for the service order that are processed by the system. These statistics should cover past, in flight and pending service orders.
15. The SOM application MUST be able to track several parallel service orders throughout the service order management process. Vendor MUST specify the maximum number of parallel activations.
16. The level of parallel execution of service order tasks MUST be configurable based on Service order parameters.
17. The SOM application MUST persist the service order details, the service order status without any loss of data at any state of the service status processing.
18. "The SOM application MUST provide a UI to track the service order. More specifically:
19. Keep track of the service order status (past, current, future)
20. Keep track of the service order tasks completed, executing, on hold, pending. This should cover both automatic or manual service order tasks
21. Track the status of the external systems that are required for the service order to be fulfilled.
22. Provide visual tools to trace on service order error on potential root causes".
23. The SOM application MUST keep the logical order of the series of tasks generated by the service decomposition from the initialisation of the service order until its full realisation.
24. The SOM MUST provide the ability to construct the response to northbound system (Commercial order system) by parsing external system response(s) and mapping them to the pre-defined order response structure. This response parameter mapping MUST NOT require extensive coding
25. The SOM MUST provide the ability to construct the request to external systems by parsing external system request(s) and mapping them to the pre-defined order request structure. This request parameter mapping SHOULD not require extensive coding
26. The SOM MUST support reporting of service orders queues based on configurable search criteria, such as:
    a) service type

b) interface
c) execution time

27. The SOM application SHOULD utilize parameter mappings (e.g. number ranges) so as to differentiate where to dispatch southbound requests
28. The SOM application MUST have configurable timeouts and retry mechanism that can be correlated to the service order tasks or on the whole service order process.
29. The SOM application SHOULD support through UI the full administration of the service order flows:
    a) Prioritisation
    b) Queue order size
    c) Start/Stop of service order processing.
    d) Retry policies.
    e) Skip Error and continue the sequence of execution.
30. In the event of fallout, the SOM application MUST support an easy & fast manual processing procedure to modify an order on task level and process it further or rolling it back. After this manual intervention the order flow MUST continue processing following the ordering flow
31. The SOM application MUST correlate the errors/exceptions of a service order with the task which is blocked by the fallout and additionally with the respective application or resource that is causing the fallout. This MUST be visualised in the provisioning flow.
32. The SOM application MUST provide a UI that will provide the functionality to view, filter, export, and trigger manual handling of the orders that have fallout.
33. The SOM application SHOULD provide a rule engine and UI dashboard to control independent to each other the service order flows. For each service order flow, it SHOULD be possible to control the flow status (normal, degraded, stopped, disabled etc.) by setting rules and parameters related to the service order fallout handling (timeout, retry, error, severity of errors, manual intervention tasks pending etc.)
34. The SOM application MUST support configuration of notifications based on the rule engine rules. The notification content and the recipients' systems or entities MUST be configurable.
35. The SOM application MUST alert the users for order fallouts. These alerts should be configurable.
36. The SOM application MUST support the batch order fallout handling. E.g. resubmission, cancellation, status change, skip etc."

37. The SOM application MUST support queueing mechanism towards both Northbound and Southbound platforms.
38. The SOM application MUST support resubmit/terminate/skip/schedule/Change Priority for any service order task/request at any given moment via GUI or API
39. The SOM application MUST provide user friendly visualization of the following data for monitoring purposes:
    a) Exact time a service order task was realised.
    b) The order messages exchanges with external system (meaning for example the exact XML string sent)
    c) Exact time response came back from external system.
    d) The actual response from external system (meaning for example the exact XML string received)
    e) Show which external system the order was sent to
    f) The status of the provisioning to network (e.g.. success, failed, timeout etc.)
    g) Sortable list of provisioning messages sent to network, default sorting by time but with ability to sort by other criteria.
    h) Configurable order history to be able to check older order details.
    i) All timestamps should support a granularity of milliseconds".
    j) Regarding resubmission:
    k) The SOM application MUST provide possibility to resend orders:
    l) These orders can be either previously failed or successful ones.
    m) It can be one individual task or a group of tasks or a full order to be resent in one Go.
    n) Each new resent order should be assigned a unique id number.
40. The new order or task should be conceptually linked with the originating order or task not only visually in GUI but also by the unique id assigned to it
41. The resubmission of an order or task should leave the initial order or task intact (no overwrite accepted)"
42. The SOM application MUST have the ability to support expected durations for each order task status (according to SC decomposition rules). When the defined timeframe has been exceeded. the order will be in jeopardy and MUST be clearly reported in SOM UI and/or notified to the users
43. The SOM Application MUST be able to identify the critical path for each service order process. The tasks that comprise the critical path should be easily identified by the user

44. The SOM application MUST report per order and per task the due dates in correlation of the expected durations defined for a specific service decomposition. The report per order must contain:
45. Completed tasks with dates and time taken
46. Pending tasks with due dates (blocked, postponed or with fallouts)"
47. The SOM application MUST send notifications when a task is passing a time threshold regarding its realisation and breaching respectively the expected duration. These thresholds MUST be configurable and at minimum should be:
48. Tasks
    a) Task initial time execution passed.
    b) Task execution time exceeded the threshold that was predefined.
    c) Task is in fallout state for more than the time threshold that was predefined.
49. Service Orders
50. Service Order expected duration due date is approaching (configurable)
51. Service Order expected duration due date was reached without service being in the needed state (e.g., active)
52. Service Order expected duration is long due "
53. The SOM application MUST store in an inventory the service order details (order parameters, tasks generated) during the full lifecycle of the service order process
54. The SOM application MUST keep historical details of the service orders and all the changes to their attributes
55. The SOM application MUST keep the different versions of the same service order in the historical order they were applied.
56. Note: The Service order can have different versions, since it can be manually modified because of a fallout"
57. The SOM application MUST support search of service orders based on arbitrary search criteria e.g. Service type, Time, Service name"
58. The SOM application MUST provide pre-Integrated support to various Open Interfaces and at least the following protocols: SOAP, Java RMI calls, CORBA IIOP, SMPP+, JDBC, sql ,pl/sql, REST/HTTP(s). It SHOULD also support their latest versions.
59. The SOM application MUST be capable to receive requests in parallel from multiple external systems either northbound (ERP, Billing) or southbound (inventory, provisioning)

60. The SOM application MUST not impose any restrictions on the amount of systems to be integrated or the amount of system interfaces that are being utilised during a service order process
61. The SOM application MUST support Both Synchronous & Asynchronous modes in both NB and SB interfaces
62. The SOM MUST support bidirectional and unidirectional (fire & forget) Web Services
63. It MUST be possible to SOM to customise Interfaces with external systems (northbound or southbound)
64. The vendor MUST provide the list of the off-the-shelf offered northbound and southbound connectors
65. The SOM application MUST support a whitelist of reply-to-address for bidirectional WS with southbound and northbound interfaces
66. The SOM application MUST support multiple encoding formats like MML, XML, JSON. It SHOULD also support their latest versions.
67. The net latency time of the SOM application (from request receipt to sending response, minus manual tasks and response latency from external systems) SHOULD be less than 0.5 sec in 95% of related transactions.
68. The SOM MUST be capable to handle:
    a) 2500 requests per day as Mean Day Value
    b) 1000 requests per day as Standard Deviation
    c) 4000 requests per hour in a Standard Busy Day
    d) 1500 requests per hour as Standard deviation among Busy Days"
69. The SOM application SHOULD provide the capability to support the utilization of platform among different departments or Service providers (i.e. GUI with isolated view on its own transactions, service order flows etc.)
70. The SOM application SHOULD provide the capability to set prioritisation restrictions when system is shared among multiple organizations.
71. The SOM application MUST provide transaction priority management for any southbound or northbound interface queues.
72. The SOM application MUST support flow control with anti-starvation function: a throttling mechanism is required to limit the number of concurrent requests
73. The SOM application SHOULD provide the capability to set the maximum memory consumption from the application modules and step forward in proper actions when exceeded.

74. The SOM application MUST be able to provide a Request and Tasks queueing mechanism of 20.000 under execution service order requests out of which a configurable amount can be kept in memory.
75. The SOM application MUST be able to process a backlog of Mean Day's amount of outstanding service orders within half a day along with the live traffic

8.2.1.2 Service Catalog

1. The service Catalog MUST be the master in the solution for the following business objects: Product, Service, Customer Facing Service, Resource Facing Service, Decomposition process, Service-specific Decomposition Rules, Service Dependencies and Exclusions, Provisioning Processes, Exception Handling, Rollback Handling, Parameters, Parameter Mapping, Bundles and Groupings.

2. The solution MUST support the specification of Service Catalog objects according to TMF SID

3. The solution MUST support service spec characteristic value translations as per the TMF SID by configuration (no coding)

4. The solution MUST support bundling and packaging of products and services according to TMF SID

5. The solution MUST offer grouping features to support the organisation of the business objects in the service Catalog.

6. The solution MUST support the definition of service characterisation following TMF SID

7. The service characterisation MUST cover default values, minimum and maximum values and namespace to define where it is applicable.

8. The solution MUST support the reuse of Catalog objects. I.e. a service can be used by several other services.

9. The service Catalog MUST support the design of provisioning processes for each transaction type supported (see below) by the business objects

10. The service Catalog MUST support the following transaction types:

a) Feasibility Check

b) Create

c) Activate

d) Read

e) Update

f) Delete

g) Suspend

h) Unsuspend

i) Rollback

j) Undo

11. The design of processes in the service Catalog MUST support the concept of parameter passing between different steps of the processes. The passing of parameters can be configured (automatic, manual, suppressed) by UI with no additional coding

12. The service Catalog MUST support the specification of exception handling for processes.

13. The service Catalog MUST support the specification of Rollback procedures for Catalog items.

14. The service Catalog management MUST support the creation, modification, deletion and viewing of business objects

15. The solution MUST support life cycle states for Service Catalog business objects. At least the states "in-study", "in design", "in test", "launched", "active", "retired", "rejected" , "obsolete" MUST be supported.

16. The solution MUST offer versioning of Service Catalog objects. Several versions of a service may be actively used at a time.

17. "The solution MUST support the following functionalities with respect to service versioning:

18. Orders coming after the publishing of a new service definition MUST use the new service definition, while order still in flight at the time of publishing MUST use the definition of the then active version

19. All the transactions except 'Create' MUST be supported for the service definition version that was active at the time of service creation"

20. The solution SHOULD support the scheduling of transitions of Catalog objects. I.e. such way that the publishing of a product can be planned and scheduled.

21. The solution SHOULD support Testing of new Service Catalog entities before actually publishing the entity.

22. The solution MUST support the following capabilities:

23. Create/Modify service Catalog objects in ""In Study"", ""In Design"" or ""In Test"" state, while maintaining the normal operation

24. Make the modifications publicly available by publishing them without deployment"

25. The service Catalog MUST support version DELTA handling so that a product/service can be transformed from one version to another version. The service Catalog MUST generate the service decomposition in order to support the modification of existing service instances to the new version.

26. The solution MUST include an integration between Service Catalog and Service Order Management.

27. The Service Catalog objects shared between solution modules MUST be identified by global unique identifiers.

28. The solution MUST provide an interface to the Service Catalog according to TMF framework "Service Catalog Management API REST Specification" (i.e. latest release of TMF633)

29. The solution MUST support Design-Time Dependencies between service components.

30. The solution MUST support Run-Time level Dependencies between service components.

31. The service Catalog MUST support the control of processes based on configurable dependency criteria (e.g. Finish-To-Start, Finish-To-Finish, Start-To-Start), so that various process steps can be synchronised and/or executed in desired order (parallel, sequential).

32. The SC MUST support reporting of service Catalog objects/hierarchies based on configurable search criteria, such as:

a) service type

b) usage

c) decomposition rules

d) specification characterisation

33. The vendor MUST provide best practices documentation on how to build a service Catalog for mobile, fixnet, NFV and SDN [IP/MPLS] services.

34. The vendor MUST provide a User Manual for the Service Designer role.

35. The vendor MUST provide a User Manual for the Provisioning Manager role.

36. The Service Catalog management MUST authenticate and authorize access user interaction.

37. The Security Model MUST at least support access control on service groups by user groups.

8.2.1.3 Service Activation

1. The Activation Solution MUST provide pre-Integrated support to various Open Interfaces and at least the following protocols: SOAP, Java RMI calls, CORBA IIOP, SMPP+, JDBC, sql, pl/sql, REST/HTTP(s), NETCONF, RESTCONF. It SHOULD also support their latest versions.

2. The Activation Solution MUST support Both Synchronous & Asynchronous modes in both NB and SB sides

3. The Activation Solution MUST support bidirectional and unidirectional (fire & forget) Web Services

4. It MUST be possible to Activation Solution to customise Interfaces with southbound systems

5. The vendor MUST provide the list of the off-the-shelf offered southbound connectors

6. The Activation Solution MUST support a whitelist of reply-to-address for bidirectional WS

7. The Activation Solution MUST support multiple encoding formats like MML, XML, JSON. It SHOULD also support their latest versions.

8. The Activation Solution MUST support the following cipher protocols for connectivity over SSH:

a) 3des-cbc

b) aes128-cbc

c) aes192-cbc

d) aes256-cbc

e) aes128-ctr

f) aes192-ctr

g) aes256-ctr

h) aes128-gcm@openssh.com

i) aes256-gcm@openssh.com

j) chacha20-poly1305@openssh.com

9. The Activation Solution MUST provide a GUI for specific NE query and settings (network model)

10. The Activation Solution SHOULD provide SOAP or REST interface for specific NE query and settings, described above, with similar access control functions.

11. The Activation Solution MUST support automated error and exception handling by using correction process templates (e.g. retry, alter route to device, etc.) for typical issues

12. NE interfaces of the Activation Solution MUST support active-standby NE architecture and seamless changeover between nodes in case of link or NE failure

13. The Activation Solution MUST provide a way to simulate capability to lock, unlock, delete, set NE in maintenance mode by scheduled or on demand setting

14. The Activation Solution MUST provide ability to configure NE's login setting such Activation Solution login prompts, exit commands, session timeout, and login mode (e.g. short mode: logout after each command; long mode: keep logged in for a configurable timeout and wait for next commands)

15. The Activation Solution MUST support a polling mechanism towards NE and follow the configured rules in case of communication or NE failure (report on GUI, initiate failover etc.). This MUST be possible to be enabled or disabled. The polling frequency MUST be also configurable

16. The http method (GET, POST) and url of polling action of the Activation Solution MAY be configurable

17. The Activation Solution SHOULD provide a way to visualize how the system is connected with the configured NEs

18. The Activation Solution SHOULD support intelligent queueing mechanism per NE with dynamic allocation of parallel sessions based on upper (triggering the creation of a new session) and lower thresholds (triggering the tearing down of an existing session)

19. The Activation Solution SHOULD export and import of all instances of a specific Network Model

20. The Activation Solution MUST support a configurable delays between commands towards the same NE (for slow NEs)

21. Distinct timeout values MUST be configurable in the following levels: command, activation task, request before the Activation Solution changes the status or a command, activation task or request in case of no reply. This applies in defining intermediate failed/expired states Activation Solution well Activation Solution in defining a final state. e.g. after 6 minutes of no reply, set status expired; retry every minute; after 20 minutes of no reply set status failed

22. In the Activation Solution there MUST be a clear separation between the definition of the Network Element and the definition of its interfaces

23. The Activation Solution MUST provide the capability to set the maximum number of retries and the delay between two consecutive ones. This delay MAY be configurable depending on the consecutive number of retries

24. The Activation Solution SHOULD support automatic and configurable rerouting of activation tasks to a backup element in case the master element is not reachable

25. The Activation Solution SHOULD the support the concept of Intermediate Network Element (e.g. EMS) between the Activation Solution and the target endpoint

26. The Activation Solution MUST correlate the errors/exceptions of a provisioning flow with the activation task which is blocked by the fault and additionally with the respective NE or resource that is causing the fault. This MAY be directly visualised in the provisioning flow.

27. The Activation Solution SHOULD support the capability to perform mass activations to one or more NEs (i.e. for Test bed clean-up or massive corrections) in a batch way and using files Activation Solution input

28. The Activation Solution MUST support resubmit/terminate/skip/schedule/Change Priority for any activation task/request at any given moment via GUI

29. Regarding resubmission:

30. These activation tasks/requests can be either previously failed or successful ones

31. It can be one individual activation task/request or a group of activation tasks based on search criteria to be resent in one go. These ones should be sent according to the original chronological order.

32. Each new resent activation task/request MUST be assigned a unique id number

33. The Activation Solution MUST provide user friendly visualization of the following data for monitoring purposes :

34. The new activation task to be resent MUST be conceptually linked with the connected task/request not only visually in GUI but also by the unique id assigned to it

35. The resubmission of an activation task/request MUST leave the initial activation task intact (no overwrite accepted)

36. With regards to cancellation:

a) It MUST be possible to select multiple requests or tasks in one Go"

b) Every activation task or request should automatically reach a final state in any case

c) Exact time provisioning message was sent to network

d) The actual provisioning message to network (meaning for example the exact XML sent)

e) Exact time response came back from network

f) The actual response from network (meaning for example the exact XML received)

g) Show to which network system the provisioning message was sent

h) The unique ID of the provisioning message to network

i) The status of the provisioning task to network (e.g.. success, failed, timeout etc.)

j) Sortable list of provisioning messages sent to network, default sorting by time but with ability to sort by other criteria

k) Long enough history stored so to be able to check older provisioning commands (6 months)

l) All timestamps SHOULD support a granularity of milliseconds"

37. The Activation Solution MUST support monitoring of provisioning queues based on configurable search criteria, such as:

a) Date

b) Status message

c) Unique ID of the provisioning message to the network

d) NE ID or/and NE Type

e) Category of Service/Activation Task

f) Error message

38. The Activation Solution SHOULD have an easy&fast manual processing procedure of failed requests/activation tasks either single or in groups (i.e. change a parameter through GUI, status modifications)

39. The Activation Solution MUST be able to restore to any given point the latest status of activation tasks and Requests in case of any abrupt shutdown

40. The Activation Solution SHOULD be possible to provide routing mechanism to NEs based on attribute values e.g. msiSDN [IP/MPLS]/cli ranges

a) The solution MUST trigger certain alarms in several scenarios like:

b) NE is down

c) connection to a NE is broken

d) certain percentage of requests within a configurable time window are failing

e) the number of activation tasks is a NE's queue is exceeding a configurable threshold"

f) Performance, Stress, Scaling requirements and Tuning Capabilities

41. The net latency time of the Activation Solution (from request receipt to sending response, minus affected NE’s response times) SHOULD be less than 0.5 sec in 95% of the transactions.

42. The Activation Solution MUST be capable to handle live traffic of:

a) 2500 requests per day as Mean Day Value

b) 1000 requests per day as Standard Deviation

c) 4000 requests per hour in a Standard Busy Day

d) 1500 requests per hour as Standard deviation among Busy Days"

43. The Activation Solution MUST provide transaction priority management for any southbound or northbound queues

44. The Activation Solution SHOULD be capable to execute 200 TPS towards other NE

45. The Activation Solution MUST support flow control with anti-starvation function : a throttling mechanism is required to limit the number of concurrent requests

46. The Activation Solution SHOULD provide the capability to set the maximum memory consumption from the application modules and step forward in proper actions when exceeded

47. The Activation Solution MUST be able to provide a Request and activation Tasks queueing mechanism of 20.000 under execution requests out of which a configurable amount can be kept in memory

48. The Activation Solution MUST be able to process a backlog of Mean Day's amount of outstanding requests within half a day along with the live traffic

49. The Activation Solution MUST support an intelligent dynamic load distribution among different application processing modules depending on the processing load. Distribution among different physical servers MUST be also possible.

50. The Activation Solution MUST provide reporting for performance statistics per NE

51. The Activation Solution MUST support a UI that keeps track of general statistics (status, processing time per activation task, etc.) for the service order that are processed by the system. These statistics should cover past, in flight and pending service orders

52. The Activation Solution SHOULD provide the capability to support the utilization of platform among different departments or Service providers (i.e. GUI with isolated view on its own transactions)

53. The Activation Solution SHOULD provide the capability to set prioritisation restrictions when system is shared among multiple organizations

54. The Activation Solution SHOULD support separation of requests based on configurable criteria assigned to different organizations

55. The Activation Solution MUST keep the logical order of the series of activation tasks generated by a service request over multiple network elements

56. The Activation Solution MUST enforce a strict sequence when multiple requests are reaching the activation layer based on configurable criteria on request parameters

57. The Activation Solution MUST support the ability to use multiple communication ports/sessions towards the same NE, while still keeping the order of commands related to the same subscriber.

58. The Activation Solution MUST be able to send technical actions like create, delete, read, modify, rollback to Internal and external Networks

59. The Activation Solution MUST provide the ability to construct the response to northbound system by parsing NE's response(s) and mapping them to the pre-defined order response structure

60. The Activation Solution MUST provide the ability to construct the request to NE's parsing northbound's requests and mapping them to the pre-defined order request structure

61. The Activation Solution MUST support multiple Northbound connection (i.e. >=100)

62. The Activation Solution MAY support a functionality to estimate the request execution time and propagate this information to the NB system

63. The Activation Solution MUST provide object-oriented or component-oriented configuration that enables reusability of workflows, interfaces, provisioning logics.

64. The Activation Solution SHOULD provide a GUI tool to easily design provisioning flows by using off-the-shelf functional blocks with limited development effort as possible

65. The Activation Solution SHOULD provide the capability to export the activation tasks sent to the SB system as executable scripts

66. The solution should support Catalog drive service provisioning/fulfilment - Optical (multi legs)

67. The solution should support Integration with WFM over RESTAPI for field tasks

68. The solution should support manual/customized orders flow and work queues

69. The solution should support Automated mail notifications to the desired mail group via fulfilment

70. The solution should support Intermediate phased notifications to BSS/ERP.

71. The solution should support Auto retry mechanism for network operations as well as notifications incase of any issue at target system

72. The solution should support Fallout management (Skip/Retry/Rollback)

8.2.1.4 Sync and Reconciliation

1. The solution MUST support the synchronization and reconciliation of network or other external data with the inventory data. The solution MUST be able to report and resolve the differences found at the entity and attribute level.
2. The solution MUST support the synchronization and reconciliation of complex multi-vendor and multi-technology networks"
3. The solution MUST cover all layers of the network domains
4. The solution MUST provide out-of-the-box support for protocols (e.g. SNMP, SSH, NETCONF, CORBA, XML, SOAP, CLI and ASCII interfaces) to connect to different data sources, NEs, and EMS/NMS systems.
5. Currently used fixed line network data sources/NEs like CPEs, Service Edge Routers , Provider Edge Routers, DSLAMs, DHCP , EMS/NMS systems ,Inventory systems MUST be supported by the solution.
6. The solution MUST be able to execute the Sync and Reconciliation process in a efficient, performant and scalable manner (e.g. increase number of synchronisation servers based on the load)
7. The solution MUST provide easy integration points to the existing discovery system and external inventory systems.
8. The solution MUST be able to sync and reconcile between multiple external systems and the inventory for the same piece of inventory information
9. It MUST be a scalable solution, able to support any scale of network growth and virtualization. Any restrictions MUST be clearly indicated by the vendor
10. The solution MUST be flexible to support new network technologies and vendor equipment.
11. The solution,

- MUST synchronize physical/logical inventory resources and service data
- MUST synchronize the status and attributes of both physical and logical network resources, including services"

12. The solution MUST be capable to sync between any two systems/data sources or any number of subset systems/data sources

13. The solution MUST cover all layers of the network including all technology domain like (IP-MPLS, Ethernet, Optical)

14. The solution MUST sync the detailed information about physical resources such as chassis, cards, slots and ports.

15. The solution MUST allow partial sync (in batches) and reconciliation

16. The following items MUST be configurable

    a) Sync frequency

    b) On demand or automatically triggered (e.g. event based, events raised from data sources, scheduled)

    c) Sync rules/policies"

17. The solution MUST have configurable and customisable sync rules and algorithms

18. The solution MUST create a consistent view of the real-time network by resolving discrepancies to support error-free fulfilment and assurance process.

    a) The solution MUST support

    b) configuration of filters, reconciliation frequencies

    c) Automatic reconciliation or on demand triggering"

19. The tool MUST support custom reconciliation rules/policies/algorithms

20. The solution SHOULD generate a GUI-based report for the discrepancies found in the sync process.

21. The solution MUST deliver a customisable proposal for reconciliation

8.2.1.5 Software Development Kit (SDK)

1. The solution framework should provide a Software Development Kit (SDK) to adopt/customize, while keeping the core framework intact.
2. System must have SDK tools for self-development of integration adapters
3. The system must provide an SDK/ UI to develop automations, with drag and drop capabilities.
4. The solution shall support auto documentation of the workflow design via the SDK tool .
5. The solution shall provide a test tool for testing a workflow created in the provisioning and activation module.

8.2.2 Service Assurance

(1) The Umbrella Performance Management system must be able to follow network evolution in terms of network growth. The supplier must demonstrate the ability to handle growth of the network in terms of size (number of managed elements now and in the future).

(2) The system must be able to follow network evolution in terms of Network Element (NE) and Element Manager (EM) updates. Backward compatibility should be also provided.

(3) The user interface should be web-based.

(4) The system must support multiple concurrent users. The supplier shall indicate maximum number of allowed users according to proposed HW architecture.

(5) "Supplier must provide, as part of the answer to this Tender, detailed dimensioning rules according to different HW size and to different system architectures, specifying in details for each configuration at least the following parameters:

a) number of interfaced EM/NE according to their types

b) supported time granularities

c) number of days guaranteed for historical storage for supported time granularities"

(6) Supplier must have backup and restore concept as part of solution.

(7) The solution should keep a record of user and system actions

(8) The umbrella Performance Management system must permit exporting of KPIs to external data warehouses (NBI). This interface should be the output of reports in CSV text based format.

(9) System releases must maintain the system data integrity and must not cause existing reports and queries to fail or lead to any data or functionality loss.

(10) Proposed assurance solution needs to handle the growing flood and complexity of data from today's cloud and future networks but also needs to connect such insights across network and service to enable the E2E management of services lifecycle, linking the network to the business layer. Assurance must collect a vast amount of data from across the network regardless of Vendor, Technology or Domain. Information may be consumed to be interpreted in a single pane of glass but must be also automated into actions.

(11) Single Pane of Glass for all network vendors and technologies, connecting network and service layers, supporting an intuitive workflow UI and engines that guides to root cause analysis and service impact analysis.

(12) Closed Loop Automation – Trigger to self-heling workflow.

(13) Describe the overall architecture of your solution components and typical deployment including scalability considerations (collection, database, correlation, adaptation etc.).

(14) The solution should be able to integrate with Orchestrator via open API interface (Restful)

(15) The solution should support automation function - Availability of GUI based workflow engine that allows definitions of automatic rule-based computation trees

(16) The solution should have scheduling capability for automatic recurring execution of the workflow/rules

(17) The solution should support settings of threshold(s) and evaluation criteria

(18) The solution should allow for automatic execution of external programs at certain stages of the workflow/rule set

(19) The proposed solution shall have a simple, intuitive interface and process for the definition and full lifecycle management of business rules for correlation and workflow/automation

(20) The solution shall correlate device, network, service, application/NF, , physical infrastructure (compute, storage,) and identify root cause

(21) The solution shall correlate Performance Management & Fault Management (including TCA) data

(22) The solution shall be able to identify and display a list of impacted network resources and generate the equivalent network level events containing detailed information of the correlated network resources

(23) The solution shall provide the capability to isolate the service problem root cause and show all the associated alarms and performance data

(24) The solution should have a simple, intuitive interface and process for the definition and full lifecycle management of business rules for correlation and workflow/automation.

(25) No data loss shall occur following failure of the system.

(26) The system shall incorporate High Availability system design.

(27) The umbrella Performance Management system must include a context sensitive online help

(28) The umbrella Performance Management system must offer the capability to change the output format without having to re-execute the shown report e.g. changing chart type or changing from table to chart.

(29) The system must be aligned with the industry principles, standards and recommendations of end to end service operations including 3GPP, TMF and ETSI.

(30) Proposed assurance solution needs to handle the growing flood and complexity of data from today's cloud and future networks but also needs to connect such insights across network and service to enable the E2E management of services lifecycle, linking

the network to the business layer. Assurance must collect a vast amount of data from across the network regardless of Vendor, Technology or Domain. Information may be consumed to be interpreted in a single pane of glass but must be also automated into actions.

(31) The system must be highly scalable and able to follow network evolution in terms of network growth. The supplier must demonstrate the ability to handle of the network in terms of size (number of managed elements now and in the future).

(32) There shall be no single point of failure in the solution design.

(33) The system should have backwards compatibility with previous network elements SW releases. The supplier must demonstrate how the system handles backwards compatibility with previous SW releases and provide details on the compatibility matrix with NE releases.

(34) The mediation layer shall support collection of data and different types of data from multiple element management systems simultaneously.

(35) The system must implement a mechanism for reporting data layer problems for missing data or data quality errors.

(36) The system must implement the capability of integrating with other external. Please enumerate the types of interfaces available with external systems.

(37) Supplier must provide, as part of the answer to this Tender, detailed dimensioning rules detailing the growth parameters and the number of EMS/NEs according to their types.

(38) System must have SDK tools for self-development of integration adapters

(39) The system must be cloud ready and supporting micro-services architecture. The system should also support vertical and horizontal scaling on the flow

8.2.2.1 Performance Management

1. Reporting and analytics capability should be available to user and off-the-shelf KPIs and Reports ready since day one for:

a) Network Dimensioning and Optimization

b) Trend analysis for Long term planning

c) Troubleshooting Network and Service Performance "

2. Create personalized views using pre-defined packs with the possibilities to drill in different dimensions, e.g time, object KPI.

3. Add reports and KPIs to the board from the pre-defined library or new ones defined by the user. The KPI manager can be used to define new KPIs. To generate alarms in threshold violations of KPI's towards Fault management. Provide simplified GUI for adding new KPI's.

4. Geo-views with outputs of analytics boards, representing KPIs information on the map. Different colour codes to distinguish status of different elements.

5. Create new automations for boards and respective content (KPIs) – it can be defined the automation recurrence, duration, type of action (e.g. TT LCM, notification) and time aggregation filters.

6. The Performance Management tool should have multi-vendor capability (i.e. Nokia, Ericsson, ZTE, Huawei, etc) reporting.

7. The Performance Management tool should be multi-technology (Transport, Core, Fixed, etc.).

8. The Performance Management tool must act as Performance Data Repository for all Network domains (IP, Transmission) and store data, including aggregations:

a) -15 minutes (raw data): 7 days

b) -Hourly (raw/aggregated): 30 days

c) -Daily Totals and Daily Busy Hour (aggregated): 1 years

d) -Weekly Totals and Weekly Busy Hour (aggregated): 1years

e) -Monthly Totals and Monthly Busy (aggregated): 1 years

9. It should be easy to administer via GUI the storing period per Technology, Aggregation type and measurement."

10. The system must be based on an extendable/customizable concept for content and KPIs.

11. Full vendor hierarchy shall be supported. The tool shall be able to drill down on network elements topology via one or two click on both tabular and charts reports.

12. User interface should be a single point of entry, which would provide access to all functionalities.

13. The Performance Management tool must include a friendly user interface which allows quick and easy performance data monitoring.

14. The tool shall support a GIS for visualization.

15. KPI drill must be available by simple click on KPI in Report so that it shows related counters in a new report and its trend.

16. Performance Data should be presented graphically, numerically and geographically.

17. It should be possible to color KPIs in both Table and Charts based on configurable threshold ranges"

18. The Performance Management tool should be able to validate the loaded data, indicate its credibility and alert about missing data. Data Availability Report must be available for both Administrator and Report consumer with minimum clicks.

19. Data import should be possible in different time granularities.

20. User shall be able to filter data in tabular mode

21. User shall be able to define multi-vendor KPIs.

22. User shall be able to add/edit and delete KPIs.

23. A short definition should be shown for every existing KPI and for the counters of its formula.

24. User shall Drill down/up/across on data to find root causes to problems.

25. Based on the reported Performance Management data, the tool shall detect problems and generate alarms if thresholds are violated

26. It must be possible to combine multiple threshold conditions. Thus, threshold notifications are only sent if combination of conditions occurs.

27. Performance Management must provide a consolidated engineering platform that automates the identification of performance problems using powerful rules. Alerting rules should be customizable.

28. Alerts periodicity (hourly, daily, weekly…) and severity (Critical, Major, Minor) should be user definable.

29. The umbrella Performance Management system must be able to generate and forward alarms via SNMP northbound interface.

30. Reporting UI must enable users to customize chart and report properties e.g. scales, colors, etc..

31. Reporting UI must support data ranking functions e.g. "top-N items"

32. Reporting presentation interface must support data drill-through i.e. moving between reports which automatic feed of existing criteria to new report

33. The system must permit users to define "Vendor Neutral" KPIs by themselves.

34. The must support the following functions but not limited to:

a) arithmetical operators

b) comparison operators

c) logical operators "

35. The system should permit users to share the definition of their reports/KPIs with other users

36. The system must have support for users' preferences, including custom workspaces e.g. after successful login the user is presented with his/her list of KPIs and reports.

37. The system must support the possibility of grouping counters and KPIs.

38. The system must have the capability to compare old counter/KPI values with actual values to quickly identify network degradation issues. Such comparison should be done without changing the KPI definition

39. The system must support interfacing to external systems through web interfaces

40. The tool should support data aggregation and trending

41. Determining the root causes of performance degradations should be possible using the tool

42. KPI value above/below predefined threshold in mentioned interval should be alerted by the tool

43. The supplier should explain the general reporting capabilities like Dashboards

44. By default, 24-hour performance data shall be collected from all collection enabled network elements every day, but operators shall have the ability to select 15-minute performance data collection for nominated network elements, with a correspondingly shorter collection period.

45. The system shall provide the capability to save and automatically email scheduled reports in csv form and spreadsheet form.

46. The system shall be able to do data correlation between Performance Management (PM) and Configuration Management (CM) domains.

47. The system shall be able to perform Performance Management reporting filtering based on CM parameters.

48. The system shall be able to perform aggregation of results in a Performance Management reporting based on the values of selected CM parameters.

49. The system shall support change tracking of CM parameters.

50. The Performance Management reporting application shall allow users to get descriptions of CM parameters without having to access a different system.

51. The system should support forecasting and trending capabilities with support of appropriate methods and algorithms. User direct inputs to influence the prediction should be possible. Tool should expose SQL Framework Interface for flexible customizations.

52. The solution must have a collector framework that is distributable and modular

53. The collector framework must support the automated discovery of monitored devices

54. The collector framework must support the automated collection of monitored devices

55. The solution shall support collection of batch & streamed Performance Management counters

56. The solution shall support automated & flexible TCA setting & generation based on e.g. base line creation, time of day, repeat alerts, etc.

57. End-to-end computed KPIs, such as customer of network slice SLAs

58. The solution shall support storage of historical Performance Management and Fault Management data without any scaling or operational limitations (e.g. backup/restore due to db size etc.)

59. End-to-end performance measurement telemetry shall include end-to-end latency measurement, Virtualized Resource Usage Management

60. The solution shall support end-to-end resource monitoring (to ensure each network slice instance - per domain, can meet its service requirement).

61. The solution shall support end-to-end SLA monitoring to ensure each network slice instance and/or service can meet its SLA. Describe your approach to SLA monitoring

62. The solution shall be extendable to address future operations use cases such as Network Service/E2E Service Monitoring and Closed Loop Operations. Bidder to outline how the solution enables these future use cases

63. The solution shall have the capability to expose collected monitoring metrics to third party platforms.

64. The solution should support full repository of historical performance data for data aggregation and analytics (hourly, daily, monthly, avg., sum, max, min, Top N etc).

65. The solution should be able to capture logical relationships between device KPIs.

66. The solution should able to support and provide Server/VM/VIM Performance reports which are used for performance insights and capacity planning, including but not limited to, details about CPU utilization, memory utilization, file solution, disk space utilization, memory usage, and network interface traffic.

67. The solution should support out-of-the-box advanced correlation, topology-based correlations, analysis, drill down, RCA, reporting, and visualization capabilities from one single GUI.

68. The solution should provide end-to-end network performance visibility Transport domains for improved operational efficiency

69. The Performance management system to provide (at-least, may not be limited to)

    a) 200-250 PM counters per controller & mediation
    b) 5 processed KPIs to be considered per controller & mediation.
    c) 1 PM dashboard per controller & mediation
    d) 3 KPI dimensions to be considered per controller & mediation.
    e) 6 reports to be considered.

8.2.2.2 **Fault Management**

1. Main dashboard to visualize overall status. Dashboard should provide the flexibility to user to view parent alarm, child alarm, assigned alarm to user, create ticket, add observation, assign alarm to user, send alarm to user etc..

2. Repetition rules - To count how many times an alarm turns on/off in a period of time. Several periods might be analysed simultaneously.

3. The solution should be able to automatically trigger corrective actions based on received events, performance metrics and health indications.

4. The system must provide an SDK/ UI to develop automations, with drag and drop capabilities.

5. Automation for operational processes

6. The solution should support the following use cases for closed loop automation along with service orchestration system:

    a) Auto scaling

    b) Healing

    c) Preventive healing

    d) Recovery operations

7. The solution shall collect alarms from physical Infrastructure including compute, storage, switches, routers

8. The solution shall collect alarms from Virtual Infrastructure Managers

9. The solution shall supress all the other alarms (or show as sympathetic) that are not the root cause alarms after the correlation is completed

10. It shall be possible to filter and browse all the correlated alarmed resources

11. The solution should manage fault and performance of both physical and virtualized networks.

12. The solution shall process alarms from multiple sources both physical and virtual using different protocols to enable, e.g. Hybrid Networks monitoring

13. The solution shall be able to processes alarms from multiple sources using different protocols such as: SNMP and others

14. Event Collection - The solution should have the capability to collect events and convert into a unified format

15. The solution shall support root cause & related alarms identification and alarm suppression. Describe your solution support.

16. Alarm Rules - The solution should provide a GUI for authorized users to manage alarm rules

17. Alarm correlation - The solution should provide a real time, policy based, proven correlation engine to streamlines event and alert management, intelligence and automations across the domains.

18. Alarm Noise Reduction

19. Alarm Flooding - The event collection layer / module should have the capability to take remedial actions such as discarding events of low severity or diverting events based on user configured actions.

20. The solution should comply with ETSI NFV reference architectural framework. The reference architecture is extended to allow for Physical Network Functions (PNFs) and Software Defined Network (SDN [IP/MPLS]).

21. The Fault management to provide (at-least, may not be limited to):

    a) Alarm enrichment through inventory
    b) 10 FM reports per controller & mediation
    c) Alarms to be re-synched in case of any outage/issues.
    d) 4 alarm grouping rules per controller & mediation.

e) 5 RCA rules to be considered per controller.

8.2.2.3 **Service and Inventory**

1. Inventory/Topology should be integral part of the solution and should take feed from existing Orchestration/Fulfilment system for reactive and pro-active monitoring of resources (Virtual & Physical) & services deployed by Orchestration system.

2. For brownfield discovery, the solution should be able to discover and reconcile network resources from multiple domains, enrich the network data with secondary data sources, stitch resources across domains to create end-to-end service(s). It should have advanced features like contextual discovery, real time discovery on network configuration change events.

3. The solution must have robust information model to enable discovery & store information about network elements across different technology domains and services deployed across these domains.

4. The solution should support enablement of the unified and dynamic creation and sharing of the end-2-end service and network topology in real-time.

5. The solution should manage physical, logical, virtual and services inventory.

6. The solution should support event based (state/value change) updates from NMS'/EMS'.

7. The solution framework should provide a Software Development Kit (SDK) to adopt/customize, while keeping the core framework intact.

8. The solution should store the stitched inter-domain multi-vendor end to end service topologies in a single graph-based inventory database (neo4j).

9. The solution must support graph-based rendering of network elements and their associations using Graph view.

10. The solution should support representation of end-to-end view for services and paths using Topology Maps and Geographical Maps.

11. The solution should support toggling of views between Topology Maps and Geographical Maps.

12. The solution should support application multi tenancy deployment on top of the same cloud native platform instance. At the application level it should be possible restrict access to the content based on user role.

13. The solution must support the ingestion of data into a scalable, multilayer data model

14. The solution shall support drill down at links, service server layers (e.g. paths) and node level to troubleshoot the problem all the different levels

15. The solution shall be extendable to support network slice discovery and associate topology.

16. The solution shall be extendable to support network transport topology modelling for network elements (Layers 1-3) for future Hybrid visualisation requirements for a comprehensive "Single Pane of Glass" platform.

17. The solution shall automatically provide a continuously updated model and discover new service components, virtual assets and add them dynamically to the monitored components.

18. Describe how the solution discovers or is informed about new components to be monitored.

19. The solution will provide an updated end to end service model when monitored resources (nodes, links and service) are added/removed.

20. The solution should support Topology based alarm correlation, Service Impact Analysis, Root cause analysis.

21. The solution should have UI based Alarm Inhibition/filtering/grouping.

8.2.2.4 **Security & Admin**

1. User shall be able to create groups described as set of network objects of the same type.

2. The system should allow to provide a unique account to each user, by which it can be uniquely identified.

3. The system should have authentication mechanisms / means (proprietary, Kerberos, NTLM, LDAP, etc.)

4. Access rights to differentiate users.

5. The system should have the ability to change the primary user password specified by the administrator at the first login.

6. The system should provide a history of user passwords to prevent reuse for what period.

7. The system should provide for blocking the user after a given number of failed authentications attempts.

8. If an error is detected when checking the user login and password, does the system specify which data is entered incorrectly Is the password displayed as you type.

9. The system should support synchronization with an NTP server (using its own means, OS means, etc.)

10. The system should have a mechanism for auditing user actions.

11. The application must record audit trail entries recorded for all system components for each user action. The audit trail entry must include.

    a) User identification

    b) Type of event

    c) Date and time

    d) Success or failure indication

    e) Origination of event

    f) Identity or name of affected data, system component, or resource"

12. The audit log entry for read operation (R) shall not contain any return values of the operation (except possible success code of the operation).

13. The audit log entry for create and update operations (CU) shall not contain actual data, but only data types.

14. The audit trail must not log sensitive personal or business data. Therefore, the actual data shall be replaced with the data types used in operation. However, the needed

identifiers of the target of operation shall be included to log entry to make it possible to understand to what entity was handled.

15. Example of create operation: ""event_type=add_customer; customerid=1234567, sno, address, phone, gender, age_group"". Note that the customer identifier shall be in place even if it would be personal data in some case (like social security number).

16. Example of update operation:""event_type=update_customer; customerid=1234567, address"" indicating that only customer's address was changed."

17. It must be possible to automatically transfer the audit logs to a centralized log repository with an agreed secure method.

18. Audit logs shall be both human and machine readable (e.g. it shall use key/value pairs)

19. An audit log entry shall be ""single-liner"" meaning that no headers or other non relevant information are included (otherwise they shall be easy to bypass with automated parser). The ""human readable"" means that the entry shall be written with printable characters and contains information, which helps reader to make the difference of different parameters in the entry. The preferred way to achieve this is to use key/value-pairs, e.g. event_time=2015-01-22T08:46:12.113014+02:00;user_id=johndoe;system_id=Hid00001234; transaction_id=2332342;event_type=get customer;parameters=”select * from products where customer_num in \“1232465\””"

20. All used log formats shall be fully defined and documented.

21. Audit log shall always be generated independently of possible general logging level.

22. The application must support secure connection for all interfaces that cross a trust boundary. This includes connections to

    a) User Interfaces

    b) APIs

23. It must be possible to enable HTTPS using TLS 1.2 (or later) cryptographic protocol.

24. It must be possible to disable non TLS endpoints (HTTP) and old TLS versions."

25. Forward secrecy is designed to prevent the compromise of a long-term secret key from affecting the confidentiality of past conversations. Are you supporting this

26. The vendor shall rate the compliance for each of the OWASP Top 10 measures to mitigate web attacks. (https://www.owasp.org/index.php/Main_Page)

27. The vendor needs to ensure that vulnerabilities are regularly scanned for and fixes are deployed within a reasonable time (based on criticality of the vulnerability). Please state your patch and vulnerability concept.

28. Bidder should mention how is proposed system hardened.

29. Solution should describe in detail your platforms capabilities with respect to local user/passwords and policies.

30. The solution should Detect hidden anomalies in the network raw performance data.

31. Network performance issues and Root Cause identification

32. Capture complex relations in the counters and KPI's, highlight offenders, anomalies & unexpected behaviour, and derive actionable insights.

33. The Solution should support adaptive operations e.g. detecting issues using multidimensional patterns [location, time of day, network domain etc

8.2.2.5 **Reports and Dashboard**

Solution should provide reports but not limited to it.

1. **ETL**

a) Data Availability

b) Data Availability 7 Days View

c) ETL Status

d) PM Load

e) Loading Statistics

f) Insertion time per hour

2. **Aggregation:**Aggregation Statistics
3. **Database**

a) Partition Statistics Analysis

b) Database size

4. **System configuration**

a) Active Measurements

b) Topology Information

c) Retention Periods

d) Possible duplicated objects

5. **Capacity and Dimensioning**

a. Million Counters

b. Active Cells

c. Bandwidth

d. Active Network Elements

e. KPI Statistics

f. Panels Statistics

6. **Alarm Analysis**

a) Total Alarms by Creation date

b) Active Alarms by Creation date

c) Active Alarms

d) Clear Alarms

e) Control Map Event

f) Active Alarm Details

g) Clear Alarm Details

7. **Ticket Analysais**

a) Active Trouble Tickets

b) Historical Trouble Tickets

c) Ticket Details

8.2.3 Discovery and Inventory

8.2.3.1 **Modelling Capabilities**

1. The Solution MUST allow the modelling of logical resources following the TMF SID standards. This includes, though is not limited to, fully customisable provisioning, functional and activation life cycles; logical connections, logical routes, logical interfaces, resource identifiers, numbers, resource topologies, logical devices, custom logical entities, logical grouping of physical and/or logical entities. All entities' specification in the form of reusable and recursive templates, along with their characterisation (attributes set) and configuration (instance data) MUST be supported.
2. Should support TMF 638, 639 standards for open interface.
3. The Solution MUST allow the modelling of customer-facing and resource-facing services with own fully customisable provisioning, functional and activation life cycles. The modelling of internal and external customers, as well as customers' sites MUST be supported. All entities' specification in the form of reusable and recursive templates, characterisation (attributes set) and configuration (instance data) MUST be supported.
4. The Solution MUST support the modelling of containing relationships among physical and logical resources, compatibly to their nature or definition. E.g. Devices containing other devices, sites containing network equipment/physical resources, resource topologies containing devices and circuits.
5. The Solution MUST support the modelling of containing relationships among any CFSs/RFSs, and between the services and any physical and logical resources, compatibly to their nature or definition.
6. The Solution MUST support the hierarchical modelling of physical and logical resources in arbitrarily complex trees or Directed Acyclic Graphs, compatibly to their nature. E.g. Hierarchy of IP ranges and addresses, hierarchy of internal and external sites, graphs modelling inter-dependencies among network resources in the delivery of a service, graphs modelling inter-dependencies among CFSs and RFSs. DB should be graphical DB and should create relationship driven metadata for RCA and AI/ML actions. The AI/ML module should provide following functionalities

    a) AI/ML based RCA and anomaly detection

b) AI/ML based adaptive operation to define automation rules

c) AI/ML based extrapolation of alarms which can be translated to recommendations

7. The Solution MUST support the hierarchical modelling of logical resources in arbitrarily complex trees and Directed Acyclic Graphs.

8. The Solution MUST support the consistent and efficient modelling of logical connections' and services' resolution over physical and logical resources.

9. The Solution MUST support the modelling of the logical compound entities according to the TMF SID definition.

10. The definition of relationships with configurable cardinality and directionality between any entities MUST be supported.

11. The Solution MUST support the specification, characterisation and configuration of custom entities.

12. The Solution MUST allow the resolution of logical connections over (among others) topologies.

13. The Solution MUST support the modelling of "hybrid" inventory objects, e.g. physical hardware (modules) associated with technology-specific child entities (DWDM logical channels) and attributes (frequencies).

14. The Solution should support the internal connectivity of containers or an equivalent alternative.

15. The Solution MUST support the definition and management of TMF SID roles for all logical entities

16. The Solution MUST support rapid on boarding of new lines of services and network technologies using predefined ready-to-use models, covering physical, logical, service layers and virtual resources, along with best practice and guidelines for use.

17. The Solution MUST cover, though not be limited to, the following technologies: MEF, Ethernet, xDSL, IPv4, IPv6, MPLS, VPN, PDH, WDM, POM.

18. The Solution MUST support all network technology layering (e.g. IPv4 over Ethernet, MPLS over Ethernet, MPLS L2VPN over Ethernet/L3VPN)

19. The Solution MUST support the effective and efficient modelling of technology-specific inventory models, being vendor neutral and according to the TMF SID definition.

20. The Solution SHOULD provide an enhanced API layer to create/modify/delete technology-specific entities and models, along with best practice and guidelines for use.

21. The OOB ready-to-use models should be configurable and customisable & Out of box Inventory Packs

22. The Solution MUST offer Modelling of physical and logical inventory per controller.

23. The Solution MUST offer Modelling and stitching of services for each service type (IPMPLS - L2 VPN, L2 VLAN, L3 VPN, Multicast, VPLS, Internet; Optical - P2P DWDM 1G, P2P DWDM 10G, P2P DWDM 100G) The Solution shall provide 10 inventory reports per controller.

8.2.3.2 IP Address Management

1. The Solution MUST support supports managing IP address pools, subnets and individual addresses.

2. The Solution MUST support managing IPv4 addresses

3. The Solution MUST support managing IPv6 addresses

4. The Solution MUST provide an API to reserve, release, allocate, de-allocate, assign and de-assign subnets and IP addresses

5. The Solution must support configuring quarantine period for de-allocated IP addresses & Should support Ipsubet management [Ipv4/Ipv6], Allocation and deallocation of subnet, Assign and Deassign, Reserve and release of subnet.

8.2.3.3 Discovery & Reconciliation

1. There shall be support for discovering the existing network and service inventory. In addition, periodical rediscovery shall be supported with reconciliation. It should be possible to define and view a complete Topology of the network in the Network inventory solution.

2. For brownfield discovery, the solution should be able to discover and reconcile network resources from multiple domains, enrich the network data with secondary data sources, stitch resources across domains to create end-to-end service(s). It should have advanced features like contextual discovery, real time discovery on network configuration change events.

3. The solution must have robust information model to enable discovery & store information about network elements across different technology domains and services deployed across these domains.

4. The solution should support enablement of the unified and dynamic creation and sharing of the end-2-end service and network topology in real-time

5. The solution should manage physical, logical, virtual and services inventory.

6. The solution should support event based (state/value change) updates from NMS'/EMS'. The logical inventory should support discovery based on

   a) Scheduled or on-demand basis.

   b) Event driven [notification from EMSs]

7. The solution should support application multi tenancy deployment on top of the same cloud native platform instance. At the application level it should be possible restrict access to the content based on user role.

8. The solution must support the ingestion of data into a scalable, multilayer data model

9. The solution shall provide a unified Operations Graphical User Interface (GUI) to ease the operational and maintenance of the NFVI based Services and Infrastructure, i.e. maps Alarms, Events and Performance to a topology model of the NFV infrastructure cross multiple data centres

10. The solution shall support drill down at links, service server layers (e.g. paths) and node level to troubleshoot the problem all the different levels

11. The solution shall be extendable to support network slice discovery and associate topology.

12. The solution shall be extendable to support network transport topology modelling for network elements (Layers 1-3) for future Hybrid visualisation requirements for a comprehensive "Single Pane of Glass" platform.
13. The solution shall support automated discovery and visualisation of Containers.
14. The solution shall support automated discovery and visualisation of Virtual Machines
15. The solution shall support automated discovery and visualisation of PNF Hosts
16. The solution shall support discovery of Datacentres SDN [IP/MPLS]
17. The solution shall automatically provide a continuously updated model and discover new service components, virtual assets and add them dynamically to the monitored components.
18. The solution will provide an updated end to end service model when monitored resources (nodes, links and service) are added/removed.
19. The Solution should support on-demand, scheduled Service Topology, Network Topology, Discovery
20. The solution should support discovery of Physical inventory (Devices, Shelf, Slot, Card, Physical channels, Port.)
21. The solution should support discovery of Logical inventory (Logical ports, logical channels, Service trails...)
22. The solution should support Number management e.g. IPAM (standard), VLAN

8.2.3.4 Visualization

1. The solution should store the stitched inter-domain multi-vendor end to end service topologies in a single graph-based inventory database.
2. The solution must support graph-based rendering of network elements and their associations using Graph view.
3. The solution should support representation of end-to-end view for services and paths using Topology Maps and Geographical Maps.
4. The solution should support toggling of views between Topology Maps and Geographical Maps.

5. The solution should be supporting user specific dashboard,
6. The solution should support role base access.
7. The solution should support time level drill.
8. It should allow to select a different time window granularity for the data shown in the report (example: month day hour)
9. The solution should support object level drill.
10. It should allow to drill in the object hierarchy.
11. The solution should KPI level drill (KPI explosion)
12. It should allow to visualize a selected KPI in detail:
13. The drilled KPI values are shown in an expanded chart or table for the selected period (week, day, hour)
14. The counter values that compose the KPI are also listed in the table.
15. The solution should support report level drill.
16. It should allow you to drill from one report to another one passing the context information (time and object levels). Drilling from one report with certain object and time levels to another report provides a greater flexibility when defining the reporting flows tailored for the organization needs and processes.

8.2.3.5 Configuration audit

1. The solution should be able to detect Policy violations and notify to person-in-charge.
2. The solution should have the ability to perform a textual configuration search using pattern matching.
3. The solution should be configurable to adapt to customer's configuration & change processes and provide compliance visibility across all network infrastructure components from single dashboard.
4. The solution should store a complete audit trail of configuration changes made to network devices including critical change information.

5. The solution should maintain policy compliance using continuous configuration auditing and remediation.

6. The solution should be capable of automated remediation to bring devices back to policy compliance or to a default configuration status.

7. The solution should complete Operational, Security & Regulatory Policy Definition and Enforcement.

8.2.4 Mediation Gateway.

8.2.4.1 SDN Controller

A. SDN Controllers (IP-MPLS & DWDM) should work independently without any involvement of OSS Layer of modules/software applications to manage the multivendor devices.

B. For IP-MPLS:

1. The SDN controller should include a unified cloud architecture that integrates management, control, and analysis. The SDN controller should have capability to manage 2000 Nodes of IP-MPLS.

2. The SDN controller must support a unified portal to access all SDN components, including device management, service provisioning, network optimization, and network monitoring. The SDN controller must support multivendor (Cisco, Juniper, Nokia and IP-infusion) devices through standard protocols. License/software required for fault & performance management for multivendor devices should be included in offer.

3. The SDN controller must provide a unified user authentication mechanism. Multiple logins are not required when all SDN functional components are used.

4. All SDN components should support a unified user authorization mechanism. The SDN system should be a complete system with uniform authentication to avoid jumping out of different applications and ensure security.
5. The SDN controller should provide unified service monitoring capabilities in one service window, including service DASHBOARD, service-related alarms, historical performance curves, and OAM tools.
6. The SDN controller must provide unified deployment and installation tools and deploy all components at a time.
7. The SDN controller must support RADIUS/LDAP authentication.
8. The SDN controller must support standard southbound protocols, including:
    1. Netconf
    2. PCEP

3. BGP-LS
4. BGP-SR
5. OSPF
6. ISIS
7. SNMP
8. Telemetry
9. CLI
10. SFTP-Client
11. Telnet/SSH

9. The SDN controller must provide unified northbound interfaces to integrate with the upper-layer OSS management system, orchestrator, and super controller. Multiple components do not need to provide multiple northbound interfaces for interconnection.
10. The SDN controller must be deployed on VMs/dockers/Physical servers and supports 1000 equivalent Nes.
11. The SDN controller must support the local blade active/standby protection mechanism.
12. The SDN controller must support the remote disaster recovery capability. The active and standby controllers must support the database synchronization mechanism.
13. The SDN controller must have the full lifecycle management capability of the network, including the following functions:
    i. Zero Touch device deployment
    ii. Automatic service provisioning
    iii. MPLS network optimization and optimal path computation
    iv. Network traffic monitoring and analysis
    v. Network SLA and E2E service performance analysis
    vi. IP network optimization
    vii. Network assurance
    viii. Configuration Management
    ix. Fault management
    x. Network discovery and basic configuration management
14. The SDN controller should support automatic discovery of network devices and connection relationships through protocols such as LLDP, and generate network topology of the entire network.
15. The SDN controller should automatically discover the logical topology of the network through protocols such as BGP-LS.
16. The SDN controller should support real-time network topology change update.

17. The SDN controller should support the display of L3 topology by region.
18. The SDN controller should support GIS map-based network topology display.
19. The SDN controller should support automatic combination of topology and inventory information and display topology information on the WebUI.
20. The SDN controller inventory can be queried based on multiple criteria and reports can be exported.
21. The SDN controller must be capable of hierarchical path view and visualization from services to tunnels to links.
22. The SDN controller must support the graphical display of the entire network topology and support subnet topology division and visualization.
23. The SDN controller should support the zero touch function, automatically discover new routers on the network, and automatically generate and deploy basic configurations for new routers. (LSR ID, IP address, IGP, protocol...) to automatically add new routers and build the physical topology.
24. MPLS/SRv6 Path Computation and Network Optimization
25. The SDN controller should be able to manage RSVP-TE LSPs, SR-TE LSPs, and SRv6 policies at the same time
26. The SDN controller supports the use of link SRLG attributes as constraints for optimal LSP calculation
27. The SDN controller supports the use of link affinity attributes as constraints for optimal LSP calculation
28. The SDN controller supports the use of hop limit as a constraint condition for optimal LSP calculation
29. The SDN controller supports the use of real measured link delays as constraints for optimal LSP calculation
30. The SDN controller supports SR policy-based path computation based on packet loss rate constraints/ BW congestion/Latency.
31. The SDN controller supports route computation based on real-time bandwidth and reserved bandwidth
32. The SDN controller supports the use of link bandwidth and bandwidth priority as constraints for LSP calculation
33. The SDN controller supports the use of link/LSP bandwidths collected in real time as constraints for LSP calculation
34. The SDN controller supports forcible specified LSPs to pass through specified nodes or links
35. The SDN controller can force a specified LSP to bypass a specified node or link

36. The SDN controller supports the establishment of different tunnels. The paths do not traverse the same node, link, and SRLG
37. The SDN controller supports the establishment of a pair of LSPs with disjoint paths. (that is, the primary and secondary paths do not traverse the same node, link, or SRLG)
38. The SDN controller supports the establishment of a pair of bidirectional LSPs that use the same path to ensure symmetric routes for upstream and downstream traffic
39. The SDN controller supports path computation for inter-AS SR-TE, SR policy, and SRv6 policies
40. The SDN controller can lock the preferred path to ensure that high-value services are always on the optimal path
41. The SDN controller supports LSP selection for multiple services based on SLAs
42. The SDN controller provides a graphical interface to implement traffic policy-based access to different tunnels
43. The SDN controller supports batch tunnel import
44. The SDN controller can deliver LSP paths for SR policies using BGP
45. The SDN controller supports UCMP/ECMP traffic load balancing based on SR policies
46. The SDN controller supports the primary and secondary LSPs of SR policies
47. SRv6 policies support load balancing among multiple lists and intelligent generation and adjustment of UCMP/ECMP weights
48. SR Policy supports load balancing among multiple lists/links. When bandwidth increases or original links are congested, a maximum of eight paths can be automatically split
49. The SDN controller supports inter-domain SR policy paths based on BSID stitching, which reduces the depth of E2E path stacking
50. The SDN controller supports slice-based latency topology
51. The SDN controller supports SID label compression, which resolves the problem of insufficient stack depth for long-path devices
52. The SDN controller automatically restores the tunnel to the original path after the bandwidth and delay of the original path are restored
53. The SDN controller supports global path computation after network-wide LSPs are managed. After bandwidth constraints are modified, paths can be automatically recalculate
54. The SDN controller supports manual global LSP re-optimization on the GUI
55. The SDN controller supports manual local traffic optimization on the GUI
56. The SDN controller supports switchover between automatic and manual optimization
57. The SDN controller can re-optimize specified tunnels on the GUI

58. The SDN controller must support global re-optimization based on the network status and performance data collected in real time
59. When a node or link fails, the SDN controller supports automatic LSP re-optimization
60. When the real-time bandwidth of a link exceeds the threshold, the SDN controller supports automatic global LSP re-optimization.
61. When the real-time tunnel bandwidth change rate exceeds the threshold, the SDN controller supports automatic LSP re-optimization.
62. The SDN controller can view the link, tunnel information, and optimization logs that trigger optimization. You can also view details about historical optimization.
63. The SDN controller supports link+node hybrid optimization to ensure bandwidth.
64. The SDN controller supports path computation and optimization for PECP-hosted primary and secondary TE LSPs
65. The SDN controller supports re-optimization based on the packet loss rate and delay
66. The SDN controller supports route computation and optimization for SRv6/SR-MPLS Policy tunnels.
67. The SDN controller can set optimization policies, such as link bandwidth thresholds and maximum latency.
68. The SDN controller supports route calculation and optimization based on the GIS map
69. The SDN controller supports network path adjustment and optimization driven by service delay and quality deterioration.
70. The SDN controller supports tunnel-level and global optimization policies.
71. The SDN controller supports path adjustment and optimization based on the Latency deterioration of links.
72. The SDN controller supports setting and cancelling maintenance windows. For scheduled maintenance jobs, a dialog box is provided to ask the user whether to start or end maintenance.
73. The SDN controller supports maintenance windows - when a link/node needs to be upgraded or maintained, the controller has the ability to re-optimize the global LSP and bypass the link/node to be maintained.
74. Automatic service provisioning and management
75. The SDN controller supports E2E configuration of the following service types:
    i. RSVP-TE/SR-TE
    ii. SRv6 Policy
    iii. L3VPN
    iv. EVPN

v. VLL

vi. VPLS

76. The SDN controller supports model-driven VPN service deployment to define the mapping from network services to device configurations.
77. The SDN controller supports the creation of QoS profiles, batch deployment of QoS profiles on devices or interfaces, and quick deployment of QoS profiles and VPN services.
78. The SDN controller supports template-based tunnel creation and tunnel bandwidth, delay, and hot-standby configuration.
79. The SDN controller supports the auto-select or binding mode to bind services to tunnels.
80. The SDN controller can automatically create a tunnel that meets service SLA requirements during service creation.
81. The SDN controller can automatically create a tunnel that meets service SLA (bandwidth) requirements during service creation.
82. The SDN controller can automatically create a tunnel that meets service SLA requirements (such as the shortest path) during service creation.
83. The SDN controller supports multiple path selection policies, including the shortest path, load balancing, and minimum latency.
84. The SDN controller supports E2E service trail preview based on different route selection policies. Users can manually select required trails.
85. When L3VPN/EVPN service bandwidth is insufficient, the SDN controller can modify UNI-side service bandwidth in real time to proactively market services.
86. When the L3VPN/EVPN service bandwidth is insufficient, the SDN controller can modify the NNI service bandwidth in real time to balance network loads.
87. The SDN controller supports service resource pool management, including RD/RT/BD/EVI/EVPL/Service ID/VNI resource pool management.
88. The SDN controller supports monitoring and visualization of service SLA performance, including delay, packet loss, jitter, and bandwidth, by using (TWAMP and Y.1731)
89. The SDN controller supports service connectivity detection, including ping/tracert diagnosis for L3VPN (including L3EVPN), EVPN, VLL, PWE3, and VPLS services and tunnels
90. The SDN controller should provide a GUI to support batch configuration of BGP peers
91. The SDN controller must support batch configuration of RSVP-TE/SR-TE
92. The SDN controller supports 360-degree service monitoring on a unified interface, including the service layer topology, centralized status display of service-related resources, and automatic alarm and service association.

93. The SDN controller supports E2E slice deployment/capacity expansion and slice monitoring topologies.
94. Network monitoring and performance analysis
95. The SDN controller must support real-time collection of network performance information through SNMP.
96. The SDN controller must support real-time collection of network performance information through Telemetry.
97. The SDN controller must support dynamic collection of link and tunnel data delay information.
98. The SDN controller should support statistical report and visual display of network performance, including packet loss, delay, jitter, and bandwidth utilization.
99. The SDN controller must support statistics reports and visualized display of QoS queue/VPN service performance and quality, including packet loss, delay, and jitter.
100. The SDN controller should support the generation of alerts when performance exceeds threshold limits.
101. The SDN controller Should support BW utilization & QoS monitoring.
102. The SDN controller should provide network performance reports based on multiple resources. (Such as ring network, NE, board, port, link, and service) Performance analysis report
103. The SDN controller should support 1 minute, 15 minutes, hour, day, week, month, and yearly reports.
104. The SDN controller shall support BW Utilization monitoring for TE tunnels and provide TE tunnel BW Utilization reporting: tunnel rates (minimum, maximum, and average)
105. The SDN controller should provide IP link traffic reporting: rate and bandwidth utilization.
106. The SDN controller should support the detection of service flow quality one by one to demarcate faults.
107. The SDN controller should support the playback of historical SR tunnels, compare historical KPIs, and quickly locate faults.
108. The SDN controller must support service quality monitoring (packet loss, jitter, and delay)
109. The SDN controller stores minute-level performance data for a maximum of 30 days
110. The SDN controller stores minute-level day-level performance data for a maximum of one year
111. The SDN controller supports Services Quality detection (packet loss, jitter, and delay) to restore the E2E path of service Quality and diagnose root cause.
112. The SDN controller supports L3VPN/L3EVPN service quality detection.

113. The SDN controller supports L2EVPN VPWS service quality detection.

114. The SDN controller must support flow-based quality monitoring (packet loss, jitter, and delay).

115. Offered system should support following IP-MPLS OEMs for fault, performance, and service management from day#1:

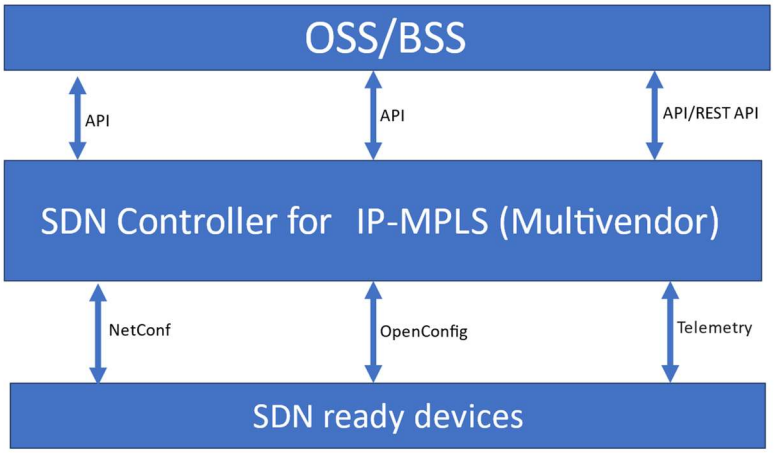
    i. Juniper
    ii. Cisco
    iii. Nokia
    iv. IP Infusion

116. SDN Controller offered for IP/MPLS domain must ensure that -

    i. The schema should have unique identifiers to identify a Managed Objective including Vendor name, NEID, etc.
    ii. Physical and logical Inventory and topology (network and service) discovered will have similar Schema (Payload) for all Vendors and will be available in the API response.
        a) No difference in attributes between vendors and should have common Schema.
        b) The inventory and topology objects and content would be same for all vendors.
    iii. The performance management will have the same schema definition and counters for all the vendors.
    iv. The Fault management will have the same schema definition for all the vendors.
    v. Re-sync to be supported for alarms.
    vi. The Interfaces supported by SDN controller shall be (at-least, may not be limited to) -

        a) FM – Kafka
        b) PM – Telemetry (Kafka)
        c) Inventory – RestAPI
        d) Discovery – Rest API
        e) Service provisioning – Rest API

117. Architecture for SDN Controller of IP-MPLS.



C. For DWDM:

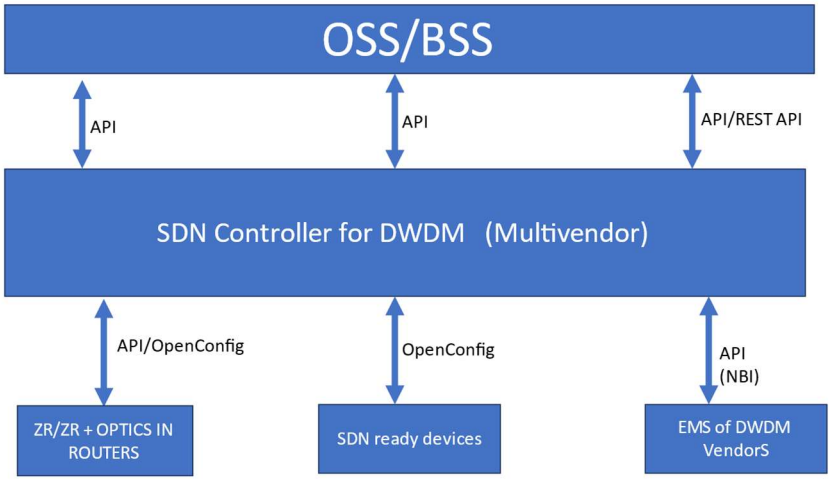
S. No	General
1	Offered System should be able to discover DWDM nodes and topology, as well optical services over the line system and the corresponding equipment's. In case of Alien wavelength, it should also reconcile the line system information with the transponder view, support optical network and services visualization in a single pane of glass, and inventory and monitor all involved network resources and services, from power levels to status and alarms, across all equipment platforms and OEM vendors. Offered System should also offer automating fault correlation, suppressing redundant alarms, and enabling the identification of the primary cause of failure.
2	Offered System shall provide support for management and control of the equipment. SDN Controller shall be connected with OSS via APIs provided by Bidder at no cost to RailTel. Bidder needs to provide SDN Controller for 5000 Nos of Nodes in HA (DC and DR) for Network management to manage the network elements of DWDM via EMS.
3	Offered system should support topology discovery and representation. Offered system should also simplify and automate common optical operational workflows of optical services include the ability to verify the physical connectivity of transponders to line system ahead of provisioning, as well as to automate transmit power settings for transponders based on the power acceptance windows of OLS (in case of third party OLS) , assuring proper optical signal equalization throughout the path.
	Topology View
4	Management system shall provide a geographical View of Third-Party Networks via its GUI.
5	Management system shall provide a View of Third-Party Networks via its GUI based on the technical structure of the Network Elements from a high-level view down to single Components.
	Third Pary Devices Management
6	Offered System shall provide capability to manage OpenConfig devices
7	Offered System shall provide capability to connect to Third Party management systems making use of ONF TAPI
8	Offered System shall provide capability to connect to Third Party management systems making use of Proprietary interfaces

9	Offered System shall provide capability to retrieve and represent Reported Open Line Systems Physical Topology
10	Offered System shall provide capability to retrieve and represent Reported Open Line Systems Logical Topology and inter node connectivity
11	Offered System shall provide capability to retrieve and represent Reported Open Line Systems Circuit entities on the OMS Ots MCH and ODX Layers
12	Offered System shall provide mechanisms to filter and select Third Party Network elements to enrol for management
13	Offered System shall provide capability to manage Coherent Pluggables.
14	Offered System shall provide capability to Provision OpenConfig Devices
	Alarms
15	Offered System shall provide capability to collect depict and administer alarms for Third Party Network Elements
16	Offered System shall be able to correlate Third Party Alarms to ports, paths and E2E services
17	Offered System shall provide Alram Log capability for Third Party Network Elements
	Performance Management
18	Offered System shall provide capability to collect depict and administer Historical Performance data for Third Party managed Entities
19	Offered System shall provide capability to correlate Historical Performance data for Third Party managed Entities with Managed Circuits
	Configuration Management North-Bound Interface
20	Offered System shall provide capability to Report in its NBI inventory for Third Party managed entities
21	Offered System shall provide capability to Report in its NBI Circuits and related parameters for third Party managed entities
22	Offered System shall provide capability to Report via its NBI Alarm data for third Party managed entities
	Graphical User Interface (GUI)
23	Offered System shall provide a seamless UI for management of all the managed entities
24	Offered System shall provide Troubleshooting capability for multi-vendor domain Circuits
	Software
25	Management system shall support and accelerate service creation over open line system
26	Offered System shall Provide Tools that allow for verification of Physical Cabling inter Vendor Domains
27	Management system shall have the capability to integrate existing 3rd Party NMS to provide a consolidated control.
28	Vendor shall offer standalone software application in order to simplify the deployment and operation in multi-vendor environment.
29	Management system shall support DWDM wavelength/open-wave management.
30	NMS shall provide end to end view preserving all the details specific to topology, connectivity and service level information for all the OEM Domains
31	Offered System shall in Its GUI embedded capability to access Third Party CLI interface
32	Offered System shall in Its GUI embedded capability to access Web Craft interface
33	Offered System shall be deployable in containerized environments

34	Offered System shall provide routing engine that allows for Route calculation across multi-vendor network
35	Offered System shall be able to Provision E2E multi-vendor domain circuits
36	System shall support end to end service management function for the provisioned services running in multi-vendor optical network.
37	Management system shall support inventory and topology discovery across multi-vendor open line system,
38	Management system shall be able to automatically define Xponders power settings over 3rd party open line system
39	Management system shall provide operational simplicity and troubleshooting over multi-vendor environment
40	Management system shall support seamless integration with Open system infrastructure.
41	Management system shall be able to manage all deployed Network Elements via one GUI.
42	Management system shall provide a GUI supporting all O&M Tasks.
43	Offered system should support OpenConfig
44	Offered system should support web-based application for Fault, Performance and service management and System should be implemented using modern cloud-native technologies.
	O&M
45	The interface toward the Network Elements shall use a open and well documented protocol.
46	Management system must be able to collect different performance statistics concerning the cards (line, Tributary, Transponder, Muxponder, Amplifier, Roadm) for all the Devices
47	Management system should support Performance log's graphical view for all the Devices
48	Management system should support Service oriented performance management for all the Devices
49	Management system shall provide a GUI for all Fault Management Tasks for multi-vendor networks
50	Offered system should support E2E circuit creation with automatic power targeting adjustment
51	Offered system should support E2E circuit creation with manual power targeting adjustment
52	Offered system should E2E Circuit Alarm correlation for multi-vendor networks
53	Offered system should support following DWDM OEMs for fault, performance, and service management from day#1: i. Adva ii. Tejas iii. Ciena iv. Nokia v. Coriant (Infinera) vi. ECI
54	Controller offered for optical domain must ensure that - i. The schema should have unique identifiers to identify a Managed Objective including Vendor name, NEID, etc.

	ii. Physical and logical Inventory and topology (network and service) discovered will have similar Schema (Payload) for all Vendors and will be available in the API response. a) No difference in attributes between vendors and should have common Schema. b) The inventory and topology objects and content would be same for all vendors. iii. The performance management will have the same schema definition and counters for all the vendors. iv. The Fault management will have the same schema definition for all the vendors. v. Re-sync to be supported for alarms. vi. The Interfaces supported by SDN controller shall be (at-least, may not be limited to) - a) FM – Kafka or SNMP v3 b) PM – RestAPI or sFTP c) Inventory – RestAPI d) Discovery – Rest API e) Service provisioning – Rest API

54. Architecture of SDN Controller for DWDM



8.2.4.2 Device Management System (Fault and Performance) for Legacy Network

1. The solution components should preferably be based on opensource or commercial supported technology and should be provided with necessary support from OEM.

2. Offered system should support following Legacy Network OEMs for fault, performance, and service management from day#1:

   i. Switch :D-Link,

   ii. Switch: Edgecore,

iii. Switch: Watchdog,
iv. Switch: Techroute,
v. Switch: Andatelecom
vi. Switch: Juniper
vii. Switch: Huawei
viii. IP-MPLS: Cisco ASR 920
ix. IP-MPLS: Juniper ACX-2200,2100,4000 and1100

3. The solution should have capabilities to handle up to 300,000 data points per second with flows.

4. The solution design should be based on open industry standards and protocols.

5. The solution should be centrally deployed and globally accessed.

6. The solution should provide interoperability across Cloud and on-premises providers, platforms.

7. The solution should utilize "best practices" and should preferably follow design driven architecture.

8. The solution may use concepts such as Micro service-based Container Architecture.

9. The solution should be modular, scalable and may be flexible as a true 'Cloud/on premise Deployable' solution.

10. The solution design should be n-tier services-based architecture for all environments.

11. The solution design should focus on developing workflow and business transaction, rules management, configuration management.

12. The solution design should be done in such a manner that components are loosely coupled; ensuring that the application components are treated individually and dependencies are reduced. The SI should ensure that addition, removal, failure or update of one component has a minimum impact on other components.

13. The bidder should ensure that services should be written in such a way that they can be automated for testing. Test automation is necessary to ensure services can be upgraded, re-factored, etc. without breaking other services that use them. The bidder should ensure that all services should be inherently versioned, and all invocations must specify the version of service.

14. The bidder should ensure that new versions of services should be backward compatible with at least one or two previous versions so that users of the service can start using new version of the service without mandatorily making changes to their code.

15. The solutions design should provide for service abstraction, to control what part of the service logic of a particular application needs to be private (hidden) and which parts need to be made public (consumable).

16. The solution should not only be modular in nature but be adaptive to converse with other technology components such as platforms and databases, complete with management suites or with the induction of adaptors and interfaces or even smaller bespoke solutions to support the same.

17. All applications must take into account appropriate security, performance, efficiency and maintainability issues based on the functional, technical and non-functional requirements.

18. The bidder needs to set up, operationalize and support system for APIs and web services.

19. The solution should support integration option in both north as well as south bound integration on each module level. The solution should be able to integrate with OSS layer and SDN Controller. The solution should support integration option through open APIs in the system which can be used by customers for integrating their own systems. Integration should provide the option in both north as well as south bound integration using multiple options like RestAPI/XML/ SOAP/ Corba etc. on each module level. Any fault details should be able to send to third party ERP, Customer Portal, UNMS or even EMS if needed using the Trap, XML and even direct database query integration.

20. The solution must be supported by at least ‘N-1’ versions of any underlying products. This will be required in case some / other functionalities become non-functional upon deployment on the latest version, or in case a roll-back is required.

21. Any proprietary software which would be part of the solution must be of the latest commercially available version.

- Proprietary software must be supported in terms of upgrades, bug fixes, functionality enhancements and patches to cater to changes to statutory requirements by their respective solution components for the entire duration of the contract plus 6 months after end of contract.

22. Commercial support from respective OEM should be made available on all deployed versions for the contract period. Data will be owned, shared, controlled and protected as a corporate asset of the RailTel.

23. Data should only be accessed through application / interfaces for create, update and delete. There should not be any direct access to the data layer for users.

24. The bidder shall provide the details of data synchronization strategy both in batch mode and in real time. RailTel, in consultation with bidder, shall decide on the methodology of data synchronization based on service requirements.

25. Data Entry: All the data entry in the system shall be performed in English only

26. The solution MUST allow distributed data collection to monitor systems and networks that are otherwise inaccessible.

27. The solution MUST allow Digital experience monitoring (DEM) from different perspectives to provide a better understanding of local conditions.

28. The solution MUST allow Dynamic scaling to adapt to changing network conditions and volumes of data collected for processing and storage.

29. The solution MUST provide Fault management capabilities.

30. The solution MUST provide Performance management capabilities.

31. The solution MUST provide Extensive network, application, service, and topology discovery.

32. The solution MUST provide Distributed monitoring.

33. The solution MUST provide zero-touch appliance service.

34. The solution MUST provide Network traffic analysis (flows)

35. The solution MUST provide Forecasting/capacity planning.

36. The solution MUST provide business service hierarchy with root cause and impact analysis.

37. The solution MUST be highly extensible.

38. The solution MUST provide easy configuration through web UI and REST API

39. The solution MUST provide configure and execute service monitors.

40. The solution MUST provide customizable web UI including dashboards, node status, resource graph viewer, geographical and logical topology maps, heat maps, trends/trend analysis, and more.

41. The solution MUST provide support for associating arbitrary metadata with nodes and interfaces

42. The solution MUST provide support data collection of types SNMP, WS-Man, HTTP, XML, JMX, JDBC, NSClient, TCA, WMI

43. The solution MUST be IPv4 and IPv6 compliant.

44. The solution MUST support Layer 2 and Layer 3 network topologies.

45. The solution MUST provide flows support for Netflow v5, Netflow v9, IPFIX, sFlow, JFlow for 1000 Interfaces.

46. The solution MUST provide Elasticsearch integration.

47. The solution MUST provide LDAP/AD authentication.

48. The solution MUST provide REST API for information, inventory, performance data, alarms, and events availability.

49. The solution MUST provide support message brokers like integrated ActiveMQ, Kafka

50. The solution MUST provide support numerous supported plugins like Grafana, Time Series Database like Cassandra or equivalent, GraphML, Logstash.

51. The solution MUST provide support for MIB compiler.

52. The solution MUST provide support for Asynchronous events, SNMP Traps, and Syslog

53. The solution MUST provide support for poll and test applications and standard network protocols.

54. The solution MUST provide support for SNMP Traps: v1, v2c, v3, and Syslog

55. The solution MUST provide support for events, events translation and events enrichment.

56. The solution MUST allow data visualization and alarm correlation to better understand the data collected and improve response times

57. The solution MUST allow customization for your unique monitoring, workflow, and personnel needs.

58. The solution MUST be horizontally scalable.

59. The solution MUST be commercially supported if using any 3rd Party and/or Open-Source components.

60. The solution MUST support the modelling of containing relationships among physical and logical resources, compatibly to their nature or definition. E.g. Devices containing other devices, sites containing network equipment/physical resources, resource topologies containing devices and circuits.

61. The solution MUST support the hierarchical modelling of logical resources in arbitrarily complex trees and Directed Acyclic Graphs.

62. The definition of relationships with configurable cardinality and directionality between any entities MUST be supported.

63. The solution MUST support the specification, characterisation and configuration of custom entities.

64. The solution MUST allow the resolution of logical connections over (among others) topologies.

65. The solution should support the internal connectivity of containers or an equivalent alternative.

66. The solution MUST support NAT and monitoring of remote offices using remote poller.

67. The solution MUST support API interface to query Inventory data, Fault Management metrics, Performance Management metrics, Assurance and Provisioning

68. The solution MUST support API interface to configure Assurance and Provisioning data.

69. The solution MUST support rapid on boarding of new lines of IP/MPLS services and network technologies using predefined ready-to-use models, covering physical, logical, service layers and virtual resources, along with best practice and guidelines for use.

70. The solution MUST cover, though not be limited to, the following technologies: Ethernet, IPv4, IPv6, MPLS

71. The solution MUST support following network technology layering (e.g. IPv4/IPv6 over Ethernet, MPLS over Ethernet)

72. The solution MUST support the effective and efficient modelling of technology-specific inventory models, being vendor neutral and according to the TMF SID definition.

73. The solution SHOULD provide an enhanced API layer to create/modify/delete technology-specific entities and models, along with best practice and guidelines for use.

74. The OOB ready-to-use models should be configurable and customisable.

75. Communication over standard protocols like SSH, REST, or NETCONF.

76. Poll network elements and store the latest configuration in the database.

77. Search for any text or regular expression in all configurations.

78. Download device configuration to a local text file.

79. Use the REST API or TFTP support to return a specified device's configuration.

80. Export all configurations to a remote Git repository (e.g. Gitlab).

81. View git-style differences between various revisions of a configuration.

8.2.4.3 Network Automation for Legacy Network

1. The solution should be GUI based and accessible through web-browser from any device.
2. The solution should be OEM agnostic and it should support all market leading OEM network devices irrespective of their Model and HW/OS Image Version.
3. The solution should be able to Manage 50k plus network devices irrespective of Physical / Virtual / Software Blade i.e. Router, Switches, Firewalls, Load balancer, IPS etc. which are present in the market.
4. The solution should Support SNMPv2, SNMPv3.
5. The solution should Support IPv4 and IPv6.
6. The solution should work on Intel Based platform on physical or Virtual Machines (VMware).
7. The solution should have option to be deployed in HA mode as well as DC-DR mode.
8. The proposed solutions database version should not be under End-of-Sale and End-of-Support.
9. The bidder has to support, plan and perform all upgrade / update of version and patches during the contract period.
10. The solution should have internal workflow management for approval process or should be capable of integrating with ITSM Ticketing tool.
11. The solution should have a built-in database to store structured data.
12. The solution should have in-built support for Role Based User Access and display content as per specific role & privileges of each user.
13. The solution should have notification to provide alerts and notification using multiple channels with like SMS, email, etc.
14. The solution should maintain audit trail of all operations and provide support for verification.
15. The solution should support multiple OEM devices and future roadmap as well.
16. The solution should be able to auto-discover network devices across WAN & LAN.
17. During subsequent discoveries, the solution should be able to identify and alert whenever any new device is added or removed.
18. In addition to auto-discovery, the solution should provide option to add/delete device manually, through CSV upload and through REST-API.
19. The solution should be capable to collect inventory information of the devices during discovery operation.

20. The solution should have ability to discover Layer 2 and Layer 3 network topology relationships between devices to ensure configuration settings.
21. The solution should display network Topology Map with connections and able to filter the maps based on device IP, Group and Location.
22. The solution should support standard communications protocols like Telnet, SSH, TFTP, FTP etc., by default.
23. The solution should have inbuilt version management of configurations with ability to compare two versions, revert to baseline version etc.
24. The solution should be capable of configuring multiple devices at a time.
25. The solution should in real-time, detect configuration and asset information changes, made across a multi-vendor device network, regardless of how each change is made.
26. The solution should be capable to detect, compare & alert on changes based on which decision could be made for rollback or implementation of changes.
27. The solution should support rollback to a previous configuration.
28. The solution should maintain at least three previous versions and/or configurations.
29. The Solution should support configuration deployment / rollback using either ad-hoc commands or configuration templates.
30. The should support multiple commands with multiple parameters at a time for individual location to perform a task. The solution should be able to perform such task in multiple locations at a time.
31. The solution should have the capability to create

    i. Multiple command set with hierarchy support (which order to execute)

    ii. Based on previous or parent command set result the next command set should exe cute or ignore,

    iii. Wait time to start each command set should be provided.
32. The solution should have option to define whitelisted / blacklisted command sets for remote CLI sessions to target network devices per user.
33. The solution should have multiple options for blacklisted commands including:

    i. Allow user to execute command but send notification to a senior stakeholder/manager,

    ii. Block the user from executing the blacklisted command but don't kill the remote session to target network device,

    iii. Terminate the remote CLI session when user tries to execute a blacklisted command.

34. The solution should provide option to schedule the Backup process.
35. The solution should have provision to Schedule the Task for specific date, weekly, monthly, and in case of any maintenance window.
36. The solution should be able to track and detect any configuration changes and alert accordingly.
37. The solution should Detect out-of-band configuration changes and trigger a configuration backup. Apply configuration changes to device configurations.
38. The solution should have capability to automates routine network operations.
39. The solution should have comprehensive Network configuration Back-up and Recovery for all network devices.
40. The solution should have capability to deploy and monitor IOS operating system images, network security patches for the supporting devices.
41. The solution should have the ability to push standard templates for newely deployed equipment's based on standard predefined policies.
42. The solution should have reusable templates for single or bulk changes.
43. The solution should have REST API that allows an external application to:
    i Get Operational data
    ii. Change device configurations
    iii. Get device configurations.
44. The device MUST support replacing current configuration with a new configuration without a reload.
45. The solution should have capability to provision new network devices as per the compliance standard. Solution should alert policy failing commands before execution.
46. The solution should have provision to have approvals for all the jobs and configuration put up in the system.
47. The solution should provide Notification when
    i. Critical job is not going to complete on defined time, or
    ii. Not started / expired within the scheduled time window due to Approval pending.
48. The solution should be capable of automatically generate a script from a list of command lines that are input by the user.
49. The solution should ability to upload entire archived configuration files to network devices.
50. The solution should allow a failed or success job to be resubmitted "x" number of times.
51. The solution should ensure audit trail of activities being carried out.

52. The solution should be capable of automating DC-DR Switch Over networking configuration as networking job through configuration management.

53. The solution should automate enforcement of ACL Policies on NEs of multiple vendors in parallel through configuration management.

54. The solution should auto provision NEs of multiple vendors using ZTP approach through configuration management.

55. The solution should support pushing downloaded configurations of NEs to external storage or FTP site.

56. The solution should support automatic clean-up of logs in firewalls and network devices.

57. The solution should automate all regular network operations on NEs through pre-defined & approved templates using configuration management.

58. The solution should define specific workflows for Service Provisioning covering NEs from multiple vendors and different environments through configuration management.

59. The solution should support definition and verification of pre-requisite conditions and post execution conditions while executing jobs as part of network operation automation.

60. The solution should be capable of error handling and auto resolution of dependencies within the workflow of network operation automation.

61. The solution should automate service provisioning in multi-vendor / multi-domain network through configuration management. The services covered under this feature should include (but not limited to):

i. L3 VPN - Central Services VPN, Hub & Spoke VPN, Full Mesh VPN, Extranet VPN,

ii. L2 VPN - L2 Point to Point VPN, L2 Point to Multipoint VPN, L2 Multipoint to Multipoint VPN,

iii. Internet Access (Common Services),

iv. Multicast service.

v. VLAN Services in Metro Ethernet Switches

62. The solution should automate Device provisioning in multi-vendor / multi-domain network through configuration management. The operations covered under this feature should include (but not limited to):

i.Zero Touch Provisioning,

ii. Day 1 Provisioning like - Host Name, Domain Name, NTP, VTY Console, SNMP, Syslog, LLDP, STP, ERPS and etc.,

iii. OEM Firmware, AMC, EoS and EoL Tracking,

iv. Pushing of configurations and Logs to FTP,

v. Firmware Upgrade,

vi. Policy Check.

63. The solution should automatically identify device vulnerabilities and provide provision for upgrade firmware.

64. The solution should have the capability to suggest remediations for the vulnerabilities.

65. The solution should be able to regularly check for updates of the vulnerabilities by the OEM's and check for new issues.

66. The solution should be able to load known resolution to the system for the vulnerabilities.

67. The solution should have the ability to resolve multiple vulnerabilities in one go.

68. The Solution should have configuration to set the frequency of vulnerability check.

69. The solution should have out of the box policies for basic checks.

70. The solution should allow user to configure multiple types of policies for the different devices in his network

71. The solution should allow regular or specific scheduling of policies defined.

72. There should be a approval process of every config and policies being defined or executed.

73. The solution should have capability for different alerts on policy violation to be defined at different levels of severity or urgency (for example, critical, severe or warning)

74. The solution should have ability to do regular Backup of Configuration data in TEXT readable format, which can be accessed even if the NCCM tool is down or disaster occurs.

75. The solution should restrict running multiple session from a single account.

76. The solution should be able to detect Policy violations and notify to person-in-charge.

77. The solution should have the ability to perform a textual configuration search using pattern matching.

78. The solution should be configurable to adapt to customer's configuration & change processes and provide compliance visibility across all network infrastructure components from single dash board.
79. The solution should store a complete audit trail of configuration changes made to network devices including critical change information.
80. The solution should maintain policy compliance using continuous configuration auditing and remediation.
81. The solution should be capable of automated remediation to bring devices back to policy compliance or to a default configuration status.
82. The solution should complete Operational, Security & Regulatory Policy Definition and Enforcement.
83. The solution should have capability to configure granular, customizable user roles to control permissions on device views, device actions, and solution actions.
84. The solution should have capability to Manage device access and authorization through a centralized control model that is integrated with standard workflow and approval processes through mail notifications.
85. The solution should allow the Administrator to view the current ongoing SSH and Telnet CLI sessions including commands send and response on all network device. Administrator should able to perform command search inside SSH and Telnet CLI sessions.
86. The solution should integration with TACACS, AD for Centralized Group / Role / User Management.
87. The solution should also integrate with Vendor Vulnerability Repository or Global Vulnerability Repository (like NIST) to automate the vulnerabilities identification on network devices.
88. The solution should be capable of integrating with SIEM, SYSLOG tools.
89. The solution should be capable of integrating with Incident Management Tool for Ticketing.
90. The solution should have option to backup the Tool configuration.
91. The solution should track All Actions According to Group / Role / User levels.
92. The solution should have provision to get feeds from OEM with regards to releases (version, patch) and notify.
93. The solution should have provision to get EOL / EOS from OEM and notify on expiry.

94. The solution should come with a browser based customizable Executive dashboard widget/page showing Device Configuration & their Compliance.

95. The solution should be able to Schedule and generate Report on all aspects of network device configuration and their compliance

96. The solution should be able to Schedule and generate custom report on all aspects of network device configuration & change management

97. The solution should support Report generation in User friendly formats like Excel, CSV, PDF.

98. The solution should be capable of controlling Reporting as per the Role based

99. The solution should be capable of maintaining and reporting following information:

i.Task output analysis,

ii. Security compliance,

iii. Operational compliance,

iv. Configuration differences,

v. How many configuration updates were performed between certain time across all devices,

vi. Which operators performed configuration updates on which devices,

vii. The number of unauthorised updates or policies violations detected.

100. The solution should support Remote Access to all types of network devices - Firewalls, Switches, Routers, etc.

101. The solution should be able to record all the remote sessions and should have an option to view the session recording at a later stage for auditing purpose.

102. The solution should allow administrator to view the live session of any ongoing remote session and to terminate the session if required.

103. The solution should have the option to Take SSH / Telnet remote session for target devices.

104. The solution should have an option to create a Device Authorization Profile which will enable the administrator to authorize a user or groups of users to perform actions on devices through remote session and File Management.

105. The solution should have an option to restrict who can execute what commands and should provie multiple options like Terminate session, Block Commands, Notify commands and Permit Commands.

106. The solution should be configurable to enforce Time based, temporary users access to specific network devices.
107. The solution should capture the session attributes like username, client name, de vice IP address, device account, client type, job creation time, first access time, and reason for the access.
108. The solution must provide report for all the Remote Jobs / Sessions taken.
109. The solution should have the option to view the active users connected followed by (user,login address, email, account type, session start time and session time).
110. The solution should automatically log all significant administrator or user actions.
111. The solution should allow the administrator to view the audit log file.
112. The solution should support viewing of the Audit logs based on the filter criteria like Time Scale, User IP, Username, and Event Types.
113. The solution should be capable of exporting Audit Trail into Excel and CSV formats.
114. Mediation for Legacy domain must ensure that -

i. Inventory discovered will have similar structure for all Vendors and will be available in the API response. The schema should have unique identifiers to identify a Managed Objective including Vendor name, NEID, etc.
ii. The inventory objects and content would be same for all vendors.
iii. The performance management will have the same schema definition and counters for all the vendors.
iv. The Fault management will have the same schema definition for all the vendors.
v. Re-sync to be supported for alarms.
vi. The Interfaces supported by Mediation shall be (at-least, may not be limited to) -

a) FM – SNMP v3 or RestAPI.
b) PM – sFTP or RestAPI.
c) Inventory – RestAPI.
d) Discovery – Rest API.
e) Service provisioning – Rest API

8.2.5 Other Requirements

8.2.5.1 Customer Dashboard/Portal

a. The Consumer Service Portal is envisaged to provide a seamless, intuitive, and interactive experience to the end users for availing services from RailTel. The portal should become the go to medium for end users to request for any of the services on offer, raise tickets for any issues they are facing or support they need regarding the services they are consuming.

b. The portal should be configurable to showcase the services on offer in a structured way that makes it easy for end customers to choose the appropriate options while registering any request or complaint. There should be a way for announcing the latest offerings or promotions to end customers via the portal with option to define either for all customers or selective customers.
c. The solution should enable the administrator to define the roles and respective privileges along with team structure to suit the operational needs of RailTel services. This configuration should result in each Operator getting to view only the tickets and requests assigned to them currently so that they can focus on their tasks efficiently and contribute to effective and speedy service support. There should be a way of defining the rules for auto allocation of the tickets and requests based on the type / category of both service and the end customer.
d. The Consumer Service Portal should also come with the facility of requesting and obtaining the feedback / response from end customers at the time of closing the tickets regarding the service requests / complaints so that the loop is completed from both RailTel and end consumer sides.
e. The manager / administrator should have the provision to view and analyse the information of all the tickets both open and closed using several filters in order to get good understanding of the nature of tickets for Services being provided, what the end customers are experiencing and where should the business and planning teams of RailTel should focus in order to enhance the Service Offerings as well as improve the Customer experience.

1. The solution should provide a web-based Consumer Service Portal to end consumers that can be accessed from anywhere and any device.
2. The solution should provide configuration options to define the Services Catalogue specific to different types of end consumers.
3. The solution should support configuration of Consumer Service Portal to reflect Customer specific Service Name and Logo.
4. The solution should provide User Management control to define the Access Privileges of Consumers to the Service Portal.
5. The solution should provide Incident Management functionality with workflow definition to handle each service individually.
6. The solution should support creation and management of KB articles relevant to the services being offered.

7. The solution should be capable of notifying the NOC team whenever the end user registers a ticket / service request from the Consumer Service Portal.
8. The Consumer Service Portal should enable end users to register a ticket / service request as per their profile.
9. The Consumer Service Portal should enable end users to refer to the knowledge base articles relevant to the services used by them.
10. The Consumer Service Portal should provide a dashboard to the end users showing the latest status of all the tickets / service requests registered by them.
11. The solution should have capability to integrate with third party ITSM solution or it should have capability to complete ITSM features.
12. The Consumer Service Portal should provide option to the end users to update and respond to the tickets / service requests registered by them.
13. The solution should provide configuration options to define the Announcements specific to different types of end consumers.
14. The solution should provide configuration options to define the Customer Surveys specific to different types of ends consumers.
15. The solution should be integrated with ERP for Billing related information ,Ticket System and OSS System.
16. Customer solution Portal shall also support following:
    a. Service availability and billing related information on Portal
    b. Customer Service Interfaces utilization on Portal
    c. SLA parameters.
    d. Latency, Packet drop and Jitter information to customer on Portal.
    e. Status of Service.
    f. Unified portal for Dashboarding and reporting purpose
    g. Inventory List assigned to the specific customer.
    h. Aggregated Inventory Health status
    i. All tickets logged by customer with ticket details and status.
    j. Invoices
    k. Payment History
    l. Detailed Inventory Status using Link Status and Bandwidth usage.
    m. Netflow stats, telemetry stats
    n. Critical Alarms, Fault Management and Performance data
    o. Geo maps

8.2.5.2 Robotics Process Automation (RPA)/Workflow Automation

A. Functional & Technical Requirements for the RPA/ Workflow Automation Tool:

1. The solution should aim at automating end-to-end process in the organization using advanced technologies such as Machine Learning, Deep Learning, Natural Language Processing, GenerativeAI, Intelligent Document Processing (IDP), and Analytics.

2. To ensure optimal performance and stability of the automated solution, the solution must incorporate a robust version control mechanism that facilitates easy rollback to a previous version in the event of a failure or error.
3. Single platform that can govern and control every component of the solution in a single unified platform:
    a. Attended and Unattended Bots,
    b. Custom human in the loop interfaces
    c. Intelligent document processing (IDP)
    d. APIs
    e. Custom Scrips and macros
    f. Intelligent Task mining
    g. Creation of the bots on low-code / no code environment
    h. Creation of customer human in the loop interfaces involving no-code components
    i. Secure credential vault
    j. Bot operations dashboards
    k. Business user dashboards (business data)

4. The solution should have mechanisms to connect to various applications using proper user ID and passwords for those applications in an intelligent process automation environment. The solution should provide a secure mechanism to store and manage user credentials and provide an audit trail of user activities.
5. The solution should be able to take snapshots of the activities performed and store them at each step for every instance. This should include detailed logs of all actions taken by bots and humans, as well as any exceptions or errors encountered during the process. The system should also provide a mechanism for tracing the lineage of data and processes, enabling auditing and compliance reporting.
6. Solution must support attended & unattended automation modes of operating a bot.
7. Business users should have dedicated customizable human in the loop user interfaces for both attended and unattended bots. Business user interfaces to support User input to bots, bot output to User, real time visibility into bot status, “Picture in Picture” mode of operation, support workflows, approvals, validations, exception handling and allow for end-to-end human in the loop automation.
8. The solution must be scalable to accommodate a large number (at least 300 bots and 100 users) of bots and users within the same administration platform and should be scalable to support growing demand.

9. Solution should allow business users to quickly create automations with a unified, drag and drop configurable development environment which requires minimal or no coding
10. Should support to create re-usable objects that can be used in later automations
11. The proposed solution should support Process Activity Recorders (e.g. web, desktop, citrix etc) to enable quick prototyping and decisions around the feasibility of automating a process; and then capturing process steps as part of the actual process automation.

12. Should support enabling insertion of custom python code - based into workflows to bring ML models into the automations.
13. Should support connectors for leading enterprise applications including SAP (GUI and web), Oracle, Siebel, PeopleSoft, etc., pre-built automation activities for interaction with applications (through the GUI) or by using integration activities (SOAP, REST, etc.).
14. Solution should captures, addresses, and communicates exceptions when handled for both reporting and process improvement reasons.
15. Solution should support full Virtual Desktop Integration (VDI) automation
16. The Proposed Solution shall comply with Secure Coding Principle:
17. The solution must have capabilities that support intelligent document processing
18. The proposed tool should support at least 10 number of user licences.
19. Solution should have capabilities for admin to provision and de-provision user access to admin and report generation capabilities and same shall be provided
20. Solution should have ISO certifications (ISO 27001, ISO 22301)
21. Solution should meet encryption standards for data at rest and in motion
22. Solution should support multi Factor Authentication
23. Solution should minimise security vulnerabilities through Veracode certification
24. Solution should allow business operations users to pre-schedule Digital Workers through a visual interface without scripting/coding/configuration changes
25. Solution should allow business operations users to business operations users dynamically allocate processes to Digital Workers on-demand in a drag and drop fashion
26. Solution should provide an in-built central command and control room to monitor all aspects of operations in real-time
27. Solution should provide in-built visual dashboards with real time visibility into bot operational data, and real time graphical visualizations of business data handled by bot
28. Solution should provide in-built Process Level Analytics to aid continuous process improvement.

USE CASES FOR RPA/ Workflow Automation TOOL:

A. Network Alarm Monitoring and Resolution

1. Improved service quality: Enabling faster resolution of issues and improving the accuracy of alarms.

2. Increased efficiency: Improving efficiency and reducing the time and effort required to identify and address issues by operations users
3. Improved accuracy: Reduce the risk of human errors
4. Reduced workload: Reduce the workload on network operations staff, freeing up their time to focus on more complex or value-added tasks.
5. The solution SHOULD support checking if Alarm Received in Network Management System (NMS):
6. RPA/ Workflow Automation to Check Network element running status.
7. The solution SHOULD support Identifying NMS issue when alarm not received in NMS:
8. RPA/Workflow Automation to get Network element details (state, process id property files)
9. Checking Network element was running at particular timeslot.
10. Pull the raw files and search raw files for alarm summary.
11. Notify users of NMS issue
12. The solution SHOULD support handling Alarm received but not processed on NMS:
13. RPA/ Workflow Automation to check log files to check if alarm was processed of discarded
14. RPA/Workflow Automation Fetch reason for Alarm discard.
15. The solution SHOULD support handling Alarm received on Network Management System:
16. Query Alarm Database for fetching alarm records
17. Match with policy rules
18. Check policy mismatch that caused ticket generation prevention
19. Check for inventory enrichment.
20. The solution SHOULD support Ticket Investigation and Resolution:
21. Run Diagnostics and 1st level Troubleshooting based on ticket
22. Qualify alarm basis alarm policies.
23. Alert triaging and Notify users with summary of diagnostics.
24. Attempt resolution for common tickets and share confirmation / failure with Users
25. Create Incident tickets to vendors.
26. The solution SHOULD support Monitoring and Highlighting Exceptions:
27. Proactive Monitoring: HUB and High-Capacity LSI
28. Monitoring of Power log for nodes in CI where RFO is captured as power fail
29. Monitoring: ODU & CEN MPLS Service Latency history

30. Port Mirroring

B. Network Provisioning Management

1. Increased agility: Easily make changes to networks to increase agility and responsiveness
2. Improved service quality: Enabling faster and accurate provisioning leading to competitive advantage and improved customer experience
3. Increased efficiency: Improving efficiency and reducing the time and effort required by automating system driven tasks
4. Reduced workload: Reduce the workload freeing up their time to focus on more complex and customer value-adding tasks.
5. The solution should support Sales Order Submission UI:
6. User Interface for Field Sales to submit orders through any device. Data flows to a bot.
7. The solution should support Order Validation:
8. RPA/workflow Automation validates the orders for confirmation of all required details. Any missing mandatory information is routed back for information.
9. The solution should support Service Feasibility:
10. RPA/ workflow Automation performs network capacity / inventory check and Verifies service feasibility.
11. The solution should support Customer account creation:
12. Create / Update customer account in the ERP
13. The solution should support Service Case Creation:
14. RPA/ workflow Automation for Automated Service Case creation in System
15. The solution should support Resource allocation and configuration management:
16. Assigning resources, automated updation of inventory systems
17. Installing software, setting up n/w elements and configuring network settings.
18. The solution should support Servicing Management:
19. Trigger notifications and service requests to various servicing teams.
20. Automated follow-ups, reminders and escalations based on SLAs.
21. The solution should support Update ERP:
22. Updating customer details, service and billing related information in downstream systems
23. The solution should support End to end visibility on each case
24. Track and audit each case throughout the provisioning cycle.
25. Real time dashboard for provisioning management and status tracking

C. Network Testing and Network Maintenance Utilities

1. Increased agility: Easily make changes to networks and test to increase agility and responsiveness
2. Improved service quality: Enabling faster and accurate provisioning leading to competitive advantage and improved customer experience
3. Increased efficiency: Improving efficiency and reducing the time and effort required by automating system driven tasks
4. Reduced workload: Reduce the workload freeing up their time to focus on more complex resolution and customer valueadding tasks.
5. The solution SHOULD support B2B link testing:
6. Setting up test environments
7. Configuring test equipment and running test scripts.
8. Data collection and reporting
9. The solution SHOULD support Twamp Troubleshooting:
10. Checking settings and verifying connectivity
11. Test packet analysis and reporting
12. The solution SHOULD support Service details:
13. Service details to be extracted out for node/ring/port through MCP
14. The solution SHOULD support Node Addition:
15. Insertion through ECI
16. Configuration and Testing
17. The solution SHOULD support Port Mirroring:
18. Configuring port mirroring
19. Traffic analysis and reporting
20. The solution SHOULD support Port Bundling:
21. Configuring bonding on network equipment
22. Monitoring bonded links for issues
23. Generating reports on bond performance
24. The solution SHOULD support Card Addition/ Removal:
25. Identifying the need for a new card
26. Testing the equipment
27. The solution SHOULD support SFP Addition/ Removal:
28. Identifying the need for a new SFP transceiver

29. Testing post addition or removal

8.2.5.3 Application Performance Monitoring

The APM module should support-

1. Automatic discovery and mapping of application and its infrastructure components to maintain real-time awareness in dynamic environments.
2. End-to-end observability of an application's complete HTTP/S transactional behaviour to understand the effect on business outcomes and user experience.
3. Mobile and desktop application monitoring on mobile and desktop browsers to track user experience across platforms.
4. Root-cause and impact analysis of application performance problems and business outcomes for faster, more reliable incident resolution
5. Integration and automation with service management tools and third-party sources to keep pace with an expanding and evolving infrastructure.
6. Business KPIs and user journey analysis (for example, login to check out) to optimize user experiences and provide transparency into how changes impact KPIs.
7. Proposed Solution should support Internal Module API accessibility: Content management API / DSDP API Management monitoring / Internal module API.
8. It should support External API request / response and parameter validation: Internal and External request / response validation and failure, request response / Time out
9. The solution should be capable of Application Process Utilization : Transaction processing Turn around Time
10. It should provide Application request / Response Queue (Lag) :Transaction Queue / Delay in transaction between internal and External end points & Application request timeout : Internal and External end points transaction read Time out and connection time out
11. It should support Tomcat / JBOSS monitoring : KPIs for Web server like – No of thread Pools , No of TPS , JVM (Heap) Memory Utilization , Database connection pool status
12. It should provide HTTPD / Nginx Process Monitoring like Thread monitoring / thread Utilization / CPU Utilization.
13. It should support Segmentation Fault Detection :Identification of Core Generation
14. It should provide Application Log Monitoring :All kind of Exception s and critical patterns

15. It should support Real time critical interface Health check : Real time Application modules functionality check .

8.2.6 Business Continuity

A. Critical Applications and Databases for Business Continuity

1. The solution MUST consider HA for all applications and services which are critical for business continuity.
2. The solution MUST consider FM (Fault Management)/Alarms, Fulfilment and Provisioning data, Configuration and application state data, and associated databases critical for business continuity.

B. Non-Critical Applications and Databases for Business Continuity

1. The solution can consider PM (Performance Management), syslog and telemetry data and associated databases to be non-critical for business continuity and can choose to not provide HA for the same.
2. The solution MUST provide a manual/automated way of backing up and restoring non-critical data on a daily basis between DC and DR.

8.2.7 Hardware Specifications

The required Server, Storage , Backup and SAN switches should be from same OEM.

8.2.7.1 Server

Following are minimum configuration required from servers.

S. No.	Component	Description
1	Form Factor	Max. 2U rack mounted with sliding rails
2	Supported CPU	Up to two 3rd Generation Intel® Xeon® Scalable processors with up to 40 cores per processor.
3	Configured CPU	2*32 cores @ 2 GHz, 48 MB Cache (Gold 6338) or better
4	Memory slots	Up to 32 x DDR4 RDIMMs/LRDIMMs
5	Memory configured	64 GB*8 populated with 512 GB RDIMMs 3200 MT/s
6	Disks supported	Up to 8 x 2.5” SAS/SATA HDD or SSD with universal slots
7	Disks configured	2*1.2 SAS
8	RAID Controller	HW RAID Card with 4 GB Cache
9	I/O slots	Support up to 8 x PCIe Slots Gen4
10	Expansion Slots	At least 4 x16 PCIe slots to be provided
11	Ports	2* 10GbE SFP+ Ports and 2x16 or 32 Gbps FC.

12	Power Supply	Platinum rated redundant Hot plug Power Supplies with hot plug fans
13	Management integration	Support for integration with Microsoft System Center, VMware vCenter, BMC Software
14	LCD panel	Should display system ID, status information and system error error code followed by descriptive text. LCD background should light up in different colours during normal system operation & error conditions.
15	Certifications for Quality and Safety Standards	1. Manufactured in accordance with the international quality standards ISO 9001:2015.
		2. Compliance to Safety of IT Equipment: UL 62368 or IEC 62368 or CSA 62368 or EN 62479.
		3. Standards for EMC (Electro Magnetic Compatibility) Standards: EN 55035 Class A or CISPR22 Class A or CE Class A or FCC Class A Standards for EMC (Electro Magnetic Compatibility) requirements.
		4. RoHS: EN IEC 63000
16	Power Supply	Redundant hot-plug power supplies
17	Fans	Redundant hot-plug system fans
18	Industry Standard Compliance	ACPI Specification v2.0c or above Compliant
		PCIe Base Specification Rev. 3.0 or above Compliant
		WOL Support
		Microsoft® Logo certifications
		PXE Support
		VGA/Display Port
		USB Specification Rev. 2.0 or above Compliant
		Energy Star
		SMBIOS 2.7 or above
		UEFI Specification, v2.1 or above
		Redfish API
		IPMI 2.0
		Advanced Encryption Standard (AES)
		SNMP v3
		TLS 1.2
		DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP)
		Active Directory v1.0
		ASHRAE A3/A4
		UEFI (Unified Extensible Firmware Interface Forum)

19	System Security	Cryptographically signed firmware, UEFI Secure Boot and Secure Start support, Secure Erase, Immutable Silicon Root of Trust, System Lockdown, FIPS 140-2, TPM 1.2/2.0, NIST SP 800-147B ("BIOS Protection Guidelines for Servers") .
20	Operating Systems and Virtualization Software Support	Microsoft Windows Server
		Red Hat Enterprise Linux (RHEL)
		SUSE Linux Enterprise Server (SLES)
		VMware
21	Provisioning	1. Should support tool to provision server using RESTful API to discover and deploy servers at scale
		2. Provision one to many servers using own scripts to discover and deploy with Linux or Scripting Tools for Windows PowerShell
22	Embedded Remote Management and firmware security	Integrated management controller should support:
		a. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures.
		b. Silicon root of trust, authenticated BIOS, signed firmware updates and BIOS Live Scanning for malicious firmware
		c. Telemetry Streaming
		d. Real-time power meter, temperature monitoring, customized exhaust temperature and System Airflow Consumption
23	System Management Solution	1. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution.
		2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication
		3. The system management solution should be provided
		a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule.
		b. Scope based access control to limit Users to specific group of devices

		c. Bare-metal server deployment and cloning
		d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation
		e. Manage remote devices and control power spikes during power-on operation.
		4. The system management solution should be of the same brand as of the server supplier.
24	Cloud Enabled Monitoring and Analytics	1. Offered servers shall have cloud enabled monitoring and analytics engine for proactive management. All required licenses for same shall be included in the offer.
		2. Cloud Enabled Monitoring and analytics engine shall have capability to provide following:
		• Health and cybersecurity scores and notification emails
		• Performance monitoring and anomaly detection
		• REST API for integrating data with automation, ticketing, and other tools
		• Visualize server telemetry including key performance, environmental, and power metrics
		• Displays heath, inventory, alerts, performance, and warranty status
25	Intrusion alert	Intrusion alert in case chassis cover being opened

8.2.7.2 Storage

Following are minimum configuration required from storage.

S.No.		Item Description
1	Storage Architecture	The proposed array should be a purpose-built storage supporting block.
2	Storage Controllers	The proposed array should have minimum dual active-active controllers with No Single Point of Failure architecture. The system should have an ability to protect data on cache if there is a controller failure or power outage. The cache on the storage should have 36 hrs or more battery backup (OR) should have de-staging capability to either flash/disk.

3	Cache	Proposed storage shall have minimum 192 GB DRAM cache. Storage system should support scalability of DRAM cache to 768 GB either by adding more DRAM on the same controllers or by replacing the controllers with higher model or adding more controllers.
4	Front-end Ports	The proposed storage array should be configured with 08 No. of 16 or 32 Gbps FC ports and 08 No. of 10 or 25 GbE ports to provide scalable and dedicated connectivity to hosts and for remote replication. All 10 or 25GbE ports should be capable to deliver iSCSI, Remote Replication etc. Storage System must support 2-way and 3-way Replication.
5	Backend Connectivity	Offered Storage should be configured with at-least 4 backend ports across Dual controllers (with each port having 4 x 12 Gbps SAS Lanes). Storage must support scalability of minimum 8 Backend Ports (with each port having 4 x 12 Gbps Lanes).
6	Disk Type	The storage array must support SSDs, SAS and NL-SAS.
7	RAID Level Support	The proposed array must support RAID 5 or 6 levels.
8	Capacity & Performance Requirement	Proposed Storage must be supplied with minimum useable 100TiB (Base-2) SSD.
9	Scalability	Offered Storage array shall support at-least 500 TB RAW Capacity
10	Protocol Support	Offered storage should be bundled with FC and iSCSI protocols from day one.
11	Data Services & Replication	The proposed storage system must support Storage Analytics, Snapshots for block, Remote Replication (sync & async) for block, & Data-at-Rest-Encryption features. Licenses, software/hardware for these features for maximum supported capacity of the storage should be factored from day1.

12	Efficiency & Data Reduction features	The proposed array should support enterprise class data services including - Thin Provisioning, Inline Compression & Deduplication. Data reduction must be supported on block (FCP, iSCSI) for the entire proposed capacity.
13	Storage Resource Pooling	The proposed array should support mixing of different capacity and type (SSD, SAS, NLSAS) of drives in storage pool. Single storage pool should be accessible to both controllers. Proposed storage should also support growing capacity by single drive increment for supporting granular upgrades.
14	Data Encryption	The proposed array must have storage controller-based Data at Rest Encryption solution or SED based encryption to encrypt data on all drives. Solution should be supplied with embedded key management solution or external key management solution with no user intervention.
15	Snapshot	Proposed storage solution should support snapshot creation. Storage arrays should have ability to use snapshot as writable volume. Proposed system should support snapshot scheduler. Proposed storage should allow snapshot replication with different retention for source and destination. Storage must support Application or crash Consistent Snapshots (for VMware, Oracle Database and MS SQL Database) for the entire proposed capacity. Any software or licenses needed for the same, must be provided from day one.
16	Quality of Service	The proposed array should support QoS feature to limit the amount of IO (IOPS) or bandwidth (MB/s) a particular Volume can drive on the array.
17	Storage Management Software	The proposed array should be supplied with native Storage management software with Web based GUI capable of generating customized reports, real time monitoring, historical performance data for analysis and trending, capacity utilization monitoring.
18	Monitoring & Reporting	Proposed solution should also have monitoring and management tool with support historical reporting. Software should support monitoring and reporting multiple storage system, VMware environment and SAN switches.

19	VMware Integration	Proposed storage solution should support Vmware VAAI, SRM, VASA, VVOLs and Vmware cloud foundation for multi-cloud data mobility. Detailed document to be provided for the same. Proposed storage should include software to create VM consistent point-in-time copies with support for granular data restoration. Storage array should be certified with VMware Cloud Foundation (VCF) using FC and iSCSI protocols.
20	Security	Proposed storage must have HIPPA compliant, TLS 1.2 support, native SHA2 certificate support, FIPS 140-2 Level 1 certification, Common Criteria Certification international standard (ISO/IEC 15408) for computer security certification, KMIP compliant.
22	Openshift and VRO Integration	CSI Drivers for integration with Redhat Openshift and Kubernetes must be available. Similarly Ansible plugins must be available to automate and orchestrate the configuration and management of proposed storage system. Furthermore, VRO plugin must be available for the orchestration and automation of storage from the VMware Cloud platforms.

8.2.7.3 Backup Solution

S. No.	Parameter	Description
1	Protocol support & Deduplication	The proposed backup solution must provide efficient data reduction by using variable block length deduplication at the source as well as target side. Proposed purpose-built backup appliance should be able to interface with various industry leading server platforms, operating systems and Must support LAN/SAN based D2D backup and VTL backup simultaneously via NFS, CIFS, FC, OST/Catalyst/NDMP protocols. All the protocols should be available to use concurrently with global deduplication for data ingested across all of them.
2	Data Security, Immutability & Recovery	The offered purpose-built backup appliance must have an inbuilt mechanism to defend the backup data against data integrity issues, it should also have a mechanism that check and validate the backup data residing on the appliance against any corruption without any human intervention.

		Proposed backup appliance must have data security feature retention lock or WORM (Write Once Read Many) and which will ensure that not even system/backup administrator can delete, expire, modify backed up data before expiry of retention period from the backup appliance.
		In case this backup data is replicated to DR/Secondary site, no additional licenses must be required at DR site to maintain retention period on replicated data.
		OEM & SI must ensure & implement backup solution in such a way that if Backups could be wrongfully expired and eventually deleted by tampered system clocks through a compromised NTP server. In this case, the local system clock would sync up based on the hacked NTP clock. This will minimize the systems clock tampering by an option which allows the security officer to set an allowed limit for the time drift between local clock & NTP server. The proposed purpose-built backup appliance must have security feature which should protect against NTP hacking/compromise in case of Ransomware or Cyber-Attacks.
3	Instant Access of VM & Data loss prevention	The proposed purpose-built backup appliance should support SSD to help in superior performance support for Instant Access and Restore of the protected virtual machine.
		Proposed purpose-built backup appliance should be offered with battery backed up NVRAM for protection against data loss in power failure scenario.
4	Backup Data Retention Policy and Sizing report/certification	The offered purpose-built backup appliance should be sized appropriately for backup of front-end data of 50 TB (20% DB, 30% VM & 50% File System) as per below mentioned backup policies:
		a. Daily Incremental Backup – retained for 4 weeks in the backup Appliance.
		b. Weekly Full Backup for all data types – retained for 4 Weeks in the backup Appliance.
		c. Monthly Full Backups – Retained for 12 Months in the backup Appliance.
		d. Yearly Full Backups - Retained for 5 years in the backup Appliance.

		The offered purpose-built backup appliance should be quoted with minimum 70TB usable capacity post RAID 6 and hot-spare's penalty. The proposed purpose-built backup appliance must be sized for adequate capacity considering 2% daily data change rate for the contract period. Any additional backup storage capacity, software and any other component required as per sizing needs to be provided by the MSI and OEM at the time of bid. Bidder must provide the backup appliance sizing on OEM's letter head with seal & sign from the authorized signatory basis the backup retention policies mentioned along with Rack, Power & cooling requirements to run the complete infrastructure.
5	Backup Software licensing	Bidder must provide 50 TB front end capacity or 40 socket base license as per Tender ask. All OS's, DB's, Application agent/module must be included in backup software licenses.
6	Data security & Integrity	The proposed appliance should have a mechanism to perform automatic data integrity check on the backup data on regular basis to ensure that the data integrity of backup data on the purpose-built backup appliance is maintained without the need of any additional third-party software
7	I/O Ports	Proposed purpose-built backup appliance should have the ability to perform different backup, restore, replication jobs simultaneously and must supports communications and data transfers through 16GB SAN, 10 Gb & 1 Gb ethernet LAN over copper and SFP+. The proposed backup appliance should be offered with minimum 1 x 1Gbps NIC, 8x 10G SFP+ and 2x 16Gbps FC.
8	Supported Backup Software OEM	Proposed purpose-built backup appliance should support industry leading backup software like Networker, NetBackup, Commvault, NetVault and Data Protector, etc. and should support deduplication at backup server/ host / application level so that only changed blocks travel through network to backup device.
9	Deduplication efficiency	Proposed purpose-built backup appliance should support global and inline data duplication using automated variable block length deduplication technology.

10	DR Readiness	Proposed purpose-built backup appliance should support different retentions for primary and DR backup appliance and should support instant copy creation on remote site for better DR readiness with support for transmitting only deduplicated unique data in encrypted format to remote sites.
11	Self-service & Multiple DB support	Proposed purpose-built backup appliance should support enterprise applications and database backups without integration with Backup Software, for better visibility of backups to application and database owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, DB2, MS SQL, etc.
12	Data Encryption	Proposed purpose-built backup appliance should support 256bit AES encryption for data at rest and data-in-flight during replication. It should offer internal and external key management for encryption.
13	Multi tenancy support	Proposed purpose-built backup appliance should be offered with Multi Tenancy features which provides a separate logical space for each tenant user while maintaining a global deduplication across data from all tenant users.
14	Backup window	The proposed solution should support completing backup of 50 TB within a backup window of 8 hours. The backup solution must support client-direct backup feature for file system, applications and databases to reduce extra hop for backup data at backup/media server to cater stringent backup window.
15	Access control	The backup solution should be capable of integration with active directory infrastructure for ease of user rights management along with role base access control to regulate the level of management.
16	Backup server/Media server	Bidder must provide the backup/media servers to implement the backup solution requiring as per proposed solution approach. The proposed backup solution , Backups software & backup appliance should be from a single OEM.
17	Backup appliance at DR Site	Bidder must provide the similar model & capacity backup appliance for DR site. Proposed backup appliance should support bi-directional, many-to-one, one-to-many, and one-to-one replication.

8.2.7.4 SAN Switch

S.no.	Description
1	The SAN Switch solution should be highly available with no single point of failure and redundant power supplies in each switch.
2	Switch should support non disruptive Micro code/Firmware upgrade
3	Bidder should provision for a highly available fiber channel switch architecture with no single point of failure
4	Switch must be provided with 16 x 16 Gbps ports per SAN Switch (including licenses and must be scalable to minimum 32 x 16 Gbps Ports. Switch must also support upgrade to 32 Gbps Ports by just replacing the 16Gbps transceivers with 32 Gbps transceivers.
5	The switch shall support Port zoning and LUN zoning, GUI management software
6	The SAN switch should have capability to interface with HBA of different makes and model from multiple OEM, supporting multiple Operating Systems, including, but not limited to HP-UX,IBM AIX, Linux, MS-Window, Sun Solaris etc. The SAN switch should support all leading SAN disk array and tape libraries including, but not limited to, EMC, Hitachi, HP, IBM, Sun, NetApp etc.
7	Product shall be provided with all the required licenses, software required accessories, cable etc. as applicable to meet all the above mentioned specification and hence the proposed solution.
8	HBA Cables shall be provided by the Bidder to meet the solution requirement

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Chapter-9
CHECK LIST (To be filled up & uploaded)

List of Documents to be Submitted with Technical Bid

SN	Have you submitted the following documents	Submitted /complied or Not	Page No./ref No. of Offer
1.	Cost of Tender Document (as per OPEN E-TENDER NOTICE, Page no. 2 of Tender) - to be submitted online through ENIVIDA portal only		
2.	Submission of Earnest Money Deposit (EMD) as mentioned in Offer Letter (Chapter-1) - to be submitted online through ENIVIDA portal only.		
3.	Offer Letter as per Chapter-1 (Section-I)		
4.	Schedule of Requirements (SORs) with quantities but with prices blanked out (this will be a replica of price bid with prices blanked out) to be submitted along with the Technical Bid as per Point-(n) under SOR, Chapter-2.		
5.	Breakup of individual itemized BOM but prices blanked out (as per Format given in SOR) as per Point-(n) under SOR, Chapter-2.		
6.	Legal Entity - Constitution of Firm and Power of Attorney as per clause 4.A.14.1 of Chapter-4.		
7.	Technical and Financial Capability of Bidder - as per eligibility Clause no. 4.A.14.1 of Chapter-4.		
8.	Technical and Financial Capability of OEM - as per eligibility Clause no. 4.A.14.2 of Chapter-4.		
9.	Compliance to Technical Requirements as mentioned in Clause 3.A.1.14 of Chapter-3 of Section-I.		
10.	Complete technical data and particulars of the equipment offered, as specified in the Tender papers together with descriptive literature, leaflets, Drawings, if any, complete with list etc.		
11.	Form no. 2 (Chapter-6) - System Performance Guarantee -be signed by the Bidder as well as OEM.		
12.	Form no. 3 (Chapter-6) - Long Term Maintenance Support- to be signed by the Bidder as well as OEM.		
13.	Form no. 4 (Chapter-6) – Affidavit – to be submitted by the bidder as per Clause no. 4.A.14.3.3.		
14.	Form no. 5 (Chapter-6) - Integrity Pact - to be submitted by the bidder as per Clause no. 4.A.44. For Consortium, this agreement must be signed by all partners or consortium members.		
15.	Form no. 6 (Chapter-6) - NIL Deviation certificate – to be signed by the Bidder as per Clause no. 4.A.26.		
16.	Form no. 7 (Chapter-6) – OEM's Undertaking on Letter Head		

17.	Form no. 8 (Chapter-6) - Bidder Undertaking on Letter Head		
18.	Form no. 9 (Chapter-6) - Certificate by Statutory Auditor/Cost Auditor on their letter head (with UDIN number) as per Clause 4.A.45 of Tender document.		
19.	Form no. 10 (Chapter-6) – Annexure Affidavit by EACH Consortium/JV Member		
20.	Form no. 11 (Chapter-6) – JV Agreement / MOA Enclosure – Board resolution of each of the Joint Venture Members authorizing: (i) Execution of the Joint Venture Agreement, and (ii) Appointing the authorized signatory for such purpose		
21.	Form no. 12 (Chapter-6) – Consortium Agreement / MOA		
22.	Form no. 13 (Chapter-6) – Past Experience Form		
23.	Any other information required to be submitted by the bidder as per technical and eligibility criteria.		
24.	Relaxation to Start-ups as per Eligibility clause 4.A.14 of Chapter-4 (Section-I).		
25.	OEM Vetted BOM as per as per Point-(f) under SOR, Chapter-2.		
26.	Project Implementation Plan as per Clause 4.A.4 of Tender document.		

DETAILS OF CREDENTIALS SUBMITTED AGAINST ELIGIBILITY CRITERIA OF Bidder as per Clause 4.A.14 of Chapter-4 (Section-I)

SN	Clause	Supporting documents	Details/Remarks	Page no of the Bid
1				
2				

DETAILS OF CREDENTIALS SUBMITTED AGAINST ELIGIBILITY CRITERIA OF OEM as per Clause 4.A.14 of Chapter-4 (Section-I):

SN	Clause	Supporting documents	Details/Remarks	Page no of the Bid
1				
2				
3				

List of Documents to be Submitted with Financial Bid

SN	Have you submitted the following documents	Submitted /complied or Not	Page No./ref No. of Offer
1.	Schedule of Requirements with quantities and priced filled up (this will be a replica of technical bid with prices).		
2.	Unit rate analysis of each SOR item of Schedule-A with break up of taxes/duties in performa given as Annexure-A		
3.	Breakup of individual itemized BOM as per Format given in para -(s) of note of Chapter-2.		
4.	Breakup of local content as per Schedule-C of chapter-2		

Note: Non submission/ non-compliance of above documents as deliberated in Check List will make the offer liable to be REJECTED.

---------End of Tender document---------