**BID DOCUMENT**

**TENDER FOR PROCUREMENT, INSTALLATION, TESTING AND MAINTENANCE OF WSS-ROADM BASED MULTI CHANNEL DWDM SYSTEMS, POTS EQUIPMENT BASED ON MULTI-SERVICE PROVISIONING PLATFORM, CLOCK SYNCHRONISATION AND ASSOCIATED EQUIPMENT FOR THE OPTICAL TRANSMISSION BACKBONE NETWORK ON TURNKEY BASIS FOR ARMED FORCES**

**TENDER NO.CA/CNP/NFS-DWDM/T-455/2013 ISSUED ON 20 Nov 2013**

****

**BHARAT SANCHAR NIGAM LIMITED**

**(A GOVERNMENT OF INDIA ENTERPRISE)**

**MMT SECTION**

**BHARAT SANCHAR BHAWAN, JANPATH, NEW DELHI-110001**

**FAX NO.91-11-23710198/91-11-23734262**

**Visit us at** [**www.bsnl.co.in**](http://www.bsnl.co.in)

TABLE OF CONTENTS

[SECTION I 1](#_Toc372801577)

[DETAILED NOTICE INVITING TENDER 1](#_Toc372801578)

[SECTION II 8](#_Toc372801579)

[TENDER INFORMATION 8](#_Toc372801580)

[SECTION III 12](#_Toc372801581)

[DETAILED TECHNICAL SPECIFICATIONS 12](#_Toc372801582)

[SECTION IV 72](#_Toc372801583)

[PART A: GENERAL INSTRUCTION TO BIDDERS 72](#_Toc372801584)

[PART B: SPECIAL INSTRUCTIONS TO BIDDERS FOR E-TENDERING 89](#_Toc372801585)

[SECTION- V 96](#_Toc372801586)

[PART A : GENERAL COMMERCIAL CONDITIONS OF CONTRACT 96](#_Toc372801587)

[PART B 106](#_Toc372801588)

[PART 1: SPECIAL TERMS AND CONDITIONS OF CONTRACT 106](#_Toc372801589)

[PART 2 : PROJECT MANAGEMENT REQUIREMENTS 116](#_Toc372801590)

[PART 3 : MAINTENANCE REQUIREMENTS 129](#_Toc372801591)

[PART C: SCHEDULE OF REQUIREMENT 136](#_Toc372801592)

[SECTION VI 139](#_Toc372801593)

[UNDERTAKING & DECLARATION 139](#_Toc372801594)

[SECTION VII 141](#_Toc372801595)

[PERFORMA’S 141](#_Toc372801596)

[PERFORMA 1: BID SECURITY FORM 141](#_Toc372801597)

[PERFORMA 2: PERFORMANCE SECURITY GUARANTEE BOND 143](#_Toc372801598)

[PERFORMA 3: LETTER OF AUTHORIZATION FOR ATTENDING BID OPENING 145](#_Toc372801599)

[SECTION VIII 146](#_Toc372801600)

[TENDERER / BIDDER’S PROFILE & QUESTIONNAIRE 146](#_Toc372801601)

[SECTION IX 148](#_Toc372801602)

[PART I : BID FORM 148](#_Toc372801603)

[PART II : PRICE SCHEDULE 150](#_Toc372801604)

[Appendix ‘A’ 156](#_Toc372801605)

[MODEL AMENDMENT LETTER INTIMATING CONDITIONS FOR EXTENSION OF DELIVERY PERIOD 156](#_Toc372801606)

[Appendix ‘B’ 158](#_Toc372801607)

[MODEL AMENDMENT LETTER FOR EXTENSION OF DELIVERY PERIOD 158](#_Toc372801608)

[Appendix ‘C’ 160](#_Toc372801609)

[FORMAT OF DOCUMENTS TO BE SUBMITTED 160](#_Toc372801610)

[Appendix ‘D’ 161](#_Toc372801611)

[INFORMATION AND DOCUMENTS REQUIRED TO BE SUBMITTED 161](#_Toc372801612)

[Appendix ‘E’ 164](#_Toc372801613)

[INTEGRITY PACT FORMAT 164](#_Toc372801614)

[Appendix ‘F’ 170](#_Toc372801615)

[SPARES LIST 170](#_Toc372801616)

[Appendix ‘G’ 172](#_Toc372801617)

[INFORMATION OF SOURCE AND MAKE/MODEL OF LINE ITEMS 172](#_Toc372801618)

[Appendix ‘H’ 174](#_Toc372801619)

[TENTATIVE DETAILS OF TRANSMISSION NODES 174](#_Toc372801620)

[Appendix ‘J’ 175](#_Toc372801621)

[NON-DISCLOSURE AGREEMENT 175](#_Toc372801622)

# SECTION I

**BHARAT SANCHAR NIGAM LIMITED**

**(A GOVT. OF INDIA ENTERPRISE)**

**(MMT SECTION)**

## DETAILED NOTICE INVITING TENDER

TENDER NO AND DATE : **CA/CNP/NFS-DWDM/T-455/2013 dated 20.11.2013**

DUE DATE OF RECEIPT : **26.12.2013** TIME UPTO **1130 HOURS**

DATE OF OPENING : **26.12.2013** TIME AT **1200 HOURS**

VENUE OF TENDER OPENING : MMT Section, 2nd Floor,

Bharat Sanchar Bhawan,

. Janpath, New Delhi- 110001

1. On behalf of **CHAIRMAN & MANAGING DIRECTOR, BHARAT SANCHAR NIGAM LIMITED Corporate Office, New Delhi,** digitallysealed tenders are invited **from the Indian companies for Procurement, Installation, Testing and Maintenance of WSS-ROADM Based Multi Channel DWDM Systems, POTS Equipment based on Multi-Service Provisioning Platform, Clock Synchronisation and associated equipment for the Optical Transmission Backbone Network on Turnkey Basis for Armed Forces as per Schedule of Requirement of Section-V of the bid document.**
2. **Overview of Tender**.
   1. **General**. This tender is intended for the rollout of ‘Exclusive and Dedicated Nationwide DWDM based Optical Transmission Backbone Network for Armed Forces’ on Turnkey basis, whereby it should conform to all the user requirements including Delivery of Professional Services for System Integration, Project Management, Training & Maintenance Support, Project Consultancy (Post APO Stage) in addition to Network Planning, Implementation and Maintenance support for this project.
   2. **Scope**. The scope of work for this project will include the following :-
      1. Planning and Design of DWDM based Nationwide Optical Transmission Backbone with multi degree optical WSS based ROADMs, Layer 1 ASON based Control Plane and NMS/EMS Overlay with inherent DR capability.
      2. Supply and installation/integration of 363xDWDM nodes and 828xPOTS based optical transmission systems along with all associated accessories including creation of transmission NOCs, active infrastructure requirements.
      3. Establishment of one National transmission NOC (NNOC), one DR NOC and six Regional NOCs (RNOC), comprising of EMS/NMS servers, desktop workstations, LCTs etc.
      4. Plan, Design, Supply, Training, Installation, Testing, Commissioning and Maintenance of clock synchronization system (comprising of 14 PRCs and 50 SSUs) for the entire network. EMS/NMS will be supplied and installed to support secure network operations from National and Regional NOCs.
      5. Supply and installation of Test and Measurement (T&M) equipment and power systems along with all associated accessories.
      6. Provision of maintenance services along with all other associated professional network services for testing, performance audit and optimization of DWDM/POTS based Nationwide Optical Transmission Backbone’ from network as well as services viewpoint on project life cycle basis.
      7. Plan, Design, Develop, Supply, Training, Installation, Testing, Commissioning and Maintenance of EMS /NMS Components for conduct of OAM requirements of Nationwide Transmission Backbone from National and Regional Transmission NOCs with inherent DR capability as well as Local OAM at all sites over a third party DCN to achieve nationwide network connectivity for NMS.
      8. Integration of DWDM based optical transmission backbone with IP/ MPLS based Nationwide Multi Service Routing network through Bulk Encryption Units, and all the existing ATM, SDH and Legacy Network of Armed Forces at multiple sites spread over pan India locations.
      9. Supply, installation and integration of following items are also under the scope of the work:-
         1. Power cabling from power room to the equipment and monitoring rooms including end terminations with adequate plug/socket arrangements to connect equipment to the power sockets. This cabling shall be separate for AC and DC power.
         2. Patch cords from FDMS/FDF to equipment room.
         3. Services of Resident Engineers at National/DR NOCs and Regional NOCs.
         4. Three years onsite warranty support and Annual Maintenance Contract for seven years after warranty.
         5. Training of Officers, JCOs and all other supervisory technical staff for operations and maintenance of the transmission backbone.
         6. Warranty and Maintenance support for the equipment.
         7. Supply of documentation for installation, O&M & training etc.
         8. Supply and installation, integration of any other item(s) listed in SoR.
      10. The scope of the delivery of professional services for this project will include the following:-
          1. High Level and Low Level Design and validation testing.
          2. Dedicated Project Management.
          3. Project Roll Out Plan.
          4. Turnkey Deployment Service including Site Survey, Site Engineering, Installation Materials, Logistics, Turn-Up & Testing.
          5. NOC Operations. 24x7x365 through resident engineers.
          6. Preventative/Corrective Maintenance. - (Post Installation Stage).
          7. 24x7x365 Technical Support Helpdesk.
          8. Hardware Repair and Return - (Post Installation Stage).
3. **Purchase of Tender Document**. Tender document can be obtainedoffline in form of CD from 25 Nov 2013 from the Office of AGM MMY, 2nd Floor, BSB, BSNL Corporate Office, Janpath, New Delhi-110001 on submitting the following:
   1. Tender fee for an amount of Rs. 10,000/- (Ten Thousand only)through DD/ Banker’s cheque drawn from any Nationalized/ Scheduled Bank in favour of AO (Cash), BSNL, C.O. New Delhi and payable at New Delhi.
   2. Duly signed NDA as per the prescribed format given at [Appendix ‘J’](#_Appendix_‘J’)on a non-judicial stamp paper of Rs 100/-.
4. **Availability of Tender Document on e-Tender Portal**.
   1. The tender document shall be available on e-Tender portal after settlement of Pre Bid Queries for submitting bids online.
   2. The Tender document shall not be available for download on its submission/ closing date.
5. **Bidding Process**.
   1. In response to this tender, the Bidder is required to bid as a System Integrator (SI) for the project for turnkey delivery of all the requirements given in this tender. The Bidder will be responsible for Supply, Installation, Integration, Commissioning, Training and Maintenance of all items/sub systems and services as given in SoR for this Project on an End to End basis.
   2. One bidder cannot submit more than one bid.
   3. Bidder should quote for 100% of the quantities/services mentioned in the SoR; else the bid shall be rejected.
   4. **OEMs/Technology Partners.**
      1. Bidder will select only one OEM for one type of equipment supplied as part of this tender. Bids offering multiple OEMs/ Technology Partners for one type of equipment are liable to be rejected.
      2. The Bidder will not be permitted to change the OEM / Technology Partners after submission of the Bid.
   5. **Teaming Agreement**.
      1. The Bidder shall have MoU/ teaming agreement with all OEMs for supply, installation, integration, commissioning, support and training of all items / sub systems and services as given in the SoR for ten years technical support (three years for warranty + seven years for AMC period) for this project. The OEM should explicitly undertake to provide support in terms of provision of spares and repair/replacement of faulty equipment during this period.
      2. The Teaming Agreement will be signed by authorized signatories of both the parties (Bidder and OEM) duly supported by Power of Attorney in the name of these signatories.
      3. Teaming agreement shall also include a clause that in case the SI/OEM ceases to exist on account of merger/acquisition then the new SI/OEM entity shall also be responsible for all obligations in terms of maintenance support, provision of spares, etc (as the initial SI/OEM) with regards to this project.
6. **Eligibility Conditions**. The Bidder must qualify as per the eligibility criteria given below:-
   1. **General eligibility criteria**.
      1. The bidder should be an Indian Registered Company registered under Company Act 1956. The bidder shall provide the following documents.
         1. Certificate of Incorporation from Registrar of Companies.
         2. Articles and Memorandum of Association.
         3. Annual Report for the last three financial years.
         4. Documentary evidence for registration with proof for Management and Control of Company with Resident Indian Nationals.
         5. List of all Directors including their name(s), Director Identification Number(s) (DIN) and address (es) along with contact telephone numbers of office and residence.
         6. Copy of Permanent Account Number.
         7. Excise, permanent sales tax and service tax registration number, if applicable.
      2. CS certified document from Bidder/Parent Company as well as the OEMs/Parent Company should be submitted confirming the following clauses:-
         1. SI/OEM should not have been blacklisted in India by any Government Department / Govt. PSU in India for Telecom business in the last three years.
         2. SI/OEM should not have been blacklisted by any sovereign government and barred from participating in government projects due to security reasons.
   2. **Technical eligibility criteria**.
      1. SI /OEM must have one test facility in India for Development of System and Network level integration solution for ICT Networks.
      2. The bidder should have at least six support centers, preferably one at Delhi and at least one each in major city in each of the Telecom Regions of BSNL. Information of support centers to include address and TIN details shall be submitted.
      3. The DWDM OEM selected by the Bidder should be OEM for DWDM optical transmission systems as well as OTN DXC and Layer 1 control plane.
      4. Synchronization OEM selected by the Bidder should be OEM for Cesium based Primary Reference Clocks as well as SSUs.
      5. The bidder should have strength of at least 100 skilled professionals in network/system integration field on its payroll. Relevant proof in this regard shall be submitted.
      6. The bidder should have ISO 9001:2008 certification.
      7. The bidder should give certificate stating that all the hardware/ software supplied under the contract shall not contain any embedded malicious codes that could inhibit the desired functions of the equipment or cause the network to malfunction in any manner.
   3. **Financial eligibility criteria**.
      1. The Cumulative Annual Turnover of the bidder during last three financial years should be at least Rs 2600 Crore.
      2. The Bidder should produce Banker's Solvency Certificate for a minimum amount of Rs 850 Crore.
   4. **Experience eligibility criteria**.
      1. The bidder should have existence as SI in India and should be a certified system/network integrator of offered network products. Relevant certificate in this regard shall be provided by their OEMs / Technology Partners.
      2. The bidder should have experience in handling such multi location, multi product large network/ system integration projects for any Government/ Enterprise / Telecom Service Provider.Should have successfully implemented and maintained / operated two such projects total amounting to Rs 100 Cr during the last 5 years.
      3. Should have successfully implemented projects worth Rs 10 Cr as an SI/OEM with Indian Defence Services in the past 5 years.
      4. The DWDM OEM/parentcompany should have successfully manufactured, supplied and installed a minimum of 250 nodes (excluding amplifier sites) of DWDM equipment in last five years. It should have also successfully implemented one single DWDM network of at least 15 nodes based on Layer 1 control plane for 10G or higher DWDM optics.
      5. The Synchronization OEM/ parent company should have deployed at least 25 PRC/SSUs for telecom networks in the past five years.
7. **Other Conditions**.
   1. Bidders are required to submit client certificates/ documentary proof of experiences as referred in Clause6.4 above, in the form of an original certificate from the relevant customer signed by the official of the company (including name, designation, contact details). References shall be considered valid only if the mentioned networks/products are deployed and in operation. The purchaser reserves the right to verify such references and the bidder shall facilitate the same. No self certification from the bidder or their collaborators shall be accepted.
8. **Bid Security/EMD**. The bidder shall furnish the bid **EMD of amount Rs Five Crores (Rs 5,00,00,000/-)** in one of the following ways:-
   1. Demand Draft/ Banker’s cheque drawn in favour of A.O. (Cash), BSNL C.O. Payable at “New Delhi”.
   2. Bank Guarantee from a scheduled bank drawn in favour of ‘DGM (MMT), BSNL C.O. New Delhi’ which should be **valid for 210 days from the tender opening date**.
9. **Date & Time of Submission of Tender bid**. As specified in the first page of this section.
   1. **Note**.In case the date of submission (opening) of bid is declared to be a holiday, the date of submission (opening) of bid will get shifted automatically to next working day at the same scheduled time. Any change in bid opening date due to any other unavoidable reason will be intimated to all the bidders separately.
10. **Place of opening of Tender bids**.BSNL has adopted e-tendering process which offers a unique facility for ‘Public Online Tender Opening Event (POTOE)’.BSNL’s Tender Opening Officers as well as authorized representatives of bidders can attend the Public Online Tender Opening Event (TOE) from the comfort of their offices. Kindly refer Section IV Part B of Tender document for further instructions.
11. Tender bids received after due time & date will not be accepted.
12. Incomplete, ambiguous, conditional, unsealed tender bids are liable to be rejected.
13. CMD, BSNL reserves the right to accept or reject any or all tender bids without assigning any reason. He is not bound to accept the lowest tender.
14. The bidder shall furnish a declaration in his tender bid that no addition /deletion / corrections have been made in the downloaded tender document being submitted and it is identical to the tender document appearing on the website.
    1. In case of any correction/ addition/ alteration/ omission in the tender document, the tender bid shall be treated as non responsive and shall be rejected summarily.
15. **Note**.
    1. All documents submitted in the bid offer should be in English. In case the certificate viz. experience, registration etc. is issued in any other language other than English, the bidder shall attach an English translation of the same duly attested by the bidder & the translator to be true copy in addition to the relevant certificate.
    2. All computer generated documents should be duly signed/ attested by the bidder/ vendor organization.

# SECTION II

## TENDER INFORMATION

1. **Type of Tender**. **Double Stage** –using Single Electronic Envelope System.
2. **Period of Validity of Bids**.
   1. Bid shall remain valid for 210 days from the date of opening of bids prescribed by the purchaser pursuant to clause. A bid valid for a shorter period shall be rejected by the purchaser being non-­responsive.
   2. In exceptional circumstances, the purchaser may request the consent of the bidder for an extension to the period of bid validity. The request and the response thereto shall be made in writing. The bid security provided under clause shall also be suitably extended. The bidder may refuse the request without forfeiting his bid security. A bidder accepting the request and granting extension will not be permitted to modify his bid.
3. The tender offer shall contain **Double electronic envelope** containing Commercial, Technical & Financial documents & shall also contain Electronic Form- with all relevant bid annexure of following, but not limited to, documents:-
   1. EMD.
   2. Cost of the tender documents i.e. tender fee.
   3. Certificates/ documents establishing fulfilment of eligibility criteria by the Bidder.
   4. Clause by clause compliance as per clause of [Section IV Part A](#_PART_A_:_1).
   5. Priced detail Bill of Material (BoM) (please include card level and module level details).
   6. Compliance statement of bid including clarifications and GRs.
   7. Bidder’s Profile & Questionnaire duly filled & signed.
   8. Near Relation Certificate in Performa duly filled & signed.
   9. Undertaking & declaration in Performa duly filled & signed.
   10. Tender documents duly signed at the end of each section for having read it & accepted it.
   11. Tender/Bid form duly filled & signed.
   12. All other documents required as per conditions of bid document.
4. At the time of opening the bids, initially the Bid security envelope of all bidders will be opened. The Commercial, Technical & Financial envelope of only those bidders will be opened who would have submitted required documents as offline submissions as per clause of [Section IV Part B](#_PART_B:_SPECIAL) in a sealed envelope.
5. In case where the documents of Bid security etc. are not submitted in the manner prescribed above the bid of the bidder shall be rejected.
6. **Payment Terms**.
   1. **First Stage Payment.**Payment for 70% of the material cost price shall be due to the bidder on receipt of goods by consignee at site and after successful Site AT as defined in clause . For claiming this payment the following documents are to be submitted to the paying authority. However, responsibility of the safeguard of the goods/ works shall be of the bidder(s) only. Inspection will be carried out by PICG/BSNL after delivery of goods. The consignee receipt, duly signed by PICG/BSNL will be issued after completion of inspection. Payment shall be released at the end of every quarter on a pro-rata basis based on deliveries made and successful Site Acceptance in that quarter.
      1. Invoice clearly indicating break up details of composite price i.e Basic, E.D, Sales Tax, any other Duties and Taxes, Freight/Packing Charges, Service Tax etc.
      2. Delivery Challan.
      3. Bidder certificate for dispatch.
      4. Excise gate pass/invoice or equivalent document.
      5. Inspection certificate signed by BSNL/PICG reps.
      6. Consignee receipt.
      7. Proof of payment of octroi/entry tax etc.
      8. “If the bidder fails to furnish necessary supporting document i.e excise/custom invoices etc. in respect of the Duties/Taxes which are CENVAT table, the amount pertaining to such Duties/Taxes will be deducted from the payment due to the firm".
   2. **Second Stage Payment.**Payment for 20% amount payment of the cost of the materials and 80% amount payment of the cost of the works/services executed shall be due to the bidder after installation, integration,acceptance testing of National Backbone/Expressway and each of the six Regional networksas defined at clause(ie total seven payments will be released in second stage, on completion of National expressway, and on completion of each of the six regional networks).
   3. **Third Stage payment.**Payment for 5% amount of the cost of the materials and 10% amount of the cost of the works shall be released on completion of Network level AT as defined in clause.
   4. **Last Stage payment.** Payment for 5% amount of the cost of the materials and 10% amount of the cost of the works shall be released on completion of one year of warranty period,successful integration of DWDM based optical transmission backbone with IP/ MPLS based Nationwide Routing network through Bulk Encryption Units (being implemented as part of a separate tender), integration of transmission layer/synchronization EMS/NMS with the Unified NMS (being implemented as part of a separate tender) and shifting of EMS/NMS servers to the Data Centres. However, if implementation of routing network, bulk encryption units and Unified NMS/ data Centres gets delayed beyond one year, this payment will be released against bank guarantee of equivalent amount valid for three years.
   5. **Payment for training**during warranty period will be released on quarterly basis based on number of batches trained.
   6. All the payments will be released to the bidder by BSNL after issue of requisite inspection and acceptance test certificates after successful completion of testing by BSNL/PICG.
   7. Liquidated Damages/penalty would be deducted based on calculation of delay incurred by the Bidder in delivery and implementation/commissioning of the system as compared with the implementation plan.
   8. No payment will be made for goods rejected at the site on testing.
   9. The bidder has to give the mandate for receiving the payment costing Rupees five lacs and above electronically and the charges, if any, levied by bank has to be borne by the bidder/bidder/bidder. The bidder company are required to give the following information’s for this purpose:-
      1. Beneficiary Bank Name.
      2. Beneficiary Branch Name.
      3. IFSC Code of beneficiary Branch.
      4. Beneficiary account No.
      5. Branch Serial No. (MICR No).
7. **Delivery and Documents**.
   1. Delivery of the goods and documents shall be made by the bidder in accordance with the terms specified by the purchaser in its schedule of requirements and special conditions of contracts, and the goods shall remain at the risk of the bidder until delivery has been completed. The delivery of the equipment shall be to the ultimate consignee(s) as given in the purchase order and indicated in the delivery schedule as part of this tender document.
   2. The complete scope of the contract/Purchase order to include delivery/installation/integration/testing**shall be completed within 18 months** from the date of issue of Advance Purchase Order. The Pan India network comprises of a National Backbone/Expressway (Large DWDM Nodes) and six regional networks (Medium, Small and Terminal Nodes), POTS, Synchronization equipment (PRC, SSU), Test and Measurement equipment, power systems , accessories, software/hardware, and any other item(s) listed in the contract/purchase order. (Refer Section III for definition of Nodes). **The network shall be implemented in Two Phases as under**:-
      1. **Phase I**. In Phase I, Bidder shall implement the National Backbone/Expressway and Regional Network for oneRegion. Delivery, Installation/integration shall be completed **within 9 months of issue of Advance Purchase Order. First four months (maximum) shall be the design/validation phase, during which the activities as given at clause shall be carried out.**
      2. **Phase II.** In Phase II, Bidder shall implement the balance five regions and carry out integration of complete network on pan India basis.Delivery, installation/integration shall be **completed within 18 months from the date of issue of Advance Purchase Order**. Final Network level ATP shall commence thereafter.
   3. All Technical assistance for installation, commissioning and monitoring of the equipment shall be provided by the Bidder at no extra cost during FAT, laboratory evaluation, validation/ type approval, field trial, site acceptance testing, Station/Network level AT, etc, as applicable for this tender.
   4. The extension of delivery period against the purchase order, if any, should be granted subject to the condition that BSNL shall have the right to levy penalty for the delayed supplies, if deemed necessary as per the conditions of the tender.

# SECTION III

## DETAILED TECHNICAL SPECIFICATIONS

1. **Introduction**.The Roll Out of ‘Exclusive and Dedicated Nationwide DWDM based Optical Transmission Backbone Network for Armed Forces is required to be executed on Turnkey basis, whereby it should conform to all the user requirements including Delivery of Professional Services for System Integration, Project Management, Training & Maintenance Support, in addition to Network Planning, Implementation and Maintenance support for this project. The scope of this project involves Planning, Design, Development, Supply, Implementation, Installation, Commissioning, Testing, Optimization, Integration, Training and Life Cycle Maintenance on Turnkey Basis. The project also includes training, spares, test and measurement equipment, documentation during three years warranty and subsequently during AMC for seven years.
2. **Scope of the Project**. The scope of the work for this project is defined in clause of [section I Detailed NIT](#_NOTICE_INVITING_TENDER).
3. The Low Level Design (LLD) for this project shall provide detailed design for all the components of the Optical Transmission Backbone with specific reference to Control Plane Strategy and Addressing Scheme, Quality of Service (QoS), Traffic Engineering (TE), Network Protection and Restoration Plan, Client and Network Side Services Flow, NMS, EMS, Performance Management, OAM, SLA Measurement, and Integration Plan for all the existing ATM, MPLS, SDH and TDM networks of Armed Forces. It should also give out clearly the site wise SOR and planned amplifier/3R locations.
4. **Network Architecture and Topology**. A nationwide exclusive and dedicated OFC based optical transmission backbone network has been planned to cater to the large bandwidth requirements for high speed packet network with New IP-based Converged Network Services/ Applications. This Next Generation Optical Network will also provide transparent interoperability with all the existing legacy networks of Defence Forces. The complete network shall be controlled from Geo Redundant Central and Regional NOCs with Next Generation Operational Support System (NGOSS). The users shall be provided with various data services through multiple Data Centers located at Central and Regional sites. The details about network architecture and topology of the network have been listed in succeeding paragraphs**.**
5. **Conceptual Network Design**.
   1. A Countrywide Multiservice and Multiprotocol Converged Next Generation Network based on Gigabit Transport is to be created by BSNL for Indian Armed Forces. This network will connect Optical Carrier Ethernet based Gigabit Access Networks over captive IP/ MPLS backbone for the Defence stations spread over nationwide footprint. The vision is to build a truly world-class Next Generation Transmission Backbone Network based on Exclusive and Dedicated Optical Fiber Cable configured for provisioning of IP/ MPLS Routing Backbone and Gigabit Optical Access.
   2. The DWDM Transmission Systems will be installed over meshed Nationwide Physical Topology of Exclusive Optical NLD routes. The Optical Transmission Backbone for Armed Forces will be rolled out as a Highly Resilient DWDM Network based on a hierarchical network comprising of National and Regional Networks with specific reference to Network Capacity, Network Re-convergence during Faults, Scalability, Traffic Engineered Failover Response and Network Protection/ Restoration Plan.
   3. The Network Architecture shall be based on mesh topology comprising of highly robust national and regional networks based on 10 Gig or better DWDM optics for Multi Rate Client Interfaces, Multi Degree WSS based ROADMs and intelligent ASON based Layer 1 Control Plane with no single point of failure. The architecture should enable capacity growth, bandwidth growth and flexibility with wavelength management, traffic engineering and service provisioning.
   4. This Next Generation Optical Transmission Backbone Network will provide transparent interoperability with all the existing legacy networks of Armed Forces. It will also act as a Next Generation Transmission Network for all the New IP-based Converged Network Applications and Services such as Packet Voice, Packet Video (IMS), Tele-presence, Telemedicine, and Distant Learning in addition to typical Defence C4ISR services. All the end users of this network will be provided with data services through multiple Data Centres.
6. **Network Architecture**.
   1. **DWDM Transmission**. The DWDM based optical transmission layer will consist of 363 DWDM nodes deployed in dual plane architecture which will be driving the traffic from edge, core and super Core network at the MPLS layer. Tentative State wise list of DWDM nodes and POTS locations is given at [Appendix ‘H’](#_APPENDIX_‘K’_1). The detailed location list will be given to L1 contractor after award of Purchase Order.
7. **Functional Requirements**.
   1. **General**. The DWDM transport network shall be built using 10G (or better) systems with multi degree WSS based ROADMs. The system should support Layer 1 ASON control plane with simple and automatic point and click service provisioning, network topology discovery, end to end routing and service restoration capabilities. It shall support in-service remote configuration and management of wavelengths using the control plane. To accurately simulate the performance of the offered equipment and to ensure successful transmission, a comprehensive network planning tool shall be supported. The network shall have a Comprehensive Element Management System (EMS) for remote management of network elements. The EMS shall be implemented as per ITU-T Recs. M.3100 and M.3010 as applicable to the scope of this tender. The client side interfaces required are STM1, STM4, STM16, STM-64 and GbE (As per IEEE 802.3 and 802.3 ah standards) and 10G Ethernet LAN and WAN PHY as per 802.3ae. The system shall also be capable to interface OTU -1, OTU-2 and SAN interfaces as per requirement. The requirement is for WSS based ROADMs, transponders, muxponders and OTN digital cross connect (DXC).
   2. **DWDM Generic Specifications**.
      1. **Capacity**. The DWDM based transmission network should support configuration of 80 Lambdas of 10 Gig (or higher) over adistance of at least 80 km. **The requisite hardware in terms of pre-amplifier(s), EDFA, DCM etc for all route directions shall be supplied as part of the DWDM node configuration.The same chassis should also support 40G and 100G coherent channels**.
      2. **Chassis Capacity.** At least four spare traffic slots shall be provided in all DWDM systems.
      3. **Attenuators**.
         1. All 10km XFPs will be supplied with one attenuator of 5 dB each.
         2. All 40 km XFPs will be supplied with one attenuator of 10 dB each.
      4. All client interfaces shall be provided at single mode, 1310 nm.
      5. Optical connectors shall be E2000 type on FDF side, minimum length 50 mtr.
   3. **Classification of Optical Transmission Nodes**.The DWDM based optical transmission nodes have been classified into various types based on the ingress, egress and pass through traffic load. In addition, there will be requirement of various amplification and regeneration sites. All nodes shall be deployed in dual plane configuration. The configuration of various types of nodes is given below:-
      1. **Large Node**. A large optical transmission **node will consist of two DWDM optical transmission systems.** Each of the two systems will have four ROADM cards (of 1x8 capacity each)at **Beginning of Life** (BoL), with a capability to add/ drop 40 channels in each system (line side equipped with 40 Nos of 10Gtuneable interfaces and related cards at BoL), upgradable to 80 channels. Each of the two systems shall also have Layer 1 ASON control plane based OTN DXC of at least **1 Tbps** switching capacity. Large nodes shall form the National expressway. DWDM systems shall be supplied with all requisite pre-amplifier(s), DCM, accessories etc for a fully functional system. The client interfaces given below shall be **distributed**50% each over the two systems :-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ser No** | **Type of Interface** | **2 km XFP 1310 nm** | **10 km XFP (with 5 dB attenuator) 1310 nm** | **40 km XFP (with 10 dB attenuator) 1550 nm** | **Total Qty** |
|  | 10G | 12 | 12 | 6 | 30 |
|  | STM 16 | 2 | 2 | 2 | 6 |
|  | STM1/4 | 2 | 2 | 2 | 6 |
|  | 1G | 2 | 2 | 2 | 6 |

* + 1. **Medium Node**. A medium optical transmission**node will consist of two DWDM transmission systems.** Each of the two systems will have three ROADM cards (of 1x4 capacity each) at Beginning of Life (BoL), with a capability to add/ drop 20 channels in each system (line side equipped with 20 Nos of 10G tuneable interfaces and related cards at BoL), upgradable to 40 channels.Medium nodes shall form part of the Regional DWDM network. DWDM systems shall be supplied with all requisite pre-amplifier(s), DCM, accessories etc for a fully functional system. The client interfaces given below shall be distributed 50% each over the two systems:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ser No** | **Type of Interface** | **2 km XFP 1310 nm** | **10 km XFP (with 5 dB attenuator) 1310 nm** | **40 km XFP (with 10 dB attenuator) 1550 nm** | **Total Qty** |
|  | 10G | 6 | 6 | 3 | 15 |
|  | STM 16 | 2 | 1 | 1 | 4 |
|  | STM1/4 | 2 | 1 | 1 | 4 |
|  | 1G | 2 | 1 | 1 | 4 |

* + 1. **Small Node**. A small optical transmission**node will consist of two DWDM transmission systems.** Each of the two systems will have three ROADM cards (of 1x4 capacity each) at Beginning of Life (BoL), with a capability to add/ drop 10 channels in each systemsystem (line side equipped with 10 Nos of 10G tuneable interfaces and related cards at BoL), upgradable to 20 channels. Small and terminal nodes shall also form part of the RegionalDWDM network. DWDM systems shall be supplied with all requisite pre-amplifier(s), DCM, accessories etc for a fully functional system. The client interfaces given below shall be distributed 50% each over the two systems:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ser No** | **Type of Interface** | **2 km XFP 1310 nm** | **10 km XFP (with 5 dB attenuator) 1310 nm** | **40 km XFP (with 10 dB attenuator) 1550 nm** | **Total Qty** |
|  | 10G | 3 | 3 | 2 | 8 |
|  | STM 16 | 2 | 1 | 1 | 4 |
|  | STM1/4 | 2 | 1 | 1 | 4 |
|  | 1G | 2 | 1 | 1 | 4 |

* + 1. **Terminal Nodes**. Terminal optical transmission **nodes will consist of two DWDM transmission systems** which do not have ROADM capability and are required only for carrying large data on optical backbone to nearest ROADM site, with a capability to add/ drop 06 channels in each system(line side equipped with 06 Nos of 10G tuneable interfaces and related cards at BoL), upgradable to 20 channels. DWDM systems shall be supplied with all requisite pre-amplifier(s), DCM, accessories etc for a fully functional system. The client interfaces given below shall be distributed 50% each over the two systems:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ser No** | **Type of Interface** | **2 km XFP 1310 nm** | **10 km XFP (with 5 dB attenuator) 1310 nm** | **40 km XFP (with 10 dB attenuator) 1550 nm** | **Total Qty** |
|  | 10G | 2 | 2 | 2 | 6 |
|  | STM 16 | 2 | 1 | 1 | 4 |
|  | STM1/4 | 2 | 1 | 1 | 4 |
|  | 1G | 2 | 1 | 1 | 4 |

* + 1. **Optical Line Amplifier Site**. These sites should be equipped with Optical Line Amplifier with requisite gain and launch power to meet the optical transmission requirements (in both the directions"East"and "West")as given below. Design parameters to be taken as per Clause and . These amplifier sites shall be supplied with all requisite components, accessories like DCM, preamplifier etc for a fully functional system.
       1. **Optical Line AmplifierSiteType A.** EDFA amplifier to cater for optical range of minimum 40 km.
       2. **Optical Line Amplifier Site Type B.** EDFA amplifier to cater for optical range of minimum 60 km.
       3. **Optical Line Amplifier Site Type C**. EDFA amplifier to cater for optical range of minimum 80 km.
       4. **Optical Line Amplifier Site Type D.** EDFA or EDFA+Raman amplifier to cater for optical range of minimum 100 km.
       5. **Optical Line Amplifier Site Type E.**EDFA+Raman amplifier to cater for optical range of minimum 150 km.
       6. From deployment perspective, a particular amplifier site may comprise of one "Type" in East direction and another "Type"in West direction,eg "40 km in East direction with 80 km in West direction" or "60 km in East direction with 40 km in West direction" etc (this shall be decided as part of Low level design).
    2. **Optical Regeneration (3R) Site**. These sites should be equipped with 3R regeneration capability to meet the long haul optical transmission requirements as given below. These 3R sites shall be supplied with all requisite transponders, chassis, mux/demux, pre-amplifier(s), amplifier(s), DCM, accessories etc for a fully functional system.The capacity of 3R sites shall be as under :-
       1. **3R Site Type A**. Type A 3R site shall be between two large DWDM nodes and shall be capable of regenerating 30 channels at BoL.
       2. **3R Site Type B**. Type B 3R site shall be between two Medium/small/terminal DWDM nodes and shall be capable of regenerating 15 channelsat BoL.
  1. **Architecture**. The system shall support a Modular Architecture, in order to allow scaling the equipment size in accordance with the requirement of growth of network. The modular architecture should facilitate identification of faults and replacement of faulty cards/modules in a hitless manner
  2. **Robustness**. The system should provide carrier grade robustness (sub 50ms change over without data, voice or video traffic deterioration) and redundancy with no single point of failure.
  3. **Security of Communication**. The information is to be encrypted while transportation on the transmission network as per existing security policy of Defence Services. The transparent carriage of encrypted payload over DWDM backbone should be ensured. The bulk encryption devices shall be provided by the purchaser.
  4. **Scalability**. The core network must be able to grow and expand using open-ended software/ hardware. The network must be scalable from NMS perspective and should cater for at least 50% future expansion by adding additional nodes.
  5. **Flexibility**. The offered transmission system should allow flexibility of configuration, addition, alteration or removal of cards/components without affecting the functionality of the system.
  6. **Continuous and Hitless Operation**. The network should be operational on 24x7x365 days basis. It should be possible to add lambdas or upgrade the channels by addition of cards or other necessary hardware in a hitless operation.
  7. **Flexible Management and Control**. The System should provide flexible management and control and should be designed to simplify network planning, engineering and operation, enable simplified testing and improve system reliability.
  8. **Safety**. The system must provide the necessary features to guarantee the safety of personnel operating the equipment. The equipment should be compliant with the ETSI/ NEBS standards. The optical safety shall be as defined in ITU-T Rec. G.664 and IEC 60825-1. The optical access port shall be designed to protect themselves against entry of dust, when not occupied by external optical fiber cable connection. It shall be possible to clean the access ports easily in the field.
  9. **Mechanical Data**.The equipment should have physical dimensions which comply with ETSI/ NEBS standards. It should fit into Standard racks and shall have front access. There shall be proper cover on the sub-rack and main rack or similar arrangement to protect the equipment from ingress of dust. The permanent wiring in racks / sub racks shall be prewired.
  10. **Equipment Redundancy**. All critical modules/cards of DWDM, whose failure may results in service outage, shall be provided in redundant configuration for high reliability. Any single point failure on the DWDM equipment should not result in outage of network including network management system.
  11. **Disaster Recovery Strategy.** Disaster recovery will be planned for the Transmission Layer components of NOC at DR Network Centre.

1. **Service Requirements**. The final site-wise BoM shall be optimally worked out with the L1 bidder based on the bandwidth requirements and protection/restoration requirements.
2. **Recommendations**. Following technical standards and recommendations should be followed, where applicable, along with latest amendments if any.
   1. G.691 ‘Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers’.
   2. G.702 ‘Digital hierarchy bit rates’.
   3. G.703 ‘Physical/electrical characteristics of hierarchical digital interfaces’.
   4. G.704 ‘Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44736 Kbps hierarchical levels’.
   5. G.707/Y.1322 ‘Network node interface for the synchronous digital hierarchy (SDH)’.
   6. G.781 ‘Synchronization layer functions’.
   7. G.783 ‘Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks’.
   8. G.784 ‘Synchronous Digital Hierarchy (SDH) management’ (06/99).
   9. G.798 ‘Characteristics of optical transport network hierarchy equipment functional blocks’.
   10. G.813 ‘Timing characteristics of SDH equipment slave clocks (SEC)’.
   11. G.823 ‘The control of jitter and wander within digital networks which are based on the 2,048 Kbps hierarchy’.
   12. G.825 ‘The control of jitter and wander within digital networks which are based on the Synchronous Digital Hierarchy (SDH)’.
   13. G.841 ‘Types and characteristics of SDH network protection architecture’.
   14. G.957 ‘Optical interfaces for equipments and systems relating to the SDH’
   15. G.7041/Y.1303 ‘Generic framing procedure (GFP)’.
   16. G.7041/Y.1303 ‘Amendment 1’.
   17. G.7042/Y.1305 ‘Link capacity adjustment scheme for virtual concatenated signals’.
   18. G.7042/Y.1305 ‘Corrigendum 1’.
   19. G.7042/Y.1305 ‘Corrigendum 2’.
   20. IEEE 802.1q ‘Virtual Bridged Local Area Networks. 2003 edition’.
   21. Y.1731 for performance monitoring.
   22. IEEE 802.3 ‘Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method and physical layer specifications. 2002 edition’.
3. **Design Criteria**.
   1. **Link Budget Calculations**.The fiber optic link budget calculations shall be calculated based upon the following criteria:
      1. **Fiber Attenuation**. Standard fiber attenuation of 0.22 dB/km shall be taken.
      2. **Splice Loss**. Minimum 0.1 dB per splice. One splice shall be considered for every 2 Kms.
      3. **Connector Losses**. Losses due to connectors shall be considered to be minimum 0.5 dB per connector.
      4. **Dispersion**.The fibre dispersion shall be taken to be the guaranteed maximum dispersion i.e. 18 ps/nm.Km for G.652D fibre and 6 ps/nm.Km for G.655 fibre. PMD coefficient shall be taken as 0.2 ps/km½.
      5. **Bit Error Rate**. The link budget calculations shall be done for a BER of 10-10 for SDH system (except STM-64) and 10-12 for DWDM system and SDH STM-64 system.
   2. All DWDM links shall be designed with span lengths of minimum 80 km, for 10Gbps bit rates at BoL, upgradable to 40G and 100G.
   3. 3 dB Span fiber margin should be considered for each span of 80 km.
   4. All the ROADMs should be multi-degree WSS based ROADMs.
   5. Links should support AGC, Automatic Laser Shutdown and automatic channel equalization.
   6. Only one time fixed attenuator to adapt to actual field span losses shall be permitted at the time of installation. No subsequent field adjustment of any kind to adjust shall be permitted. Use of built-in electronic attenuator (VOA) with software adjustment is mandatory.
   7. The DWDM equipment must support working of all 80 channels in C-band.
   8. **Optical Engineering**. OSNR calculations from ROADM to ROADM for all the 80 channels in the network should be done in such a manner that future traffic addition can be done without any optical re-engineering. The addition of channels should be in a seamless manner without any reengineering. This will ensure speed of deployment and simpler planning for future services.
   9. Both the transmitter booster amplifier and the receive preamplifier shall be an integral part of DWDM systems whereas the line amplifier shall be located somewhere along the transmission line away from the terminal stations. The In Line Amplifier shall be upgradable to become OADM by addition of some modules and modification of software (if required).
   10. The Optical Amplifiers shall be ‘Mid-Access’/Modular type and should have the mechanism to maintain error free system operation under dynamic conditions.
   11. Fast gain control loop: to protect against short term transient conditions such as sudden loss of signal.
   12. Slow output power control loop: to protect against long term conditions such as fibre ageing.
4. **Technical Requirements for DWDM**.
   1. **Hierarchical Deployment.** DWDM nodes shall be deployed in a hierarchical manner. Large nodes shall form the National expressway for inter region traffic. Medium nodes shall form the regional network (in six regions), whereas small and terminal nodes shall form the aggregation layer in each region. Detailed low level architecture shall be worked out by the bidder after award of contract, in consultation with the purchaser.
   2. **Dual Plane Architecture**. All DWDM nodes provided for this project shallbe deployedin dual plane architecture. The two planes/systems in a node shall be interconnected on ROADMs.
   3. **Wavelength Planning**.Wavelength planning for all types of systems will be done in ac**cordance with ITU-T** DWDM Grid as specified in G.694.1.
   4. **10 G Systems**. **Technical requirements for the proposed DWDM systems should conform to the specifications as laid down in TEC GR No GR/WDM-06/01 dt Aug 2008 or latest, including amendments if any, unless they have been specified differently anywhere in this tender document**. **Any item(s) mentioned as "Optional" in the TEC GR shall NOT be supplied unless specifically asked in this tender**.All 10G interfaces on client side for all types of DWDM should be capable to accept any of the following:-
      1. STM 64.
      2. OTU 2.
      3. LAN PHY.
      4. WAN PHY.
   5. **Optical Line Amplifier Site**. As per details given at .
   6. **Optical Regeneration Site**. As per details given at **.**
   7. **Protection**.
      1. **Fibre Path Protection**. The transmission layer shall be able to support redundant fiber path protection. The total time taken for fault detection and switching from active to standby fibre link should be less than 50ms without any interruption of live traffic. **The protection path should be so provisioned that there is no shared common physical path between the main and the protection path** and the absolute route diversity will be maintained.
      2. **Equipment Protection**. The offered DWDM based optical transmission systems should be configured in redundant controller configuration. In case of failure of the active controller, the standby controller should take over automatically with no disruption in the services/transmission connectivity.
      3. **Power Supply Protection**. There shall be provision for feeding DC supply from two sources. Failure of one of the two supplies shall not cause shut down of the system. In case of complete power failure the DC voltage given to the equipment will be suddenly disconnected. Under these conditions there shall not be any damage to the software, hardware and configuration data. System should automatically recover to last configuration when the power comes up without any manual intervention.
   8. **Control Plane**.
      1. The system shall support intelligent Layer 1 ASON based control plane based automatic network physical and circuit topology auto discovery and automated end to end Service provisioning independent of network topology..
      2. The system’s control plane shall support a robust signalling and routing protocol that supports traffic engineering at the fiber, lambda and sub 10G wavelength service levels.
      3. User should have control to define the protection and restoration (P&R) for each of the service independently.
      4. Following features shall be compliant for I-NNI interfaces for Wavelengths and OTN (Wherever applicable).
         1. The system control plane shall support separate call control and connection control. Calls and connections shall be separately identified by call and connection identifiers.
         2. The system signalling communication network (SCN) shall be physically or logically separated from management network and transport network.
         3. The system control planes shall support diverse topologies, i.e., point to point, mesh, ring, hub-and-spoke, and combinations of these. And, shall support in-service transitions between these topologies.
         4. The control plane implementation shall be embedded within the Network Element (NE) and not depend upon external systems or tools.
         5. The system shall support sub 50 millisecond protection switching and sub 10 second restoration.
   9. **Network Topology Auto-Discovery**. The Layer 1 control plane shall discover the Network topology automatically and must support traffic engineering at the fibre, wavelength and sub-wavelength levels. The Network topology has to be modelled by defining the following elements:-
      1. A routing node, which corresponds to a NE (OADM Node or Line Amplifier node) within the Network.
      2. A control link, which corresponds to OSC control between adjacent network elements.
      3. Transport capacity between adjacent OADM’s.
      4. Through the management applications users must be able to view the physical network topology as well as service provisioning topology maps.
   10. **Physical Network Topology**. The physical network topology shall mirror the physical fiber connectivity between the network elements. It represents the topology of the control plane traffic (e.g. OSPF-TE messages) and management plane traffic (messages exchanged between the network element and the management application).
   11. **Service Provisioning Topology**. The service provisioning topology must provide users with a view of nodes where services can be terminated or groomed as per the associated links between them. The service provisioning topology shall represent the data plane traffic (client traffic).
   12. **Automated circuit provisioning**. The control plane implementation must support dynamically signalled permanent virtual circuits that persist across disruptions to the control plane or management plane.
   13. Provisioned circuit shall support appropriate states to allow users to administratively lock and unlock circuits, without deleting the circuit endpoint systems.
   14. Traffic engineering control utilizing constraint-based source routing. Various traffic engineering parameters both at the link level and node level must be supported enabling user to create networks that are utilized most efficiently.
   15. The node and equipment level traffic engineering parameters shall include Inclusion and Exclusion list, Switching Capacity, Multi-hop end-to-end circuit setup by control plane within a routing domain and link level traffic engineering includes Link capacity, Link Inclusion, Exclusion lists, and user-configurable administrative weights or link costs etc.
   16. **Integration with Network**. The network should be designed in a manner that transmission backbone network should be able to integrate with all the other layers to ensure that the network is rolled out and operated in a seamless manner.
   17. **Interoperability and Compatibility**. The systems in transmission layer shall be compatible with the systems being planned as part of other layers in the network. The DWDM system should transparently pass through the STM-1/4/16/64, OTU 1/2, and 1/10GigE signals to meet the system integration requirement for inter-workability with Bulk Encryption Devices of the end user. The equipment should be interoperable with majority of standard storage equipment of OEMs like IBM/ SUN/ HP/ EMC/ Netup etc.
   18. **Forward Error Correction (FEC)**. The equipment shall support out of band Forward Error Correction (FEC) for extended reach for long haul DWDM applications. The system shall provide with FEC enabling / disabling facility through LCT and EMS. **Single span ranges of 80 Kms should be feasible without any intermediate amplification site**.
   19. **ITU-T Guidelines**. The system shall support and comply with all protocols and specifications as per standard ITU-T guidelines for all systems including latest revisions if any.
   20. **Hitless Operation**. The modules should be hot swappable and live insertion should be possible to ensure maximum network availability and easy maintainability. The removal or addition of any cards should not affect traffic on mother cards. The system must facilitate “hitless” or uninterruptible wavelength provisioning such that active wavelengths are uninterrupted by the addition or deletion of wavelengths , hot insertion of DWDM system components necessary to provision wavelengths or by upgrade of channel capacity by insertion of additional cards.
   21. **OTN DXC**.
       1. The Bidder shall quote for a state of the art OTN DXC platform for services delivery over multi degree WSS-ROADM mesh network using ASON control plane (Layer-1).
       2. The DXC equipment should support traditional protection mechanism along with ASON/GMPLS based Layer-1 restoration. Following variants of service level agreements should be achieved within the ASON/GMPLS architecture:-
          1. **Platinum Service**. Permanent 1+1 path restoration + ASON/GMPLS based Layer-1 restoration ensuring sub 50ms restoration.
          2. **Gold Service**. Permanent 1+1 path protection.
          3. **Silver Service**. ASON/GMPLS based Layer-1 restoration.
          4. **Bronze Service**. No Protection mechanism for network restoration.
       3. The system should support ODUk (all rates and sub-slot access for traffic grooming).
       4. The switch fabric shall be redundant in N+1 equipment protection with sub 50ms switching time for data path even when one switch fabric card fails.
       5. All data and control paths along with backplane shall be fully redundant in the entire system from ingress to egress. The Details of the system design and architecture shall be submitted.
       6. The switching fabric in the System Should support the following services:-
          1. **Ethernet**- 1GE/nGE.
          2. **Ethernet**- 10GE.
          3. STM-16/16c/OTU-1.
          4. STM-64/64c/OTU-2.
          5. ODU0.
          6. ODU1.
          7. ODU2.
       7. The switch fabric/Cards shall support following OTN cross-connect and traffic grooming:-
          1. ODU0.
          2. ODU1.
          3. ODU2.
          4. nxODU0 to ODU1/2.
          5. nxODU1 to ODU2.
       8. The switch fabric shall support fully non blocking cross-connect with no distinction between tributary and line cards from switch fabric perspective.
       9. A mixture of protected and unprotected ports shall be supported on Port level.
       10. System should support Layer 1 co-ordinated ASON enabled large mesh networks for all supported switch fabric signals.
       11. It should be possible to launch 10G, 40G or 100G waves from the same equipment on the DWDM Layer.
       12. System shall provide universal shelf, and universal slots for modules except switch fabric, controller cards and power supply.
       13. Power supply, Switching Matrix, Control Processor and other traffic impacting controller cards shall be fully Redundant.
       14. All the proposed interfaces shall meet the G.709 and G.872 functional implementation of OTN hierarchy. All interfaces shall support ALS and ALR.
       15. The Bidder should offer the System with full capacity of switching fabric and the line cards can be equipped as per configuration mentioned in the tender. Only Additional Line cards should be required for future expansion.
       16. The Proposed DXC equipment should be managed by common Network Management System proposed for DWDMelements. There should not be separate NMS system for DXC equipment.
       17. **Synchronization**. The system has to provide following functionalities:-
           1. 1+1 protected timing source hardware.
           2. Timing reference collection from packet and TDM interface cards and station clock resources has to be supported.
           3. Free-run and holdover operation mode possibility as per ITU-T G.813 option 1 requirement.
           4. Timing reference distribution through line card and station clock outputs.
           5. Synchronous State Message (SSM) processing.
           6. Real time clock for time stamping.
       18. **Other services**.
           1. The platform has to be able to support Fiber Channel services (1G, 2G, 4G, 8G and 10G).
           2. The platform should be able to support other services as well (DVBASI, etc.).
       19. **OTN Interfaces**.
           1. The platform must support OTU interfaces according to G.709 (OTU-1, OTU2, OTU3, OTU4) and G.Sup43 (OTU2e).
           2. OTN interfaces have to support FEC as per G.709 and super FEC.
           3. The system shall support 100G, 40G and 10G interfaces.
       20. **Common interfaces**.The system has to support following interfaces:-
           1. Two station clock inputs (T3) and two station clock outputs (T4), which can support G.703 2.048MHz and 2.048Mbps clock signals.
   22. **Layer-1 Control Plane**.
       1. Layer-1 ASON Control Plane shall perform functions such as Neighbour discovery, resource discovery, service discovery, protocol control link, link resource management, routing control, signalling, connection control and call control.
       2. Operator controlled re-routing shall support routing constraints (e.g., include/exclude resources, diverse paths, etc) in accordance with the policies for the connection.
       3. It shall be possible to request re-routing of connections from the management plane without the presence of a failure in the network. The user through the EMS shall be able to manually initiate a re-routing event on a service path.
       4. It should support automatic mechanism in order to ensure that main and protect path of any circuit should not take any common path( Diverse Path) to avoid any single point of failure.
       5. Administrative re-routing shall support re-routing of the Current Path, without changing the Nominal Path.
       6. Operator management tools should allow re-routing of connections around a specified resource or SRLG.
       7. Control Plane signalled & routed circuit should free the bandwidth in the event of a failure so that it should allow other circuits to use any available bandwidth in the event of failure among any hop of the circuit.
       8. Connection re-routing shall support both revertive and non-revertive behaviour (i.e., manual reversion).
       9. The control plane shall report to the management plane the success/failure of a connection re-routing request.
       10. It should be possible to exclude resources from any use (i.e., freeze resources from use for additional set-up, re-route, or restoration of connections) in support of maintenance activities.
       11. The control plane must be able to automatically calculate connection paths and resolve resource contention without operator intervention.
       12. The Control Plane should have local restoration capability if more than one direct diverse path is available between two locations ensuring faster performance as compared to End to End restoration.
       13. The control plane shall support path computation for:-
           1. Cost (shortest path).
           2. Latency.
           3. Hop based.
       14. The control plane shall provide a reliable transfer of signalling messages.
       15. The control plane shall support recovery from failures:-
           1. Recovery from loss of DCN to a node.
           2. Recovery from loss of a software process.
           3. Recovery from total loss of control plane of a node.
           4. Recovery from loss of a control card (hardware failure).
           5. Recovery from loss of switching capability.
           6. Network wide control plane failure recovery and reset.
       16. The control plane shall be able to recognize a failed node and route connections around the NE.
       17. The control plane, data, and management planes shall be completely isolated.
       18. The control plane shall enable the addition of NEs, links, customers, or domains without affecting services.
       19. Control plane signalling shall support all call/connection management actions including setup, release, modification and query.
       20. Control plane signalling shall support all connection management actions for individual connections.
       21. Control plane signalling shall support all connection management actions for groups of connections.
       22. Topology information shall include necessary parameters to compute shortest path, least latency path, restorable path, diverse (from another path) path.
       23. Link advertisements shall support Shared Risk Link Group (SRLG) identifiers to allow diverse path computation.
       24. The vendor shall support a fully distributed control plane implementation in the network elements.
       25. The architecture should be open to support multi-layer GMPLS interworking.
       26. **Traffic Engineering (TE) Links**.
           1. Should support soft permanent connections.
           2. Should support switched connections via OIF UNI 2.0.
           3. Performance and Fault management for layer 1 ASON control plane paths.
           4. Support of multi-domain networks using OIF E-NNI 2.0.
       27. Automatic topology and resource discovery of data/transport network (TE links).
       28. Pre-planned shared restoration that allows protection resource sharing between multiple services has to be supported.
       29. **Performance Management (PM)**.
           1. Performance monitoring has to be supported according to Telcordia GR-820 and GR-253 (ANSI).
           2. Performance monitoring has to be supported according to ITU-T G.709, G.798 and G.806 (ETSI).
           3. Performance monitoring must be configurable (ANSI or ETSI).
           4. ODUk delay measurement must be supported.
           5. Should support generating and monitoring of traffic patterns.
           6. Pre FEC BER monitoring is required.
           7. SDH performance monitoring according to ITU-T G.783 has to be supported.
       30. **Fault Management (FM)**.
           1. Remote fault monitoring must support fault localization at the field-replaceable unit level.
           2. The system must support alarm logs.
           3. Equipment and service alarms must be separated.
           4. Real time clock synchronization and time stamps for alarms via NTP support is required.
   23. **Network (NW) Planning Tool**.
       1. Network Planning tool shall facilitate purchaser to plan and simulate networks with an automated control plane such as GMPLS/ASON. The NW Planning Tool shall emulate the behaviour of GMPLS/ASON networks in all the possible operative scenarios such as link, node and Shared Risk Link Group (SRLG) failures.
       2. The purpose of the Planning tool is to carry out greenfield network planning, maximize the quality of service provided to customer and to optimize the network resources. The NW Planning Tool shall help purchaser to plan, develop, manage and upgrade their transport network.
       3. **Planning the needed Capacity of a Network**. The NW Planning Tool shall be able to perform capacity planning of greenfield new network builds. For an optimal design of the network, the tool shall provide an option to specify the following parameters:-
          1. The traffic matrix, and more specifically:-
             1. The number of circuits to be created with the same characteristic.
             2. The source and a (the) destination(s).
             3. The required protection/restoration scheme.
             4. The required diversity between work and protection/restoration circuit (link, node or SRLG).
             5. Resources (link, node or SRLG) to be included or excluded in the network.
             6. Traffic parameters for the circuit(s) e.g. the bandwidth, Cost of sales.
          2. The physical topology of the network, including the connectivity among the network elements.
          3. The required network survivability specifying the number and type of the failure(s) policy, e.g. double links failure, single SRLG failure etc.
          4. The type of network interfaces to be used during the capacity planning process.
       4. It should be possible to update the snapshot of the network status, either from Network Management System or directly from the network via standard SNMP interface. These snapshots shall be used to:-
          1. Perform the sensitivity analysis or ‘what if’ scenarios of failures or planned works.
          2. Verify if there are enough resources to accommodate new traffic requests when a new or modified traffic matrix is applied to the snapshot.
          3. Check if the network status is in line with the forecast.
       5. **Capacity Planning**. Having the current network topology (and the current network occupation) as input, it should be possible to do the capacity planning analysis. If some link or node requires an extension as per the Capacity Planning analysis like addition of ports and pairs of fiber to the links (or in case of DWDM links, of the number of transponders required by the line terminals), the NW Planning Tool shall be able to perform such automated operations.
       6. **Fault Analysis**. Fault analysis shall allow the simulation of network faults and evaluation of the possibility to recover traffic. It shall be possible to simulate faults on every link, node or SRLG of the network. The report should highlight the quantity of circuits protected and the circuits not saved by the network resource.
       7. **Bottleneck Analysis**.The bottleneck analysis shall allow the ability to find out network bottlenecks (nodes or links) that need to be upgraded in order to properly satisfy the traffic requirements of the network.
       8. **Network Inventory**.The network inventory shall allow generation of a list of all the resources available in the network, and the map of the circuits.
       9. **Available Reports**.For each of the NW Planning tool functionalities given above, it should be possible to generate a report. The reports should be available in text file, Word and Excel compatible formats.
       10. **NW Planner GUI**. NW Planning tool should provide the network operator with a user friendly graphical interface.
       11. **Features**.
           1. Support of traffic at ODU0, ODU1, ODU2.
           2. **Additional Constraints**. Administrative colours, explicit routes or inclusion/exclusion of certain categories of network resources.
           3. Import of network topology files from NMS Server.
           4. Import/Export of Traffic Matrix data from/to Excel (CSV); Full import/export of network data from/to Excel (CSV).
           5. Must provide the utilization on each link (service, protection, restoration).
   24. **Network Management System (NMS)/Element Management Systems (EMS)**.
       1. Network Management System/ Element Management System will be supplied by the vendor for management and control of the DWDM and POTS Network. EMS/NMS servers will be placed at National NOC (NNOC) and DRNOC to provide redundancy.The NMS/EMS servers shall synchronize time with the NTP server in the network. There will be six regions in the network with one Regional NOC (RNOC) each.
          1. **NMS/EMS Clients**. Client Desktop workstations shall be deployed at all NOCs (Regional as well as National/DR site) with role based privileges.Clients in RNOC shall be authorised to manage NEs within their respective region only. Clients at NNOC/ DRNOC shall be authorised to manage the complete network elements.In addition, GUI/Web based client software will be available on a portable LCT placed along with each node to enable viewing rights as per policy to be promulgated at a later stage. Licences for these functionalities shall be provided in all the client terminals supplied (Desktop terminals and portable LCT, both)
       2. **This EMS/NMS shall be integrated with Umbrella NMS (based on NGOSS) at a later stage (being procured as part of a separate tender). Hence all interfaces shall comply to accepted International standards for north bound interfacesas per TMF standards**.
       3. The Specifications below detail the technical and functional requirements for a Integrated Network and Element Management System. This is required to provide management and control of the Network Elements (NEs). Northbound interfaces are also required to provide an interconnection mechanism for other third party applications such as OSS.
          1. There shall be a primary and secondary gateway connection between the system at the necessary ends.
          2. The System shall process all alarm, condition and performance monitoring information for the system and provide them to the Management System.
       4. The Management System shall be capable of forming an integrated subset of an overall TMN in accordance with ITU-T M.3010.
       5. The overall principles and structure of Management System layer shall be according to the ITU-T G.784, M.3010, E.410. The protocol suites shall be in accordance to G.773, Q.961 and Q.862.
       6. Deployment shall comprise of two independent servers in geographically diversified locations for disaster recovery. The Management Servers shall be in 1+1 hot standby for all applications. Both Management system servers shall operate in an "active" mode and shall not require data replication mechanisms to synchronize NE related information within the Management System servers. Both Management System servers shall be connected to all the NEs simultaneously.
       7. The Management System shall represent with GUI based interfaces.
       8. The Management System shall be able to auto-discover the NEs and the corresponding connections between the NEs, and auto-create the subnetworks using one of the designated Gateway Network Element (GNE) IP addresses. The different types of NEs (e.g., ROADMs, cross connect nodes and ILAs) within a subnetwork shall also be identified and distinguished. The auto discovery process shall identify which NEs are configured as GNEs.
       9. The NMS GUI should allow NOC personnel to create and activate end-to-end services at both the packet, optical and photonic layer — photonic wavelength, OTN and E-LINE/E-LAN/E-TREE packet services.
       10. The Management System functions shall be processed thru 'point-and-click’ using a Graphical User Interface [GUI].
       11. End to end Trail creation shall be available in the network management system.
       12. It should be possible to extend 50 client session from NMS.
       13. The Management System should be able to handle upto 100% additional Network Elements in future without any hardware/software/licence upgrade.
       14. It should be possible to define 500 users in the NMS.
       15. It should support service management of all SNC types supported (Perm, Mesh, S-SNCP, MR-SNCP, ARD, Hi/Lo Priority SNC) from OTN Control plane perspective.
       16. OTN Service Management should support periodic import of performance monitoring data from the NMS; this data, collected in at least 15- minute increments, is to be used to maintain a historical profile of the performance of individual circuits, as well as the aggregate performance of the network as a whole.
       17. Layer 2 services should be displayed on the NMS Network Map. Multiple services and their infrastructure should be displayed at the same time, and services should be displayed over their associated infrastructure. A user should be able to select one or more services from the displayed links. Selected services should be highlighted on the network map; multiple selections shall be highlighted in a different colour. Information for each selected link should be listed in the Details table, including service status and endpoints.
       18. **Configuration Management**. The Management System shall support the provisioning of :-
           1. All equipment parameters.
           2. Cross-connects between SDH,OTN, Packets environment.
           3. Threshold Crossing Alert (TCA) thresholds for individual NE's and group of NEs with Same ID.
           4. Alarm severities.
           5. Equipment and facility states.
           6. Passwords and logins in NEs.
       19. The Management System shall track all available port and facility capabilities, and deny provisioning requests that would utilize in-use capacity.
       20. All client application requests to create, modify and delete Managed Entities shall be logged. Each request shall be recorded with the identity of the source that originated the request and timestamp.
       21. The Management System shall report to the requesting client on successful (and unsuccessful) attempts to satisfy the client configuration request.
       22. The Management System shall provide a Search command to facilitate searches for specific entities and objects with wildcard character searches.
       23. The Management System shall support automatic database update of software version changes from the Network Element. These software version changes will be reported to the Management System by the network element.
       24. The Management System shall be able to report the software generic that is currently active on the NE, as well as all software generics alternately stored within the NE.
       25. In collaboration with the NEs, the Management System shall present all configuration data to client applications on managed sub-networks and NE configuration instances, including logical resources, physical resources, connectivity elements, state information, and services running.
       26. Upon re-establishing the DCN Link to an existing NE, the Management System shall support auto-discovery capabilities for all NEs and automatically synchronize its view of the NE with all relevant configuration data of the NEs added in the network.
       27. The Management System shall provide synchronization and consistency and integrity between physical and logical network resource data.
       28. The Management System shall accurately represent the current state of the NE without performing a refresh at the Management System.
       29. The Management System shall support requests from the northbound OSS to retrieve information concerning the available capacity of a link in order to generate a capacity report either scheduled or on-demand.
       30. The Management System shall be able to generate reports that address the universe of currently managed/databased NEs, through a menu option available on the Management System GUI. The content of these reports shall be for:-
           1. The quantity of NEs currently data-based.
           2. The “type” of each NE included in the report.
           3. The software generic/version of each NE included in the report.
       31. The Management System shall be able to generate a report based upon User-defined “search criteria” such as a card/plug-in model number.
       32. The Management System shall be able to coordinate the software download to multiple NEs based on a single software source.
       33. The Management System shall support remote activation of successfully downloaded and distributed NE software loads. The Management System shall be able to coordinate the activation on multiple NEs based on a single client request.
       34. The Management System shall manage version control for all NE software and be able to ascertain if a specific software version need to be downloaded to a target NE.
       35. The Management System shall log the results of every software activity.
       36. The Management System shall provide the ability to easily add a new NE to its scope of control.
       37. Any configuration parameters for the NE shall be remotely configurable by the Management System.
       38. The Management System shall coordinate scheduled back-up of NE configuration and control data to a designated file server (which may be the Management System Server itself).
       39. The Management System shall provide access to specific functionality via a user class (Minimum four user class are required).
       40. The Management System shall be able to synchronize the NE’s date and time to the Management System server’s clock.
       41. The Management System shall maintain a topological view according to ITU-T Recommendation G.805. The Management System shall provide an interface for client applications to access such topological information and to navigate between different layers.
       42. The Management System shall support the provisioning of protection groups.
       43. The Management System shall satisfy client application requests for service provisioning.
       44. The Management System shall be able to associate service instance information with network resources, including ports and circuits including service instance ID.
       45. The Management System shall provide an open, published API northbound to OSS system for provisioning and activation of each of the elements of functionality and features specified.
       46. The End to end service creation shall have options to automatically show all the available ports/ Paths/ Wavelengths available for service creation.
       47. **Fault Management**.
           1. All alarms generated from the NE to the Management System shall be able to be sent to the upstream OSS thru the northbound interface.
           2. The Management System shall display alarms for NEs in near real-time.
           3. The Management System shall automatically refresh and update the alarm screen so that operators view events in near real-time. Management System shall also provide a means for operators to manually refresh the alarm screen.
           4. The Management System should provide the ability for a user to perform quick sorts of alarms by clicking on column headings.
           5. The Management System shall autonomously receive and process alarms/events from the NE.
           6. The Management System shall autonomously receive threshold crossing information as an “alarm”.
           7. The Management System shall distinguish between service affecting (e.g. critical) and non-service affecting alarms (e.g. major, minor).
           8. The Management System shall log all alarms/events with the time stamping.
           9. Different alarm colors shall reflect critical, major and minor alarms.
           10. The Management System shall monitor Management System-to-NE communication links and report communications failures as an alarm.
           11. The Management System shall, upon user request, display current and historical alarm/event records associated with a NE.
           12. The Management System User shall be able to set alarm/event filters (by NE or by alarm/event type) to temporarily inhibit display/notification. However the use of alarm/event filters shall not prohibit the alarms/events from being logged within the Management System alarm/event history log.
           13. Use of, creation of, modification of or deletion of, alarm/event filters shall be based on individual User privileges assignable by the Management System Administrator.
           14. The Management System shall forward alarms/events to OSSlayer immediately upon receipt.
           15. The Management System shall be capable of discriminating between alarms/events and forwarding selectively to OSS based upon such criteria as:-
               1. NE type identified by TID.
               2. Type of alarm/event.
           16. The Management System shall not delay in reporting service affecting alarms/events even when the root cause cannot immediately be determined.
           17. The Management System shall provide a fault manager screen that displays alarms and threshold events in a tabular format.
           18. The Management System interface shall support operations from users for manual clearing of alarms in the current alarm list.
           19. The Management System shall log all alarm events and clearing in a historical alarm log.
           20. The Management System Log interface shall support browsing of the historical alarm log records by clients.
           21. The Management System shall support automatic re-synchronization of alarm information associated with any NE that has been temporarily out of management contact with the Management System.
           22. The Management System shall support user acknowledgement of any outstanding alarms, indicating that the user is addressing resolution of the failure condition indicated by the alarm message.
       48. **Performance Management**.
           1. The Management System shall provide the activation and deactivation of performance data collection on individual termination points contained in the NEs.
           2. The Management System shall support the collection and Reporting of performance monitoring data for the L0, L1 layer.
           3. The Management System shall provide the capability for the User to set threshold levels.
           4. The Management System shall provide the ability to enable / disable performance monitoring on a “per managed element” basis.
           5. The Management System shall provide storage of a minimum of 15 days of 15-minute and 24-hour interval digital PM data for the complete network.
           6. The Management System shall support the retrieval and display of performance monitoring statistics from the NEs:-
              1. 15 min interval.
              2. 24 hr interval.
           7. The Management System shall provide an open, published API northbound to the NML for performance monitoring and data collection from each of the applicable elements.
       49. **Security**.
           1. The ability to deliver and load software upgrades and maintenance changes to NEs shall be restricted to a privileged user, as per the security policy.
           2. The Management System shall log all security alarm events and no one shall be able to modify or delete a security alarm record within the log of the Management System.
           3. The Management System shall generate and maintain security audit logs on user access for forwarding to interested client applications on a scheduled basis and on request.
           4. The Management System shall not display the password of the user in the audit logs.
           5. The Management System and NE shall support temporary NE user logins, including the login expiration date.
           6. The Management System shall keep track of which user logins are currently logged on to the Management System GUI. Timestamps corresponding to when the user logged in and logged off should be recorded. The Management System shall support query of this information by the authorized commands.
       50. **Backup and Disaster Recovery**.
           1. The Management System shall support disaster recovery requirements including the mirroring of network resource data and roll-over to an alternate location as well as revert mechanisms.
           2. The Management System shall support a full backup for all data archived on the Management System including database information, logged event information and user task logs and/or system logs.
           3. The Management System shall verify that periodic database backups are successfully completed. Backups shall be able to be scheduled typically on 24 hr basis. Successful backups should be logged as events. Unsuccessful backups should be logged as alarms.
       51. **GUI Representation in Management System**.
           1. A user-friendly GUI client application shall be available that minimizes user keystrokes through the use of features as ‘drop-down’ menus, templates and user-definable defaults for field values.
           2. The Management System shall support launching a browser neutral GUI client using a Web browser such as IE or Mozilla, etc.
           3. The GUI shall provide the ability to create, delete and modify topology views of the network that will be displayed graphically.
           4. The Management System GUI shall provide the operator with the ability to easily navigate between location information (such as a map or regional list of NEs) and network resource details. It shall also provide navigational capabilities between sub-network view.
           5. The colours red, orange, yellow or amber, green, and white shall be used as visual indications of system status. Provision to change these colours shall be there in Management System.
              1. Red indicates a critical failure.
              2. Orange indicates a major failure.
              3. Yellow (or amber) indicates a minor or warning failure condition.
              4. Green indicates perfectly fine status.
           6. The Management System shall support access to multiple Network Elements regardless of their IP address on a single GUI client application session.
           7. The Management System shall provide on-line context-sensitive Help menus that provide users with information such as interpretation of fields, field ranges allowed and how field entries are used.
       52. **Packet Service Management**.
           1. Packet service management should support below mentioned services from the NMS.
              1. MEF compliant services.

E-line, E-Tree, E-LAN.

Major/Sub Rings/Sub-Sub Rings; Major-Major.

* + - * 1. **MPLS-TP**.

E-line. E-Tree Services.

Dynamic tunnels and Pseudowires.

* + - * 1. Q-in-Q Linear: E-Line Services.
      1. Following Real-Time Performance Monitoring should be supported from NMS:-
         1. Service Endpoint; UNI/ENNI; INNI; Port; Y.1731.
         2. Service Types: MPLS-TP, Linear QinQ.
      2. NMS Should support following Test and Diagnostics tools:-
         1. 802.1ag Loopback and Link traces.
         2. 802.1ag Continuity Checks.
         3. MPLS: PW Ping; LSP Ping; LSP Traceroute.
      3. The application should automatically discover E-LINE/E-LAN/E-TREE, packet-based services and service infrastructure from the managed network, to ensure the centralised system has the most up-date and accurate view of deployed services.
      4. The operator shall be able to provision an end-to-end packet service from a centralised system with a few mouse clicks.
      5. It should be possible for each end-point on a per service basis to display 802.1ag continuity check information.
    1. **Wavelength Service Management**.
       1. Network and service information should be discovered from the network.
       2. The operator should provision an end-to-end wavelength service from a centralized system with a few mouse clicks.
       3. All tasks required to turn up the wavelength—including cross-connect provisioning, fiber connectivity verification, and service enablement—should be performed from a single screen in the NMS GUI.
       4. Power values should be overlaid on the topology map:-
          1. Per lambda Power.
          2. Total AMP Power.
          3. OSC (Optical Supervisory Channel) Power.
    2. **EMS/NMS Server**.
       1. The EMS/NMS (application and database both) shall be based on a server blade chassis (at both locations viz NNOC and DRNOC) with multiple server blade cards installed as part of the solution. The chassis shall be required to provide shared storage capability to recover from failover.
       2. A single blade server shall be deployed as a spare server (at both locations viz NNOC and DRNOC), to be activated in case of failure of any other server blade.
       3. A virtualization layer shall be provided to optimally allocate pooled hardware resources to the virtual machines running the software modules mentioned above. The allocation of resources shall be dynamic and can be changed based on the utilization pattern.
       4. The NNOC/ DRNOC shall contain data corresponding to National expressway and all six regions.
       5. **EMS/NMS of all other equipment (POTS, synchronisation clock etc)also shall ideally reside on the same server blade chassis as DWDM EMS/NMS, through multiple virtualised machines. However, Separate dedicated servers for EMS/NMS of different equipment may be deployed if it is technically not feasible to deploy them on the same blade server chassis; in this case dedicated rack servers, with 1+1 redundancy at National NOC as well as DR NOC should be catered for by the bidder in the technical and financial bid.**
       6. **Failure of Server Blade Card**.
          1. Multiple virtual machines would be functioning on a single server blade card.
          2. Failure of a single card should seamlessly transfer all the virtual machines onto a spare server blade card provided for the purpose.
          3. The reserve card would be functioning in an active passive mode and shall provide a minimal failover time not exceeding five minutes.
          4. The reserve card shall function using the shared storage provided as part of blade chassis system.
       7. **Failure of Blade Storage**.
          1. The blade shall provide shared storage resource that can be accessed by the server blade cards. The storage shall comprise of multiple disks attached to the blade chassis.
          2. Data stored in the storage shall incorporate suitable RAID 1+0 volumes to cater for failure of any storage disk and subsequent recovery of data.
       8. **Failure of Server Blade Chassis at NNOC**.
          1. The data from NEs in National expressway and all regions is constantly fed at the central site. This provides a unified view of the entire network at the NNOC.
          2. During normal operations, the data being updated at the central site is updated in parallel at the DR site in an asynchronous manner. The DR site is in active mode during normal operations. The DR site will hence maintain a full working copy of the Central site.
          3. Communication channel between the Central & DR site shall be provided by purchaser.
          4. On failure of the Server Blade Chassis at the NNOC, the DR site chassis is activated. The users at the NNOC would be provided services through the DR site.
          5. All NEs would report/update to the DR site for the duration of failure of the NNOC chassis.
          6. On restoration of the NNOC chassis, the data is updated and control is transferred to the National site. The DR site shall then shifts to passive mode.
          7. The failover solution should facilitate shifting of operations from the NNOC to the DRNOC and vice versa every six months.
          8. The goal of the DR site is to restore system operations in minimum possible time with minimum data loss. The failover time should not exceed ten minutes.
       9. **Blade Server Chassis**.
          1. The chassis should provide common resources essential for the Blade Servers like Power, Ethernet, Fiber Channel/iSCSI/SAS & Integrated Storage.
          2. Blade Chassis should accommodate up to six number of 2 CPU upgradeable Hot Pluggable Blade Servers with redundant I/O Connections as well as Power Connections for redundancy.
          3. It should have Internal/External, Layer 2/Layer 3 Ethernet switch module with minimum of six 1Gbps(or higher) uplink ports.
          4. The chassis should have dual I/O connections from every blade server to help provide maximum uptime.
          5. It should have Redundant Hot-Swap iSCSI/SAS Switch Modules/Fiber Channel Switch Modules for connecting Internal/External storage and should support RAID 0, 1, 5 and 10.
          6. The chassis should be configured with integrated KVM switch module for managing the blade chassis locally as well as remotely.
          7. The chassis should be configured with Internal/External storage with useable capacity after RAID 5 configuration as given below:-

NNOC/ DRNOC:7TB.

RNOC :2TB.

* + - * 1. The Storage Controller should have minimum 1Gb Cache Memory with a 72 hour battery backup unit.
        2. The chassis should be fully configured with the power supplies of highest capacity.
        3. The chassis should be configured with Internal/external CD-ROM/DVD-ROM RW Drive which can be shared among all the blade servers.
        4. It should have an LED/LCD panel to provide power-on, location, over-temperature, information and system error conditions.
        5. Blade chassis should be provided with OEM management software license which provides an automatic blade failover (inter- and - intra - chassis) to a standby blade server without any manual intervention. The failover should be automatic whenever any blade in the chassis fails. Failover blade should be either in the same chassis or any chassis in the domain.
      1. **Blade Server**.
         1. **CPU**: 2 x Intel Xeon Quad Core 2609CPU or AMD Opteron Quad Core 6204 CPU, or latest
         2. **L3 Cache** : 12 MB of L3 Cache or better.
         3. **Chipset** : Intel /AMD Chipset.
         4. **Memory** : 16 GB Registered DDR-3 ECC memory Upgrade- able to 384 GB.
         5. **SCSI Controller** :Integrated Hardware RAID Controller to support multiple configurations.
         6. **Disk Drives** : 2x300GB 10K SAS Hard Disk Drive.
         7. **Graphics Controller**:16MB SDRAM.
         8. **Ethernet Adapter**:Four Number of 1GbpsEthernet Ports.
         9. **iSCSI/SAS/ FC Adapter** :
         10. Server should beconfigured with Dual Port SAS HBA Adapter/Dual Port Fiber Channel adapter/Dual Port iSCSI adapter for connecting to Internal/External Storage.
         11. **I/O slots** : 2 x8 PCIe or better.
         12. **Power Supply**. From the Blade Chassis via Dual Redundant PowerConnections.
         13. **Form Factor**: Full height blade server.
         14. **System Software** :OEM Server Management software with the device drivers.
         15. **Quantity** : Four fully populated server blade cards per chassis shall be provided.
      2. **Backup Solution**.
         1. A tape drive based solution shall be provided to backup data at both the sites (NNOC and DRNOC).
         2. The backup shall be created in a cycle of seven days.
         3. The backup solution should be sized to store backup of data for up to one year.
  1. **Desktop Machine**.
     1. Processor : Intel Core I7 Processor 2.4 GHz or better.
     2. RAM : 4 GB.
     3. Hard Disk Storage : 500GB.
     4. Network Interface : 10/100/1000 Mbps.
     5. Monitor : 19” TFT.
     6. Video RAM : 1GB.
     7. DVD Writer : 48x or better.
     8. OS : Windows 8 or better
     9. Miscellaneous : Wireless Multimedia Keyboard, Optical Mouse, Webcam & Mic etc.
  2. **Portable LCT**.
     1. Processor : Intel Core I7 Processor 2.4 GHz or better.
     2. RAM : 4 GB.
     3. Hard Disk Storage : 500GB.
     4. Network Interface : 10/100/1000 Mbps.
     5. Display : 15” HD.
     6. Video RAM : 1GB.
     7. DVD Writer : 48x or better.
     8. Battery : Lithium 6 Cell
     9. OS : Windows 8 or better
     10. Others : 1x USB 3.0 Port,   
          1 HDMI/VGA Port with connector, Bluetooth,WiFi and HD Web Camera & Mic etc.
  3. **Theblade server/desktop/Portable LCT configuration given above is the minimum required, however if higher configuration is required for meeting the functional requirements, the same shall be catered by the bidder as part of deliverables**.
  4. **Identification and Labelling**. All the important modules for operation like switch card, CPU card and power supply card should be provided in full redundant configuration for high reliability. Each terminal block, cables and individual tags must be numbered suitably with clear identification code and must correspond tothe associated wiring drawings.
  5. **Protectionagainst Transient Surges and Lightning**.Allthe equipment, cables and outdoor installation shall be protected from induced current, voltage as per CCITT regulations. Protection should also be provided against all surge/transient voltages**.**
  6. **Alarms**. Visual and audio indicators must be provided for alarms/warning generated by the switches. All modules must provide LED/LCD display to indicate operational status of the module. Provision for extension of Alarms to external devices shall be provided.
  7. **Remote Management**. It should be possible to remotely manage all the equipment being procured as part of the project through EMS and LCT. It should also be possible to upload / download software / upgrades etc to all NEs to be installed as part of the Network
  8. **Software**.
     1. The supplier shall provide maintenance, future releases, upgrades and patches for all software components of the system at no cost outside the normal supply and support agreements, such as firmware, operation SW, communication SW and application SW, including :-
        1. Installation and update instructions.
        2. Documentation of changes.
        3. Compatibility with all other hardware and software.
     2. The supplier shall provide maintenance and bug- fix releases for all management software components of the system at no cost outside the normal supply and support- agreements, including Installation and update instructions, Documentation of changes, and Compatibility with all other hardware and software.
     3. Software license for ultimate capacity is to be provided from the beginning of life.
     4. Original licensed copy of all the Software to be provided.
  9. **Other Requirements**.
     1. The equipment should have physical dimensions which comply with ETSI/ NEBS standards, and should fit into the standard racks. **Equipment racks, as required, shall be supplied and installed by the bidder**.
     2. Any single point failure on the equipment should not result in network or network management system downtime. All critical modules should be identified and provided in fully redundant configuration for high reliability.
     3. **Interconnections**.
        1. All power and signal cabling between component units of the communications systems shall be supplied and installed by the bidder.
        2. The bidder shall supply and install all primary power cords, powerstrips, receptacles, circuit breakers, fuse panels, switches, earth fault detectors, surge protectors, distribution cabling, and power connectors required to support all equipment enclosures and system components furnished and installed under this specification, except as specifically excluded.
        3. Plug-type power connectors with captive fastening (such as "Twist-Lock") shall be used for interconnection of source power to the equipment enclosures or racks.
        4. Plug-type connectors with captive fasteners (ie. DB-25, etc) shall be used for the interconnection of all inter and intra-enclosure signalling cable.
  10. **State wise DWDM nodes and POTS locations are available at**[**Appendix ‘H’**](#_APPENDIX_‘K’_1).

1. **POTS.**  The POTS component required for backbone/access networks shall be based on Multi-Service Provisioning Platform (MSPP). POTS equipment shall be used to carry aggregated traffic from remote locations to nearest DWDM site(s), for legacy integration and to create an end-to-end circuit switched overlay across the network. Equipment should work onITU G. 652D/G.655 fiber and provide an**optical range of 80 kmon line sidewithout the need for amplifier**. Following specifications should be met:-
   1. The line side interfaces of POTS should integrate with client side interfaces of DWDM.The proposed equipment should be mountable in ETSI/NEBS standard Racks.
   2. **Capacity**.There are three types of POTS equipments required asper configuration given below:-
      1. **Type-1: Large POTS**.
         1. 6x 10G (Line side).
         2. 8 x 1GigE.
         3. 2 x STM 16.
         4. 8 x STM 1.
         5. 20 x E1.
      2. **Type-2: Medium POTS**.
         1. 3 x 10G (Line side).
         2. 4 x 1GigE.
         3. 2 x STM 16.
         4. 8 x STM 1.
         5. 20 x E1.
      3. **Type-3: Small POTS**.
         1. 4 x STM 16 (Line side).
         2. 4 x 1GigE.
         3. 8 x STM 1.
         4. 20 x E1.
   3. **Technical Specifications. In addition to requirements given above,**POTS equipment shall be provided as per following TEC GR :-
      1. **Large and Medium POTS.**TEC/GR/TX/SDH-007/02 Jan 2011.
      2. **Small POTS.** TEC/GR/TX/SDH-008/03 Jan 2011.
      3. Following issues are clarified in the above mentioned TEC GRs.
         1. Equipment should provide a **fully non blocking switching fabric capacity.**
         2. Equipment should provide an optical range of 80 km without the need for amplifiers.
         3. All client side interfaces (except E1) shall be provided for short haul optics at 1310 nm. E1 interfaces shall be provided as 120 ohm balanced, electrical.
         4. Parallel hot standby power supply at chassis level shall be supplied.
         5. Optional layer 2 service attributes as per clause 9.3.1.1.3 in TEC/GR/TX/SDH-007/02 Jan 2011 and clause 8.3.1.1.3 in TEC/GR/TX/SDH-008/03 Jan 2011 shall be supplied.
         6. All interfaces shall support single mode operation.

**NETWORK SYNCHRONIZATION**

1. The network synchronization assumes more significance in view of the fact that lot of ATM/ TDM services will be riding over NGN packet transport due to requirement of inter-working with legacy networks. The network synchronization for Secured Optical DWDM based Transport Backbone will be implemented Using PRC and SSUs as per following specifications. The synchronization references shall be in accordance with ITU-T Rec. G.783. The Bidder is required to submit detailed synchronization plan for supplied equipment during detailed engineering. If additional hardware/ software (over and above what is mentioned in the schedule of requirements), is required to meet the functional requirements of the network as given in this tender, the same shall be included by the bidder in his bid.
   1. It should be possible for the system to work without the requirement of connecting again to GPS and GLONASS after initial update of time at the time of installation. Requirement of GPS connectivity in SSU should be the last choice in the SSU configuration. However GPS and GLONASS must be included as available hardware/software.
   2. **PRC**.Primary Reference Clock should be built using Caesium Frequency Standard to maintain accurate frequency indefinitely without the need for calibration and periodic adjustments and be traceable to Universal Time Coordinated (UTC) maintained by Bureau International des Provides Measure (BIPM).
      1. Once connected to the power source, the equipment shall automatically power up to its full accuracy specifications.
      2. There shall be no adjustments or alignments necessary during power-up or at any time during the lifetime of the caesium tube. There should be no need of any antenna installation.
      3. Following output interfaces shall be available from the Primary Reference Clock:-
         1. 2 x 2048 KHz as per ITU-T rec. G.703.
         2. 2 x 2048 Kb/s as per ITU-T rec. G.703.
         3. 1 x 5 MHz sinusoidal.
         4. 1 x 10 MHz sinusoidal.
      4. The Guaranteed life of Cesium tube shall be at least 10 years without performance degradation with stability as specified in ITU-T G.811 recommendation.
      5. **Technical Requirements**.
         1. **Accuracy and Stability**.
            1. **Warm up Time (typical)**. 30 minutes to normal operating status and 45 minutes to full specifications.
            2. Accuracy Calibrated to ≤ ±1 x 10-12.
            3. Reproducibility should be ≤ 3 x 10-12.
         2. **Stability**.
            1. 1 s 1.2 x 10-11.
            2. 10 s 8.5 x 10-12.
            3. 100 s 2.7 x 10-12.
            4. 1,000 s 8.5 x 10-13.
            5. 10,000 s 2.7 x 10-13.
      6. **Interfaces**.
         1. 2048 KHz as per ITU-T rec. G.703, table 11.

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Description** | **Requirement** |
|  | Frequency | 2048 KHz |
|  | Type of pair | Coaxial pair |
|  | Impedance | 75 Ohms resistive |
|  | Maximum peak voltage (Vp) | 1.5 |
|  | Minimum peak voltage (Vp) | 0.75 |
|  | Maximum jitter at output port | 0.05 UI peak to peak, measured within the frequency range f1 = 20 Hz to f1 = 100 KHz. |

* + - 1. 2048Kb/s as per ITU-T rec. G.703, table 7

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Description** | **Requirement** |
|  | Pulse shape (Nominally rectangular) | All marks of the signal must conform with the mask (fig. 15/G.703) irrespective of the sign. The value V corresponds to the nominal peak value |
|  | Type of pair | Coaxial pair |
|  | Impedance | 75 Ohms resistive |
|  | Nominal peak voltage of a mark (Pulse) | 2..37 V |
|  | Nominal peak voltage of a space (No Pulse) | 0± 0.237 V |
|  | Nominal pulse width | 244ns |
|  | Ratio of the amplitudes of positive and negative pulses at the centre of pulse interval | 0.95 to 1.05 |
|  | Ration of the widths of positive and negative pulses at the nominal half amplitude | 0.95 to 1.05 |
|  | Maximum Jitter (peak to peak | As per ITU-T G.823 |

* + - 1. 5 MHz sinusoidal & 10 MHz sinusoidal

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Description** | **Requirement** |
|  | Sinusoidal Output Characteristics for 5MHz | 1V rms/50 Ω, |
|  | Connector | BNC |
|  | Sinusoidal Output Characteristics (10 MHz) | 1V rms/50 Ω, |
|  | Connector | BNC |

* + 1. **Alarms**.The equipmentshall indicate alarms at least under following conditions:-
       1. Power supply failure.
       2. Output failure.
       3. Oscillator failure.
       4. Synthesizer failure.
    2. **Alarm Interface**.The equipment should continuously monitor key operating parameters and provide alarms to indicate if they deviate from acceptable values. An alarm should be indicated by the ALARM LED on the front panel and by a set of relay contacts.
    3. **Power Supply Requirements**.The equipment shall meet the following requirements:-
       1. It should be powered from a – 48 volts DC source by two redundant connections. It should accept a variation over the range – 40 V to –60 V. The equipment shall operate over this range without any degradation in performance.
       2. The equipment shall be protected in case of voltage variation beyond the range specified above and also against input reverse polarity. The manufacturer shall furnish data on the voltages at which protection will operate.
  1. **SSU**.
     1. **Requirement Definition**.
        1. The Synchronisation Supply Unit(here-after referred to as the SSU), as part of the synchronisation network, shall function as a stand-alone network element, separate from any other telecommunication equipment.
        2. The SSU is needed for the intra-node timing distribution in a synchronisation network with architecture as specified in ITU-T recommendation G.803.
        3. The SSU shall be able to select an input reference from various sources including 2.048 Mbit/s and 2.048 MHz, using signal frequency metrics, digital transmission error checking, synchronisation quality messages and input priorities as criteria.
        4. The SSU will remove phase instabilities from the selected reference and capable of providing multiple 2.048 Mbit/s and 2.048 MHz outputs.
        5. In the case of a failure of all input references, the SSU will maintain the output accuracy and stability based on the internal clock modules by entering the holdover mode.
        6. The SSU shall provide the facility to perform non-intrusive performance monitoring on E1 input signals in input module.
        7. Facility to do local management of SSU using local terminal should be supported.
        8. The SSU will also be manageable through the synchronisation management network via the remote management interface of SSU.
        9. The SSU shall meet the synchronisation demands of Next Generation packet based networks by supporting the addition of carrier class NTP server plug-in modules as well as Precision Timing Protocol PTP IEEE1588-2008 Grandmaster Clock Modules. All such modules should be integrated in main/expansion self of SSU.
     2. **SSU will be provided in following Configurations**:-
        1. **SSU Type A**.
           1. 1x SSU main shelf.
           2. 2x G.812 Type II Clock Modules.

1 x Rb module.

1 x Quartz module.

* + - * 1. 1x Communication and management card.
        2. 2x SSU 3 port E1 input modules (75 ohms).
        3. 1x 3 Port input panel with BNC connectors.
        4. 2x GPS and GLONASS input module (in redundant mode).
        5. 2x Output modules E1/2048M (20 outputs).
        6. 1x BNC Output Panels 75 ohms.
        7. 2x Roof Mount Antenna kit including lightening arrestor and minimum 60 m cable length.
        8. 1 x NTP module.
        9. 1 x PTP Modules.
        10. NMS/EMS capable of managing all SSUs and discover third Party PTP clients.
        11. 2x Power supply (48 V)(in redundant mode).
      1. **SSU Type B**.
         1. 1x SSU main shelf.
         2. 2x G.812 Type II Clock Modules.

1 x Rb module

1 x Quartz module

* + - * 1. 1x Communication and management card.
        2. 2x SSU 3 port E1 input modules(75 ohms).
        3. 1x 3 Port input panel with BNC connectors.
        4. 2x GPS and GLONASS input module in redundant mode.
        5. 2x Output modules E1/2048M (20 outputs).
        6. 1x BNC Output Panels 75 ohms.
        7. 2x Roof Mount Antenna kit including lightening arrestor and minimum 60 m cable length.
        8. 1 x PTP Modules.
        9. NMS/EMS capable of managing all SSUs and discover third Party PTP clients.
        10. 2x Power supply (48 V) (in redundant mode).
    1. **Interface Definition**.
       1. **2.048 Mbit/s, E1 interface**. External reference inputs from telecommunication equipment, and outputs used to synchronize telecommunication equipment.
       2. **2.048 MHz interface**. External reference inputs from telecommunication equipment, and outputs used to synchronize telecommunication equipment.
       3. **NTP Server Interface**. NTP output traffic port from NTP server modules to synchronize NTP clients in the network.
       4. **PTP IEEE 1588-2008 Interface**. PTP output traffic port from IEEE 1588-2008 Grandmaster Clock modules to synchronize standards based PTP clients in the network.
       5. **Alarm interface**. Interface to extend SSU alarms to audible or visual indications.
       6. **Management Interface**. The interface used for the remote management of the SSU and shall be either EIA-232 or a 10-BaseT Ethernet interface.
    2. **Requirement Specification**.
       1. **Equipment Vendor**. To ensure long term support and execution of warranties, products will only be accepted from OEMs or the authorised agents/channel partners of OEMs.
       2. The performance and stability of the SSU for PRC nodes shall comply with ITU-T recommendation G.811 when PRC reference inputs such as Cesium, GPS, GLONASS signals are provided.
       3. The following table specifies the required accuracy and holdover stability:-

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Description** | **Requirement** |
|  | Clock hold-over stability | ± 1x10 –10 /day or better |
|  | Output frequency accuracy | 1.6 x 10-8 over the entire temperature range |
|  | Pull-in/Hold-in range | ± 1.6 x 10-8 or better |
|  | Warm-up time for internal oscillator | < or = 1 hour |

* + 1. **Architecture**.
       1. The SSU shall have a modular design.
       2. All printed circuit modules shall be housed in sub-racks according to the equipment practice.
       3. Input Card, GPS and GLONASS card, Local oscillator module, PTP Grandmaster Clock module and the output module shall be duplicated or protected.
       4. There shall be no damage to the SSU if an attempt is made to insert a card in the wrong position.
       5. System may be configured using main SSU shelf and / or expansion shelf.
    2. **System Requirements**.
       1. **Communication Sub-System**. The unit shall provide a sophisticated Communication Unit for local and remote management. The equipment shall provide the following communication interfaces and capabilities.
       2. **Physical Interfaces**.
          1. At least one EIA-232 interfaces supporting direct serial connection for ASCII and TL1.
          2. One10-Base-T Ethernetinterface.
       3. **Communication Interfaces**.
          1. Integrated ASCII Terminal for craft functions.
          2. Telecommunication Language 1 (TL1).
       4. **Communication Survivability**.
          1. Failure of the communication module shall result in only failure in communications to the SSU.
          2. Corrected timing outputs shall continue unaffected in this event.
       5. **GPS and GLONASS Input Sub-System**. The GPS and GLONASS Reference Source shall be based on the Global Positioning System and GLONASS system respectively to provide a timing reference with good, long term stability. Based on availability system shall select either GPS or GLONASS.
       6. **General Requirements**.
          1. The GPS and GLONASS Reference module shall be integrated in the main SSU shelf and /or expansion shelf so that it may be managed using common management interface.
          2. The GPS and GLONASS Reference module will provide a synchronisation reference to the SSU.
          3. The output from the GPS and GLONASS Reference module shall provide GPS and GLONASS correction information directly to the SSU without consuming any input port of SSU Input Module.
          4. The GPS and GLONASS antenna shall be able to operate with at least 60 meter of coaxial antenna cable and transient eliminator without the need for line amplifiers or frequency converters (up-down converters).
       7. **Performance**.
          1. The performance and stability of the GPS and GLONASS Reference module for PRC nodes shall comply with ITU-T recommendation G.811 when tracking healthy GPS and GLONASS satellites over a 24 hour time period.
          2. The GPS and GLONASS Reference module shall provide a timing signal whose long term accuracy is maintained at 1x10-11 or better after 24 hours of uninterrupted service, with verification to Universal Time Coordinates (UTC), and whose timing signal may be used as the basis of reference for the control of other clocks within the network.
       8. **Network Time Protocol (NTP)**. The GPS and GLONASS Reference module shall be capable of providing a time of day reference to the SSU for Network Time Protocol purposes. The NTP format shall be NTP version 3or later.
       9. **Precision Time Protocol (PTP)**. The GPS and GLONASS Reference module shall be capable of providing a time of day reference to the SSU for Precision Time Protocol purposes. PTP shall be per ITU 1588-2008.
       10. **Input Sub-System**. The unit is responsible for the synchronisation input reference selection, using digital transmission error detection, performance monitoring, input priority tables, and Synchronisation Status Message (SSM) levels.
       11. **Input Types**.
           1. The SSU input sub-system must accept at least three reference inputs in addition to GPS / GLONASS input.
           2. The SSU must accept 2.048 Mbit/s and 2.048 MHz telecom inputs. The 2.048 Mbit/s signals shall be structured in accordance with ITU-T recommendation G.703, and shall accept signals with CCS or CAS, selectable, and with SSM byte. Any one of above said inputs should be software selectable.
       12. **Input Selection**.The input selection shall be done according to the following criteria:-
           1. Check for digital error events, including LOS, OOF, CRC (selectable), BPV and AIS and disqualify those references of which the error events exceed pre-set thresholds.
           2. Select valid inputs using from a pre-set user defined priority, and disqualify input references that exceed pre-set performance thresholds based on at least the following reference types:-

Cesium.

GPS / GLONASS.

Network (external line(s)).

* + - * 1. Weigh the qualified input references according to the quality as indicated by the synchronisation quality messages and according to a user selectable priority table.
        2. If no valid input is present, the SSU must enter the holdover mode.
      1. **Local Clock Sub-System**. The local clock assemblyis responsible for providing the primary reference distribution for PRC nodes, and the required holdover stability (for all other types of nodes) when there is no input reference available, to provide clock references to be used in the reference selection process, and to filter the selected input to remove phase instabilities.
         1. **Oscillator Type**.

The rubidium/ quartz based oscillator must meet the requirements of the ITU-T and ETSI specifications for G.812 Type II clocks.

The frequency output from the local oscillators should be based on Direct Digital Synthesis to avoid direct adjustment of the local oscillators.

Rubidium Oscillators shall not require any adjustment, calibra-tion or maintenance throughout its lifetime.

* + - * 1. **Filtering**. The local oscillators will be used to eliminate phase transients and jitter and to reduce frequency wander feed through.
      1. **Output Sub-System**. The output sub-system shall provide multiple synchronisation outputs to be used for the synchronisation of a node.
      2. **Number of Outputs**.
         1. SSU with one management connection shall be capable of providing a minimum of 20 outputs and each output with 1:1 protection.
         2. Each output module shall have no less than 20 outputs.
         3. It should be possible to increase output capacity by insertion of additional modules and additional shelves. Such upgrades shall behitless.
      3. **Output Types**.
         1. The SSU shall provide software selectable E1 2.048 Mbit/s and 2.048 MHz outputs as specified in ITU-T recommendation G.703.
         2. The 2.048 Mbit/s signals shall be structured in accordance with ITU-T recommendation G.704, and shall provide signals with CCS or CAS, selectable, and must provide SSM.
      4. **Phase Alignment**. All outputs of a single SSU will be phase aligned to the selected reference.
      5. **Output Management**.
         1. It shall be possible to provision each output signal type individually.
         2. It shall be possible to manage outputs at the individual output level/ card level/ in groups of 10.
         3. It must be possible to configure output ports to either 2.048 Mbit/s or 2.048 MHz.
         4. It shall be possible for the user to assign a “text” string to name each output individually for direct correlation to network elements.
      6. **Equipment Switching Stability**. The phase discontinuity of the output of the SSU shall never exceed the limits given in the Table below:-

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Switching Criteria** | **Maximum Phase Discontinuity** |
|  | A transfer between reference inputs; | 1 nanosecond |
|  | A transfer between input cards; | 1 nanosecond |
|  | A transfer between local oscillator cards; | 60 nanoseconds, i.e., ≤ 1/8 UI |
|  | Output protection switching. | 1 nanosecond |

* + - 1. **Manual and Automatic Switching**.
         1. It shall be possible to perform equipment protection switching manually via the Local management interface.
         2. All equipment protection switching shall be performed automatically by default.
      2. **NTP Server Sub-System**. The NTP Server sub-system shall be provided as plug-in module in the SSU.
         1. It shall be possible to increase the NTP Server scalability by adding extra NTP plug-in modules later on.
         2. It shall support NTP traffic rates of 400/sec fully authenticated and up to 800/sec unauthenticated.
         3. It shall be possible to plug the modules into any available shelf output slot.
         4. The NTP Server shall derive its reference from the internal SSU’s GPS/GLONASS clock or operate as a Stratum 2 server by receiving an input from a Stratum 1 server at another location.
         5. In order to minimize security risks from malicious users, the NTP server modules shall utilize MD5 encryption (Message Digest Encryption 5) techniques.
      3. **PTP IEEE 1588-2008 Sub-System**.
         1. The PTP Grandmaster sub-system shall be provided as plug-in modules in the SSU.
         2. The PTP Grandmaster shall comply with IEEE 1588-2008 requirements.
         3. The SSU system time shall be set to a Time of Day (TOD) source such as the GPS and GLONASS subsystem.
         4. The SSU PTP subsystem shall support one step and two step clock capability.
         5. Each PTP Grandmaster module shall offer the capacity to support up to 100 PTP slaves at rates of128 transactions per second. Transaction rate of 16, 32, 64 and 128 per second should be supported.
         6. The PTP module shall support the IEEE 1588-2008 default profile with delay response mechanism and the IEEE 1588-2008 telecomm profile per the ITU-T G.8265.1 standard. PTP GM module should support unicast mode of PTP addressing messages.
         7. It shall be possible to increase the PTP Grandmaster scalability by adding extra PTP plug-in modules. It shall be possible to plug the modules into any available master or expansion shelf output slot.
    1. **Local & Remote Management**.
       1. **Fault Management**.
          1. **Alarm Interface**.

The SSU shall provide an alarm interface for the connection of an external alarm by means of dry changeover relay contacts.

Major, Minor and Critical alarm contacts shall be provided.

* + - 1. **Fault & Event Management**.
         1. Faults shall be classified as critical, major or minor.
         2. Alarms will be indicated locally on the SSU by LEDs. The indications must be sufficient to enable troubleshooting without the need to be connected to a local or remote management system.
         3. Major, minor and critical alarm indications shall be extended to relay contacts to provide audio and visual indications in the station.
         4. Alarms will be reported to the local management terminal, which will keep an alarm log with date and time stamped alarms.
      2. **Configuration Management**. All equipment configuration changes shall be possible via the local management terminal.
      3. **Performance Management**. The SSU will constantly monitor all input references and provide indications and alarms to indicate any degradation in performance.
      4. **Security Management**.
         1. Access to different areas of the local management terminal shall be limited to users or user groups by means of password protection.
         2. The password protection shall support advanced security features including password ageing, logging of login failure attempts, temporary passwords and user lockout.
         3. Passwords and privileges shall be authorized by a system administrator, or from the synchronisation management system.
         4. Local access to the system shall be controlled by the synchronisation management system.
      5. **Management of GPS /GLONASS Receiver(s), NTP Server(s) and IEEE 1588 Grandmaster Clocks**. It shall be possible to manage the GPS and GLONASS receivers, NTP and PTP modules via the management facilities of the SSU. This may be done locally as well remotely using NMS.
  1. **General Requirements**.
     1. The equipment should be installed in ETSI/ NEBS standard racks.
     2. The racks should use natural airflow in such a way that there is no need for forced air cooling of the system. However cooling fans will be provided in the racks.
     3. The SSU shelf shall be capable of accepting top or bottom power cable and top or bottom signal cable entry.
     4. **Connectors**.
        1. All 75 ohm sub-rack connectors shall be BNC type.
        2. NTP Server modules shall support 100 Base-T or 1000Base-T electrical, or 1000 Base-X optical fiber using standard Small Form-factor Pluggable (SFP) modules.
        3. IEEE 1588 modules shall support optical and electrical interfaces. It shall be possible to support 100Base-T or 1000Base-T electrical, or 1000Base-X optical fiber using standard Small Form-factor Pluggable (SFP) modules.
     5. **Power Supply**.
        1. The equipment shall be capable of operating from a power supply with a nominal voltage of -48V DC, with a minimum range of ‑40V DC to ‑60V DC.
        2. Each module shall have either a duplicated power supply unit with a 1+1 protected configuration or work on duplicate power supply feed given to SSU chassis in a way that working should not be impacted due to failure in any one power supply feed to SSU chassis.
     6. **Power Failure**. The equipment must be able to tolerate an uncontrolled power failure without damaging the equipment. When the power is restored after a total power failure, the equipment must automatically be restored to the configuration it had prior to the power failure without operator intervention.
     7. **Power Brown-Out**. During a power brown-out, the input voltage to the equipment gradually falls to less than 50 % of the normal operating voltage. The equipment must be able to tolerate such a power brown-out without damaging the equipment. When the power is restored after a power brown-out, the SSU must automatically be restored to the configuration it had prior to the power brown-out, without operator intervention.
     8. **Earthing**.
        1. It shall be possible to earth a signal cable on either input or output side, or on both sides.
        2. The equipment shall have a positive power earth and a separate signal earth (rack earth). The signal earth shall not carry any power current.
        3. The connection of the positive power supply to the signal ground in the rack shall be an optional strapping facility.
     9. **Interchangeability**. All modules and cards of the same type shall be physically and electrically compatible and interchangeable between similar stations.
     10. **Maintainability**.
         1. The system shall require no routine maintenance or adjustment to keep it in operation, and no external test equipment shall be required on a regular basis to maintain the system.
         2. Maintenance shall be performed on a card replacement basis so as to keep the maintenance skill level as low as possible.
         3. The equipment shall provide sufficient local and remote diagnostic capability to assist maintenance staff in fault localization.
         4. Maintenance is to be accomplished by means of replacing cards or modules. The alarm indications shall be such that the faulty card or module can be easily identified without the need for detailed on-site diagnostics/ external test equipment.
     11. **EMI**. The equipment shall not be susceptible to interference from other telecommunication equipment or radio signals, and shall comply with EN 300 386-2 Class B EMC requirements.
     12. **Quality Assurance Provisions**. OEM shall have ISO 9001:2008 certification.
  2. **Synchronization Element Management System (EMS)**.
     1. A comprehensive web-based Synchronization Element Management System with its platform being scalable, modular, multi-tier architecture that will grow and evolve with the network needs to be supplied that should allow user to manage all synchronization equipments deployed in the network from a single point and also enables control at regional level via remote Ethernet connection on TCP/IP network. It should provide comprehensive FCAPS functions for managing the synch network.
     2. The Sync NMS should be based on flexible configuration to adapt to any size of synchronization network. Multiple client applications should be able to connect with a server to allow access to applications such as network browser, alarm list and performance management. The system should offer a user friendly graphical interface with network and element views.
     3. EMS/NMS for synchronization network shall be hosted on the same blade server(s) chassis on which DWDM and POTS EMS/NMS is residing. The implementation and failover strategy is as described in clauses to.
     4. The NMS should support at least following features:-
        1. Geographical representation of the entire synchronisation network.
        2. Intuitive and User-friendly Graphical Interface with internal block diagram and exact replication of the equipment physical front view.
        3. Real-time and historical performance monitoring of inputs and alarm management.
        4. Comprehensive management services including Fault, Configuration, Performance, Security and Operational Management.
        5. Dynamic inventory data management and remote SW upgrade support.
        6. User-configurable security levels.
        7. Local RS232 and Remote Ethernet communications support.
        8. Generation of PDF and XML reports.
        9. Geographical topology and domain navigation.
        10. User preference Dashboard customization.
        11. SNMP and / or TeMIP northbound interface for OSS integration.
        12. Management Capacity up to minimum 200 SSUs.
        13. ITU-T M.3400 (FCAPS), ITU-T X.733 and X.734 compliant.
        14. Management Protocol SNMP v1, v2c, v3, HTTP, HTTPS, TCP/IP.
     5. **Fault Management**: It should be able to handle the collection and processing of alarm messages, status data, events and other information from the elements. It should also enable consolidation and prioritization of data, filtering of alarm listings and presentation of data, to alert the system administrators of any problems in the synchronization network.
     6. **Configuration Management**: It should provide control over all available functions across the synchronization systems connected, enabling reconfiguration, restoration and other operating functions.
     7. **Performance Management**. It should be able to correlate data relating to the performance of the synchronization systems to evaluate short and long term trends as well as potential problems in the networks. It should also generate MTIE, TDEV and frequency graphs for comparison with international standards such as ITU-T or ETSI.
     8. **NMS/EMS Clients.**Refer clause

1. **Equipment Racks**.Bidder will be responsible to provide ETSI/NEBSstandard equipment racks for all the equipment being provided as a part of this tender. All the racks will be of minimum 42U size irrespective of the rack space actually occupied.
2. **Integration with Unified NMS and Data Center(s).**
   1. Project NFS also comprises of other layers involving the physical layer (OFC), IP/MPLS routing backbone, Access networks, Bulk Encryption, etc. An NGOSS based Unified NMS (UNMS) solution including Data Center(s) is planned to be deployed separately as part of another tender that shall provide a unified platform for monitoring, configuring and managing all the assets of the complete network. The DWDM/POTS/Synchronization EMS/NMS solution shall hence be required to be architected in a manner that it supports TMF 814 based standard interface to integrate with the Unified NMS on northbound interfaces.
   2. During implementation of the project, the EMS/NMS hardware/software at the Regional and National level will be setup in existing communication nodes. Subsequently, after implementation of the NOC/Data Centres, these EMS/NMSsare to be integrated with the UNMS solution and also required to be physically shifted to Data Center(s) established at the Regional and National level.
3. **Test and Measurement Equipment**. The Test and Measurement instruments should be planned as part of the project to facilitate testing for operation and maintenance of network. The instruments should meet the specifications as under including latest amendments if any; if a new TEC GR is issued replacing those given below at the time of submission of bids, the same shall be applicable :-

|  |  |  |
| --- | --- | --- |
| **SerNo** | **Items** | **TEC GR** |
|  | Spectrum Analysers | GR/OSA-01/02.AUG.2007 |
|  | Multi Wavelength Meters | GR/MWM 01/ 01 DEC 2002 |
|  | SDH Analysers (STM1/4/16/64) with jitter | GR/SDA-05/02.FEB.2009 |
|  | SDH Analysers (STM1/4/16/64) without jitter | GR/SDA-04/02.FEB.2009 |
|  | E1 Testers (BER/ EFS/ Jitter/ Pulse Mark) | GR/DCA-04/03.JAN2002 |
|  | OTN Testers | TEC/GR/TX/OTA-001/01/MAR-2011 |

1. **Optical Patch Chords**. Bidder will be responsible to provide all necessary patch cords from FDMS to the equipment (FDMS end will be E2000).
2. **Associated Civil/Electrical Works**.The bidder shall provide all required minor civil works necessary for full connectivity as required in the Contractor’s scope of work as follows:-
   1. All wall and floor penetrations necessary for the installation of all cabling to be performed in accordance with the requirements of this tender.
   2. Installation of racks, cabinets, cable raceways, and cabling supplied as part of this contract. All electrical cabling shall be done to support at least 50% future load expansion. The cabling from power room to equipment room shall be of adequate length with 10% slack.
   3. The bidder shall be responsible to provide for any additional electrical wiring and plug points wherever required over and above the existing wiring.

**FCBC**

1. Regulated DC supply of 48 V will be provided for communication equipment through Float Cum Boost Charger (FCBC). It shall include battery banks comprising of Sealed Maintenance Free 2V batteries to provide one hour backup. Cabling from FCBC to the equipment racks is also within the scope of this tender. The specifications for FCBC are as given below:-
2. **General Features**.
   1. This specification describes a continuous duty, three-phase system, referred to as the FCBC.
   2. The characteristics described in this part are applicable for all different type of FCBC asked in this tender.
      1. Modular System (with N+1 redundancy).
      2. Hot Plug-In Modules.
      3. Active Current Sharing.
      4. Power Factor Correction.
      5. Input High Voltage Disconnect (HVD) & Battery Low Voltage Disconnect (LVD).
      6. Analog/Microprocessor Controllers : Replaceable and Standby
      7. Common O/P Voltage Control.
      8. Battery Current Limiting for each battery path (Presettable to suit battery Capacity).
3. **Environmental Requirement**.
   1. Operating Temperature : - 0º to 45º C.
   2. Storage Temperature : -20º C to +70º C.
   3. Humidity : < 95% RH.
4. **Input Specification**.
   1. Nominal Voltage : 415 VAC, Three Phase.
   2. Voltage Range : 180 - 460 VAC.
   3. Frequency : 47 – 53 Hz.
   4. Power Factor : 0.95 MIN.(50% Load to 100% Load).
   5. Efficiency : >90%.
5. **Capacity**. Capacity of FCBC are given in SoR in Section V Part C.
6. **Web Based Support**.
   1. The bidder shall provide around-the-clock web access to following information, which must be updated periodically:-
      1. Product overview, product descriptions, data sheets and specifications.
      2. Product, system and network management user manuals.
      3. Compatibility matrices and release notes
      4. Equipment hardware and software installation / upgrade instructions.
      5. All equipment software patches and maintenance releases.
      6. Equipment software files, MIB files, integration scripts.
      7. Technical Tips, Application Notes, Protocol and Attenuation Guides.
   2. The supplier shall automatically notify the buyer within 10 days about:-
      1. Release of a new software version - release notes, reason for new SW (feature enhancement / customer request / bug-fix), new features, upgrade procedure, inter-working information.
      2. Release of new hardware variant.
      3. Discovery of a common technical issue software bug with workaround, issues concerning; specific network scenarios (for example inter-working with manufacturer X).
      4. New or updated material (configuration j \ instructions, training, service portfolio).
7. **Documentation**. The System Manuals provided by the bidder should be comprehensive and it shall incorporate but not necessarily be limited to the following:-
   1. Comprehensive index.
   2. System functional block diagram.
   3. Principles of operation, controls, indicators and monitor points for each unit including fault diagnosis and removal techniques should be documented.
   4. The supplier shall provide the administrative function documentation for the offered equipment.
   5. Terminology and symbols used shall be uniform throughout the documentation, and shall follow ITU-T Recommendations wherever applicable. A table indicating symbol meanings shall be included in each major document.
   6. The bidder shall provide the acceptance test procedures documentation for the procured systems to be installed in the field. The documentation shall specify the local installation and commissioning test procedures and final acceptance test procedures/certificates.
   7. The bidder shall provide the acceptance test procedures documentation for the offered network management system (NMS).
   8. **Any hardware/software specifications/configurations given in the complete tender document are the minimum acceptable. It will be the bidder's responsibility to ensure that functional requirements as given in this tender are fully met and any additional hardware/software required to meet the same will be catered for by the bidder as part of his technical and financial bid.If the bidder does not include such requirements as part of the bid, but the requirement is revealed during Technical evaluation, installation, integration, ATP, or at any stage, the bidder shall supply and install/integrate the same free of cost.**
   9. **BoM**.
      1. Bidder shall **submit detailed UNPRICED BoM** giving details down to chassis/ cards/ connectors/ cables/ patch cord level, **as part of the technical bid** else the bid shall be treated as non responsive and is liable to be rejected.
      2. Bidder shall **submit detailed PRICED BoM** giving details down to chassis/ cards/ connectors/ cables/ patch cord level, **as part of the financial bid** else the bid shall be treated as non responsive and is liable to be rejected

# SECTION IV

## PART A:GENERAL INSTRUCTION TO BIDDERS

1. **Introduction**
2. **Definitions**
   1. **“The Purchaser”** means the CMD, BSNL, New Delhi.
   2. “**The Bidder**” means the System Integrator(s) or the firm(s) who participate in this tender and submit its bid.
   3. “**The Supplier**” means the System Integrator, OEM, any other individual or firm supplying the goods/work, who executes the project on turnkey basis under the contract.
   4. “The **Goods/Work**” means all the equipment, machinery, and/or other materials, services which the Supplier is required to supply to the Purchaser under the contract.
   5. “The **Advance Purchase Order**” means the intention of Purchaser to place the Purchase Order on the bidder.
   6. “The **Purchase Order**” means the order placed by the Purchaser on the Supplier signed by the Purchaser including all attachments and appendices thereto and all documents incorporated by reference therein. The purchase order shall be deemed as “Contract” appearing in the document.
   7. “The **Contract Price**” means the price payable to the Supplier under the purchase order for the full and proper performance of its contractual obligations.
   8. “**Validation**” is a process of testing the equipment as per the Generic Requirements in the specifications for use in BSNL and Defense network. Validation is carried out in simulated field environment and includes stability, reliability and environmental tests.
   9. “**Telecom Service Provider**” (TSP) means any Telecom operator in India, who is licensed by the Department of Telecommunications (DOT), Government of India to provide telecom services to the general public or to the other DOT licensed Telecom operators. “Telecom Service Provider” also refers to any Telecom operator in other countries providing telecom services to general public of that country.
   10. **Contract**. The term contract means, the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the BSNL and the contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time, jointly by the Engineer-in-charge, BSNL and all these documents taken together shall be deemed to form one contract and shall be complementary to one another. In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them. The expression works or work shall unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
   11. **Contractor**. The Contractor shall mean the individual, firm or company.
   12. **Work**. The expression “works” shall unless there be something either in the subject or context repugnant to such construction be construct and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent and whether original altered, substituted or additional.
   13. **Schedule(s)**. The Schedule(s) referred to in these conditions shall mean the relevant schedule(s) or the standard schedule of rates mentioned in the document.
   14. **Site**. The site shall mean the land /or other places on, into or through which work is to be executed under the contract.
   15. **Normal Time or Stipulated Time**. Normal time or stipulated time means time specified in the work order to complete the work.
   16. **Extension of Time.** Extension of Time means the time granted by the BSNL to complete the work beyond the normal time or stipulated time.
   17. **Date of Commencement of Work**. Date of commencement of work means the date of actual commencement of work or 7th day from the date of issue of work order, whichever is earlier.
   18. **Due date of Completion**. Due date of completion shall be the date by which the work shall be completed at site including clearance of site.
   19. **Duration of Completion of Work**. The duration of completion of work or completion time shall be time specified in the work order plus extension of time granted, if any.
   20. **Excepted risk**. Excepted risk are risks due to war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, military or usurped power, any acts of Government damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods and other causes over which, the contractor has no control and the same having been accepted as such, by the Accepting Authority or causes solely due to use or occupation by the government of the part of the work, in respect of which a certificate of completion has been issued.
   21. **BSNL Authority**. The BSNL authority means the Bharat Sanchar Nigam Limited, which invites the tenders on behalf of all officers in the BSNL, whatever designations assigned to them from time to time, who may be the in-charge of direction supervision, testing, acceptance & testing including their successor(s) in the office appearing in various clauses shall be taken to mean the BSNL).
   22. “**BSNL Authority**” means the Bharat Sanchar Nigam limited, which invites the tenders on behalf of the all references of.
       1. CMD BSNL.
       2. Director (Enterprise).
       3. ED (Core Network).
       4. Chief General Managers.
       5. Principal General Managers.
       6. General Managers.
       7. Deputy General Managers.
       8. Assistant General Managers/Managers/Deputy Managers.
       9. Divisional Engineers/ Sub Divisional Engineers.
       10. Junior Telecom Officers.
       11. Chief Accounts Officers.
       12. Accounts Officers.
       13. Assistant Accounts Officers.
       14. Junior Accounts Officers.
       15. Including other officers in the BSNL, whatever designations assigned to them from time to time, who may be the in-charge of direction supervision, testing, acceptance & testing including their successor(s) in the office appearing in various clauses shall be taken to mean the BSNL.
   23. **The GM (Projects)** means the Head of GM (Projects) Area (Name) and his successors.
   24. **Representative of the DGM (Projects)**. Representative of the DGM (Projects) means Officers and staff for the time being in the DGM (Projects) Area deputed by the DGM (projects) for inspecting or supervising the work or testing etc.
   25. **PICG Authority**. The PICG authority means the Project Implementation Core Group, Ministry of Defence which will be involved during evaluation, execution, testing of this project. The PICG will own, operate and maintain the entire infrastructure created after successful implementation of this project by BSNL. The PICG refers to an Defence organization on behalf of following references: -
       1. Chairman, PICG.
       2. Chief Network Architect, PICG.
       3. Director (NFS).
       4. Jt Director(s) (NFS).
       5. Other officers in the PICG, whatever designations assigned to them from time to time, who may be the in-charge of direction supervision, testing, acceptance & testing including their successor(s) in the office appearing in various clauses shall be taken to mean the PICG.
   26. **Representative of the PICG**. Representative of PICG mean Officer and staff deputed by Chairman PICG for inspecting or supervising the work or testing etc.
   27. **Engineers–in-Charge**. The Engineers–in-charge means the team of Engineering Officers nominated by the PICG/BSNL to supervise the work, under the contract. (Minimum Divisional Engineer level officer from the BSNL and a Defence Officer of the rank of Major and above or equivalent from Air Force/Navy). Means the engineering Officer nominated by the BSNL to supervise the work, under the contract (minimum Divisional Engineer level officer).
   28. **Site Engineer.** It shall mean an SDE/JTO of the BSNL who may be placed by the SSA Head, / the DGM (Projects), or a Defence officer nominated by the PICG, as in-charge of the work at site at any particular period of time.
   29. **Inspection Circle**. It shall mean A/T (Acceptance Testing) unit of the BSNL.
   30. **A/T Officer (BSNL)**. An officer authorized by Inspection Circle, BSNL to conduct A/T.
   31. **A/T Officer (PICG**). An officer authorized by PICG to conduct A/T.
3. **Lead Bidder, Bidding Process and Eligibility Conditions**. Please refer Section I.
4. **Cost of Bidding**. The bidder shall bear all cost associated with the preparation and submission of the bid. The purchaser will, in no case, be responsible or liable for these costs, regardless of the conduct or outcome of the biding process.
5. **The Bid Documents**.
6. **Documents Required**.
   1. The goods/work required to be supplied; bidding procedures and contract terms and conditions are prescribed in the Bid Documents. The Bid documents include:-
      1. Notice Inviting Tender and Eligibility.
      2. Tender Information.
      3. Detailed Technical Specifications (Section III).
      4. General Instructions to Bidders (Section IV Part A).
      5. Special Instructions for Bidders for e Tendering (Section IV   
         Part B).
      6. General (Commercial) Conditions of Contract (Section V Part A).
      7. Special Conditions of Contract. (Section V Part B).
      8. Schedule of Requirement (Section V Part C).
      9. Under taking and Declaration.
      10. Performa’s.
      11. Bidders Profile and Questionnaire.
      12. Bid Form &Price Schedule.

* + 1. [Appendix](#_APPENDIX_‘A’) ‘A’ to [Appendix ‘J’](#_Appendix_‘M’_1).
  1. The Bidder is expected to examine all instructions, forms, terms and specifications in the Bid Documents. **Failure to furnish all information required as per the Bid Documents or submission of the bids not substantially responsive to the Bid Documents in every respect will be at the bidder’s risk and may result in rejection of the bid.**
  2. **The Bidder is required to furnish details required for evaluation of eligibility criteria as per the format given at** [**Appendix ’C’**](#_APPENDIX_‘C’)**. The Bidder is also required to furnish documents as per the list given at** [**Appendix ‘D’**](#_APPENDIX_‘D’)**.**

1. **Clarification of Bid Documents**.
   1. A prospective bidder, requiring any clarification on the Bid Documents shall submit his queries through E-tender portal. The Purchaser shall respond to any such request for the clarification of the Bid Documents, which it receives **not later than 21 days prior to the date of opening of the Tenders**. Copies of the query (without identifying the source) and clarifications by the Purchaser shall be uploaded as Clarifications to the concerned tender on BSNL C.O. website & on ETS portal, as addenda, for all the prospective bidders who have downloaded the official copy of tender documents from ETS portal.
   2. The clarifications should be sought for commercial conditions and technical conditions separately in the prescribed format. The clarifications sought without any mention of the clauses of the tender document/GR may not be considered.
   3. Any clarification issued by BSNL in response to query raised by prospective bidders shall form an integral part of Bid Documents and it may amount to an amendment of relevant clauses of the tender Documents.
   4. The clarifications to be sought by the bidders from the purchaser shall be furnished in the following format.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Section** | **Clause No** | **Brief Description of the clause** | **Ref Page No in Tender** | **Query/ Comments of Bidder** |
|  |  |  |  |  |  |

1. **Amendment of Bid Documents**.
   1. At any time, prior to the date of submission of Bids, the Purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify tender documents by amendments.
   2. In order to afford prospective bidders a reasonable time to take the amendment into account in preparing their bids, the purchaser may, at its discretion, extend the deadline for the submission of bids suitably.
2. **Preparation of Bids**.
3. **Documents Comprising the Bid**.The bid prepared by the bidder shall comprise of the documents specified in clause of the tender information (Section II) in addition to the following components:-
   1. Documentary evidence established in accordance with the clause that the bidder is eligible to bid and is qualified to perform the contract if his bid is accepted.
   2. Bid Security furnished in accordance with clause 59 below(Section IV A), Bid form and price schedule completed in accordance with clauses&
4. **BidForm**. The bidder shall complete the bid form and appropriate Price Schedule furnished in the Bid Documents, indicating the goods/work to be supplied, brief description of the goods/work, quantity and prices as per [Section IX Part II](#_PART_II_:_1).
5. **Bid Prices**.
   1. The bidder shall give the total composite price inclusive of all Levies & Taxes i.e. Sales Tax & Excise, packing, forwarding, freight and insurance in case of material to be supplied and inclusive of all taxes and levies in case of works to be executed etc but **excluding Octroi /Entry Tax** which will be paid extra as per actual, wherever applicable. The contractor shall be responsible for transporting the materials to execute the goods/work under the contract, to the site at his/their own cost. The costs of transportation are subsumed in the standard Schedule Rates and therefore no separate charges are payable on this account. The basic unit price and all other components of the price need to be individually indicated against the goods/work it proposes to supply under the contract as per the price schedule given in [Section IX Part II Price Schedule for Indigenous items.](#_PART_II_:_1) Prices of incidental services should also be quoted. The offer shall be firm in Indian Rupees. No Foreign exchange will be made available by the purchaser.
   2. Prices indicated in the Price Schedule shall be entered in the following manner:-
      1. The Basic Unit price (Ex­ Factory Price) of the goods/work, Excise duty, Sales Tax, Freight, Forwarding, discounts, Packing, Insurance and any other Levies/Charges already paid or payable by the supplier shall be quoted separately item wise.
      2. The supplier shall quote as per price schedule given in [Section IX Part II](#_PART_II_:_1) for all the items given in schedule of requirement.
   3. A bid submitted with an adjustable price quotation will be treated as non ­responsive and rejected.
   4. The prices quoted by the bidder shall be in sufficient detail to enable the Purchaser to arrive at the price of equipment/system offered.
   5. “DISCOUNT, if any, offered by the bidders shall not be considered unless specifically indicated in the price schedule. Bidders desiring to offer discount shall therefore modify their offers suitably while quoting and shall quote clearly net price taking all such factors like discount, free supply, etc, into account”.
   6. The price approved by BSNL for procurement will be inclusive of Levies and Taxes, packing, forwarding, freight and insurance as mentioned in clause subject to other terms and condition as stipulated in clause of [Section IV Part A](#_PART_A:_GENERAL) and clause of section V Part A of bid document.
6. **Documents Establishing Bidder’s Eligibility and Qualification**.
   1. The bidder shall furnish, as part of bid documents establishing the bidder’s eligibility, the following documents or whichever is required as per terms and conditions of Bid Document :-
      1. Certificate of Incorporation.
      2. Article or Memorandum of Association or partnership deed or proprietorship deed/ joint endure deed as the case may be.
      3. Registration certificate from State Director of Industries or from Secretariat for Industrial Approval (SIA), Ministry of Industries, Government of India.
      4. Approval from Reserve Bank of India/SIA in case of foreign collaboration.
      5. Latest and valid NSIC Certificate duly certified by NSIC.
      6. Undertaking duly signed by front bidder and its technology/consortium partner(s) stating that all of them shall be liable for due performance of the contract jointly and severely.
   2. The bidder shall furnish Annual Report as evidence that he has financial capability to perform the contract.
   3. The bidder shall furnish documentary evidence about technical and production capability necessary to perform the contract.
   4. In order to enable the Purchaser to assess the provenness of the system offered, the bidder shall provide documentary evidence regarding the system being offered by him.
   5. A signed undertaking from Authorised Signatory of the bidder that shall certify that all the components/parts/assembly/software used in the Desktops and Servers like Hard Disk, Monitors, memory etc. shall be original, new components/parts/assembly/software and that no refurbished/ duplicate/ second hand components/ parts/ assembly/software are being used or shall be used.
   6. For supply of any software i.e. operating system or any applications software the bidder should submit an undertaking for Certificate of Authenticity (COA), signed by Authorised Signatory stating that all Software supplied are authentic and legal copy is/are being supplied.
7. **Documents Establishing Good’s Conformity to Bid Documents**.
   1. Pursuant to clause, the bidder shall furnish, as part of his bid, documents establishing the conformity of his bid to the Bid Documents of all goods/work and services which he proposes to supply under the contract.
   2. The documentary evidences of the “goods/work and services” conformity to the Bid Documents, may be, in the form of literature, drawings, data etc and the bidder shall furnish:
      1. A detailed description of goods/work with essential technical and performance characteristics;
      2. A clause-by-clause compliance on the purchaser’s Technical Specifications and Commercial Conditions demonstrating substantial responsiveness to the Technical Specifications and Commercial Conditions. A bid without clause-by-clause compliance of the [Technical Specifications Section III](#_DETAILED_TECHNICAL_SPECIFICATIONS_1), Commercial Conditions ([Section IV Part A](#_PART_A_:_1) and [Section V Part A](#_PART_A_:)) and Special Conditions ([Section V Part B Part 1](#_PART_1:_SPECIAL_1)) shall not be considered.
   3. For the purpose of compliance to be furnished pursuant to the clause, the bidder shall note that the standards for the workmanship, material and equipment and reference to the brand names or catalogue number, designated by the Purchaser in its Technical specifications are intended to be descriptive only and not restrictive.
8. **Bid Security**.
   1. The bidder shall furnish, as part of his bid, a bid security of **Rs 5,00,00,000/- (Rupees Five Crore only)**.
   2. Bidders (small scale units) who are registered with National Small scale Industry Corporation under SINGLE POINT REGISTRATION SCHEME are exempted from payment of bid security upto the amount equal to their monetary limit or Rs 50,00,000/- (Rs Fifty lacs) whichever is lower.
      1. A proof regarding current registration with NSIC for the tendered items will have to be attached along with the bid.
      2. The enlistment certificate issued by NSIC will not be permanent and should be renewed within two years of its presentation.
      3. The unit claiming concession of NSIC is required to submit its monthly turnover in support of its claim for meeting the delivery schedule.
   3. If a vendor registered with NSIC under single point registration scheme claiming concessional benefits is awarded work by BSNL and subsequently fails to obey any of the contractual obligation he will be debarred from any further work/ contract by BSNL for one year from the date of issue of such order.
   4. The bid security is required to protect the purchaser against the risk of bidder’s conduct, which would warrant the forfeiture of bid security pursuant to Para.
   5. The bid security shall be in the form of a Bank Guarantee issued by a nationalized scheduled bank in favour of the purchaser, valid for a period of **210 days from the date of tender opening**.
   6. A bid not secured in accordance with clause shall be summarily rejected by the Purchaser being non-responsive at the bid opening stage.
   7. The bid security of the unsuccessful bidder will be discharged/returned as promptly as possible as but not later than 30 days after the expiry of the period of the bid validity prescribed by the purchaser pursuant to clause .
   8. The successful bidder’s bid security will be discharged upon the bidder’s acceptance of the advance purchase order satisfactorily in accordance with clause and furnishing the performance security.
   9. The bid security may be forfeited
      1. If the bidder withdraws his bid during the period of bid validity specified by the bidder in the Bid form or
      2. In the case of successful bidder, if the bidder fails:
         1. To sign the contract in accordance with clause.

or

* + - 1. To furnish performance security in accordance with clause.
    1. In both the above cases, i.e.&the bidder will not be eligible to participate in the tender for same item for one year from the date of issue of APO. The bidder will not approach the court against the decision of BSNL in this regard.
    2. The lead bidder (SI) shall submit Teaming agreement(s) duly signed by it andall OEMs/Technology partners stating that **"Bidder (SI) and OEM partner shall be liable for due performance of the contract jointly and severally, failing which both of them shall be liable to be barred from participating in any BSNL/MoD tenders for a period of 3 years”.**

1. **Period of Validity of Bids**.
   1. **Bid shall remain valid for 210 days from the date of opening of bids** prescribed by the purchaser pursuant to clause. A bid valid for a shorter period shall be rejected by the purchaser being non-­responsive.
   2. In exceptional circumstances, the purchaser may request the consent of the bidder for an extension to the period of bid validity. The request and the response thereto shall be made in writing. The bid security provided under clause shall also be suitably extended. The bidder may refuse the request without forfeiting his bid security. A bidder accepting the request and granting extension will not be permitted to modify his bid.
2. **Format and Signing of Bid**.
   1. The bidder shall submit his bid, online, complying all eligibility conditions, other terms and conditions of tender document to be read along with the clarifications and amendments issued in this respect. All the documents must be authenticated using Digital Signature by the authorized person. **Please refer Section IV Part B for further instructions**.
   2. The copy of quality manual and Article or Memorandum of Association should be uploaded along with other documents as required.
   3. The bid shall be digitally signed by the bidder or a person duly authorized to bind the bidder to the contract. The letter of authorization shall be indicated by written power-of-attorney accompanying the bid.
   4. The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the bidder in which case such corrected documents or revisions shall be authenticated by the person signing the bid using digital signature.
   5. The Power of Attorney should be submitted and executed on the non-judicial stamp paper of appropriate value as prevailing in the respective states(s) and the same be attested by a Notary public or registered before Sub-Registrar of the states(s) concerned.
   6. The Power of Attorney to be executed by a person who has been authorized by the Board of Directors of the bidder in this regard, on behalf of the Company/Institution/Body Corporate.
   7. In case of the bidder being a firm, the said Power of Attorney should be executed by all the partner(s) in favour of the said Attorney.
3. **Submission of Bids**.
4. **Sealing and Marking of Bids**.
   1. The tender offer shall contain **double electronic envelope** containing Commercial, Technical & Financial documents & shall also contain Electronic Form- with all relevant bid annexure.
   2. The bid should be submitted online using **double**electronic envelope methodology. The Technical part shall consist the eligibility requirements, Technical specification and compliance to all terms and condition of the bid document including clarifications, addendums and the financial part shall contain price schedule i.e. tender/Bid form only.
5. **Submission of Bids**.

**Bids must be submitted online by the bidders as per instructions in** [**Section IV Part B**](#_PART_B:_SPECIAL)**not later than the specified date & time indicated in the covering letter**.

* 1. The Purchaser may, at its discretion, extend this deadline for the submission of bids by amending the Bid Documents in accordance with clause in which case all rights and obligations of the purchaser and bidders previously subject to the deadline will thereafter be subjected to the deadline as extended.
  2. The bidder shall submit his bid offer against a set of bid documents purchased by him for all or some of the systems/equipment as per requirement of the Bid Documents. He may include alternate offer, if permissible as per the bid. However, not more than one independent and complete offer shall be permitted from the bidder.
  3. **Late Bids**. No bid shall be accepted online by the Electronic Tender System (ETS) after the specified deadline for submission of bids prescribed by the purchaser.

1. **Modification and Withdrawal of Bids**.
   1. The bidder may modify, revise or withdraw his bid after submission provided that the written notice of the modification or withdrawal is received by the purchaser prior to the deadline prescribed for submission of bids.
   2. The bidder’s modification, revision or withdrawal shall have to be online and digitally authenticated as per clause.
   3. Subject to clause no bid shall be modified subsequent to the deadline for submission of bids.
2. **Bid Opening and Evaluation**.
3. **Opening of Bids by Purchaser**.
   1. The purchaser shall open bids in the presence of bidders or their authorized representatives who choose to attend the same. The bidder’s representatives, who are present, shall sign in an attendance register. Authority letter to this effect shall be submitted by the bidders before they are allowed to participate in bid opening (A [Format is given in Section VII](#_PERFORMA_3:_LETTER)).
   2. A maximum of two representatives of any bidder shall be authorized and permitted to attend the bid opening.
   3. The bidder’s names, modifications, bid withdrawals and such other details as the purchaser, at its discretion, may consider appropriate will be announced at the time of opening.
   4. The date fixed for opening of bids, if subsequently declared as holiday by BSNL, the revised date of schedule will be notified. However, in absence of such notification, the bids will be opened on next working day, time and venue remaining unaltered.
4. **Clarification of Bids**. To assist in the examination, evaluation and comparison of bids, the purchaser may, at its discretion ask the bidder for the clarification of its bid. The request for the clarification and the response shall be in writing. **However, no post bid clarification at the initiative of the bidder shall be entertained**.
5. **Preliminary Evaluation**.
   1. Purchaser shall evaluate the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and whether the bids are generally in order.
      1. “If the sum of components of the unit price adds upto an amount different from the quoted unit price, still the quoted unit price will be taken into account for evaluation. However, if the sum of the components of the unit price is lower than the quoted unit price, then the lower component prices shall become the basis for determining the ordering price”.
   2. Arithmetical errors shall be rectified on the following basis. If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected by the purchaser. If there is a discrepancy between words and figures, the amount in words shall prevail. **If the supplier does not accept the correction of the errors, his bid shall be rejected**.
   3. Prior to the detailed evaluation pursuant to clause, the Purchaser will determine the substantial responsiveness of each bid to the Bid Document. For purposes of these clauses, a substantially responsive bid is one which confirms to all the terms and conditions of the Bid Documents without material deviations. The purchaser’s determination of bid’s responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.
   4. A bid, determined as substantially non-­responsive will be rejected by the purchaser and shall not, subsequent to the bid opening, be made responsive by the bidder by correction of the non­-conformity.
   5. The Purchaser may waive any minor infirmity or non­-conformity or irregularity in a bid which doesn’t constitute a material deviation, provided such waiver doesn’t prejudice or effect the relative ranking of any bidder.
6. **Evaluation and Comparison of Substantially Responsive Bids**.
   1. The Purchaser shall evaluate in detail and compare the bids previously determined to be substantially responsive pursuant to clause.
   2. The evaluation and comparison of responsive bids shall be done on the basis of Net cost to BSNL on the prices of the goods/work offered inclusive of Duties and taxes (but excluding Cenvatable Duties & Taxes), Sales Tax, Packing, Forwarding, Freight and Insurance charges etc. as indicated in Col. 18 of the price schedule in the [Section IX Part II Price Schedule for Indigenous items](#_PART_II_:). As stipulated in clause Octroi/Entry Taxes are not to be included in the composite price and hence the same will not be considered for the purpose of evaluation and comparison of responsive bids. However, Octroi/Entry Taxes will be paid extra as per actual wherever applicable on production of proof of payment/relevant invoices/documents. As per Govt guidelines issued on the subject from time to time.
      1. “Duties & Taxes for which the firm has to furnish Cenvatable Challans/ Invoices will be indicated separately in the PO/APO.
      2. Vendors should furnish the correct E.D./Customs tariff Head in the price Schedule. If the credit for the Duties and Taxes under CENVAT Credit Rules, 2004 is found to be not admissible at any stage subsequently owing to wrong furnishing of Tariff Head, then the vendors will be liable to refund such non­ admissible amount, if already paid, along with penalty if charged by the concerned authority.
      3. In case the Duties & Taxes which are non CENVAT­-able as per the quotes indicated in the price schedule by the vendors and subsequently at any stage it is found that Credit for such Duties & Taxes is admissible as per CENVAT Credit Rules, 2004, then the vendors will be liable to refund the amount equivalent to such Duties & Taxes if already paid to them. However, the purchaser may allow the supplier to submit necessary documents in this regard which may enable the purchaser to avail the CENVAT credit provided such credit is still available for the amount so paid as per CENVAT Credit Rules 2004.
      4. The purchaser reserves the right to ask the bidders to submit documentary proof confirming the correct Tariff Head from the E.D./Customs authority where the Tariff Head furnished against the particular tendered item by different bidders differs from each other or the same is found apparently not furnished in accordance with E.D./Customs Tariff notifications.
      5. “If the supplier fails to furnish necessary supporting documents i.e. Excise/Customs invoices etc. in respect of the Duties/taxes which are Cenvatable, the amount pertaining to such Duties/Taxes will be deducted from the payment due to the firm”.
7. **Contacting the Purchaser**.
   1. Subject to clause, no bidder shall try to influence the Purchaser on any matter relating to its bid, from the time of the bid opening till the time the contract is awarded.
   2. **Any effort by a bidder to modify his bid or influence the purchaser in the purchaser’s bid evaluation, bid comparison or contract award decision shall result in the rejection of the bid**.
8. **Award of Contract**.
9. **Placement of Order**. The Purchaser shall consider placement of orders for commercial supplies only on those eligible bidders whose offers have been found technically, commercially and financially acceptable and whose goods/work have been approved/validated by the purchaser. The Purchaser reserves the right to counter offer price(s) against price(s) quoted by any bidder.**Purchaser may, at its discretion, issue two separate Purchase Orders to the L1 Bidder, one for the Network Synchronisation/clock requirements (PRC, SSU), and other for balance items/services of the SoR.**
10. **Purchaser’s Right to Vary Quantities**.
    1. BSNL will have the right to increase or decrease up to 25% of the quantity of goods/work and services specified in the schedule of requirements without any change in the unit price or other terms and conditions at the time of award of contract or upto 50% of the additional quantities of goods/work and services contained in the running tender/contract can be ordered within a period of twelve months from the earliest date of acceptance of APO at the same rate or a rate negotiated (downwardly) with the existing venders considering the reasonability of rates based on prevailing market conditions and the impact of reduction in duties and taxes etc. and supplies to be obtained within delivery period scheduled afresh.
    2. In exceptional situation where the requirement is of an emergent nature and it is necessary to ensure continued supplies from the existing venders, the purchaser reserves the right to place repeat order up to 100% of the quantities of goods and services contained in the running tender/contract within a period of twelve months from the earliest date of acceptance of APO at the same rate or a rate negotiated (downwardly) with the existing venders considering the reasonability of rates based on prevailing market conditions and the impact of reduction in duties and taxes etc. Exceptional situation and emergent nature should be spelt out clearly detailing the justification as well as benefits accrued out of it and loss incurred in case this provision is not invoked and approved by the authority competent to accord administrative and financial approval for the procurement calculated on the basis of total procurement i.e. initial and proposed add on quantity.
    3. BSNL Board will have full power to accord administrative approval and financial concurrence to procure equipment/material in the exigencies of services and interest of BSNL or Defence Forces.
11. **Purchaser’s Right to Accept any Bid and to REJECT ANY OR ALL BIDS**.The purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of contract without assigning any reason whatsoever and without thereby incurring any liability to the affected bidder or bidders on the grounds of purchaser’s action.
12. **Issue of Advance Purchase Order**.
    1. The issue of an Advance Purchase Order shall constitute the intention of the Purchaser to enter into contract with the bidder.
    2. The bidder shall, within 14 days of issue of, from the date of advance purchase order, give his acceptance along with performance security in conformity with [Section VII](#_SECTION_VII) provided with the bid document.
13. **Signing of Contract**.
    1. The issue of Purchase order shall constitute the award of contract on the bidder.
    2. Upon the successful bidder furnishing performance security pursuant to clause, the Purchaser shall discharge the bid security in pursuant to clause.
14. **Annulment of Award**. Failure of the successful bidder to comply with the requirement of clause shall constitute sufficient ground for the annulment of the award and the forfeiture of the bid security in which event the Purchaser may make the award to any other bidder at the discretion of the purchaser or call for new bids.
15. **Quality Assurance Requirements**. The supplier shall have Quality Management System supported and evidenced by the following :-
    1. A Quality Policy.
    2. A management representative with authority and responsibility for fulfilling QA requirements and for interfacing with purchaser in the matters of Quality.
    3. Procedure for controlling design/production engineering, materials, choice of components/vendors, manufacturing and packaging process for supplying quality products.
    4. System of Inward Good Inspection.
    5. System to calibrate and maintain required measuring and test equipment.
    6. System for tracing the cause for non­conformance (traceability) and segregating product which don’t conform to specifications.
    7. Configuration management and change­ control mechanism.
    8. A quality plan for the product.
    9. Periodical internal quality audits.
    10. A ‘Quality Manual’ detailing the above shall be furnished.
16. While all the conditions specified in the Bid documents are critical and are to be complied, special attention of bidder is invited to the following clauses of the bid documents. Non­compliance of anyone of which shall result in outright rejection of the bid.
    1. **Clauses , , of Section IV Part A**. The bids will be rejected at opening stage if Bid security is not submitted as per Clauses & and bid validity is less than the period prescribed in Clause .
    2. **Clause & of Section IV Part A**. If the eligibility condition is not met as per clause of section IV Part A and/or documents prescribed to establish the eligibility as per clause of section IV Part A are not enclosed, the bids will be rejected without further evaluation.
    3. **Clause of Section IV Part A**. If clause-by-clause compliance and deviation statements as prescribed are not given, the bid will be rejected at the stage of primary evaluation. A Nil Deviations Certificate must be given by the Bidder.
    4. **Section III Detailed Technical Specifications, Section V Part A General Commercial Conditions of Contract, Section V Part B Special Terms and Conditions of Contract**. Compliance if given using ambiguous words like “Noted”, “Understood”, “Noted & Understood” shall not be accepted as complied. Mere “Complied” will also be not sufficient, reference to the enclosed documents showing compliances must be given.
    5. Section IX Part II Price Schedule for Items. Prices are not filled in as prescribed in price schedule.
    6. **Section IV Part A clause on discount which is reproduced below**. **“Discount, if any**, offered by the bidder shall not be considered **unless specifically indicated in the price schedule**. Bidders desiring to offer discount shall therefore modify their offer suitably while quoting and shall quote clearly net price taking all such factors like Discount, free supply etc. into account”.
    7. Before outright rejection of the Bid by Bid opening team for non­compliance of any of the provisions mentioned in clauses to of Section IV Part A though the bidder company is given opportunity to explain their position, however if the person representing the company is not satisfied with the decision of the Bid opening team, he/they can submit the representation to the Bid opening team immediately but in no case after closing of the tender process with full justification quoting specifically the violation of tender condition if any.
    8. Bid opening team will not return the bids submitted by the bidders on the date of tender opening even if it is liable for rejection and will preserve the bids in sealed cover as submitted by taking the signatures of some of the desirous representatives of the participating bidder/companies present on the occasion.
    9. The in­-charge of Bid opening team will mention the number of bids with the name of the company found unsuitable for further processing on the date of tender opening and number of representations received in Bid opening Minutes and if Bid opening team is satisfied with the argument of the bidder/company mentioned in their representation and feel that there is prima­ facie fact for consideration, the in­-charge of the bid opening team will submit the case for review to competent authority i.e. GM in circles and Director (Enterprise) in corporate office BSNL as early as possible preferably on next working day and decision to this effect should be communicated to the bidder company within a week positively. Bids found liable for rejection and kept preserved on the date of tender opening will be returned to the bidders after issue of P.O. against the instant tender.
    10. If the reviewing officer finds it fit to open the bid of the petitioner, this should be done by giving three (working) days notice to all the participating bidders to give opportunity to desirous participants to be present on the occasion.
17. Purchaser reserves the right to disqualify the supplier for a suitable period who habitually failed to supply the equipment in time. Further, the suppliers whose equipment does not perform satisfactory in the field in accordance with the specifications may also be disqualified for a suitable period as decided by the purchaser.
18. Purchaser reserves the right to blacklist a bidder for a suitable period in case he fails to honor his bid without sufficient grounds.
19. The bidder should give a certificate that none of his/her near relative is working in the units as defined below where he is going to apply for the tender. In case of proprietorship firm certificate will be given by the proprietor. For partnership firm certificate will be given by all the partners and in case of Limited Company by all the Directors of the company excluding Government of India/Financial institution nominees and independent non Official part time Directors appointed by Govt. of India or the Governor of the state and full time Directors of PSUs both state and central. Due to any breach of these conditions by the company or firm or any other person the tender will be cancelled and Bid Security will be forfeited at any stage whenever it is noticed and BSNL will not pay of any damage to the company or firm or the concerned person. The company or firm or the person will also be debarred for further participation in the concerned unit. The near relatives for this purpose are defined as:­
    1. Members of a Hindu undivided family.
    2. They are husband and wife.
    3. The one is related to the other in the manner as father, mother, son(s) & Son’s wife (daughter in law), Daughter(s) and daughter’s husband (son in law), brother(s) and brother’s wife, sister(s) and sister’s husband (brother in law).
    4. The format of the certificate is as given in [Section VI](#_UNDERTAKING_&_DECLARATION).
20. **Verification of Documents and Certificates**.
    1. “The bidder will verify the genuineness and correctness of all documents and certificates, including experience/performance certificates, issued either by the bidder or any other firm / associate before submitting them in the bid. The onus of proving genuineness of the submitted documents would rest with the bidder.
    2. As per requirement of the tender’s conditions, if any document / paper / certificate submitted by the participant bidder is found to be false / fabricated / tampered / manipulated at any stage during bid evaluation or award of contract, then the bid security of the bidder would be forfeited and the bidder would be disqualified from the tender. Action would also be taken for banning of business dealing with the defaulting firm. In case contract has already awarded to the bidder, then PBG would be forfeited and the contract would be rescind / annulled and BSNL would be at liberty to procure the ordered goods and services from any other source at the risk and cost of the defaulting bidder. Action would also be taken for banning business dealing with the defaulting firm.
    3. To obviate any possibility of doubt and dispute and maintain veracity of the documents / papers / certificates, the documents conforming to eligibility part will be submitted by the participant bidder duly authenticated by the authorized signatory along with EMBG (bid security) of requisite amount and will be checked at the time of tender opening. This bid part (already digitally signed by the authorized representative of the bidder company during bid submission) will be digitally signed by the in charge of the tender opening team and will be kept preserved along with the bid submitted online. In case of any dispute these papers will be treated as authentic one”.

**SECTION IV**

## PART B: SPECIAL INSTRUCTIONS TO BIDDERS FOR E-TENDERING

1. **General**.
   1. The Special Instructions (for e-Tendering) supplement ‘Instruction to Bidders’, as given in these Tender Documents. Submission of Online Bids is mandatory for this Tender.
   2. E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Suppliers/ Vendors will be the biggest beneficiaries of this new system of procurement. For conducting electronic tendering, BSNL has decided to use the portal (<https://www.tcil-india-electronictender.com>) through TCIL, a Government of India Undertaking.
   3. Benefits to Suppliers are outlined on the Home-page of the portal.
2. **Instructions**.
   1. **Tender Bidding Methodology**.
      1. Sealed Bid System – **‘Single Stage - Double Envelope’**.
   2. **Broad Outline of Activities from Bidders Prospective**.
      1. Procure a Digital Signing Certificate (DSC).
      2. Register on Electronic Tendering System® (ETS).
      3. Create Users and assign roles on ETS.
      4. View Notice Inviting Tender (NIT) on ETS.
      5. Download Official Copy of Tender Documents from ETS.
      6. Clarification to Tender Documents on ETS.
         1. Query to BSNL (Optional).
         2. View response to queries posted by BSNL, as addenda.
      7. Bid-Submission on ETS.
      8. Attend Public Online Tender Opening Event (TOE) on ETS.
         1. Opening of Technical & Financial-Part.
      9. View Post-TOE Clarification posted by BSNL on ETS (Optional).
         1. Respond to BSNL’s Post-TOE queries.
      10. Participate in e-Reverse Auction on ETS.
3. For participating in this tender online, the following instructions are to be read carefully. These instructions are supplemented with more detailed guidelines on the relevant screens of the ETS.
   1. **Digital Certificates**. For integrity of data and its authenticity/ non-repudiation of electronic records, and be compliant with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC). also referred to as Digital Signature Certificate (DSC), of Class 2 or above, issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer <http://www.cca.gov.in>].
   2. **Registration**. To use the Electronic Tender® portal (<https://www.tcil-india-electronictender.com>). Vendor need to register on the portal. Registration of each organization is to be done by one of its senior persons who will be the main person coordinating for the e-tendering activities. In ETS terminology, this person will be referred to as the Super User (SU) of that organization. For further details, please visit the website/portal, and click on the ‘Supplier Organization’ link under ‘Registration’ (on the Home Page), and follow further instructions as given on the site. Pay Annual Registration Fee as applicable.
      1. **Note**. After successful submission of Registration details and Annual Registration Fee (as applicable). Please contact TCIL/ ETS Helpdesk (as given below), to get your registration accepted/activated.

|  |  |
| --- | --- |
| TCIL Helpdesk/ ETS Helpdesk | |
| Telephone | *011-26241071/26241072*  *[between 9:30 hrs to 18:00 hrs on working days]* |
| Mobile Nos. | *9868393717 / 9868393775* |
| E-mail ID | *ets\_support@tcil-india.com*  *[Please mark CC:* [*support@electronictender.com*](mailto:support@electronictender.com)*]* |

|  |  |
| --- | --- |
| SNL Contact-1 | |
| BSNL’s Contact Person | *Mr. Sanjay Vatsa, Dy. Mgr.(MMY)* |
| Telephone/ Mobile | 011-23717844  *[between 9:30 hrs to 18:00 hrs on working days]* |
| E-mail ID | *srvatsabsnl*[@](mailto:manoj_jain@bsnl.co.in)*gmail.com* |

|  |  |
| --- | --- |
| BSNL Contact-2 | |
| BSNL’s Contact Person | *Mr. Manoj Jain ,Dy. Mgr.(MMX)* |
| Telephone/ Mobile | 011-23037172  *[between 9:30 hrs to 18:00 hrs on working days]* |
| E-mail ID | [*manoj\_jain@bsnl.co.in*](mailto:manoj_jain@bsnl.co.in) |

* 1. **Some Bidding related Information for this Tender (Sealed Bid)**. The entire bid-submission would be online on ETS. Broad outline of submissions are as follows:-
     1. Submission of Bid Security/ Earnest Money Deposit (EMD).
     2. Submission of digitally signed copy of Tender Documents/ Addendum/addenda.
     3. Techno-commercial & Financial –Part.
  2. **Offline Submissions**. The bidder is requested to submit the following documents offline to DM (MMT), BSNL Corporate Office, 2nd Floor, Bharat Sanchar Bhawan, Janpath, New Delhi – 110001 on or before the date & time of submission of bids specified in covering letter of this tender document, in a Sealed Envelope. The envelope shall bear (the project name), the tender number and the words ‘DO NOT OPEN BEFORE’ (due date & time).
     1. EMD-Bid Security (Original copy).
     2. Power of attorney in accordance with clauses to of [Section IV Part A](#_PART_A_:_1).
     3. Integrity Pact.
  3. **Special Note on Security of Bids**.Security related functionality has been rigorously implemented in ETS in a multi-dimensional manner. Starting with 'Acceptance of Registration by the Service Provider', provision for security has been made at various stages in Electronic Tender's software. Specifically for Bid Submission, some security related aspects are outlined below:
     1. As part of the Electronic Encryptor™ funsctionality, the contents of both the ‘Electronic Forms’ and the ‘Main-Bid’ are securely encrypted using a Pass-Phrase created by the Bidder himself. Unlike a ‘password’, a Pass-Phrase can be a multi-word sentence with spaces between words (eg I love this World). A Pass-Phrase is easier to remember, and more difficult to break. It is recommended that a separate Pass-Phrase be created for each Bid-Part. This method of bid-encryption does not have the security and data-integrity related vulnerabilities which are inherent in e-tendering systems which use Public-Key of the specified officer of a Buyer organization for bid-encryption. Bid-encryption in ETS is such that the Bids cannot be decrypted before the Public Online Tender Opening Event (TOE), even if there is connivance between the concerned tender-opening officers of the Buyer organization and the personnel of e-tendering service provider.
     2. Typically, ‘Pass-Phrase’ of the Bid-Part to be opened during a particular Public Online Tender Opening Event (TOE) is furnished online by each bidder during the TOE itself, when demanded by the concerned Tender Opening Officer.
     3. There is an additional protection with SSL Encryption during transit from the client-end computer of a Supplier organization to the e-tendering server/ portal.
  4. **Public Online Tender Opening Event (TOE)**.
     1. ETS offers a unique facility for ‘Public Online Tender Opening Event (TOE)’. Tender Opening Officers as well as authorized representatives of bidders can attend the Public Online Tender Opening Event (TOE) from the comfort of their offices. For this purpose, representatives of bidders (i.e. Supplier organization) duly authorized are requested to carry a Laptop and Wireless Connectivity to Internet.
     2. Every legal requirement for a transparent and secure ‘Public Online Tender Opening Event (TOE)’ has been implemented on ETS.
     3. As soon as a Bid is decrypted with the corresponding ‘Pass-Phrase’ as submitted online by the bidder himself (during the TOE itself), salient points of the Bids are simultaneously made available for downloading by all participating bidders. The tedium of taking notes during a manual ‘Tender Opening Event’ is therefore replaced with this superior and convenient form of ‘Public Online Tender Opening Event (TOE)’.
     4. ETS has a unique facility of ‘Online Comparison Chart’ which is dynamically updated as each online bid is opened. The format of the chart is based on inputs provided by the Buyer for each Tender. The information in the Comparison Chart is based on the data submitted by the Bidders in electronic forms. A detailed Technical and/ or Financial Comparison Chart enhances Transparency. Detailed instructions are given on relevant screens.
     5. ETS has a unique facility of a detailed report titled ‘Minutes of Online Tender Opening Event (TOE)’ covering all important activities of ‘Online Tender Opening Event (TOE)’. This is available to all participating bidders for ‘Viewing/ Downloading’.
     6. There are many more facilities and features on ETS. For a particular tender, the screens viewed by a Supplier will depend upon the options selected by the concerned Buyer.
  5. **Information related in respect of e-Reverse Auction for this Tender**.
     1. **e-Reverse Auction shall not be applicable for this tender**.
     2. The following would be parameters for e-Reverse Auction:-

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Parameter** | **Value** |
|  | Date and Time of Reverse-Auction Bidding Event |  |
|  | Duration of Reverse-Auction Bidding Event |  |
|  | Automatic extension of the ‘Reverse-Auction Closing Time’, if last bid received is within a ‘Pre-defined Time-Duration’ before the ‘Reverse-Auction Closing Time’ |  |
|  | Pre-defined Time-Duration |  |
|  | Time-Duration of Automatic extension |  |
|  | Maximum number of Auto-Extensions |  |
|  | Criteria of Bid-Acceptance |  |
|  | Entity – Start-Price |  |
|  | Minimum Bid-Decrement |  |
|  | Display of ‘Pseudo Identity’ of Bidders during bidding |  |
|  | Display of Bidder’s own current Rank |  |

* 1. **Other Instructions**.
     1. For further instructions, the vendor should visit the home-page of the portal (<https://www.tcil-india-electronictender.com>), and go to the User-Guidance Center
     2. The help information provided through ‘ETS User-Guidance Center’ is available in three categories – Users intending to Register / First-Time Users, Logged-in users of Buyer organizations, and Logged-in users of Supplier organizations. Various links are provided under each of the three categories.
     3. Important Note: It is strongly recommended that all authorized users of Supplier organizations should thoroughly peruse the information provided under the relevant links, and take appropriate action. This will prevent hiccups, and minimize teething problems during the use of ETS.
     4. The following ‘**FOUR KEY INSTRUCTIONS for BIDDERS**’ must be assiduously adhered to:-
        1. Obtain individual Digital Signing Certificate (DSC or DC) well in advance of your first tender submission deadline on ETS.
        2. Register your organization on ETS well in advance of your first tender submission deadline on ETS.
        3. Get your organization’s concerned executives trained on ETS well in advance of your first tender submission deadline on ETS.
        4. Submit your bids well in advance of tender submission deadline on ETS (There could be last minute problems due to internet timeout, breakdown, et al) While the first three instructions mentioned above are especially relevant to first-time users of ETS, the fourth instruction is relevant at all times.
  2. **Minimum Requirements at Bidders end**.
     1. Computer System with good configuration (Min P IV, 1 GB RAM, Windows XP).
     2. Broadband connectivity.
     3. Microsoft Internet Explorer 6.0 or above.
     4. Digital Certificate(s) for users.
  3. **Vendors Training Program**.
     1. One day training (10:00 to 17:00) would be provided. Training is optional.
     2. Vendors are requested to carry a Laptop and Wireless Connectivity to Internet.

|  |  |
| --- | --- |
| Tentative Dates | Date of uploading of Tender document + 7 days |
| Venue | Meeting Room, 2nd Floor,  BSNL Corporate Office,  Bharat Sanchar Bhawan,  Janpath, New Delhi – 110001 |
| Vendors Training Charges  (Per Participant) per training day | Rs. 2,500/-  (plus Service Tax @ 10.3 %) |
| Mode of Payment of Fees | DD payable to BSNL, New Delhi at New Delhi |

# SECTION- V

## PART A : GENERAL COMMERCIAL CONDITIONS OF CONTRACT

1. **Application**. The general condition shall apply in contracts made by the purchaser for the procurement of goods/works.
2. **Standards**. The goods/works supplied under this contract shall conform to the standards prescribed in the Technical Specifications mentioned in Section III.
3. **Patent Rights**. The bidder shall indemnify the purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the goods/work or any part thereof in Indian Telecom Network.
4. **Performance Security**.
   1. All bidders (including small scale units who are registered with the National Small Scale Industries Corporation under Single point registration scheme) shall furnish performance security to the purchaser for an amount equal to **5%** of the value of purchase order within 14 days from the date of issue of Advance Purchase Order by the Purchaser. **The Performance Bank Guarantee shall be valid for upto three months after completion of warranty period.**
   2. The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the bidder’s failure to complete its obligations under the contract.
   3. The performance security Bond shall be in the form of Bank Guarantee issued by a scheduled Bank and in the form provided in section VII of this Bid Document.
   4. The performance security Bond will be discharged by the Purchaser after completion of the bidder’s performance obligations including any warranty obligations under the contract.
5. **Inspection and Tests**.
   1. The Purchaser or his representative shall have the right to inspect and test the goods/works as per prescribed test schedules for their conformity to the specifications. Where the Purchaser decides to conduct such tests on the premises of the bidder or its sub-bidder(s), all reasonable facilities and assistance like Testing instruments and other test gadgets including access to drawings and production data shall be furnished to the inspectors at no charge to the purchaser. Inspection will be carried out by PICG/ BSNL after delivery of goods.
   2. Should any inspected or tested goods/works fail to conform to the specifications the purchaser may reject them and the bidder shall either replace the rejected goods/works or make all alterations necessary to meet Specification requirements free of cost to the purchaser.
   3. Notwithstanding the pre-supply tests and inspections prescribed in clause &, the equipment and accessories on receipt in the Purchaser’s premises will also be tested during and after installation before “take over” and if any equipment or part thereof is found defective, the same shall be replaced free of all cost to the purchaser as laid down in clause.
   4. If any equipment or any part thereof, before it is taken over under clause, is found defective or fails to fulfil the requirements of the contract, the inspector shall give the Bidder notice setting forth details of such defects or failure and the bidder shall make the defective equipment good, or alter the same to make it comply with the requirements of the contract forthwith and in any case within a period not exceeding three months of the initial report. These replacements shall be made by the bidder free of all charges at site. Should it fail to do so within this time, the purchaser reserves the discretion to reject and replace at the cost of the bidder the whole or any portion of equipment as the case may be, which is defective or fails to fulfill the requirements of the contract. The cost of any such replacement made by the purchaser shall be deducted from the amount payable to the bidder.
   5. When the performance tests called for have been successfully carried out, the inspector / ultimate consignee will forthwith issue a Taking Over Certificate. The inspector /ultimate consignee shall not delay the issue of any “Taking Over Certificate” contemplated by this clause on account of minor defects in the equipment which do not materially affect the commercial use thereof provided that the bidder shall undertake to make good the same in a time period not exceeding three months. The Taking Over Certificate shall be issued by the ultimate consignee within six weeks of successful completion of tests. In this case, BCPC (Bills Copy Payable Challan) shall be equivalent to “Taking Over Certificate”, issuance of which shall certify receipt of goods in safe and sound condition. However, they shall not discharge the bidder of their warranty obligation. BCPC in respect of last consignment against the purchase order will be equivalent to “Taking Over Certificate” for the material only. The warranty of systems/equipment will only start when the all the equipment and systems are installed and fully integrated as per details given in Section III Detailed Technical Specifications and Section V Part B Special Terms and Conditions of Contract. Bidder will make own arrangement of storage. BCPC & TOC will be issued by purchaser.
   6. Nothing in clause and shall in any way release the Bidder from any warranty or other obligations under this contract.
6. **Delivery and Documents**. Please refer clause of [section II](#_SECTION_II_1).
7. **Training**.
   1. The bidder shall provide training for installation and maintenance staff as per the details given in Section V Part B.
   2. The bidder shall specify in his bid pre-training qualifications required of the trainees.
   3. The bidder shall provide all training material and documents to the trainees.
8. **Incidental Services**.
   1. The bidder may be required to provide any or all of the following services.
      1. Performance or supervision of on-site assembly and/or start-up of the supplied Goods/works.
      2. Furnishing of tools required for assembly and/or maintenance of supplied Goods/works.
      3. Performance of supervision or maintenance and/or repair of the supplied Goods/works, for a period of time agreed by the parties provided that this service shall not relieve the bidder of any warranty obligations under this contract.
   2. **Spares**.
      1. As part of the Financial bid, the bidder shall give the item wise breakdown of cost considered for arriving at the price of spares being procured as part of this tender, as given in [Appendix ‘F’](#_APPENDIX_‘F’_1)
      2. The bidder shall also be required to provide a list of spare parts manufactured or distributed by the OEM(s) including cost (other than those spares being procured as part of this tender).
      3. Purchaser may elect to purchase spares parts from the bidder in future, provided that such purchase shall not relieve the bidder of any warranty obligation under the contract.
      4. In the event of termination of production of the spare parts, the bidder shall:-
         1. Give advance notification to the purchaser pending termination (not less than 2 years), in sufficient time to enable the purchaser to procure life time spare.
         2. Following such advance intimation of termination, furnish at no cost to the purchaser, the blue prints, drawings and specifications of spare parts, if and when requested.
9. **Warranty**.
   1. The bidder shall warrant that the stores to be supplied shall be new and free from all defects and faults in materials used, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for materials of the type ordered and shall perform in full conformity with the specifications and drawings. The bidder shall be responsible for any defect that may develop under the conditions provided by the contract and under proper use, arising from faulty material, design or workmanship such as corrosion of the equipment, inadequate quantity of material to meet equipment requirements, inadequate contact protection, deficiencies in circuit 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. This warranty shall survive inspection of payment for/and acceptance of goods/work but and **shall expire (except in respect of complaints notified prior to such date) thirty six months after successful acceptance testing and commissioning of complete Pan India integrated network**.
   2. If it becomes necessary for the Bidder to replace or renew any defective portion(s) of the equipment under this clause, the provisions of the clause shall apply to the portion(s) of the equipment so replaced or renewed or until the end of the above mentioned period of thirty six months. If any defect is not remedied by the bidder within a reasonable time, the Purchaser may proceed to get the defects remedied from other bidder etc., at the bidder’s risk and expenses, but without prejudice to any other rights which the purchaser may have against the bidder in respect of such defects.
   3. Replacement under warranty clause shall be made by the bidder free of all charges at site including freight, insurance and other incidental charges.
10. **Payment Terms**. Please refer clause of Section II.
11. **Prices**.
    1. Prices charged by the bidder for goods delivered and services performed under the contract shall not be higher than the prices quoted by the Bidder in his Bid.
    2. Prices will be fixed at the time of issue of purchase order as per taxes and statutory duties applicable at that time.
    3. In case of reduction of taxes and other statutory duties during the scheduled delivery period, purchaser shall take the benefit of decrease in these taxes/duties for the supplies made from the date of enactment of revised duties/taxes.
    4. In case of increase in duties/taxes during the scheduled delivery period, the purchaser shall revise the prices as per new duties/taxes for the supplies, to be made during the remaining delivery period as per terms and conditions of the purchase order.
    5. Any increase in taxes and other statutory duties/levies after the expiry of the delivery date shall be to the bidder’s account. However, benefit of any decrease in these taxes/ duties shall be passed on to the Purchaser by the bidder.
12. **Changes in Purchase Orders**.
    1. The purchaser may, at any time, by a written order given to a bidder, make changes within the general scope of the contract in any one or more of the following: -
       1. Drawings, designs or specifications, where Goods/work to be supplied under the contract are to be specifically manufactured for the Purchaser.
       2. The method of transportation or packing;
       3. The place of delivery; or
       4. The services to be provided by the bidder.
    2. If any such change causes an increase or decrease in the cost of, or the time required for the execution of the contract an equitable adjustment shall be made in the contract price or delivery schedule, or both, and the contract shall accordingly be amended. Any proposal by the bidder for adjustment under this clause must be made within thirty days from the date of the receipt of the change in order.
13. **Subcontracts**. The bidder shall notify the Purchaser in writing of all subcontracts awarded under this contract if not already specified in his bid. Such notification, in his original bid or later shall not relieve the bidder from any liability/ obligation under the contract.
14. **Delays in the Bidder’s Performance**.
    1. Delivery of the Goods and performance of the services shall be made by the Bidder in accordance with the time schedule as given in the Purchase Order. In case the supply/services is not completed in the stipulated period, as indicated in the Purchase Order, purchasers reserve the right to either short close /cancel this purchase order and/or recover liquidated damage charges. The cancellation/short closing of the order shall be at the risk and responsibility of the bidder and purchaser reserves the right to purchase balance unsupplied item at the risk and cost of the defaulting vendors.
    2. Delay by the Bidder in the performance of its delivery obligations shall render the Bidder liable to any or all of the following sanctions: forfeiture of its performance security, imposition of liquidated damages and/or termination of the contract for default.
    3. If at any time during the performance of the contract, the bidder encounters conditions impacting timely delivery of the goods and performance of service, the bidder shall promptly notify to the Purchaser in writing the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the bidder’s notice, the purchaser shall evaluate the situation and may at its discretion extend the period for performance of the contract (by not more than 20 weeks or as per provisions of clause toof   
       Section V Part A) as per provision given below.
    4. The vendor has to submit their request for extension along with the required additional BG and undertaking as per clause(Fall clause) at least two weeks before the expiry of delivery period. The decision regarding extension shall be communicated within two weeks of the receipt of request.
    5. In case extension is being granted beyond 20 weeks then the vendor shall submit additional BG while seeking extension. For peace meal items the amount of additional BG shall be 5% of the value of balance quantity of items to be supplied for which extension in delivery period has been sought. In case of infrastructure/turnkey projects other than as stated above, 1% of the total project value shall be the value for additional BG. The additional BG shall be valid for six months beyond extension of delivery period sought and shall be discharged after the full ordered quantity has been supplied to the ultimate consignee and executed zone wise within the last extended delivery period on submission of consignee receipt without prejudice to the other remedies available to the purchaser.
    6. If the vendor fails to deliver the full ordered quantity even during extended delivery period then the PO shall be short-closed and the Performance Bank Guarantee as well as additional BG shall be forfeited.
    7. Format letter for conveying conditions of DP extension is given at  
       [Appendix ‘A’](#_APPENDIX_‘A’) and [Appendix ‘B’](#_APPENDIX_‘B’).
15. **Liquidated Damages**.
    1. The completion date of turnkey project for delivery of stores and works/ services for execution of this project stipulated in the tender should be deemed to be the essence of the contract and delivery must be completed not later than the dates specified therein. Extension will not be given except in exceptional circumstances. Should, however, if the completion of contract be made after expiry of the contracted delivery period, with/without prior concurrence of the purchaser and be accepted by the consignee, such delivery will not deprive the purchaser of his right to recover liquidated damage under clause. However, when contract is completed within 21 days of the contracted original delivery period, the consignee may accept the work and in such cases the provision of clause will not apply.
    2. Should the bidder fail to deliver the store or any consignment thereof, or fail to complete the installation/ integration within the period prescribed and agreed , the purchaser, without prejudice to other remedies available to the purchaser shall be entitled to recover, as agreed liquidated damages for breach of contract, **a sum equivalent to 0.5% of the value of the delayed material/works/services for each week of delay or part thereof for a period up to 10 (TEN) weeks, and thereafter at the rate of 0.7% of the value of the delayed material/works/services for each week of delay or part thereof for another TEN weeks of delay**. **Liquidated damages shall be levied on delay in delivery of material as well as delay in works/services, installation/integration**, as applicable for each phase of the contract as given at Clause .
    3. DP extension beyond 20 weeks would not be generally allowed. The extension beyond 20 weeks may be decided in most exceptional circumstances on case to case basis, by the CGM concern in case of tenders floated by circles concern in case tender floated by Corporate Office, BSNL, stating reasons and justifications for grant of extension of period beyond 20 weeks.
    4. In the case of turnkey projects when the delayed portion of the supply materially hampers installation and commissioning of the systems, LD charges shall be levied as above on the total value of the Purchase Order.
    5. Quantum of liquidated damages assessed and levied by the purchaser and decision of the purchaser thereon shall be final and binding on the bidder, further the same shall not be challenged by the bidder either before Arbitration tribunal or before the court. The same shall stand specifically excluded from the purview of the arbitration clause, and as such shall not be referable to arbitration. However, when supply is made to the ultimate consignee within 21 days of QA clearance in the extended delivery period and the goods/work were dispatched within this delivery period, the consignee may accept the stores and in such cases the LD shall be levied up to the date of dispatch after QA clearance only.
    6. The total value of the liquidated damages as per above sub-clauses shall be limited to a maximum of 12% (Twelve percent) i.e. LD shall be levied upto 20 weeks only as per provision at Para99.2 above.
16. **Force Majeure**.
    1. If, at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract is prevented or delayed by reasons of any war or hostility, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts or act of God (hereinafter referred to as events) provided notice of happenings of any such eventuality is given by either party to the other within 21 days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate this contract nor shall either party have any claim for damages against other in respect of such non-performance or delay in performance, and deliveries under the contract shall be resumed as soon as practicable after such an event come to an end or cease to exist, and the decision of the Purchaser as to whether the deliveries have been so resumed or not shall be final and conclusive. Further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reasons of any such event for a period exceeding 60 days, either party may, at its option, terminate the contract.
    2. Provided, also that if the contract is terminated under this clause, the Purchaser shall be at liberty to take over from the Bidder at a price to be fixed by the purchaser, which shall be final, all unused, undamaged and acceptable materials, bought out components and stores in course of manufacture which may be in possession of the Bidder at the time of such termination or such portion thereof as the purchaser may deem fit, except such materials, bought out components and stores as the Bidder may with the concurrence of the purchaser elect to retain.
17. **Termination for Default**.
    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.
       1. If the bidder fails to deliver any or all of the goods/work within the time period(s) specified in the contract, or any extension thereof granted by the purchaser pursuant to clause98 above.
       2. If the bidder fails to perform any other obligation(s) under the Contract;

and

* + 1. If the bidder, in either of the above circumstances, does not remedy his failure within a period of 15 days (or such longer period as the purchaser may authorize in writing) after receipt of the default notice from the purchaser.
  1. In the event the purchaser terminates the contract in whole or in part pursuant to Para the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods/works similar to those undelivered and the bidder shall be liable to the Purchaser for any excess cost for such similar goods/works. However the bidder shall continue the performance of the contract to the extent not terminated.

1. **Termination for Insolvency**. The Purchaser may at any time terminate the Contract 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.
2. **Arbitration**.
   1. In the event of any question, dispute or difference arising under this agreement or in connection there-with (except as to the matters, the decision to which is specifically provided under this agreement upto the installation and commissioning stage), the same shall be referred to the sole arbitration of the CMD, BSNL or in case his designation is changed or his office is abolished, then in such cases to the sole arbitration of the officer for the time being entrusted (whether in addition to his own duties or otherwise) with the functions of the CMD, BSNL or by whatever designation such an officer may be called (hereinafter referred to as the said officer), and if the CMD, BSNL or the said officer is unable or unwilling to act as such, then to the sole arbitration of some other person appointed by the CMD, BSNL or the said officer. The agreement to appoint an arbitrator will be in accordance with the Arbitration and Conciliation Act 1996. There will be no objection to any such appointment on the ground that the arbitrator is a Government Servant or that he has to deal with the matter to which the agreement relates or that in the course of his duties as a Government Servant he has expressed his views on all or any of the matters in dispute. The award of the arbitrator shall be final and binding on both the parties to the agreement. In the event of such an arbitrator to whom the matter is originally referred, being transferred or vacating his office or being unable to act for any reason whatsoever, the CMD, BSNL or the said officer shall appoint another person to act as an arbitrator in accordance with terms of the agreement and the person so appointed shall be entitled to proceed from the stage at which it was left out by his predecessors.
   2. The arbitrator may from time to time with the consent of both the parties enlarge the time frame for making and publishing the award. Subject to the aforesaid Arbitration and Conciliation Act, 1996 and the rules made there under, any modification thereof for the time being in force shall be deemed to apply to the arbitration proceeding under this clause.
   3. The venue of the arbitration proceeding shall be the office of the CMD, BSNL or such other places as the arbitrator may decide.
   4. After commissioning and handing over of the network to PICG, PICG will sign the agreement for AMC with the successful Lead Bidder (SI). In the event of any question, dispute or difference arising out under this agreement or in connection there-with (except as to the matters, the decision to which is specifically provided under this agreement), the same shall be referred to the sole Arbitrator appointed by Chairman, PICG. The agreement to appoint an arbitrator will be in accordance with the Arbitration and Conciliation Act 1996.
   5. The venue of the arbitration proceeding shall be the office of Arbitrator appointed by Chairman, PICGor such other places as the arbitrator may decide.
3. **Set Off**.
   1. Any sum of money due and payable to the bidder (including security deposit refundable to him) under this contract may be appropriated by the purchaser or BSNL or any other person(s) contracting through BSNL and set off the same against any claim of the Purchaser or BSNL or such other person or person(s) for payment of a sum of money arising out of this contract or under any other contract made by the bidder with the Purchaser or BSNL or such other person(s) contracting through BSNL.
   2. The bidder(s), who are given Purchase Orders, must give the details of the supplies made against all the Purchase Orders every month on the first working day of the following month to MM, and concerned Planning Branches of BSNL (Corporate Office).
   3. The bidder should furnish the name of his collaborator (if applicable), brand name, model No. and type of the products offered in this tender. The technical literatures of the products should also be submitted. No change in either technology or product shall be permitted after opening of bids.
4. **Fall Clause**.
   1. The prices once fixed will remain valid during the scheduled delivery period except for the provisions in clause in thissection. Further, if at any time during the warranty period.
      1. It comes to the notice of purchaser regarding reduction of price for the same or similar equipment/ service,

and /or

* + 1. The prices received in a new tender for the same or similar equipment/ service are less than the prices chargeable under the contract. The purchaser, for the purpose of delivery period extension, if any, will determine and intimate the new price, taking into account various related aspects such as quantity, geographical location etc., and the date of its effect for the balance quantity/ service to the vendor. In case the vendor does not accept the new price to be made applicable during the extended delivery period and the date of its effect, the purchaser shall have the right to terminate the contract without accepting any further supplies. This termination of the contract shall be at the risk and responsibility of the bidder and the purchaser reserves the right to purchase the balance unsupplied quantity/ service at the risk and cost of the defaulting vendor besides considering the forfeiture of his performance security.
    2. The bidder while applying for extension of time for delivery of equipment/services, if any, shall have to provide an undertaking as “We have not reduced the sale price, and/ or offered to sell the same or similar equipment/ service to any person/organization including Department of central/state Government or any central/state PSU at a price lower than the price chargeable under the contract for scheduled delivery period.”
    3. In case under taking as in clause is not applicable, the vendor will give the details of prices, the name(s) of purchaser, quantity etc. to the purchaser, while applying extension of delivery period.

1. **Court Jurisdiction**.
   1. Any dispute arising out of the tender/bid document/evaluation of bids/issue of APO shall be subject to jurisdiction of the competent court at the place from where the NIT/tender has been issued.
   2. Where a bidder has not agreed to arbitration, the dispute/claims arising out of the Contract/PO entered with him shall be subject to the jurisdiction of the Competent Court at the place from where Contract/PO has been issued. Accordingly , a stipulation shall be made in the contract as under:

**“This Contract/PO is subject to jurisdiction of Court at Delhi only”**

**SECTION V**

## PART B

### PART 1: SPECIAL TERMS AND CONDITIONS OF CONTRACT

1. The special conditions of contract shall supplement the `Instructions to the Bidders’ as contained in Section IV & “General Commercial Conditions of the Contract” as contained in Section V Part A, and **wherever there is a conflict, the provisions herein (Section V Part B) shall prevail over those in Section IV and Section V Part A**.
2. The bidder will abide by the Non Disclosure Agreement and therefore not disclose any information to any unwarranted source.
3. **Participation of Indian Agent or Principal/OEM**.
   1. Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in this tender.
   2. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in this tender for the same product.
4. Date fixed for opening of bids is, if subsequently, declared as holiday by BSNL, the revised schedule will be notified. However, in absence of such notification, the bids will be opened on next working day, time and venue remaining unaltered.
5. **Important Aspects during Bid Preparation**.
   1. Each and every page of the bid must be page numbered serially. Complete bid must be properly indexed and flagged. All documents should be placed in the sequence as given in the tender. If the bid is submitted in multiple volumes, the index of complete bid must be available in respective volume. Reference page number(s) of all the documents required as per the bid document must be clearly mentioned.
   2. **In case the bid is not submitted in the manner prescribed in the above clause, the bid shall be rejected**.
   3. Purchaser reserves the right to disqualify such bidders who have a record of not meeting contractual obligations against earlier contracts entered into with the purchaser.
   4. The Bid shall be liable to be rejected without seeking any clarifications from the bidder, if any of the above clauses are not complied by the bidder.
   5. **Vendors are required to offer only one option in terms of Make/Model as part of the Technical Bid; Bids offering multiple options will be rejected**.
6. **Ordering Quantity for works**.
   1. BSNL will order for Supply of all materials and services as per SoR given in Section V Part C and spares given in [Appendix F](#_SPARES_LIST_1).
7. The purchaser intends to limit the number of bidders selected for ordering against this tender to only one eligible bidder. The bidders for placement of order will be shortlisted after they meet the eligibility criteria. The bidders for placement of order will be selected from the list of the technically and commercially responsive bidders arranged in increasing order of their evaluated prices starting from the lowest evaluated price. The **lowest evaluated prices will be worked out on the basis of total project cost** comparison comprising of cost of each line item as per attached Price Bid [(Section IX Part II)](#_PART_II_:_1).
8. **Selection Process**. **The tender will be evaluated by Committee for Evaluation of Tender (CET) which will comprise of representatives of BSNL/PICG. The CET will adopt ‘Two Stage Processes’ to select the successful bidders who can execute this project on turnkey basis as per details given below.**
   1. **Stage I**. Inviting technical and financial bids through tendering process and short-listing techno-commercially responsive and compliant Bidders who fulfill the eligibility and special conditions as per requirements set against the project as defined in the tender document.
      1. The loading, if any, to be done as per the tender conditions in the financial bid shall be determined in this stage using the unpriced BOM and the technical bid submitted by the bidder. Necessary documents in form of manufacturing/ reputed third party lab reports to substantiate the compliance status of offered products/ systems with respect to technical specifications and tests mentioned in the tender documents will be submitted by the bidders as part of their technical documentation along with the bid. These documents will be one of the important technical evaluation criteria for this tender. The loading shall be done on the financial bid to be opened in the Stage-II.
      2. Techno-commercial evaluation will be done based on documentary proof of compliance to the tender requirements. The Committee for Evaluation of Tender (CET) shall assess conformance of all sub systems to meet the specifications given in the tender. In case of ambiguity/doubt in the technical literature submitted, the CET may, at its discretion, call for a demonstration of specific equipment(s) to ascertain adherence to the specifications of the tender. Such demonstrations shall be carried out by the bidder at a location to be specified by the purchaser, on No Cost No Commitment basis.
   2. **Stage II**.The financial bids of technically and commercially responsive and compliant bidders shall be opened and evaluated with the loading determined in the stage-I, for determination of the rankings of the various bidders. The lowest evaluated bidder shall be designated as L-1 for the purpose of ordering. Warranty charges for three years will be included in the basic cost of project. The supplier shall also quote for a year wise comprehensive AMC for seven years. The cost of AMC will be added to the basic cost of project for the purpose of financial evaluation. The evaluation will be done based on tender cost inclusive of cost of all items materials, spares as well as services (incl AMC charges). The evaluation will be done on the total cost of all items mentioned in the Price Schedule.
   3. **Disproportionate pricing for supply and services component of the tender as per prevalent industry norms shall render the bid to be rejected at the discretion of the Purchaser**.
9. The teams of BSNL/PICG while clearing the equipment/ stores will strictly adhere to the discipline as described in Purchase Order. Supplies made in full, “as per purchase order”, during delivery period only will be deemed to have been supplied within the schedule delivery period. The teams of BSNL/PICG while clearing the material offered for inspection will strictly adhere to regular inspection and discipline as prescribed in the purchase order.
10. The delivery of goods/services shall be completed as per delivery schedule mentioned in this tender. Failure to adhere to this delivery schedule will attract liquidated damages.
11. If a bidder who is given Purchase Order fails to supply during the stipulated delivery period, **the purchaser reserves the right to cancel the P.O. and encash the Performance Bank Guarantee**.
12. Purchaser reserves the right to blacklist a bidder for a suitable period in case he fails to honour his bid without sufficient ground. The Purchaser reserves the right to offer counter offer price(s) against the price(s) quoted by any bidder.
13. The bidders, who are given Purchase Order, must give the details of the supplies made against various purchase orders every month on first working day of the following month to Core Network Planning Cell & MM Cell of BSNL.
14. Minimum quantity to be quoted in the bid by the bidder is for 100% of the quantity.
15. The bidder must comply with all tender and GRs conditions. Clause by clause compliance for the tender document shall be submitted by the bidder along with the No deviation certificate.
16. The Bid shall be liable to be rejected without seeking any clarifications from the bidder, if any of the above clauses are not complied by the bidder.
17. **Audit and Technical Evaluation**. BSNL/PICG shall have the right to cause an audit and technical examination of the work and the final bills of the bidder including all supporting vouchers, abstract etc. to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the bidder under the contract or any work claimed by him to have been done by him under the contract and found not to have been executed, the bidder shall be liable the refund the amount of over payment and it shall be lawful for BSNL/PICG to recover the same from him and if it is found that the bidder was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by BSNL to the bidder.
    1. Provided that BSNL shall be entitled to recover any sum overpaid, nor the bidder shall be entitled to payment of any sum paid short where such payment have been agreed upon between the Divisional Engineer or his subordinate officer on one hand and the bidder on the other under any term of the contract permitting payment for work after assessment by the DGM (Projects).
    2. Any sum of money due and payable to the bidder (including security deposit returnable to him) under this contract may be appropriate by BSNL for the payment of a sum of money arising out or under any other contract made by the bidder with BSNL.
18. **Terms & Conditions**.
    1. The delivery of the goods and services including installation, integration, commissioning and documentation shall be completed **within specified period as per clause** .
    2. Purchaser reserves the right to blacklist a bidder for a suitable period in case he fails to honour his bid without sufficient ground. The Purchaser reserves the right to offer counter offer price(s)against the price(s) quoted by any bidder.
19. **Issue of POs and Time Limit**. The BSNL reserves the right to cancel or modify the scope of work stipulated to be carried out against the PO in the event of change of plan necessitated on account of technical reasons or in the opinion of the PO issuing authority, the bidder is not executing the work at the required pace.
20. **Indemnities**.
    1. The bidder shall at all times hold BSNL/PICG harmless and indemnify from against all action, suits, proceedings, works, cost, damages, charges claims and demands of every nature and descriptions, brought or procured against BSNL/PICG, its officers and employees and forthwith upon demand and without protect or demur to pay to BSNL/PICG any and all losses and damages and cost (inclusive between attorney and client) and all costs incurred in endorsing this or any other indemnity or security which BSNL/PICG may now or at any time have relative to the work or the bidders obligation or in protecting or endorsing its right in any suit on other legal proceeding, charges and expense and liabilities resulting from or incidental or in connection, with injury, damages of the bidder or damage to property resulting from or arising out of or in any way connected with or incidental to the operations caused by the contract document. In addition the bidder shall reimburse BSNL/PICG or pay to BSNL/PICG forthwith on demand without protect or demur all cost, charges and expenses and losses and damages otherwise incurred by it in consequences of any claim, damages and actions which may be brought against BSNL/PICG arising out of or incidental to or in connection with the operation covered by the bidder.
    2. The bidder shall at his own cost, at BSNL request, defend any suit or other proceeding asserting a claim covered by this indemnity, but shall not settle, compound or compromise any suit or other finding without first consulting BSNL
21. **Quality of Works**. The BSNL/PICG shall be the final judge of the quality of the work and the satisfaction of BSNL/PICG in respect there of set forth in the contract document. Laxity or failure to enforce compliance with the contract documents by BSNL/PICG and/ or its representative shall not manifest a change or intent of waiver. The bidder shall remain responsible for complete and proper compliance with the contract documents and the specification there in.
22. **Protection of Life and Property and Existing Facilities**. The bidder is fully responsible for taking all possible safety precaution during preparation for and actual performance of the works. The bidder shall protect all life and property from damage or losses resulting from his operations.
    1. The current market value of any commodities lost as a result of any damage to public/private property/persons shall be paid by the bidder together with such additional sums necessary to liquidate the personal of property damages, resulting there from.
23. **Insurance**.Without limiting any of his other obligations or liabilities, the bidder shall, at his own expense, take and keep comprehensive insurance including third party risk for the plant, machinery, men, materials etc. brought to the site and for all the work during the execution. The bidder shall also take out workmen’s compensations insurance as required by law and under take to indemnify and keep indemnified BSNL/PICG from and against all manner of claims and demands and losses and damages and cost (including between attorney and client) charges and expenses that may arise in regard the same or that BSNL/PICG may suffer or incur with respect to end/or incidental to the same. The bidder shall have to furnish originals and/or attested copies as required by the department of the policies of insurance taken within 15 (fifteen) days of being called upon to do so together with all premium receipts and other papers related thereto which BSNL/PICG may require.
24. **Compliance with Laws and Regulation**.During the performance of the works the bidder shall at his own cost and initiative fully comply with all applicable laws of the land and with any and all applicable by-laws, rules, regulations and orders and any other provisions having the force of law made or promulgated or deemed to be made or promulgated by the Government, Governmental agency or BSNL/PICG municipal board, Government of other regulatory or Authorized body or persons and shall provide all certificates of compliance therewith as may be required by such applicable law, By-laws, Rules, Regulations, orders and/or provisions. The bidder shall assume full responsibility for the payment of all contributions and pay roll taxes, as to its employees, servants or agents engaged in the performance of the work specified in the bidder documents. If the bidder shall require any assignee or sub bidder to share any portion of the work to be performed hereunder may be assigned, sub-leased or sub-contracted to comply with the provisions of the clause and in this connection the bidder agrees as to undertake to save and hold BSNL/PICG harmless and indemnified from and against any/all penalties, actions, suits, losses and damages, claims and demands and costs (inclusive between attorney and client) charges and expenses whatsoever arising out or occasioned, indirectly or directly, by failure of the bidder or any assignee or sub-bidder to make full and proper compliance with the said by-laws, Rules, Regulations, Laws and Order and provisions as aforesaid.
25. **Inspection, Test and Availability**.
    1. All materials furnished and all work performed under this Contract shall be inspected and tested. The Bidder shall furnish all manpower and materials for tests, including testing facilities, power and instrumentation, and replacement of damaged parts. The costs shall be borne by the Bidder and shall be deemed to be included in the contract price.
    2. The entire cost of testing for site acceptance, routine tests**,** production tests, acceptance test and other test during manufacture & site activities specified herein shall be treated as included in the quoted unit price of materials, except for the expenses of Inspector/Purchaser representative.
    3. Should any inspections or tests indicate that specific item does not meet Specification require­ments; the appropriate items shall be replaced, upgraded, or added by the Bidder as necessary to correct the noted deficiencies at no cost to the Purchaser. After correc­tion of a deficiency, all necessary retests shall be performed to verify the effectiveness of the corrective action.
    4. The Purchaser also reserves the right to require any retesting of previously approved tests at his expense. However if the retest(s) reveal non compliance to the specification, the Bidder shall bear the expense for the retesting and remedial action.
    5. **Inspection**. Access to the Bidder's facilities during system manufacturing and testing and to any facility where systems/ equipment are being produced/ tested/ integrated, shall be available to the Purchaser. At all times the Purchaser shall have full facilities for unrestricted inspection of such materials or equipment. To facilitate this, the Bidder shall submit for the Purchaser approval, a comprehensive Quality Assurance Plan using ISO 9000 as a general guideline. In addition, the Quality Assurance Plan shall satisfy the following:-
       1. Sufficient office facilities, equipment, and documentation necessary to complete all inspections and to verify that the equipment is being fabricated and maintained in accordance with the Specification shall be provided by the Bidder to the Purchaser.
       2. Inspections to be performed by the Purchaser will include visual examination of hardware, labelling, etc. Bidder's documentation will also be examined to verify that it adequately identifies and describes all offered items and spare parts.
       3. Access to inspect the Bidder's standards, procedures, and records that are applicable to the supplied equipment shall be provided to the Purchaser. Documents will be inspected to verify that the Bidder has performed the required quality assurance activities.
       4. The inspection rights described above shall also apply to sub Bidders who are responsible for supplying major components described in this Specification. These items may be inspected and tested at the sub Bidder's premises by the purchaser representatives prior to shipping this equipment to the Bidder's facility or directly to the purchaser.
       5. The above inspection rights shall also apply to sub Bidders supplying assemblies, subassemblies and components. However, such items will normally be inspected and tested by the purchaser’s representatives at the Bidder's site before acceptance.
       6. All materials furnished and all work performed under this Contract shall be inspected and tested. The Bidder shall furnish all manpower and materials for tests, including testing facilities, power and instrumentation, and replacement of damaged parts. The costs shall be borne by the Bidder and shall be deemed to be included in the contract price.
       7. All tests shall be witnessed by the BSNL/PICG reps and/or its authorised representative.The Purchaser’s representative shall sign the test form indicating approval of successful tests.
    6. **Testing Methodology**.
       1. There is a need to have an elaborate test methodology to ensure quality of supply and services being delivered as part of this tender. The following tests shall be conducted during the validation and implementation stage:-
       2. **Production Testing**.
          1. Production testing shall mean those tests which are to be carried out during the process of production by the Bidder to ensure the desired quality of end product to be supplied by him. The production tests to be carried out at each stage of production shall be based on the Bidder’s standard quality assurance procedures. The production tests to be carried out shall be listed in the Manufacturing Quality Plan (MQP), along with information such as sampling frequency, applicable standards, acceptance criteria etc.
          2. The production tests would normally not be witnessed by the Purchasers representatives. However, the Purchaser reserves the right to do so or inspect the production testing records in accordance with Inspection rights specified for this contract.
       3. **Factory Acceptance Testing (FAT)**.Factory acceptance tests shall be conducted by the Bidder/OEM on randomly selected samplesfrom final material to be supplied (at least 10% of batch size). Factory acceptance testing shall be carried out on all items being supplied. Equipment shall not be shipped to the Purchaser until required factory tests are completed satisfactorily and all variances are resolved.Full test documentation shall be delivered to the Purchaser along with the delivery of the equipment. Purchaser reserves the right to ask Bidder/OEM to carry out FAT in his presence.
       4. **Site Acceptance Tests (Site AT)**.
          1. The Bidder shall be responsible for the submission of all equipment supplied in this contract for site acceptance tests and inspection as required by the Purchaser. All equipment shall be checked on site immediately after delivery, as designated by the BSNL/PICG. Delivery sites for the purpose of conduct of Site AT shall be intimated by the purchaser after award of contract.
          2. Site ATshall be conducted immediately after delivery to ensure that there is no physical damage of material after dispatch from factory premises and that the quantities match the invoice.
          3. The site acceptance certificate will be issued by BSNL/PICG**.** Initial payment for supply shall be released only after successful conduct of Site AT.
       5. **RegionalAcceptance Tests (RegionalAT)**.
          1. Station level BoM (for all items in the SoR) shall be mutually decided during Low Level design activity (after issue of Advance Purchase Order). Regional AT shall mean installation/integration of all such items listed in the BoM for all stations in a particular Region,and activation of all intra-region services.Regional ATwill be undertaken by the reps of BSNL/PICG. The acceptance certificate for each Region will be issued by BSNL/PICG for release of second stage payment.An independent third party may also be appointed by the purchaser for conduct of acceptance testing on behalf of BSNL/PICG.National expressway/backbone shall be considered as one region for the purpose of this AT and release of second stage of payment.
          2. The bidder shall be responsible to provide test/ measurement tools and testers for conducting various tests.
          3. The bidder shall be obligated to remove defects/deficiencies pointed out by the Inspection Officers without any additional cost.
       6. **Network Acceptance Tests (Network AT)**.
          1. Network AT shall mean installation/integration of all network components as per the purchase order, integration of all regional networks with National expressway, testing of all intra/inter Region services and theNational Backbone/Expressway services, . Network AT will be undertaken by the reps of BSNL/PICG. The acceptance certificate will be issued by BSNL/PICG for release of third payment after successful completion of Network AT. An independent third party may also be appointed by the purchaser for conduct of acceptance testing on behalf of BSNL/PICG.
          2. The bidder shall be responsible to provide test/ measurement tools and testers for conducting various tests.
          3. The bidder shall be obligated to remove defects/deficiencies pointed out by the Inspection Officers without any additional cost.
    7. **Test Plans and Procedures**. **Test plans and test procedures for FATand AT shall be submitted by the Bidder as part of the Technical bid**. Purchaser reserves the right to add additional tests as deemed suitable. The list of tests shall be finalised after award of contract with mutual discussion between Purchaser and the Bidder.Test plans and test procedures shall ensure that each test is comprehensive and verify all the features of the equipment to be tested. Test plans and test procedures shall be modular to allow individual test segments to be repeated upon request.
       1. The Bidder shall submit a Test Schedule for SAT for the Purchasers approval within two weeks after the award of contract. The test schedule shall list the tests to be carried out, dates, and the approximate test duration. The test periods shall also be indicated in the PERT chart or equivalent for the work.
       2. The Bidder shall give the Purchaser twenty one (21) days written notice of any material being ready for testing.
26. **Test Records**.
    1. Complete and indexed records of all SAT and AT tests results shall be maintained and provided to the Purchaser by the Bidder in hardcopy and its scanned copy on DVD.
    2. All principle test records, test certificates and performance curves shall be supplied for all tests carried out as proof of compliance with the specifications and/or each and every specified test. These test certifi­cates, records and performance curves shall be supplied for all tests, whether or not they have been witnessed by the Purchaser. Information given on such test certificates and curves shall be sufficient to identify the material or equipment to which the certificates refer, and shall also bear the Bidder's reference and heading.
27. **Rejection of Elements**.
    1. Any item or component which fails to comply with the requirements of this Specification in any respect, at any stage of manufacture, test or on completion at site may be rejected by the Purchaser either in whole or part as considered necessary.
    2. Material or components with defects of such a nature that do not meet the requirements of the Specification by adjustment or modification shall be replaced by the Bidder at his own expense. Bidder shall submit the replaced items to the Purchaser for further inspection and/or tests.

**SECTION V**

**PART B**

PART 2 : PROJECT MANAGEMENT REQUIREMENTS **FOR TURNKEY IMPLEMENTATION ON NATIONWIDE BASIS**

1. **Allied Activities**
   1. **Transportation of Materials**. The bidder shall be responsible for transporting the materials, to execute the work under the contract, to the PICG site at his/ their own cost. The costs of transportation are subsumed in the standard Schedule Rates and therefore no separate charges are payable on this account.
2. **Project Management Aspects**
   1. **Objective**.To define process, logistics and flow chart with clear demarcation of activities and steps involved to design, plan & implement the project. The process will optimize the time line required in serial and parallel activities to streamline each & every activity, so involved.
3. **Project Management Organization**.
   1. The prospective bidders should have an efficient organization structure to handle the project on PAN India basis. The prospective bidders must submit the organization structure to handle & execute the project along with the bid.
   2. Minimum expected requirements from the prospective are as follows: -
      1. Well established organization structure.
      2. Pan India Presence.
      3. Adherence to timelines.
      4. Quality of network and services.
4. **Responsibilities & Obligations**
   1. **Bidder’s responsibilities and Obligations**. The Bidder's obligations include:
      1. The Bidder shall be responsible for implementation of project complying to the functional and performance requirements as per specifications.**Upto first four months (after issue of Advance Purchase Order)shall be the design/validation phase. During this phase of the project bidder shall undertake the following activities**.
         1. Submit a detailed project implementation/management plan containing design data, work method, schedules, project organization chart, safety, quality and manufacturing plan to BSNL/PICG for review and approval (within one month of issue of Advance Purchase Order).
         2. The bidder shall carry out sample survey site and ascertain site preparation and connectivity requirements for rollout of the project. Thereafter the complete network design would be prepared by the bidder in consultation with the Purchaser. This shall include the following:-
            1. Detailed network design to include Low Level Design (LLD). Service (traffic) matrix shall be provided by the purchaser during this phase; Bidder shall analyse the same and achieve best effort case for achieving the service matrix within the hardware/software ordered as part of the purchaser order. Bidder shall also review and work out the optimised logical connectivity requirements of DWDM nodes, if required.**A detailed site wise BoM shall be generated based on the LLD; in case of unavoidable variations in the requirement of hardware/software as compared to the ordered SoR, bidder shall be paid on actuals. Purchaser reserves the right to accept/decline the said variation(s).**
            2. **Validation Test**. The Bidder will be required to establish a test bed (in Delhi NCR region) for carrying out Proof of Concept (PoC) for validation of functional requirement of the offered products/solution. During this validation test, Bidder will have to demonstrate a transmission network comprising of minimum six DWDM nodes (three Large nodes, two medium nodes and one small node), six POTS equipment (Two of each type), two PRCs, two SSUs, EMS/NMS, Network Planning Tool, LCT etc as offered in the bid. Bidder will be required to demonstrate the EMS/NMS features, service provisioning, data handling, protection/restoration, switching, intelligent control plane, and other functional requirements/ technical specifications as given in this tender. Any additional hardware/ software required to verify the functional requirements/ technical specifications as given in this tender shall also be deployed by the bidder. OFC links shall be simulated using fiber spools of requisite lengths to demonstrate the system capabilities. The validation tests shall be duly evaluated by reps of BSNL/PICG. The entire setup deployed as part of the test bed shall be duly transferred to PICG Test & Validation lab being established as part of a separate tender or shall be deployed in other PICG locations. Hence the items deployed as part of the test bed form a part of the deliverable of the project and have been included in the SoR. The exact test cases for evaluation of the test bed shall be submitted by the bidder as part of the Technical Bid. The Purchaser shall duly approve the proposed test plans and ascertain that the operational requirements are being evaluated.
            3. Submit detailed Implementation Plan along with timelines for Supply & Delivery Schedule of equipment and rollout of the network, in consonance with the higher level delivery/implementation plan given in this tender.
            4. Submit Project Management Plan.
            5. Submit Test Plan for conduct of Acceptance Tests.
         3. The low level design, site wise BoM, project management/implementation plans, project management organisation, detailed work schedule, validation tests etc would be duly approved by the Purchaser prior to commencement of work for implementation of the network.

* + 1. Site visits, and studies necessary to identify and develop the installation guidelines and procedures including testing and documentation.
    2. The Bidder shall submit the project organization chart appointing key personnel for the project such as Project Manager, Site Manager, Design Engineer, Installation & Testing Engineer etc, (within one month of award of contract).
    3. Project management, project scheduling, including monthly project reports documenting progress during the contract period.
    4. Engineering and technical assistance during the contract and warranty period.
    5. Supply, installation, inspection, delivery at site including all accessories required.
    6. Facilitate site acceptance testing of all equipment provided.
    7. All documentation as specified.
    8. Training of the PICG personnel.
  1. **Purchaser responsibilities and obligations**.BSNL/PICG will provide the following items and services as part of the procurement project:
     1. Review and approval of the Bidder's designs, documents, survey report and recommendations.
     2. Review and approval of test procedures.
     3. Participation in and approval of FAT, SAT and A/T.
     4. Review & approval of training plans.
     5. Providing support and access to facilities at the sites.
     6. Providing input / support required by the Bidder during testing & commissioning.

1. **Organization**.The Bidder shall identify the project team, clearly identifying the key personnel for the following activities at the least; additional roles if felt necessary by the bidder may be defined and personnel deployed accordingly.

|  |  |  |  |
| --- | --- | --- | --- |
| **Ser No** | **Key Roles** | **Minimum Qualification** | **Minimum Experience related to project scope (Yrs)** |
|  | Project Manager | B.E/B Tech, MBA and PMP | 10 |
|  | Design engineer(s) | B.E/B Tech | 05 |
|  | Site Engineer(s) for installation/integration | B.E/B Tech (OEM Certified) | 03 |

* 1. The project team shall be headed by a senior level executive who shall be responsible to BSNL/PICG for the execution of the project. Separately designated functions shall be identified for each of the areas mentioned above. These functions shall have sufficient personnel to coordinate technical/procedural matters and to quickly resolve any day to day issues of the Bidder and also to resolve quickly any queries or references made by BSNL/PICG.
  2. Bidder shall submit detailed Bio-data of their key personnel, within one month of issue of Advance Purchase Order.
  3. **General Requirements of Programs and Schedules**.
     1. Bidder *shall include in his Bid proposal a Level-1 (L-1) network showing the major activities and various major milestones to achieve the Commercial Operation Date.* In case of award of contract, the Bidder shall use **Primavera (latest edition) Software or equivalent** to develop and monitor the Detailed Project Master Network. The schedule shall fully inter-relate design and manufacture. Events shall indicate points in the programs at which a significant stage has been reached and which is of sufficient status for reporting to management. All programs containing scheduled dates including those for design, manufacturing shall be adhered to by the Bidder and shall not be changed except as may be agreed by BSNL/PICG. The Bidder shall designate a Planning Representative who shall be readily available at all reasonable times to the BSNL/PICG and who shall be of sufficient status to have free access to the Bidder's management staff and to the Bidder's and Sub-Bidders workshops, site works etc. and shall be able to represent the Bidder on all matters of planning and progress.
     2. The Bidder shall not change the Master Network without prior intimation to BSNL/PICG. In the event that BSNL/PICG have comments to a revision to the Master Network in accordance with the Conditions of Contract, the Bidder shall submit a revised Master Network within two weeks thereafter. Such a revised program shall become the Overall Contract Program for the outstanding works.
     3. **Manufacturing and Delivery Schedule**.The Bidder shall submit to BSNL/PICG his detailed manufacturing and delivery/implementation schedules for all equipment within one month from the date of issue of the Advance Purchase Order, in accordance with delivery/implementation schedule given in the tender. Such schedules shall be in line with the detailed network plan for all phases of work. Such schedules shall be reviewed, updated and submitted to BSNL/PICG, once in every two months thereafter, by the Bidder. Schedules shall also include the materials and equipment purchased from outside Bidders. The Bidder shall also submit the program for procurement of bought out items, and shipping schedule, for BSNL/PICG approval.
     4. **Monitoring, Progress Reporting & Management Information System**. The progress reports shall be issued every month by the Bidder. Reports shall include such schedules, charts and drawings as BSNL/PICG considers necessary for adequately monitoring the Contract. The reports shall be made available to BSNL/PICG at least five working days prior to scheduled progress review meeting. The progress report should necessarily include the following sections: -
     5. Report on key milestones.
     6. Management summary indicating critical areas with details of actions Initiated and its effect, if any, on the project.
     7. Action needing attention of BSNL/PICG.
     8. Detailed location wise status of survey, delivery, installation, integration etc.
     9. Critical Path Analysis along with corrective actions.
  4. **Project Co-ordination Meeting**.The Bidder and his sub-vendors will be called upon to attend project coordination meetings with BSNL/PICG, other Bidders, Consultants or agencies authorised by BSNL/PICG during the period of execution of Contract. The Bidder including his sub-vendors shall attend such meetings at their own cost at BSNL/PICG office or at any other venue, as specified by the purchaser, as and when required, and fully cooperate with such persons and agencies involved during those discussions
  5. **Cooperation with other Bidders and Consulting Engineers.** The Bidder shall cooperate with BSNL, PICG, other Bidders and Consulting Engineers and freely exchange with them such technical information as are necessary to obtain the most efficient way and to avoid unnecessary duplication of efforts. Purchaser (BSNL/PICG)'s Consulting Engineer shall be provided with copies of all correspondences addressed by the Bidder to other Bidders and Engineers in respect of such exchange of technical information.

1. **Resident Engineers** will be provided during warranty and AMC as follows:-
   1. One resident engineer per shift in National NOC on two shift basis (total 02).
   2. One resident engineer per shift in DR Central NOC on two shift basis (total 02).
   3. One resident engineer per shift in each of the six Regional NOCs on three shift basis (total 18).
   4. Resident engineers shall be OEM certified, competent to handle the DWDM/POTS/synchronisation systems and other equipment/accessories supplied under the contract. They should have at least two year experience of managing similar systems.
2. **Project Management, Schedule and Implementation Plan**. **This section describes** the project management, schedule, quality assurance, and implementation plan requirements for the Project.
   1. **Project Management**. The Bidder shall assign a Project Manager with the authority to make commitments and decisions that are binding on the Bidder. The Project Manager's responsibility shall be interface and coordination with the Project Bidder. The BSNL/PICG will designate a Project Manager to coordinate all the Purchasers project activities. All Project correspondence and communications between the Purchaser and the Bidder shall be coordinated through the Project Managers.
   2. The project shall be staffed from the list of project management and engineering personnel presented in the proposal. The assignment and reassignment of the Bidder's principal participants in the project shall be subject to the Purchaser's approval.
   3. **Reporting Period**. The Project Manager shall provide updated project schedules and complete progress reports on fortnightly basis for the duration of the project. All references to the reporting period throughout this Specification shall refer to this period.
   4. **Progress Meetings**. The Project Managers shall schedule and attend Progress Meetings as deemed necessary but no less than once in every month.
   5. **Transmittals**. Every document, letter, progress report, change order, and any other written or electronic media transmissions exchanged between Bidders and the Purchaser shall be assigned a unique transmittal number. Discussions, phone calls and e-mails where project related information is exchanged shall be documented in a transmittal. The Bidder shall maintain a correspondence index and assign transmittal numbers consecutively for all Bidder documents. The Purchaser will maintain a similar correspondence numbering scheme identify­ing documents and correspondence that the Purchaser initiates.
   6. **Use of Consultants**. The Purchaser shall have the option of adding consultants to the transmittal distribution list and document distribution list to receive all correspondence and all or selected system documents. The consultants will be bound by the same confidenti­ality restrictions imposed on the Purchasers personnel.
3. **Variance Reporting and Processing**
   1. An automated variance recording and tracking system shall be placed in service within one month from the date of issue of Purchase order. This system shall be designed to record and track variances for documentation deficiencies, functional deficiencies, performance deficiencies, procedural deficiencies (as when deviations from contractually required QA procedures are observed), and test deficiencies (as when the System cannot satisfactorily pass a step within a test procedure).
   2. Variances may be initiated by both Bidder and BSNL/ PICG personnel and shall be classified as follows:-
      1. Open (recorded but not necessarily agreed to).
      2. Assigned (denoting acceptance by the Bidder).
      3. Pending (denoting fixed, in the Bidder’s opinion, and awaiting retest or verification).
      4. Resolved (denoting Purchaser acceptance or verification).
   3. For the tracking of the variances and to support the automatic printout of subset lists, the following information fields shall be stored for each variance:
      1. Variance number (automatically assigned).
      2. Date initially recorded.
      3. Status (open/assigned/pending/resolved).
      4. Date current status recorded.
      5. Names of involved BSNL/ PICG representatives.
      6. Names of assigned Bidder personnel.
      7. Subsystem involved.
      8. Test name (where applicable).
      9. Description (up to five lines in a full printout and part of the first line in a one-line-per-variance printout).
      10. Urgency description (1, 2, or 3).
   4. The variance recording and tracking system shall allow full printouts of all of the above information, condensed printouts of abbreviations of the above information (one-line-per-variance) and shall produce subsets of the variances based on searches of the fields singly or in combinations. For example, it shall be possible to produce a printout of all the variances (and only those variances) that were at level 1 or 2 urgency, concerning a specific named subsystem, had open or assigned status, and were initiated within a named period.
   5. Depending on its impact, each variance shall be assigned to one of three urgency levels the Bidder with BSNL/ PICG Purchaser having level assignment approval rights.
      1. **Level 1**. Testing will stop for immediate evaluation and correction by the Bidder.
      2. **Level 2**. Testing will continue and the variance will be corrected at the end of the current session or day.
      3. **Level 3**. Testing will continue and the variance will be corrected and tested at a mutually agreed upon time (e.g., at the end of the test or later in the test period prior to shipment).
   6. A variance status summary shall be included in the monthly project progress reports, and up-to-date variance reports shall be made available to Purchaser on demand.
   7. The variance recording and tracking system shall be subject to approval by Purchaser.
4. **Project Schedule**. The project schedule shall consist of an implementation schedule, a documentation schedule.
   1. **ImplementationSchedule**.
      1. The Bidder shall produce and maintain the implementation schedule using Microsoft Project®. Primavera/Maximo/any other equivalent ERP solution with web based capability. A copy of the implementation schedule files on a / DVD or CD-ROM shall also be provided to the Purchaser. The overall project plan shall consist of a Milestone Plan and a detailed Schedule Plan.
      2. The Bidder shall provide a critical path analysis report and a manpower resource analysis report. Other standard reports will be defined during the Work statement.
      3. Within two weeks of contract signing, the Bidder shall submit detailed project schedule, as described below. The project schedule shall include all tasks to track overall direction and integration of the project from inception through completion. The Schedule Plan shall be developed utilizing the concept of Work Breakdown Structures. No task shall be greater than 3 weeks in duration.
      4. The implementation schedule shall include the project milestones, the Bidder activities, and the Purchasers activities. The project schedule shall be an accurate representation of the progress and planned activities of the project.
      5. The actual progress made to date and the scheduled date for the systems shall be closely monitored by both the Bidder and the Purchaser project managers. This application will be web server based. The following information shall be reported to the Purchaser in a clear and concise manner using the tabular and graphic capabilities of the project management software.
         1. An overview and general assessment of all the Purchaser and Bidder activities and any progress or delays in these activ­ities since the last reporting period.
         2. Identification of tasks in the critical path together with an analysis indicating any required remedial action.
         3. The amount of contingency time (float) remaining in the schedule.
         4. Information on each task, including:
            1. Estimated start and finish dates.
            2. Any change in the estimated dates since the last reporting period.
            3. Estimated total number of calendar-days to complete the task.
            4. Percent of task completed.
            5. An indication of whether the start date was manually entered or computed.
         5. Total project resources.
         6. The tasks to begin in the next two reporting periods.
         7. The tasks to be completed in the next two reporting periods.
         8. The tasks completed in the last two reporting periods.
      6. The content and format of the project schedule shall be subject to the Purchasers approval. The Bidder shall update and submit the project schedule to the Purchaser at least one week prior to each progress meeting.
5. **Progress Reporting**. With the intent to assure quality management and project progress as per the implementation schedule, progress reports submitted for each reporting period and Progress Review Meetings shall focus on the following:-
   1. **Fortnightly Progress Reports**. A Fortnightly Progress Report shall be prepared by the Project Manager that includes inputs from all its subsystem. The report shall be made available to the Purchaser as hard copy by the 5th and 20th day of each month and shall include but not be limited to:
      1. Updated project schedule highlighting any deviations from the previous issue of the project schedule.
      2. Explanation and anticipated effect of each schedule deviation and its implication to the Purchaser.
      3. Schedule recovery plan for any deviation incurring a delay in delivery date.
      4. A summary of activities performed by the Bidder and the Purchaser during the previous reporting period.
      5. An updated list of all correspondence transmitted and received by the Bidder.
      6. List of all Bidder personnel and the Purchaser person­nel resident at the Bidder facility, identifying all activi­ties performed by each person and the activities scheduled for the next two reporting periods.
      7. Updated list of Bidder and the Purchasers action items with status, description of required information, and required resolution dates.
      8. Summary of pending and upcoming Bidder and the Purchaser activities during the next two reporting periods along with required completion dates.
      9. Status of unresolved contract questions and change re­quests.
      10. Summary of variances.
      11. Description of current and anticipated project problems and steps to be taken to resolve each problem.
   2. **Bi-Monthly Progress Review Meetings**.
      1. Progress Review Meetings shall be scheduled by the project managers and attended by the Bidder and the Purchaser to review progress of the project. Progress meetings shall be used to review the progress reports for the previous reporting periods, written correspondence exchanged since the last meeting, and open action items.
      2. The Bidder shall also attend technical meetings as required to discuss technical aspects of the project and to review the Purchaser comments on approval documents.
      3. All meetings shall be held at the Purchaser's offices or at other venues as specified by the purchaser The Bidder Project Manager shall record the minutes of each meeting and shall provide hard copies to the Purchaser and all attendees on the same day whenever possible, but not later than within two working days after the meeting.
      4. Progress review meeting(s) may be called for earlier than the bi-monthly schedule also, at the discretion of the purchaser.
6. **Implementation Steps**.The basic implementation steps pertaining to the project are:-
   1. Design & parameterise the system, including implementation strategies.
   2. Conduct site surveys, identify equipment locations and required site preparations.
   3. Subsystems design, manufacture.
   4. Delivery, installation, integration for above.
   5. Site Acceptance testing.
   6. A/T of the integrated network.
   7. The Bidders shall propose preliminary implementation plans as part of the bid. The Purchaser and the Bidder shall finalise the detailed implementation plan following the award of the contract
7. **Resource Control**.To enable the Purchaser to assess whether the Bidder's proposals are adequate to meet the Contract requirements, the Bidder shall describe his resource management system.
   1. The Bidder in his proposal shall define the resources that shall be deployed during design, delivery, installation, and commissioning phases and show that those will be adequate to meet the Contract commitment.
   2. Following the placing of the Contract, the Bidder shall submit monthly resource deployment schedules segregated into design, delivery, installation and commissioning.
   3. Bidder shall have facility and proper material management system in place to keep inventory of major supply items and accessories in advance of installation schedule.
8. **Purchaser’s Rights**. The Purchaser reserves the right to evaluate and audit the Bidder's project management organisation, systems and control measures concerning Contract Management, Management Information, Program Management, Resource Management, Quality Assurance, Design, Production and Manufacture, Industrial Relations, Testing, Commissioning, Sub-Contract Control and Site Management. The Bidder shall provide all necessary assistance to enable the Purchaser's Engineers to carry out such audits and evaluations. Such audits and evaluations shall not in any way relieve the Bidder of any of his liabilities and responsibilities under the Contract. A corrective action program shall be agreed and implemented in respect of any deficiencies revealed by such monitoring, without any cost implication to the Purchaser and impact on the time schedule for the project.
9. **Training**. The bidder shall provide suitable O&M training to all the Project implementation teams nominated by PICG as per the details below:
   1. Training shall be imparted at PICG designated sites.
   2. Training schedule:
      1. For a period of 10 working days (8 hours each day).
      2. Five (5) days are compulsory for on the job training   
         (Installation, testing, operation, commissioning,service provisioning, fault rectification and maintenance of DWDM, POTS, PRC, SSU, EMS/NMS, T&M equipment and all other items as mentioned in the SoR).
      3. Training shall be provided for the number of days specified above during warranty as well as AMC period, once in every six months, at 10 different locations (to be decided by the PICG). First batch of training will be conducted immediately after installation/commissioning of the system.
   3. Maximum number of trainees per batch: 20.
   4. **Selection of Trainees**.
      1. Trainees shall be nominated by the purchaser.
      2. The bidder shall specify the pre-training qualifications required of the trainees.
   5. **Trainer/Instructor**.
      1. Trainer/Instructor shall be appointed by the bidder.
      2. All the instructors/trainers shall be OEM certified and possess high technical ability to impart training.
      3. Trainer should have minimum of five (5) years of work experience in relevant systems and training experience on the related subjects.
   6. **Training Expectations**.
      1. The training shall be sufficiently comprehensive and include hands on practical operations to allow trainees to carry out installation, operation and maintenance, supervise etc. Independently.
      2. Sufficient diagrams and explanatory material shall be prepared by the bidder and distributed to the trainees during the training sessions.
      3. The persons trained are expected to train the other people at the Purchasers end.
   7. **Training Material**.
      1. The bidder shall provide the sufficient training material and explanatory notes to the trainees during the training period one set for each trainee.
      2. The training material (text books, notes etc.) provide to the trainees shall cover all the aspects of the installation practices & procedures, testing, preventive maintenance and fault finding/rectification.
      3. The training material (text books, notes etc.) provided to the trainees shall be in English.
   8. **Training Certifications**. Bidder shall provide the training certifications to the trainees after the successful completion of the training after conducting the test.
   9. **Training Cost**. The training cost during warranty period of three years (ie total 60 batches @ 10 batches per six months) shall be included in the space provided in the price schedule.**Training cost for AMC period shall be assumed to be included in the quoted AMC rates**.
   10. **Schedule**. Training schedule shall be mutually decided between the bidder and purchaser.

**SECTION V**

**PART B**

### PART 3 : MAINTENANCE REQUIREMENTS

1. **Warranty and Annual Maintenance Contract (A M C)**.
   1. The supplied solution shall be under **warranty for a period of three years** from the date of successful acceptance testing and commissioning of the project. On expiry of warranty successful bidder will be required to enter into Annual Maintenance Contract with the purchaser for a period of seven years as per Annual Maintenance Contract Agreement.
   2. The supplier shall quote for a year wise comprehensive Annual Maintenance Contract for 7 years to be signed at the end of warranty period. The cost shall be quoted as a lump sum including cost of resident engineers and site visit of any specialists as and when required.
   3. Towards fulfilment of vendors obligation in respect of AMC obligation the vendor is required to submit, three months before the expiry of warranty period, a **performance bank guarantee of 2% of the original purchase order value, valid for a period of seven and half years from the date of expiry of warranty period**. The 5% PBG taken initially will be released only after submission of the 2% PBG stated above, subject to the fulfilment of other terms and condition of the purchase order. **A separate agreement for AMC of complete equipment will have to be signed by the Bidder before expiry of warranty period.** The agreement shall remain in force for Seven years from the expiry of the warranty while at the same time the terms and conditions of this agreement shall also apply during the warranty period, except for payment of charges to the supplier. **Extension of agreement beyond seven years shall be negotiable depending upon the performance of supplier during the agreement period**.
   4. The cost of AMC will be added to the basic quotation for the purpose of evaluation at the discount rate of 12% per year. Since the AMC is to be entered at the end of warranty period of three years, the calculation for NPV of AMC will be done as follows:-
      1. Net Present Value (NPV) of AMC = Quoted rates for AMC for 1st year / (1.12)4.
      2. + Quoted rates for AMC for 2nd year / (1.12)5.
      3. + Quoted rates for AMC for 3rd year / (1.12)6.
      4. + Quoted rates for AMC for 4th year / (1.12)7.
      5. + Quoted rates for AMC for 5th year / (1.12)8.
      6. + Quoted rates for AMC for 6th year / (1.12)9.
      7. + Quoted rates for AMC for 7th year / (1.12)10.
   5. **If the bidder quotes AMC rates less than 3% of the total cost of project, the bid evaluation will be done on 3% of the total cost of project**.
   6. During warranty AMC the bidder shall perform all the functions as enunciated free of cost. All the penalty clauses shall be applicable during the period of warranty/AMC.
   7. BSNL/PICG reserves its right to procure, during the warranty period, additional quantity of any item or maintenance spares in the form of modules / units / cards at prices finalized during the tender.
   8. **Teaming Agreement**. The bidder shall have Teaming Agreement with **all OEM partners** for providing services, maintenance support, Warranty and AMC obligation which shall be valid for Ten Years. However, for repair of cards/modules and maintenance, BSNL/PICG shall not be liable to interact with any of the OEMs/ partners/ collaborators or subcontractors of the bidder.
   9. Bidder should guarantee the spares so long as the equipment is in service, at least for 10 years from the date of commissioning the project. The purchaser would like to stock spares as and when the supplier decides to close down the production of the offered equipment. In such event, supplier shall give a two years notice to the purchaser so as to stock the spares.
   10. All layers of the NFS network are being implemented as separate tenders in a staggered time frame. It is planned that the Unified NMS (UNMS) tender shall incorporate Managed Services component as a single window maintenance contract for the complete NFS network. There is hence a need for Bidders of all layers to extend AMC Services as part of each individual contract to the selected Managed Services Provider.
   11. A separate agreement for AMC of complete equipment will hence have to be signed by the Bidder with BSNL/PICG or a third party Managed Services Provider nominated by the BSNL/PICG, before expiry of warranty period. The agreement shall remain in force for seven years from the expiry of the warranty. The terms and conditions of this agreement shall apply during the warranty period as well as the AMC period of seven years. Extension of agreement beyond seven years shall be negotiable depending upon the performance of supplier during the agreement period.
2. **Maintenance**.
   1. The nationwide optical transmission backbone system to be maintained during warranty/AMC will comprise of 1x National NOC, 1x DR NOC 6xRegional NOCs, DWDM, POTS, PRC, SSU, T&M equipment, IT equipment, hardware, software and all other items, accessories supplied/installed under the contract.
   2. The bidder shall have Maintenance Centres in India as per requirement of the Bid. The bidder has to set up more such Centres, if required. The bidder shall furnish the names, locations, complete postal address, telephone numbers, email and FAX numbers of all Maintenance Centres within 30 days of issue of Advance Purchase Order and again at the time of signing the AMC Agreement. The bidder shall also specify the areas/stations to be covered by each Maintenance Centre.
   3. The Maintenance Centres shall work as repair Centers and they shall be responsible for repairing the faulty cards/units and shall also maintain a requisite minimum stock of such cards/equipment often going faulty, in order to keep the down time within limits as envisaged in this agreement.
   4. The lead bidder shall ensure that all the Maintenance Centers are manned by fully competent Engineers and are capable of giving all types of necessary technical guidance/assistance over phone to the respective resident engineers/PICG representatives for fast restoration of faults.
   5. **Software Support**. The following activities shall constitute **Warrantyand AMC** obligations:-
      1. Analysis and bug fixing on being notified by the purchaser.
      2. Provision of all patches/upgrades/updates (on physical media), free of cost.
      3. Reloading of software in case of system crash.
3. **Description of Work**.
   1. The BIDDERshall be responsible for the maintenance of nationwide optical transmission backbone system to be maintained during warranty/AMC comprising of 1x National NOC, 1x DR NOC 6xRegional NOCs, DWDM, POTS, PRC, SSU, T&M equipment, IT equipment, hardware, software and all other items, accessories supplied/installed under the contract, to include, but not limited to all required preventive measures, rectification of faults and restoration jobs achieving the laid down systems availability.
   2. Any refusal of team for taking up maintenance and preventive maintenance work shall be treated as failure of team to attend failure in network and penalty may be imposed accordingly.
   3. The maintenance bidder is planned to be fixed for a period of seven years after expiry of warranty period.
   4. During the period of warranty/AMC the SUPPLIER shall provide full & time bound assistance in integrating the NMS/EMS/middleware and associated systems with any other NMS (including umbrella NMS) as required by BSNL/PICG. Bidder shall also provide API’s of systems supplied by it against the Purchase Order for sharing with NMS or similar systems supplied for the purpose of integration.
4. **Time-To-Restore & Quality of work**.
   1. **Restoration Time**.The maximum restoration time is allowed for different types of faults is as given under :-
      1. **Critical Faults**.Critical faults are those which affect the functioning of the whole system at national or regional level. Such faults will be restored within 4 hours of reporting irrespective of the time of fault reporting, holidays etc. Penalty will be imposed at the rate of Rs 50,000/- per hour or part thereof thereafter.
      2. **Severe Faults**.Severe faults are those which affect the functioning of a part of the system. Such faults will be restored within 24 hours of reporting irrespective of the time of fault reporting, holidays etc. Penalty will be imposed at the rate of Rs 50,000/- per 4 hours or part thereof thereafter.
      3. **Normal Faults**.Normal faults are those which affect a particular card/module without much affecting the overall system functionalities. These also include faults in items such as T&M equipment, accessories, etc. Such faults will be restored within 72 hours of reporting irrespective of the time of fault reporting. Penalty will be imposed at the rate of Rs 50,000/- per 48 hours or part thereof thereafter.
      4. Bidder is expected to maintain spares inventory to achieve the laid down repair time/uptime. However, in case of crisis, spares available with the purchaser may be utilized to repair the system, but the same shall be replenished in a reasonable time frame (maximum 15 days), failing which ten times the cost of the item utilized shall be deducted from the payment due or bank guarantee may be encashed.
      5. Any holidays/weekends will be counted towards calculation of repair time.
      6. **Uptime**. In addition to above mentioned repair time, an overall system uptime of 99.9 % shall be maintained by the bidder as part of warranty/AMC. Uptime shall be calculated on quarterly basis as given below.
         1. **Critical Faults.** Downtime = repair time = A
         2. **Severe Faults.** Downtime= 50% of repair time = B
         3. **Normal Faults.** Downtime = 10% of repair time =C
         4. **Total Downtime = sum of A, B and C = D**
         5. **Uptime (in %) = ((Total time – D)/Total Time)x 100**
      7. In case the laid down uptime is not achieved at the end of the quarter, penalty shall be levied @ Rs 2,00,000/- (Rs Two lac Only) per 0.1% of degradation in performance or part thereof, which shall be deducted from the payment due or bank guarantee may be encashed.
   2. **Record of Fault Repair Time**.Time taken by the Bidder from the time of lodging the complaint to the resident engineer up to the time of restoration of end-to-end functionalities after rectification of fault(s) shall be considered for calculation of penalties. The Repair time of any fault occurred shall be calculated by collecting data from respective NOCs. After restoration of the system, a fault report is to be generated by bidder and signature obtained with PICG, NFS site representative for records.
      1. **Maintenance Plan**. The Bidder as part of the tender response has to submit a detailed plan for the maintenance of the network including the details of the man-power and equipments proposed to be located at different sites to cover the jurisdiction. The Bidder shall mobilize the maintenance team & the equipment within 14 days from the date of acceptance testing. Submission of monthly & emergency report as desired by Network Manager in the Performa specified by PICG, NFS will also be a part of maintenance contract.
      2. **Supply of Consumables/ Items**. Supply of spares/consumables/ items required for carrying out repairs/replacement etc shall be the responsibility of the bidder. Bidder has to keep minimum stock of required spares to the satisfaction of Engineer in Charge BSNL/PICG to meet the laid down uptime/MTTR.
5. **Conditions of Maintenance Contract**.
   1. While quoting, it is advisable that the prospective bidder shall make themselves fully conversant with the locations and types of jobs in details to be carried out therein as per the tender requirement, so that they clearly understand the scope of work and assess the requirement of resources to complete the work in scheduled time.
   2. The BIDDER shall be totally responsible for the successful execution of the maintenance contract.
   3. **The Bidder shall not sub-contract whole or any part of the work without explicit clearance from PICG**.
   4. Zonal Network Managers (NFS) shall be entitled to reject the goods, materials and work executed by the bidder, which may not be conforming to the specifications within a reasonable time of installation of the said goods and materials.
   5. The BIDDER shall be totally responsible for the calibration & functionality of test equipment to be used at site. All the tools & Test instruments shall be duly certified by the authorized agency. Bidder should not shift the test instruments from the site and is liable for penalizing if found so.
   6. During the course of execution of the work, if any discrepancy or inconsistency, error or omission in any of the provisions of the contract is discovered which needs to be clarified, the matter shall be referred to PICG, NFS Cell, New Delhi who shall give its decision in the matter and this decision shall be final and conclusive.
   7. Inspection and acceptance of the work shall not relieve the BIDDER from any of his responsibilities under this contract.
   8. The BIDDER shall observe in addition to codes specified in respective specification, all national and local laws, ordinances, rules and regulations and requirements pertaining to work and shall be responsible for extra costs arising from violations of the same, which shall be borne by the Bidder.
   9. By entering into the maintenance contract with PICG, the bidder shall agree to maintain the secrecy of all documents/information/drawings etc provided by PICG during the period of contract and shall handover all the documents back immediately after the termination of the contract.
   10. In case purchaser feels that the bidder is not able to execute the work to the satisfaction of PICG, then Rep of PICG shall be at his own discretion can engage other agencies to ensure the smooth execution of the job at the risk and cost of the bidder.
   11. The BIDDER shall be solely responsible for making available for executing the work, all requisite equipment, special aids, tools and testing equipment and appliances. Such equipment etc. shall be subject to examination by the PICG representatives and approval for the same. Any discrepancies pointed out by the PICG representatives shall be immediately got rectified, repaired or the equipment replaced altogether, by the BIDDER.
       1. All faults shall be intimated to the BIDDER'S resident engineer or Maintenance Centres by PICG officers or the Engineer-in-charge BSNL/PICG, as indicated through telephonic communication, SMS, e-mail or through fax. For this the BIDDER shall provide NOCs/SOCs with the contact number, landline and Mobile & e-mail address / Fax no. within 14 days from the award of the contract.
       2. While executing the job at site by the BIDDER, penalty claimed against any damage caused to the infrastructure of PICG & other parties shall be borne by the Bidder.
       3. Bidders are advised to submit their quotations strictly based on the terms, conditions, and specifications in the tender document and not to stipulate any deviations.
   12. **The BIDDER becomes defaulter on the following conditions**:-
       1. If he fails to repair fault and make the system/card/module available within time limits as laid down.
       2. Improper maintenance resulting in down time/ loss of parts.
       3. Loss or damage to PICG property due to the acts of Bidder.
6. **Termination of Contract**. PICG reserves the right to interrupt and terminate the contract at any time after giving **twomonths notice,** should in PICG’s opinion, the cessation of work become necessary, owing to paucity of funds of the Bidder, the Bidder’s apparent inability to perform, non possession of personnel, equipments and tools required for the work or defective and malfunctioning equipments, non-availability of proper/nominated instrumentation, inability to provide men and material, repeated slippages/defaults and payment of penalty thereof or for any other cause deemed reasonable . In such case, the payment due to the bidder shall be paid for in full at the rates specified in the Contract subject to the clause of penalty/Liquidated damages contemplated herein. **The security deposit will be forfeited & Bank guarantee shall been encashed in such case of termination,** if deemed required as per PICG’s opinion.
7. **Income Tax**. Income Tax at the prevailing rate as applicable from time to time shall be deducted from the BIDDER’s bills as per Income Tax Act and quoted Rates shall be deemed to include this.
8. **Escalation**. The maintenance charges quoted by the BIDDER shall be kept firm till the completion of entire period of contract, and no Price Escalation shall be paid on any ground.
9. **Payment Terms (After expiry of Warranty)**. AMCPayment will be made in two equal instalments at the end of every six months after deduction of penalties.
   1. **Satisfactory Certificate by User**. Charges will be paid only after the submission of a relevant certificate by the concerned PICG officers stating that the maintenance has been carried out satisfactorily as per the contract agreement during the relevant period by the vendor, which shall be further countersigned by the Director, NFS for release of payment. The certificate shall also indicate any penalties to be deducted on account of delay in repair as per the contract giving full details thereof.

**SECTION V**

## PART C: SCHEDULE OF REQUIREMENT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ser No** | **Item Description** | **Unit** | **Total Qty** | |
| **Material Supply** | | | | |
|  | **DWDM Nodes** |  |  | |
|  | Large DWDM Node | Nos | 22 | |
|  | Medium DWDM Node | Nos | 67 | |
|  | Small DWDM Node | Nos | 195 | |
|  | Terminal DWDM Node | Nos | 102 | |
|  | **Optical Line Amplifier Site** |  |  | |
|  | Type A | Nos | 253 | |
|  | Type B | Nos | 462 | |
|  | Type C | Nos | 413 | |
|  | Type D | Nos | 17 | |
|  | Type E | Nos | 17 | |
|  | **Optical Regeneration (3R) Site** |  |  | |
|  | Type A | Nos | 38 | |
|  | Type B | Nos | 11 | |
|  | **POTS** |  |  | |
|  | Large POTS | Nos | 126 | |
|  | Medium POTS | Nos | 590 | |
|  | Small POTS | Nos | 134 | |
|  | Server Blade Chassis with Server Blades & Internal Storage (NNOC and DRNOC). Bidder to include cost of multiple dedicated servers if required, refer clause | Nos | 02 | |
|  | Desktop Workstation with client software | Nos | 31 | |
|  | Portable Local Craft Terminal (LCT) with client software | Nos | 736 | |
|  | Tape Drive (with tapes) | Nos | 02 | |
|  | EMS/NMS, Layer 1 control plane Software with licenses, for DWDM and POTS (NNOC and DRNOC) | Nos | 02 |
|  | PRC | Nos | 15 |
|  | **SSU Type A** | Nos | 16 | |
|  | **SSU Type B** | Nos | 40 | |
|  | Synchronization NMS/EMS software capable of managing all PRC, SSUs (NNOC and DRNOC) | Nos | 02 | |
|  | **Test and Measurement Equipment** |  |  |
|  | Spectrum Analysers | Nos | 97 |
|  | Multi Wavelength Meters | Nos | 52 |
|  | SDH Analysers (STM1/4/16/64) with jitter | Nos | 22 |
|  | SDH Analysers (STM1/4/16/64) without jitter | Nos | 92 |
|  | E1 Testers (BER/ EFS/ Jitter/ Pulse Mark) | Nos | 828 |
|  | OTN Testers | Nos | 22 |
|  | **FCBC** |  |  |
|  | 48V 150 Amps | Nos | 89 |
|  | 48V 100 Amps | Nos | 66 |
|  | 48V 50 Amps | Nos | 29 |
|  | 48V 30 Amps | Nos | 31 |
|  | Equipment Racks | Lot | As Required |
|  | Patch cords, cabling | Lot | As Required |
|  | Technical manuals | Lot | As Required |
|  | Network planning tool | Nos | 02 |
|  | Software Licenses | Lot | As Required |
|  | Power and data Cabling | Lot | As required |
| **Services** | | | | |
|  | Testing, Installation, integration, acceptance testing of DWDM National expressway/backbone | Lot | As required |
|  | Testing, Installation, integration, acceptance testing of six regional DWDM networks, including POTS | Lot | As required |
|  | Testing, Installation, integration, acceptance testing of clock network (PRCs and SSUs) | Lot | As required |
|  | Integration with Unified NMS and shifting of EMS/NMS hardware/software to Data Centre(s) | Lot | As required |
|  | Training | Batches | 60 |
|  | Resident Engineers | Nos | 22 |

**Note : All quantities of equipment given in the SoR are inclusive of the spares given at** [**Appendix ‘F’**](#_APPENDIX_‘F’_1) **which are to be supplied as per Clause 92.2 above.**

# SECTION VI

## UNDERTAKING & DECLARATION

**Performa for understanding the terms & condition of Tender & Spec. of work**

A) Certified that:

1. I/ We ……………………………………. have read and agree with all the terms and conditions, specifications included in the tender documents & offer to execute the work at the rates quoted by us in the tender form.

2. If I/ We fail to enter into the agreement & commence the work in time the EMD/ SD deposited by us will stand forfeited to the BSNL.

B) The tenderer hereby covenants and declares that:

1. All the information, Documents, Photo copies of the Documents/ Certificates enclosed along with the Tender offer are correct.

2. If anything is found false and/or incorrect and/or reveals any suppression of fact at any time, BSNL reserves the right to debar our tender offer/ cancel the LOA/ Purchase/ work order if issued and forfeit the EMD/ SD/ Bill amount pending with BSNL. In addition, BSNL may debar the contractor from participation in its future tenders.

Place: …………… Signature of Tenderer……………………

Date: …………… Name of Tenderer ………………………

Along with date & Seal

**NEAR RELATIVES IN BSNL**

(Certificate to be given by the contractor in respect of status of employment of his/ her near relative (s) in BSNL)

**“I…………..s/o…….……r/o……………... hereby certify that none of my relative(s) as defined in the tender document is/are employed in BSNL unit as per details given in tender document. In case at any stage, it is found that the information given by me is false/ incorrect, BSNL shall have the absolute right to take any action as deemed fit/without any prior intimation to me.”**

Signature of the tenderer with date and seal

# SECTION VII

## PERFORMA’S

### PERFORMA 1: BID SECURITY FORM

Whereas .................................. (hereinafter called “the Bidder”) has submitted its bid dated............for the supply of ........................ vide Tender No. MM/CNP/042010/000388 Dated 23.04.2010KNOW ALL MEN by these presents that WE ....................... OF .................... having our registered office at .................(hereinafter called “the Bank”) are bound unto Bharat Sanchar Nigam Limited (hereinafter called “the Purchaser”) in the sum of Rs.................... for which payment will and truly to be made of the said Purchaser, the Bank binds itself, its successors and assigns by these present.

THE CONDITIONS of the obligation are :

1. If the Bidder withdraws his bid during the period of bid validity specified by the Bidder on the Bid form or
2. If the Bidder, having been notified of the acceptance of his bid by the Purchaser during the period of bid validity
   1. fails or refuses to execute the Contract, if required; or
   2. fails or refuses to furnish the Performance Security, in accordance with the instructions to Bidders.

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

This guarantee will remain in force as specified in clauses and of section IV Part A of the Bid Document upto and including THIRTY (30) days after the Period of bid validity and any demand in respect thereof should reach the Bank not later than the specified date/dates.

Signature of the Bank Authority.

Name

Signed in Capacity of

Name & Signature of witness Full address of Branch

Address of witness Tel No. of Branch

Fax No. of Branch

### PERFORMA 2:PERFORMANCE SECURITY GUARANTEE BOND

1. In consideration of the CMD, BSNL (hereinafter called ‘BSNL’) having agreed to exempt \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereinafter called ‘the said contractor(s)’) from the demand under the terms and conditions of an agreement/Advance Purchase Order No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ dated \_\_\_\_\_\_\_\_\_\_\_\_ made between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the supply of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hereinafter called “the said agreement ”), of security deposit for the due fulfillment by the said contractor (s) of the terms and conditions contained in the said Agreement, on production of the bank guarantee for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_we, (name of the bank) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( hereinafter refer to as “the bank”) at the request of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (contractor(s)) do hereby undertake to pay to BSNL an amount not exceeding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ against any loss or damage caused to or suffered or would be caused to or suffered by BSNL by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.
2. We (name of the bank) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from BSNL by reason of breach by the said contractor(s)’ of any of the terms or conditions contained in the said Agreement or by reason of the contractors(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 where the decision of BSNL in these counts shall be final and binding on the bank. However, our liability under this guarantee shall be restricted to an amount not exceeding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. We undertake to pay to BSNL any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)/supplier(s) in any suit or proceeding 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 valid discharge of our liability for payment there under and the contractor(s)/supplier(s) shall have no claim against us for making such payment.
4. We (name of the 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 BSNL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(office/Department) BSNL certifies that the terms and conditions of the said Agreement have been fully or properly carried out by the said contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the expiry of TWO/TWO AND HALF/THREE YEARS (as specified in P.O) from the date hereof, we shall be discharged from all liabilities under this guarantee thereafter.
5. We (name of the bank)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ further agree with BSNL that BSNL 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 said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by BSNL 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 being granted to the said Contractor(s) or for any forbearance, act or omission on the part of BSNL or any indulgence by BSNL 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 effect of so relieving us.
6. This guarantee will not be discharged due to the change in the constitution of the   
   Bank or the Contractor(s)/supplier(s).
7. We (name of the bank) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lastly undertake not to revoke this   
   guarantee during its currency except with the previous consent of BSNL in writing.

Dated the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ day of \_\_\_\_\_\_\_

for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Indicate the name of bank)

### PERFORMA 3: LETTER OF AUTHORIZATION FOR ATTENDING BID OPENING

(To reach Jt DDG (MMT) before date of bid opening)

To

The DGM (MMT),

Bharat Sanchar Nigam Limited,

(Corporate Office),

2nd Floor, Bharat Sanchar Bhawan,

Janpath, New Delhi – 110 001

Subject : Authorisation for attending bid opening on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (date) in the Tender of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Following persons are hereby authorised to attend the bid opening for the tender mentioned above on behalf of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Bidder) in order of preference given below.

Order of Preference Name Specimen Signatures

I.

II.

Alternate Representative

Signatures of bidder

Or

Officer authorized to sign the bid

Documents on behalf of the bidder.

**Note**

1. Maximum of two representatives will be permitted to attend bid opening. In cases where it is restricted to one, first preference will be allowed. Alternate representative will be permitted when regular representatives are not able to attend.
2. Permission for entry to the hall where bids are opened may be refused in case authorization as prescribed above is not recovered.

# SECTION VIII

## TENDERER / BIDDER’S PROFILE & QUESTIONNAIRE

(To be filled in and submitted by the bidder)

1. **Tenderer’s Profile**
2. Name of the Individual/ Firm: ………………………………………
3. Present Correspondence Address …………………………..…

……..………………………………………………………………………

………………..……………………………………………………………

Telephone No. …………………… Mobile No. ………………………...

FAX No. ……………………………………………………………………

1. Address of place of Works/ Manufacture

……..………………………………………………………………………

………………..……………………………………………………………

Telephone No. …..…………………Mobile No. ……………………………

1. State the Type of Firm: Sole proprietor-ship/ partnership firm / (Tick the correct choice): Private limited company.
2. Name of the sole proprietor/ partners/ Director(s) of Pvt. Ltd Co.:

|  |  |  |  |
| --- | --- | --- | --- |
| S. No. | Name | Father’s Name | Designation |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Name of the person authorized to enter into and execute contract/ agreement and the capacity in which he is authorized (in case of partnership/ private Ltd company):

……..………………………………………………………………………

………………..……………………………………………………………

1. Permanent Account No. : …………………………………………………
2. Whether the firm has Office/ works (i.e. manufacture of the tendered item) in Delhi? If so state its Address

……..………………………………………………………………………

………………..……………………………………………………………

1. **Questionnaire**
2. Do you think any other detail/ material is required to complete the work specified in the specification? Yes/ No.
   1. If Yes, Give details

……..………………………………………………………………………

………………..……………………………………………………………

1. Do you think any other item of work need be included in tender form to complete the work specified in the specification? Yes/ No.
   1. 2.1 If Yes, Give details

……..………………………………………………………………………

………………..……………………………………………………………

1. Suggestion for improvement of the tender document.

……..………………………………………………………………………

………………..……………………………………………………………

Place…………………. Signature of contractor ……………………

Date …………………. Name of Contractor ……………………

# SECTION IX

## PART I : BID FORM

Tender No. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

To

DGM (MMT)

Bharat Sanchar Nigam Limited,

(Corporate Office)

2nd Floor, Bharat Sanchar Bhawan,

Janpath , New Delhi – 110 001.

Dear Sir,

1. Having examined the conditions of contract and specifications including addenda Nos......................the receipt of which is hereby duly acknowledged, we, undersigned, offer to supply and deliver .............................................. in conformity with the said drawings, conditions of contract and specifications for the sum shown in the schedule of prices attached herewith and made part of this Bid.
2. We undertake, if our Bid is accepted, to commence deliveries within three months and to complete delivery of all the items specified in the contract within Twelve ( 12) months calculated from the date of issue of your advance purchase order.
3. If our Bid is accepted, we will obtain the performance guarantees of a Scheduled Bank for a sum @ 5% of the contract value for the due performance of the contract.
4. We agree to abide by this Bid for a period of 210 days from the date fixed for Bid opening and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
5. Until a formal Purchase Order of Contract is prepared and executed, this Bid together with your written acceptance thereof in your notification of award shall constitute a binding contract between us.
6. Bid submitted by us is properly sealed and prepared so as to prevent any subsequent alteration and replacement.
7. We understand that you are not bound to accept the lowest or any bid, you may receive.
8. We understand that the Bid document so submitted is the true copy of BSNL tender documents available on BSNL website [www.bsnl.co.in](http://www.bsnl.co.in). Any deviation will result in the rejection of the bid.

Dated this .............................. day of ........................ 20

Name and Signature ------------------------

In the capacity of ----------------------

Duly authorised to sign the bid for and on behalf of ..............................................

Witness.........................................

Address......................................

Signature

**SECTION IX**

## PART II : PRICE SCHEDULE

**Note: Performa**.The bidder will submit the make/ models of items to be supplied as per the [Appendix ‘G’](#_INFORMATION_OF_SOURCE) attached.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ser No** | **Item Description** | **Unit** | **Total Qty** | | **Basic Unit Rate exclusive of all levies and charges** | **Excise Duty (ED)** | | **Sales Tax(ST)** | | **F F packing & I** | | **Other Levies and Charges if any(service tax etc)** | **Unit Price All Inclusive**  **(5+7+9+11+12)** | **Duties and Taxes CENVAT- able on Unit Price** | **Unit price excluding Duties and taxes CENVAT- able (13 - 14)** | **Total Price inclusive of all levies and charges including duties and taxes**  **(4 x 15)** | **Discount offered if any** | **Total Discounted Price excluding Duties and Taxes CENVAT-able (16-17)** | **E.D Tarrif Head** | **Import Content** | **% of Customs duty** | **Customs Tarrif Head** |
| **%** | **Amount** | **%** | **Amount** | **%** | **Amount** |
| **1** | **2** | **3** | **4** | | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** |
| **Material Supply** | |  | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **DWDM Nodes** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Large DWDM Node | Nos | 22 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Medium DWDM Node | Nos | 67 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Small DWDM Node | Nos | 195 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Terminal DWDM Node | Nos | 102 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Optical Line Amplifier Site** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type A | Nos | 253 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type B | Nos | 462 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type C | Nos | 413 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type D | Nos | 17 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type E | Nos | 17 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Optical Regeneration (3R) Site** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type A | Nos | 38 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Type B | Nos | 11 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **POTS** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Large POTS | Nos | 126 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Medium POTS | Nos | 590 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Small POTS | Nos | 134 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Server Blade Chassis with Server Blades & Internal Storage (NNOC and DRNOC). Bidder to include cost of multiple dedicated servers if required, (refer clause ) | Nos | 02 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Desktop Workstation with client software | Nos | 31 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Portable Local Craft Terminal (LCT) with client software | Nos | 736 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Tape Drive (with tapes) | Nos | 02 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | EMS/NMS, Layer 1 control plane Software with licenses, for DWDM and POTS (NNOC and DRNOC) | Nos | 02 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | PRC | Nos | 15 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **SSU Type A** | Nos | 16 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **SSU Type B** | Nos | 40 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Synch NMS/EMS software capable of managing all PRC, SSUs (NNOC and DRNOC) | Nos | 02 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Test and Measurement Equipment** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Spectrum Analysers | Nos | 97 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Multi Wavelength Meters | Nos | 52 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | SDH Analysers (STM1/4/16/64) with jitter | Nos | 22 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | SDH Analysers (STM1/4/16/64) without jitter | Nos | 92 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | E1 Testers (BER/ EFS/ Jitter/ Pulse Mark) | Nos | 828 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | OTN Testers | Nos | 22 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **FCBC** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 48 Volts 150Amps | Nos | 89 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 48 Volts 100Amps | Nos | 66 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 48 Volts 50Amps | Nos | 29 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 48 Volts 30 Amps | Nos | 31 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Equipment Racks | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Patch cords, cabling | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Technical manuals | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Network planning tool | Nos | 02 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Software Licenses | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Power and Data Cabling | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A** | **Total Supply Cost** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **SERVICES** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Testing, Installation, integration, acceptance testing of DWDM National expressway/backbone | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Testing, Installation, integration, acceptance testing of six regional DWDM networks, including POTS | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Testing, Installation, integration, acceptance testing of clock network (PRCs and SSUs) | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Integration with Unified NMS and shifting of EMS/NMS hardware/software to Data Centre(s) | Lot | As required | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Training | Batch | 60 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Resident Engineers | Nos | 22 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **B** | **Total Services Cost** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **C** | **Total Supply and Services Cost (A+B)** |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | AMC for seven years at a discount rate of 12 % per year |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1st Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2nd Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3rd Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4th Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 5th Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6th Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 7th Year | **Lumpsum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **D** | **AMC Total** |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **E** | **Grand Total (C+D)** |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Note**

* + 1. We hereby declare that in quoting the above prices, we have taken into account the entire credit on inputs available under the MODVAT SCHEME introduced w.e.f. 1st Mar 1986 and further extended on more items till date.
    2. "We hereby certify that E.D/Customs Tariff Head shown in the price bid above are correct & CENVAT Credit for the amount shown in price bid above are admissible as per CENVAT Credit Rules 2004".
    3. The bidder submitted the offer with concessional E.D/sales tax shall submit the proof of applicable concessional ED/Sales Tax.
    4. Prices are to be quoted line item wise.
    5. Form `C’ will be issued by BSNL.
    6. Custom Duty exemption certificate shall be provided by the purchaser.
    7. Annual maintenance Contract charges. Basic charges should be shown in column 5 & the service tax in column 12.

# Appendix ‘A’

(Refer clause of Section V Part A)

**REFER TO CLAUSE OF SECTION V Part A**

## MODEL AMENDMENT LETTER INTIMATING CONDITIONS FOR EXTENSION OF DELIVERY PERIOD

***Registered Acknowledgement Due***

Address of the purchaser

--------------------------------

--------------------------------

--------------------------------

To

M/s ………………………………..

………………………………………

Sub : This office contract no………….. dated …………. placed on you for supply of ………………

Ref : Your letter No……………………………… dated ……………….

1. You have failed to deliver the goods/work/ entire quantity of the goods/work/ execution/ construction/ commissioning of the entire project within the contract delivery period/ delivery period as agreed schedule or last extended up to \_\_\_\_\_\_\_\_\_\_\_\_\_\_. In your above referred letter, you have asked for extension/ further extension of time for delivery/ execution/ construction/ commissioning. In view of the circumstances stated in your above referred letter, the time of delivery can be extended from \_\_\_\_\_\_\_ (original/ last delivery period) to \_\_\_\_\_\_\_\_\_\_\_\_ (presently agreed delivery period) subject to your unconditional acceptance of the following terms and conditions:
2. That, liquidated damages shall be levied in accordance with agreed terms and conditions of the tender/ PO.
3. That, notwithstanding any stipulation in the contract for increase in price on any ground, no such increase, whatsoever, which takes place after zzz shall be admissible on such of the said goods/work as are delivered after the said date.
4. That, the prices during this extended delivery period shall be provisional and shall be governed as per agreed clauses of the tender/contract and shall be finalized in accordance with the current PO price or the current PO price with latest budget/ duty impact or the prices in the new tender (T.E. No. ………..)from the date of its opening, on whichever is lower basis.
5. An additional BG of Rs. \_\_\_\_\_\_\_\_\_in accordance with relevant clauses of the contract with validity upto \_\_\_\_\_\_\_.
6. An undertaking as required vide clause of Section V Part A.
7. Please intimate your unconditional acceptance of this letter alongwith the additional BG within ten days of the issue of this letter failing which the contract will be cancelled at your risk and expense without any further reference to you. This letter shall form part and parcel of the agreement/ contract/ APO/ PO and all other terms & conditions of the contract remain unaltered.

Yours faithfully,

(………………………)

for and on behalf of………..

zzz Original delivery date or the last extended/ re-fixed delivery period (as the case may be)

NB : The entries which are not applicable for the case under consideration are to be deleted.

# Appendix ‘B’

(Refer clause of Section V Part A)

**REFER TO CLAUSE OF SECTION V PART A**

## MODEL AMENDMENT LETTER FOR EXTENSION OF DELIVERY PERIOD

***Registered Acknowledgement Due***

Address of the purchaser

--------------------------------

--------------------------------

M/s ………………………………..

………………………………………

Sub : This office contract no………….. dated …………. placed on you for supply of ………………

Ref :

1. Your letter no……………………………… dated ………………. requesting DP extension

2. This office letter no. ……………… dated ……… intimating conditions for DP extension

3. Your letter no………………….. dated …………. accepting the conditions for DP extension

You have failed to deliver the goods/work/ entire quantity of the goods/work/ execution/ construction/ commissioning of the entire project within the contract delivery period/ delivery period as agreed schedule or last extended up to \_\_\_\_\_\_\_\_\_\_\_\_\_\_. In your above letter under reference (1), you have asked for extension/ further extension of time for delivery/ execution/ construction/ commissioning. The terms and conditions for extension of delivery period were conveyed to you vide this office letter under reference (2). In view of the circumstances stated in your above referred letter, and upon your unconditional acceptance of the terms and conditions of this extension vide your letter under reference (3), the time of delivery is hereby extended from \_\_\_\_\_\_\_ (last delivery period) to \_\_\_\_\_\_\_\_\_\_\_\_ (presently agreed delivery period) on the terms and conditions in letter under reference (2) above and agreed by you vide letter under reference (3) i.e.:

1. Liquidated damages shall be levied in accordance with agreed terms and conditions of the tender/ PO.
2. Notwithstanding any stipulation in the contract for increase in price on any ground, no such increase, whatsoever, which takes place after zzz shall be admissible on such of the said goods/work as are delivered after the said date
3. The prices during this extended delivery period shall be provisional and shall be governed as per agreed clauses of tender/ contract and shall be finalized in accordance with current PO price or the currentPO price with latest budget/ duty impact or the prices in the new tender (T.E. No. ………..) from the date of its opening, on whichever islower basis.

The letters under reference above and this letter shall form part and parcel of agreement/ contract/ APO/ PO and all other terms & conditions of the contract remain unaltered.

Yours faithfully,

(………………………)

for and on behalf of………..

Copy to :

…………………..

…………………..

…………………..

(All concerned)

zzz Original delivery date or the last unconditionally re-fixed delivery date (as the case may be)

NB : The entries which are not applicable for the case under consideration are to be deleted.

# Appendix ‘C’

(**Refer clause of Section IV Part A)**

## FORMAT OF DOCUMENTS TO BE SUBMITTED

1. **Experience Eligibility**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Ser No** | **Client Name with Contact Details** | **Contract Start Date** | **Contract Value** | **Contract Completion Date** | **Description of Items Supplied** | **Qty Supplied** | **Remarks if any** |
| 1. |  |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |  |
| 3. |  |  |  |  |  |  |  |
| 4. |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |

1. **Financial Eligibility**.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ser No** | **Description** | **Financial Year \_\_\_\_\_\_\_\_**  **(In Rupees Crores)** | **Financial Year \_\_\_\_\_\_\_\_**  **(In Rupees Crores)** | **Financial Year \_\_\_\_\_\_\_**  **(In Rupees Crores)** | **Total** |
| 1. | **Annual Turnover** |  |  |  |  |
| 2. | **Networth** |  |  |  |  |
| 3. | **Working Capital** |  |  |  |  |
| 4. | **Profit** |  |  |  |  |

# Appendix ‘D’

(**Refer clause of Section IV Part A)**

## INFORMATION AND DOCUMENTS REQUIRED TO BE SUBMITTED

**AS A PART OF RESPONSE TO THE TENDER**

|  |  |  |
| --- | --- | --- |
| **Ser No** | **Document** | **References** |
| 1. | **Bidding Process** |  |
|  | Teaming Agreement with all the OEMs | Clause No |
|  | **General Eligibility Conditions** |  |
|  | Certificate of Incorporation from Registrar of Companies | Clause No |
|  | Articles and Memorandum of Association | Clause No |
|  | Annual Report of last three financial years | Clause No |
|  | Documentary evidence for registration with proof of Management and Control of Company with resident Indian Nationals | Clause No |
|  | List of all Directors including their name(s), Director Identification Number(s) (DIN) and address (es) along with contact telephone numbers of office and residence. | Clause No |
|  | Copy of Permanent Account Number. | Clause No |
|  | Excise/ Service Tax and Permanent Sales Tax Registration Number (if applicable). | Clause No |
|  | CS certified document that bidder is not debarred/ blacklisted/convicted in India for Telecom business in last three years | Clause No |
|  | CS certified document that bidder is not debarred/ blacklisted/convicted by any sovereign government and barred from participating in government projects due to security reasons | Clause No |
|  | **Technical Eligibility Criteria** |  |
|  | Details of Test facility in India for development of system and network level integration solution for ICT Networks. | Clause No |
|  | Details of support centres including address and TIN details | Clause No |
|  | Documentary proof that the DWDM OEM selected by the bidder is OEM for DWDM optical transmission systems as well as OTN DXC and Layer 1 control plane | Clause No |
|  | Documentary proof that the Synchronization OEM selected by the bidder is the OEM for Cesium based Primary Reference Clocks as well as SSUs. | Clause No |
|  | Details of certified/skilled professionals in networking/ system integration field on bidder’s payroll, to include Name, Age, Appointment, Academic qualifications and duration of employment with the bidder, certified by an authorised signatory of the bidder. | Clause No |
|  | Certifications of ISO 9001 : 2008 and equivalent | Clause No |
|  | Certificate stating that the all hardware/ software supplied under the contract shall not contain any embedded malicious codes | Clause No |
|  | Detailed Technical Specifications / literatures for all items mentioned in the SoR | Clause No |
|  | Nil Deviation Certificate | Clause No |
|  | Organization Structure to handle & execute the project | Clause No |
|  | Test Plan Procedures | Clause No |
|  | Detailed Project Management Plan | Clause No |
|  | Maintenance Plan | Clause No |
|  | **Financial Eligibility Conditions** |  |
|  | Audited financial statements for last three financial years showing Cumulative Annual Turnover and profit | Clause No |
|  | Bankers Solvency Certificate | Clause No |
|  | **Experience Eligibility Criteria** |  |
|  | Documentary proof showing bidder is a certified system/network integrator of offered network products in India | Clause No |
|  | Documentary proof of implementing multi location, multi product large network/ system integration projects for any Government/Enterprise/ Telecom Service Provider during the last five years | Clause No |
|  | Documentary proof of executing projects as an SI/OEM with Indian Defence Services in past 5 years | Clause No |
|  | Documentary proof showing SI/OEM have successfully manufactured, supplied and installed a minimum of 250 nodes (excluding amplifier sites) of DWDM equipment in last 5 years. | Clause No |
|  | Documentary proof showing DWDM OEM/parent company have successfully implemented one single DWDM network of at least 15 nodes based on Layer 1 control plane for 10G or higher DWDM optics. | Clause No |
|  | Documentary proof showing Synchronization OEM/parent company have successfully deployed at least 25 PRC/SSUs for telecom networks in the past five years | Clause No |
|  | **Miscellaneous Conditions** |  |
|  | Registration Certificate from State Director of Industries or from Secretariat for Industrial Approval (SIA), Ministry of Industries, Government of India (if applicable). | Clause No |
|  | Approval from Reserve Bank of India/SIA, in case of foreign collaboration | Clause No |
|  | Latest and valid NSIC Certificate duly certified by NSIC (if applicable). | Clause No |
|  | Certificate for all Software supplied are authentic and legal copy is/are being supplied | Clause No |
|  | A proof regarding current registration with NSIC for the tendered items will have to be attached along with the bid (if applicable). | Clause No |
|  | Power of Attorney for Signing Authorities | Clause No |
|  | Undertaking Certificate from the bidder which certifies that none of his/her near relative is working in BSNL units as per format given in Section VI. | Clause No |
|  | Undertaking Certificate duly signed by it and its technology/consortium partner stating that both of them i.e. the front bidder and its technology/ consortium partner shall be liable for due performance of the contract jointly and severally | Clause No |

**Note**.

1. **The work covered under the mentioned scope of project this tender is extremely skilled and technical in nature and only the firms having sufficiently skilled and experienced staff with them and who have carried out tight targeted Telecom works shall submit their responses against this invitation.**
2. **Any other documents, as deemed required by the bidder, to support his claim with regards to eligibility, specification, experience etc should also be submitted.**
3. **All financial documents shall be certified by a CA.**

# Appendix ‘E’

(**Refer Clause 84.4.3 above**

**of Section IV PART B)**

## INTEGRITY PACT FORMAT

Between

Bharat Sanchar Nigam Limited (BSNL) / PICG, Ministry of Defence 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 and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal will appoint an Independent External Monitor 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:-
   1. 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 him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.
   2. 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 tender process or the contract execution.

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

1. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

**Section 2 – Commitments of the Bidder(s)/Contractor(s)**

1. The Bidder(s)/Contractor(s) commits itself 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.
   1. Thee Bidder(s)/Contractor(s) will not, directly or through any other person 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 immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
   2. The Bidder(s)/Contractor(s) will not enter with other Bidder(s) 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 cartelisation in the bidding process.
   3. The Bidder(s)/Contractor(s) will not commit any offence under the relevant Anti-corruption Laws of India; further the Bidder(s)/Contractor(s) 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.
   4. 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**

1. If the Bidder(s)/Contractor(s), before contract 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 defined procedure.

**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 terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor the amount equivalent to Security Deposit / Performance Bank Guarantee in addition to any other penalties/ recoveries as per terms and conditions of the tender.

**Section 5 – Previous transgression**

1. The Bidder declares that no previous transgression occurred in the last 3 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 or action can be taken as per the defined procedure.

**Section 6 – Equal treatment of all Bidders/Contractors/Subcontractors**

1. The principal will enter into agreements with identical conditions as this one with all Bidders/Contractors.
2. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact.
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   
violating Bidder(s) / Contractor(s) / Subcontractor (s)**

1. If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an 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 Corporate Vigilance Office.

**Section 8 – External Independent Monitor/Monitors**

1. 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 of BSNL.
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. Notwithstanding anything contained in this Section, the Bidder(s)/Contractor(s) shall have no obligation whatsoever to provide any internal costing mechanisms or any internal financial or commercial data pursuant to any audit or review conducted by or on behalf of the Principal. Further, the Bidder(s)/Contractor(s) shall not be required to provide any data relating to its other customers, or any personnel or employee related date.
5. 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.
6. 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.
7. The Monitor will submit a written report to the Chairperson of the Board of the Principal 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.
8. If the Monitor has reported to the CMD of BSNL, a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and BSNL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Corporate Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
9. The word ‘Monitor’ would include both singular and plural.

**Section 9 – Pact Duration**

1. This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.
2. If any claim is made/ lodged 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, BSNL.

**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. The arbitration clause provided in the tender document / contract shall not be applicable for any issue/ dispute arising under Integrity Pact.
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 intensions.

-------------------------------- ----------------------------------

For the Principal For the Bidder/Contractor

Place…………………… Witness 1 : ………………………………

Date …………………… Witness 2 : ……………………

# Appendix ‘F’

(**Refer Clause 92.2 above)**

## SPARES LIST

|  |  |  |  |
| --- | --- | --- | --- |
| **Ser No** | **Item Description** | **Unit** | **Total Qty** |
|  | **DWDM Nodes** |  |  |
|  | Large DWDM Node | Nos | 02 |
|  | Medium DWDM Node | Nos | 06 |
|  | Small DWDM Node | Nos | 10 |
|  | Terminal DWDM Node | Nos | 05 |
|  | **Optical Line Amplifier Site** |  |  |
|  | Type A | Nos | 23 |
|  | Type B | Nos | 42 |
|  | Type C | Nos | 38 |
|  | Type D | Nos | 02 |
|  | Type E | Nos | 02 |
|  | **Optical Regeneration (3R) Site** |  |  |
|  | Type A | Nos | 03 |
|  | Type B | Nos | 01 |
|  | **POTS** |  |  |
|  | Large POTS | Nos | 06 |
|  | Medium POTS | Nos | 10 |
|  | Small POTS | Nos | 06 |
|  | Server Blade Chassis with Server Blades & Internal Storage | Nos | 00 |
|  | Desktop Workstation | Nos | 03 |
|  | Portable Local Craft Terminal (LCT) | Nos | 10 |
|  | Tape Drive (with tapes) | Nos | 00 |
|  | PRC | Nos | 01 |
|  | **SSU Type A** | Nos | 02 |
|  | **SSU Type B** | Nos | 04 |
|  | Test and Measurement Equipment |  |  |
|  | Spectrum Analysers | Nos | 04 |
|  | Multi Wavelength Meters | Nos | 05 |
|  | SDH Analysers (STM1/4/16/64) with jitter | Nos | 02 |
|  | SDH Analysers (STM1/4/16/64) without jitter | Nos | 05 |
|  | E1 Testers (BER/ EFS/ Jitter/ Pulse Mark) | Nos | 00 |
|  | OTN Testers | Nos | 02 |

# Appendix ‘G’

(**Refer** [**Note**](#_PART_II_:_1) **of   
Section IX Price Schedule)**

## INFORMATION OF SOURCE AND MAKE/MODEL OF LINE ITEMS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ser No** | **Item Description** | **Make** | **Model** | |
|  | **DWDM Nodes** |  | | |
|  | Large DWDM Node |  |  | |
|  | Medium DWDM Node |  |  | |
|  | Small DWDM Node |  |  | |
|  | Terminal DWDM Node |  |  | |
|  | **Optical Line Amplifier** |  |  | |
|  | Type A |  |  | |
|  | Type B |  | |
|  | Type C |  | |
|  | Type D |  |  | |
|  | Type E |  |  | |
|  | **Optical Regeneration (3R) Site** |  |  | |
|  | Type A |  |  | |
|  | Type B |  |  | |
|  | **POTS** |  | | |
|  | Large POTS |  |  | |
|  | Medium POTS |  |  | |
|  | Small POTS |  |  | |
|  | Server Blade Chassis with Server Blades & Internal Storage |  |  | |
|  | Desktop Workstation |  |  | |
|  | Portable Local Craft Terminal (LCT) |  |  | |
|  | Tape Drive (with tapes) |  |  | |
|  | EMS/NMS Software for DWDM and POTS (to be deployed at all NOCs) |  | |  |
|  | PRC |  | |  |
|  | **SSU Type A** |  |  | |
|  | **SSU Type B** |  |  | |
|  | Synch NMS/EMS capable of managing all PRC, SSUs and discover third Party PTP clients (to be deployed at all NOCs) |  |  | |
|  | **Test and Measurement Equipment** |  | |  |
|  | Spectrum Analysers |  | |  |
|  | Multi Wavelength Meters |  | |  |
|  | SDH Analysers (STM1/4/16/64) with jitter |  | |  |
|  | SDH Analysers (STM1/4/16/64) without jitter |  | |  |
|  | E1 Testers (BER/ EFS/ Jitter/ Pulse Mark) |  | |  |
|  | OTN Testers |  | |  |
|  | FCBC 48 Volts 100AH |  | |  |
|  | Equipment Racks |  | |  |
|  | Network planning tool |  | |  |

# Appendix ‘H’

(Refer Para of Section II)

## TENTATIVE DETAILS OF TRANSMISSION NODES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SER NO** | **NAME OF STATE** | **DWDM QTY** | **POTS QTY** | **REMARKS** |
|  | ANDAMAN AND NICOBAR ISLANDS | 0 | 3 |  |
|  | ANDHRA PRADESH | 5 | 15 |  |
|  | ARUNACHAL PRADESH | 12 | 12 |  |
|  | ASSAM | 21 | 42 |  |
|  | BIHAR | 4 | 7 |  |
|  | DELHI | 3 | 71 |  |
|  | GOA | 2 | 3 |  |
|  | GUJARAT | 16 | 40 |  |
|  | HARYANA | 7 | 19 |  |
|  | HIMACHAL PRADESH | 16 | 25 |  |
|  | JAMMU AND KASHMIR | 95 | 168 |  |
|  | JHARKHAND | 3 | 7 |  |
|  | KARNATAKA | 6 | 27 |  |
|  | KERALA | 4 | 10 |  |
|  | MADHYA PRADESH | 10 | 18 |  |
|  | MAHARASHTRA | 14 | 52 |  |
|  | MANIPUR | 1 | 1 |  |
|  | MEGHALAYA | 3 | 10 |  |
|  | NAGALAND | 2 | 6 |  |
|  | ODISHA | 6 | 7 |  |
|  | PUNJAB | 27 | 68 |  |
|  | RAJASTHAN | 37 | 69 |  |
|  | SIKKIM | 6 | 6 |  |
|  | TAMIL NADU | 11 | 19 |  |
|  | TRIPURA | 1 | 1 |  |
|  | UTTAR PRADESH | 19 | 58 |  |
|  | UTTARAKHAND | 13 | 18 |  |
|  | WEST BENGAL | 19 | 46 |  |
|  | **TOTAL** | **363** | **828** |  |
|  | SPARES | 23 | 22 |  |
|  | **GRAND TOTAL** | **386** | **850** |  |

# Appendix ‘J’

(Refer Para 3.2 aboveof Section I DNIT)

**BHARAT SANCHAR NIGAM LTD**

**(A Government of India Enterprise)**

Corporate Office

New Delhi – 110001

## NON-DISCLOSURE AGREEMENT

This Agreement is made on \_\_\_\_\_\_\_\_\_\_ day of \_\_\_\_\_\_\_\_\_\_ 2012 between BHARAT SANCHAR NIGAM LIMITED (BSNL) a Government of India enterprises, having its registered and corporate office at Bharath Sanchar Bhawan, Janpath, New Delhi hereinafter called BSNL which expression shall unless repugnant to the subject or the context mean and included its successor, nominees or assigns and M/s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a company incorporated under the Indian Companies act, 1956, and having its registered office at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ herein after called “bidder” which expression shall unless repugnant to the subject or the context mean and include its successors, nominees or assigns.

1. Whereas an RFP was floated by BSNL for **PROCUREMENT, INSTALLATION, TESTING AND MAINTENANCE OF WSS-ROADM BASED MULTI CHANNEL DWDM SYSTEMS, POTS EQUIPMENT BASED ON MULTI-SERVICE PROVISIONING PLATFORM, CLOCK SYNCHRONISATION AND ASSOCIATED EQUIPMENT FOR THE OPTICAL TRANSMISSION BACKBONE NETWORK ON TURNKEY BASIS FOR ARMED FORCES**and M/s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is one of the bidders. The bidder will be issued tender document, which contains highly classified and confidential information. The information is to protected from unauthorized use and disclosure:

In consideration of this, the bidder agrees as follows:-

1. This Agreement will apply to any information included in this tender pertaining to the project disclosed by BSNL/PICG to the bidder in writing or otherwise; information consists of tender document, specifications, designs, plans drawing, software, prototypes and / or technical information, and all copies and derivatives containing such Information that may be disclosed to bidder for and during the Purpose. Information may be in any form or medium, tangible or intangible, and may be communicated/disclosed in writing, orally, or through visual observation or by any other means by BSNL to the bidder.
2. The bidder shall use the information pertaining to this project only for the purpose and shall hold information in confidence using the same degree of care as it normally exercise to protect its own proprietary information, but not less than reasonable care, taking into account the nature of the information, and shall grant access to information only to its employees who have need to know, but only to the extent necessary to carry out the business purposes of this project as defined in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The bidder shall cause its employees to comply with the provisions of this Agreement applicable to his and shall not reproduce information without prior permission of BSNL. The permission to reproduce shall only be given if considered necessary and to the extent essential for fulfilling the purpose. The bidder may, however, disclose the information to its consultants and contractors with a need to know; provided that by doing so, the bidder agrees to bind those consultants and contractors to terms at least as restrictive as those stated herein, advise them of their obligations and indemnify BSNL for any breach of those obligations.
3. The bidder shall not disclose any information pertaining to this project to any third party.
4. Upon the request of BSNL, he shall return all information to BSNL immediately, provided, however, that an archival copy of the information may be retained in the files of the bidder’s counsel, solely for the purpose of providing the contents of the information.
5. In case the bidder is not selected for awarding the work of this project, he shall return to BSNL all the original documents that have been made over by BSNL to him pertaining to this project Within 15 days of outcome of the tender and shall destroy all hard / soft copy /(ies) of the information pertaining to this project. Intimation in this regard is to be given by bidder to BSNL.
6. The bidder recognizes and agrees that all the information pertaining to this project is highly confidential and is owned solely by BSNL Govt of India and that the unauthorized disclosure or use of such Confidential information would cause irreparable harm and significant injury, the degree of which may be difficult to ascertain. Accordingly, the bidder agrees that BSNL will have the right to obtain an immediate injunction enjoining any breach of this Agreement, as well as the right to pursue any and all other rights and remedies available at law or in equity for such a breach.
7. The bidder’s failure to enforce any provision, right or remedy under this agreement shall not constitute waiver of such provision, right or remedy.
8. This Agreement will be construed in, interpreted and applied in accordance with the laws of India.
9. This Agreement and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ attached hereto constitutes the entire agreement with respect to the bidders obligations in connection with information disclosed hereunder.
10. The bidder shall not assign this Agreement without first securing BSNL’s written consent.
11. This agreement will remain in effect for ten years from the date of the last disclosure of confidential information, at which time it will terminate, unless extended by BSNL in writing.

IN WITNESS WHEREOF, the parties hereto have executed this agreement by their duly authorized officer or representatives.

M/s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ BHARAT SANCHAR NIGAM LIMITED

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## 