بسم الله الرحمن الرحيم

القيادة العامة للقوات المسلحة الأردنية – الجيش العربي
مديرية المشتريات الدفاعية
شعبة الاتصالات والأنظمة الالكترونية

فاكس : ٥٠٠٠١٤٠
هاتف: ٥٠٠١١٦٦
ص . ب : ٩٢٦٦٨٠

دعوة عطـــاء

شراء اجهزة (Multiplexers)

رقم العطـــــــــــــاء: م ش ٥/٢٠/٢٠٢٣/هيئة

١.   ترغب القوات المسلحة الأردنية- الجيش العربي بشراء اللوازم المبينة كمياتها ومواصفاتها بالملحق (ب) المرفق.

٢.   مرفقات دعوة العطاء:

أ. الملحق (أ) الشروط العامة للدخول في العطـــــاءات والتعاقد مع المتعهدين (للاطلاع على الملحق من خلال موقعنا على الانترنت (www.jafdop.mil.jo) .

ب. الملحق (ب) المواصفات والكميات والشروط الخاصه.

٣.   ثمن نسخة العطاء (١٢٥) دينـــــــــــــــــــــار.

٤.على المتعهدين تسليم المناقصات قبل الساعة (١٣٠٠) الواحده ظهراً يوم **(الخميس)** الموافق **٢٠٢٣/٦/١٥**   إلى سكرتير لجان الشراء ولا تقبل أية مناقصات ترد بعد هذا التاريخ مطلقاً.

العنـــــــوان :	اسم الشركة أو المتعهـــد :
رقم الفاكس :	اسم المفوض عن الشركة :
رقم الهاتف :	التوقيــــــــــــــــــع :
ص . ب :	التاريــــــــــــــــــخ :

ملاحظات هامة جدا :

* على الشركه الالتزام بختم دعوة العطاء بالختم الرسمي للشركه وارفاقها بالعــرض.
* تكون مدة العرض (٩٠) يوم من تاريخ الاغلاق مع ارفاق كفالة دخول عطاء بنسبة (٣%) ثلاثة بالمئة من إجمالي قيمة أعلى عرض مقدم صالحة لمدة (٩٠) يوما من تاريخ اغلاق العطاء.

* يجب فرز العروض المالية والفنية في مغلفين منفصليــــــــن .
* ارفاق نسخه الكترونيه من العرض المالي والعرض الفني إضافه الى النسخه الورقيـــــه .

SCC CARRIER-CLASS MULTIPLEXER 2023

1. INTRODUCTION

    1.1. Special Communication Commission (SCC) is governmental agency, part of ministry of defense, managed by Jordan Armed Forces which provides communication services to both public (government and army) and private sector.

    1.2. SCC is planning to purchase four (4) carrier-class Multiplexers that supports the TDM and Ethernet traffic, the new equipment shall handle the existing SDH/PDH traffic and packet traffic, the planned capacities of these equipment are listed in section (3.2).

2. GENERAL

    2.1. The new equipment shall handle all types of traffic (TDM traffic (SDH & PDH), Ethernet traffic, management data, etc.…).

    2.2. All various equipment of this project shall be controlled and managed by one management system; this system will be installed at control site (site 05).

    2.3. The equipment shall provide advanced management capabilities including GUI.

    2.4. The management system shall be scalable to handle the addition of new equipment in future.

    2.5. The bidder shall provide the details necessary to demonstrate that the proposed solution meets the requirements of these specifications. The details shall include schematics, mechanical assemblies, drawings … etc.

    2.6. The bidder shall propose 10% of the total offer as spare parts recommended from manufacturer and the list of the spare parts shall be priced.

3. TECHNICAL REQUIREMENTS

    3.1. The required systems shall be a non-blocking cross connects type, and each system shall have one and only one back plane.

3.2. The required equipment shall be equipped with:
    3.2.1. (16)x STM-1 S-1.1 optical SFP interface (LC type).
    3.2.2. (16)x Ethernet (8x100/1000Base-T, 8x100/1000 Base-LX single mode) SFP interface.
    3.2.3. (3)x 10Giga Ethernet optical SFP interface single mode (WAN Port up to 50Km distance).
    3.2.4. (126) x E1 interface (75 Ohm Unbalanced, BNC connector, HDB3 line code with DDF).

4. TECHNICAL SPECIFICATIONS:

4.1. General Functionality:

4.1.1. The specification in this part covers the technical requirements of SDH/Ethernet transmission for optical line equipment operating on NZDF, standard single mode and DSF optical fibres conforming to latest relevant ITU-T Recommendations.

4.1.2. All the firmware and software needed for operation, installation and maintenance of the equipment shall be supplied by the bidder.

4.1.3. The SDH/Ethernet transmission for line equipment systems shall conform to the relevant ITU-T recommendations.

4.2. Operating Modes

4.2.1. The transmission equipment has to provide flexible SDH and Ethernet functionality so it can be configured in the following operating modes:

4.2.1.1.   Layer2 Ethernet Functionalities,

4.2.1.2. IP/MPLS-TP Functionalities.

4.2.1.3. TDM over Ethernet.

4.2.1.4. Termination Node.

4.2.1.5. ADM (Add-Drop Multiplexer).

4.2.1.6. SDXC (Synchronous Digital Cross-Connect).

4.2.2. The switch matrix shall provide non-blocking cross-connect capability for both TDM/SDH and packet traffic for at least double the requested capacities.

4.2.3. bidder shall provide switch-matrix capabilities and calculations for both TDM/SDH and packet traffic.

4.2.4. Offered equipment shall map the SDH signal according to ETSI ETS 300 417.

4.3. Architecture

All equipment shall support the following network applications:

4.3.1. Line network.

4.3.2. Mesh network.

4.3.3. Ring network.

4.4. Equipment Redundancy

Equipment shall have protection on the following modules:

4.4.1. 1+1 on switching module (for both TDM and Packet traffic).

4.4.2. 1+1 on power supply module.

4.5. Protection

    4.5.1. Equipment shall support the following TDM protection based on relevant ITU recommendations:

        4.5.1.1.   Sub Network Connection Protection (SNCP) or equivalent.

    4.5.2. Equipment shall support the following Ethernet protection based on relevant ITU recommendations:

        4.5.2.1. Spanning Tree Protocol (STP) including RSTP and MSTP or equivalent standard protocol to ensure stable and redundant network topology.

        4.5.2.2.   Link Aggregation Group (LAG).

        4.5.2.3.   Ethernet Ring Protection (ERP).

        4.5.2.4.   MPLS Path Switching.

4.6. Ethernet Functionality:

    4.6.1. **Ethernet Module**

        4.6.1.1.   Ethernet module/card shall support the following interfaces:

            4.6.1.1.1.   100/1000 Mb/s interfaces:

                4.6.1.1.1.1.   100/1000Base-T/TX.

                4.6.1.1.1.2.   100/1000Base-FX/SX/LX.

            4.6.1.1.2.   10 Gb/s interfaces

                4.6.1.1.2.1.10G Base-SR/LR/LH.

        4.6.1.2. Interface modules shall support simultaneously a mixture of optical and electrical interfaces.

        4.6.1.3. Bidders shall provide details on their implementation and/or future plans for other interfaces, where such interfaces are planned Bidders should indicate when they will be available.

    4.6.2. **Link Loss Forwarding (LLF)**

        4.6.2.1.   All multiplexers shall support link loss forwarding feature.

    4.6.3. **Ethernet Switching Functionality**

        4.6.3.1. The equipment shall support VLAN tagging including IEEE802.1q and QinQ to enable efficient and flexible network segmentation.

        4.6.3.2. The equipment must be capable of switching Ethernet frames based on both MPLS/MPLS-TP labels and Ethernet MAC Addresses.

        4.6.3.3. The equipment must offer the capability of allocating one or more virtual MAC switches to a certain customer's VPN.

        4.6.3.4. The system should be able to mix MPLS/MPLS-TP switching and MAC switching within a single customer domain.

        4.6.3.5. Using the MPLS/MPLS-TP label and MAC switching functionalities, Equipment should be used to provide either Layer 1 and Layer 2 Ethernet Private Line service, or Layer 2 Ethernet VPN services.

        4.6.3.6. The equipment shall support transparent transmission of IEEE 802.1q VLAN tagged frames.

4.6.4. **Ethernet Virtual Connection (EVC)**
4.6.4.1.   Point-to-point:
4.6.4.1.1. In this mode one port is bound to another port forming a point-topoint Ethernet tunnel.
4.6.4.1.2.   These two ports can be either in the same equipment or in separate units.
4.6.4.1.3.   The tunnel must be completely transparent.
4.6.4.1.4. Layer 2 Ethernet private line based on Ethernet VLAN tagging or MPLS/MPLS-TP for assuring QoS guarantees and differentiated services.
4.6.4.1.5. At each Ethernet port, where Ethernet Layer 2 Capability is available in the Card, the equipment shall be able to label the frames using VLAN ID or MPLS/MPLS-TP.
4.6.4.1.6. Point-to-point Ethernet connections between customers end sites shall be established based on Layer 2 Ethernet private lines (i.e. based on VLAN or MPLS/MPLS-TP).
4.6.4.2.   Multipoint-to-Multipoint:
4.6.4.2.1. In this mode many ports (end user) in the same equipment or in separate equipment are bound together and connected in a virtual LAN.
4.6.4.2.2. Connections from the same customer domain can be established via Layer 1 Ethernet private lines or Layer 2 Ethernet private lines to the virtual MAC.
4.6.4.2.3. The equipment connecting a customer port must also be able to transparently forward incoming Ethernet frames that already have an 802.1q VLAN tag.
4.6.4.2.4. In a network with transparent customer ports the equipment connecting the aggregation port must be able to forward incoming Ethernet frames to the correct customer port by examination of the 802.1q/802.1ad VLAN tag on the incoming packets.

4.6.5. **Circuit Emulation Services (CES)**
4.6.5.1.   Equipment shall support the mapping of TDM (E1 and STM-1) Circuits over the Packet-switched Network according to ITU/IETF/MEF international standards.

4.6.6. **Quality of Service**
4.6.6.1. In Contention based point-to-point and Multipoint-to-Multipoint services, the equipment shall support MPLS/MPLS-TP Functionality as the means to preserve Quality of Service.
4.6.6.2. The equipment shall support classification of frames and association of these into service classes based on:
4.6.6.2.1.   Physical port.
4.6.6.2.2.   802.1q/802.1ad VLAN tag.
4.6.6.2.3.   MPLS/MPLS-TP tag.

4.6.6.3. The equipment shall support a QoS features including traffic classification, prioritization and shaping to ensure efficient use of network resources and shall satisfy the following:

4.6.6.3.1. A "Real-time" class suitable for voice or video applications.

4.6.6.3.2. An "Assured quality" class suitable for bursty business data.

4.6.6.3.3. A "Best effort" class without any guarantees.

4.6.6.4. It shall be possible to specify a committed Information Rate and a Peak Information Rate for any customer flow of data traffic.

4.6.6.5. The relation to the Service Classes shall be so that

4.6.6.5.1. Real Time: CIR=PIR

4.6.6.5.2. Assured Quality: PIR>CIR>0

4.6.6.5.3. Best Effort: CIR=0

4.6.6.6. It shall be possible to overbook the system so that the sum of PIR exceeds the bandwidth of the link between two Network elements

4.6.6.7. It shall be possible to deliver "hard" QoS for the Ethernet traffic by ensuring that the CIR value is met i.e. to fulfil and guarantee the service characteristics that are promised to an end user. (802.1p is considered "soft" QoS only).

4.7. Interworking

4.7.1. Bidder shall provide a reference list over vendors to whom the Bidder has proven the Equipment's Ethernet capabilities e.g.E-Line, E-LAN, E-Tree,MPLS/MPLS-TP, QoS.

4.8. Synchronization

4.8.1. All synchronisation functions in the equipment shall comply with ITU recommendations.

4.8.2. Offered equipment shall be able to derive timing from the following ports:

4.8.2.1. Synchronous Ethernet (Synch-E).

4.8.2.2. Internal clock.

4.8.3. Depending on the application, more than one timing reference input may be available and equipment should have the ability to switch between these automatically if the selected input fails. Bidders are requested to provide full details on the capability of the offered equipment.

4.9. Jitter and Wander

4.9.1. Jitter& Wander accumulation shall comply with latest relevant ITU recommendations for SDH and Ethernet traffic.

4.10. Multiplex Structure

4.10.1. Bidders must confirm that the essential interfaces provided on the offered equipment are multiplexed as per ITU-T Recommendation G.707 multiplexing structure ETS EN 300 147.

4.10.2. For each of the desired or other tributary interfaces offered, Bidders are requested to give a full description of the multiplexing path used.

4.11. Multiplex transport function:

 4.11.1. Bidder shall confirm that the equipment conforms with ETS EN 300 417.

4.12. Interfaces

 4.12.1. **Tributary Interfaces**

  4.12.1.1. Equipment shall support the ITU-T G.703 interface 2.048 MB/s (E1), line code is HDB3, and impedance of 75 ohm Unbalanced.

  4.12.1.2. Equipment shall support framed and unframed 2.048 Mbit/s signals on the same interface card, and it shall be configurable using the associated LCT / EMS.

  4.12.1.3. Equipment shall have an external Digital Distribution Frame (DDF) with the number of requested interfaces with all necessary materials (**3m industrial Baseband cables terminated with connectors between device and DDF**), this DDF shall have interfaces for traffic monitoring and switches for traffic Loops.

 4.12.2. **SDH Interfaces (SFP)**

  4.12.2.1. Equipment shall support the following SDH interfaces:

   4.12.2.1.1.   Electrical interface: (STM-1) electrical according to ITU-T G703.

   4.12.2.1.2.   Optical interfaces for equipment:

    • STM-1 Short Haul (S-1.1). • STM-1 Long Haul (L-1.1).
     • STM-1 Long Haul (L-1.2).

 4.12.3. **Ethernet Interfaces:**

  4.12.3.1. Equipment shall support the following interfaces:

    •100/1000 BASE-T/TX.
    • 100/1000 BASE-SX/FX/LX.
    •10G Base-SR/LR/LH/ER

 4.12.4. **Management Interface**

  4.12.4.1. Equipment shall have separate NMS and LCT ports.

  4.12.4.2. NMS interface shall be Ethernet RJ-45 and shall support IPv4.

  4.12.4.3. The Local Craft Terminal software shall be executable on a portable laptop PC equipped with genuine Microsoft Windows operating system.

  4.12.4.4. Two laptops with local Craft Terminal software (and licenses) shall be provided by the bidder as the manufacturer recommended specifications for hardware and software.

4.13. Alarms

 4.13.1. The Bidder shall list all functional blocks and all alarms submitted by these in the following areas:

  4.13.1.1. Communication& Routing

  4.13.1.2. Connection & Protection

  4.13.1.3. Equipment and Software

  4.13.1.4. Generic Support Functions

  4.13.1.5. Overhead Access/User Channels

4.13.1.6. Performance Management

4.13.1.7. Security

4.13.1.8. Synchronisation

4.13.1.9. Test & Diagnostics

4.13.1.10. Transmission

4.13.2. The alarms shall have following associated severity levels (ITU-T X.733):

4.13.2.1. Critical

4.13.2.2. Major

4.13.2.3. Minor

4.13.2.4. Warning

4.13.2.5. None

4.13.3. It shall be possible to suppress emission of an alarm

4.13.4. It shall be possible to link alarms with severity "Critical" or "Major" to the Rack Alarm and/or Visual Rack Alarm

4.13.5. Offered equipment shall maintain a Current Problem List (CPL) of all active alarms. It must be possible to read this list from the LCT/EMS

4.13.6. Offered equipment shall maintain a list of the most recently alarms, active and cleared. It must be possible to read this list from the LCT/EMS.

4.14. Performance Management

4.14.1. The equipment shall support end to end performance management functions for TDM and Ethernet traffic types as described in the ITU-T Recommendations.

4.15. Data Collecting

4.15.1. Equipment shall contain at least 24 hours performance data (static or differential) reported in 15 minutes interval.

4.15.2. It shall be possible to investigate the performance data with NMS and LCT.

4.15.3. It shall be possible to reset performance data by the NMS and LCT.

4.16. Operation and Maintenance

4.16.1. The equipment shall have the capability of creating software loops on traffic ports towards network side and customer side.

4.16.2. It shall be possible to download software to equipment centralized from the Management System and locally from the LCT.

4.16.3. It shall be possible to download and upload data (shelf, alarm and traffic configuration) between the equipment and the Management System or the LCT.

4.17. Power Source and Consumption

4.17.1. Offered equipment shall operate on nominally - 48 VDC (1+1 protected).

4.17.2. The Bidder shall state the power consumption of all relevant equipment modules.

4.17.3. The Bidder shall state maximum and average power consumption for all offered equipment

4.18. Safety

    4.18.1. Offered equipment shall support ALS according to ITU-T G.958 on all interfaces or any equivalent safety mechanism.

5. MANAGEMENT SYSTEM

5.1. **The management system shall be offered separately in the technical and financial offer of the tender and SCC reserves the right to consider it or not.**

5.2. It shall be the bidder's responsibility to install, configure and operate the management system

5.3. The bidder shall design and plan the DCN for all the requested equipment based on SCC network topology, which will be provided prior to installation.

5.4. The bidder shall provide the management system as a complete solution (operational) including hardware, software, licenses.

5.5. During installation of the system an OJT (On Job Training) is required.

5.6. All documents, plans and schematics of the system and connections to equipment shall be clearly provided as soft copy and hard copy after installation.

5.7. The manager shall be equipped with redundant power supply and hard disk array (e.g. RAID configuration).

5.8. The system shall be based on the FCAPS standards model (Fault, Configuration, Accounting Performance and security).

5.9. Manager shall provide following capabilities:

    5.9.1. Automatic and manual Backup and restore of manager's hard disk and configurations.

    5.9.2. Remote equipment configuration.

    5.9.3. Remote Circuit (TDM and Ethernet) configurations with end-to-end circuit creation ability.

    5.9.4. Configuring software loops on traffic ports towards network side and customer side.

    5.9.5. Show alarms and status of equipment.

    5.9.6. Remote equipment software upgrade.

    5.9.7. Remote access to equipment (similar to LCT GUI capabilities).

    5.9.8. Alarms and notifications (active and history).

    5.9.9. Performance data for traffic and equipment on a time period bases.

    5.9.10. Remote equipment's configuration files upload and download.

6. SIZE AND DENSITY

6.1. Offered equipment shall be rack mounted on 19" EIA rack, in case of ETSI rack shall be offered.

6.2. The Bidder shall state the dimensions of the offered equipment.

7. CONFIGURATION SOFTWARE

All firmware, software and licenses needed for the operation, installation and maintenance of the equipment shall be supplied by the Bidder.

8. EXPECTED LIFETIME

Manufacturer is requested to submit MTBF figures for all offered modules where applicable, and to calculate the expected life time of the offered systems.

9. OFFERED EQUIPMENT

The Bill of material of the offered equipment shall provide both part number and version in an itemized matter.

10. TRAINING

10.1. Intensive training course for eight (8) engineers for not less than ten (10) working days, Training shall cover theoretical aspect of:

10.1.1.   (SDH theory, Packet data, TDM over Ethernet, MPLS/MPLS-TP and other recommended topics from manufacturer) installation, operation and maintenance of equipment.

10.1.2. Management training (DCN, management system operation and administration, NE administration, Ethernet and TDM traffic configuration and other recommended topics from manufacturer) operation and maintenance of manager.

10.2.   Training shall be prior to shipment of equipment.

10.3.   Training shall be held in manufacturer training centre.

10.4. Detailed training schedule shall be provided by manufacturer showing the timetable for each day of the course and the training materials prior to training, and SCC have the right to modify the topics of the training according to actual needs.

10.5.   Instructor qualifications:

10.5.1. A good command of English.

10.5.2. Qualified and have a good technical experience in the related field.

10.6.   Training cost shall cover:

10.6.1. Training fees.

10.6.2. Accommodation.

10.6.3. Air tickets.

10.6.4. Visa fees.

11. DOCUMENTATION

11.1. Two sets of documents (hard copy) and one set (software copy) covering in details installation, operation and maintenance of equipment shall be provided.

12. WARRANTY

12.1.   Warranty period shall be at least 24 months from in country final acceptance.

12.2.   Warranty shall cover all equipment including software.

12.3.   All software updates during warranty period shall be provided to SCC free of charge.

12.4. During the warranty period, defective units or modules shall immediately and free of charge be replaced by the Contractor through express mail service (i.e. DHL, Aramex) within 20 working days of notification.

12.5.   The faulty unit or module will be return back to manufacturer by the Contractor.

12.6. The manufacturer is required to provide the Repair and Return (R&R) policy after warranty period.

12.7.   R&R policy shall include both equipment and software bugs.

13. DELIVERY

13.1. All prices shall be CPT QAIA or CIF Aqaba port, bidder shall be responsible for the delivery of the equipment to SCC Warehouses, Amman-Jordan

13.2.   Prior to shipment the materials shall be packed and marked for each node.

13.3. All materials excluded from custom duties, sales tax and any other governmental fees. (Freight cost included).

13.4. SCC shall be responsible for custom clearance and any other expenses shall be under supplier's responsibility.

13.5.   Delivery period of the equipment shall be during 150 days after awarding notification.

14. ACCEPTANCE:

14.1.   Final acceptance for the Equipment will be carried out after testing the equipment in SCC workshop.

14.2.   Final acceptance for the management system will be carried out after the installation, provisioning and testing of the systemin SCC main control site to ensure that the equipment performance is according to technical specifications.

15. INSTALLATION MATERIALS

15.1. All necessary recommended installation materials needed for the equipment shall be provided with each node:

15.1.1. 1x Programming cable.

15.1.2. 30m Power cables.

15.1.3. 30m grounding cable.

15.1.4. Recommended Circuit panel and circuit breakers.

15.1.5. Batch cord (20m) according to number of interfaces.

15.1.6. DDF with 3m industrial baseband cables equipped with connectors (separate cables and connectors will not be accepted) according to number of requested E1 interfaces.

16. SPARE PARTS

16.1. The Bidder shall supply all necessary spare parts on modular level covering 10% of equipment prices and must cover all main units of the offered system.

16.2.   The spares shall be divided into:

16.2.1. Consumable spares shall be stated and provided by the manufacturer.

16.2.2. Other spares and modules recommended by manufacturer.

16.3. The manufacturer must guarantee the supply of spare parts (when required) of the offered equipment for a period of 10 years.

16.4.   Bidder is required to provide the prices of the recommended spare modules.

SPECIAL TERMS AND CONDITIONS

1. The proposed equipment shall be 100% brand new and shall be of the latest up to date product (old product equipment will be disqualified).

2. **The Management** system shall be offered as **Optional Item** in the technical and financial offer within the tender and SCC reserves the right to consider it or not.

3. SCC reserves the right to increase and/or decrease quantities of system items with the same prices according to any updates might require any modification and has the right to terminate the tender at any time without justifications.

4. The bidder shall prepare the offer in an itemized manner and give a clear list of equipment in each site to meet the requirements.

5. All various manufacturers of equipment proprietor of trade mark (brand name) must be either North American, West European, New Zealand or Japanese origin.

6. All information supplied by Bidder as well as all markings and designations on the equipment, drawings and circuit diagrams shall be in English.

7. The training shall provide both theoretical and practical aspects, and cover all sections of this project.

8. All software and hardware of the proposed equipment shall be of proven industrial quality and workmanship according to relevant international standards.

9. The bidder shall guarantee the availability of spare parts for at least 10 years.

10. The bidder is required to fill in and sign a point-by-point compliance list for all sections and points of this document, the bidder shall complete the filling of compliance list and shall indorse it, the final compliance list will be considered as a vital part of project documents and will be used as a reference for all related matters in future.

11. In case of multiple bidding options, bidder shall contain each option in separate offer with maximum two options.

12. SCC shall disregard the offer if any of the followings:

12.1.   Ambiguous or Incomplete offers.

12.2.   Missing or incomplete compliance sheets.

12.3.   Offer not accompanied by original catalogues, technical drawings and calculations or does not match the related items in the document.

13. The bidder shall fulfil each of the following requirements:

    13.1.   Be well established and have efficient, reliable, and technical capabilities for the technical support and supervision when needed free of charge during the installation and the warranty period.

    13.2.   Quote for the equipment in an itemized manner for each site separately and SCC reserves the right to determine the final number of sites and equipment subject to budget.

    13.3.   Provide the necessary documentation (manuals, data sheets and schematic diagrams of the supplied system in soft & hard copy versions in English) and accessories needed for the installation.

    13.4.   Present original catalogues, and software releases by the mother company in English.

    13.5.   All mandatory "missing in the offer" appliances or cards and licenses recommended from the manufacturer for proper operation (as per the requirements) of equipment shall be delivered free of charge.

14. In case where the bidder is not fully compliant with the specifications, bidder shall state the reason and/or why SCC should reconsider his position.

15. The bidder is invited to suggest any change to any required specification which will improve the performance of the required equipment together with the reasoning for this alteration, SCC reserves the right to accept this change (solution) or refuse it.

16. All the connectors and cables shall be of high quality and in compliance with code recommendations and SCC reserves the right to reject any item not in conformance with the international standards.

17. Any abbreviation or symbol used in the schematics, drawings and calculations shall be clearly described.

18. The proposed equipment, materials and services shall be in accordance with these technical specifications. Any comments regarding transmission plan, network management, etc. shall be included in the technical proposed solution as "Engineering considerations".