

**AIR TRAFFIC AND NAVIGATION SERVICES CO. LTD EPUBLIC
OF SOUTH AFRICA**



REQUEST FOR PROPOSALS:

ATNS/RFP06/07/2026/27/TO-FIBRE-TERM-NODES-COM-2025-291

Fibre Termination Node Replacement

**THE SUPPLY, DELIVERY, INSTALLATION, COMMISSIONING, AND SUPPORT OF
FIBRE TERMINATION NODES AT FACT, FAGG, FAPE, FALE, FAEL, FABL, FAKM,
FAUP AND AT THE ATA**

VOLUME 2

TECHNICAL SPECIFICATIONS

SEPTEMBER 2026

The information contained within this document is confidential to ATNS in all respects and it is hereby acknowledged that the information as provided shall only be used for the preparation of a response to this document. The information furnished will not be used for any other purpose than stated and that the information will not directly or indirectly, by agent, employee or representative, be disclosed either in whole or in part, to any other third party without the express written consent by the Company or its representative.

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ABBREVIATIONS

°C	Degrees Celsius
ANSP	Air Navigation Service Provider
ATC	Air Traffic Controller
ATNS	Air Traffic and Navigation Services Company Soc. Ltd.
ATSEPS	Air Traffic Safety Electronics Personnel
ATSU	Air Traffic Service Unit
CNS	Communication Navigation and Surveillance
COTS	Commercial Off-The-Shelf
DME	Distance Measuring Equipment
DSCP	Differentiated Services Code Point
E&M	Ear and Mouth
ERPS	Ethernet Ring Protection Switching
EUROCAE	European Organisation for Civil Aviation Equipment
FAT	Factory Acceptance Test
GNSS	Global Navigation Satellite System
HTTPS	Hypertext Transfer Protocol Secure
ICAO	International Civil Aviation Organisation
ID	Identity
IEEE	Institute of Electrical and Electronics Engineers
ITU	International Telecommunication Union
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
OJT	On the Job Trainers
OJTI	On-The-Job Training Instructor
PMP	Project Management Plan
PTP	Precision Time Protocol
PTT	Push-To-Talk
QoS	Quality of Service
RPL	Ring Protection Link

RSPAN**SANS****SANS****SAT****SFP****SMR****SNMP****TCP/IP****UPS****VDF****VHF****VLAN****VoIP****VOR****WBS****Remote Switched Port Analyser****South African National Standards****South African National Standards****Site Acceptance Test****Small Form-factor Pluggable****Surface Movement Radar****Simple Network Management Protocol****Transmission Control Protocol/Internet Protocol****Uninterrupted Power Supply****Very High Frequency Direction Finder****Very High Frequency****Virtual Local Area Network****Voice over Internet Protocol****VHF Omnidirectional Radio Range****Work Breakdown Structure**

1 GENERAL INSTRUCTIONS TO BIDDERS

The Bidder shall submit all responses, diagrams, project management documentation and drawings according to the GENERAL INFORMATION AND INSTRUCTIONS TO BIDDERS document and in the English language.

To assist Bidders only, each paragraph or article has been appended throughout with the letters “(M)”, “(D)”, “(O)” or “(I)”, to indicate whether the requirement is Mandatory, Desirable, Optional or for Information only.

ALL RESPONSES TO THE REQUIREMENTS IN THIS DOCUMENT SHALL BE PROVIDED AS FOLLOWS:

BIDDERS SHALL RESPOND IN FULL TO EACH ITEM IN THE FORMAT PROVIDED AND REFERENCES (CHAPTER, SECTION, PAGE NUMBER, PARAGRAPH NUMBER) TO DOCUMENTS AND RELEVANT INFORMATION SUPPORTING THE RESPONSES SHALL BE INDICATED IN THE SPACE PROVIDED. THIS INFORMATION WILL BE THE ONLY RESPONSE USED FOR THE EVALUATION AND ASSESSMENT.

Responses, provided in the space allowed, that are not clear or inadequate or the lack thereof shall be interpreted as “Not Compliant” even though the compliance column is declared as “Comply” and/or the Bidder’s offer meets the requirement. Bidder’s shall ensure that each response correctly addresses the requirement stated. Responses not addressing the requirement of the specific paragraph shall be interpreted as “Not Compliant”.

Bidder’s shall declare compliance to each and every paragraph of this document in the column labelled “Compliance” as follows:

C:	fully compliant	=	2 points:
PC:	partly compliant	=	1 point;
NC:	not compliant	=	0 points.

Noted: Noted and accepted (applicable to paragraphs marked as “I”, not containing requirements)

Bidder’s shall, for paragraphs declared “PC” or “NC”, include a statement as to the nature of the variation and may additionally supply supporting information in the space provided to demonstrate how the proposal meets the needs of ATNS.

Paragraphs marked “(M)”, indicates that the requirement is mandatory and proposals not compliant with the requirement shall be disqualified for further evaluation.

Paragraphs marked “(D)”, indicates that the requirement is desirable, and the Bidder is expected to declare their level of compliance, formal response and reference supporting documents.

Paragraphs marked “(I)”, indicates that the requirement is for information, however the Bidder is still expected to respond and provide information if requested. Any information gathered herein may form part of the contractual terms.

Paragraphs marked “(O)”, indicates that the requirement is optional, and the Bidder may decide how to respond.

CHAPTER 1: INTRODUCTION

2 INTRODUCTION

2.1 Scope of work

The scope of the project is to supply, deliver, install, test and commission new fibre termination nodes at FACT, FAGG, FAPE, FALE, FAEL, FABL, FAKM, FAUP and at the ATA.

The project scope further includes:

- [A] Training of technical personnel to operate and maintain the fibre termination nodes
- [B] Maintenance and support agreement for the lifespan of the system.
- [C] Decommissioning and disposal of the existing fibre termination nodes.

2.2 System Description

Fibre termination nodes are switching devices that perform functions such as traffic switching, multiplexing, and traffic distribution while maintaining network performance, reliability, and signal quality.

These nodes are used to establish a fibre ring network that provides a resilient, deterministic, and low-latency transport layer between sites. The network supports monitoring, control, data exchange, and real-time communications between connected systems and associated operational or management infrastructure.

CHAPTER 2: GENERAL SPECIFICATIONS FOR FIBRE TERMINATION NODES

3 GENERAL REQUIREMENTS

3.1 General

3.1.1 The project shall include the provision and installation of the fibre termination nodes at the stations listed below. The ring configuration for each site is defined under the relevant sections related to each site . The Bidder shall indicate compliance with the requirement and provide detailed technical specifications of the proposed fibre termination nodes. (D)

[A] Fourteen (14) nodes at FACT

[B] Six (6) nodes at FAGG

[C] Six (6) nodes at FAPE

[D] Twelve (12) nodes at FALE

[E] Four (4) nodes at FAEL

[F] Five (5) nodes at FABL

[G] Four (4) nodes at FAKM

[H] Four (4) nodes at FAUP

[I] Three (3) nodes at ATA

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.1.2 The fibre termination nodes shall be connected to the existing single mode fibre optic cables at each of the stations. The Bidder shall indicate compliance and detail their understanding of the scope of work. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.2 Operation Environmental Conditions

- 3.2.1 The fibre termination nodes and its supporting infrastructure shall operate under the environmental conditions specified in Table 1. The Bidder shall provide a datasheet of the proposed solution meeting the below environmental conditions. (D)**

Table 1: Environmental Conditions

Ambient Temperature	-10 °C to +40 °C
Relative Humidity	10% to 80% non-condensing
Temperature Variations	0 °C to 20 °C in 24-hour Period

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.3 Power Requirements

- 3.3.1 The fibre termination nodes and auxiliary infrastructure shall operate from 230V $\pm$ 10% at 50Hz $\pm$ 5% AC mains power supply. The Bidder shall provide a datasheet indicating compliance with the requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.3.2 The fibre termination nodes shall be protected against electrical surges. Suitable electrical protection devices shall be provided in accordance with South African National Standards (SANS). The Bidder shall provide a datasheet/technical specification of the proposed surge protection devices. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

- 3.3.3 The fibre termination nodes and its auxiliaries shall be connected to the building earth bar. The Bidder shall indicate compliance to this requirement and provide an explanation on how this will be achieved. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.3.4 The fibre termination nodes shall cater for dual power feed. The Bidder shall provide a datasheet indicating compliance with the requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.3.5 Suitable circuit breakers shall be provided for each installation, including cables. The Bidder shall indicate compliance with the requirement and including costing for the items in Volume 1C. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.3.6 A Certificate of Compliance (COC) for all electrical work for each site shall be provided after commissioning has been completed. The Bidder shall indicate compliance to this requirement and make provision for it in the costing. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.4 Lifespan

- 3.4.1 The fibre termination nodes and supporting infrastructure shall be designed to operate within specifications under the stated environmental conditions in Table 1 for a minimum period of 15 years. The Bidder shall state the lifespan of the proposed fibre termination nodes and provide supporting information. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.4.2 All interventions required to ensure the system's optimal performance and lifespan shall be defined, including maintenance activities and, software updates. The Bidder shall list all the interventions required to achieve the 15-year lifespan. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.5 Auxiliary Items

- 3.5.1 The project shall provide all necessary auxiliaries for the fibre termination nodes to be commissioned and deemed fully operational. The Bidder shall list all the auxiliaries required and include the costing for them on Volume 1C. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.6 Environmental Sustainability

- 3.6.1 The fibre termination nodes shall be energy efficient and support low power consumption during normal operation. The Bidder shall state if the proposed fibre termination nodes have any energy efficiency features or low power consumption operation modes and provide details of it. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 3.6.2 The fibre termination nodes shall support modular expansion to reduce unnecessary hardware replacement and electronic waste. The Bidder shall indicate compliance using datasheets/technical specifications. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

3.6.3 Provided equipment racks shall be perforated to allow airflow without the use of fans. The Bidder shall indicate compliance using equipment rack datasheet/technical specifications. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

CHAPTER 3: FIBRE TERMINATION NODE SPECIFICATIONS

4 FIBRE TERMINATION NODE SPECIFICATIONS.

4.1 General Requirements

- 4.1.1 The fibre termination nodes proposed shall be, at minimum, managed industrial switching nodes. The Bidder shall provide a datasheet indicating that the proposed fibre termination node is a managed industrial switching node. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.2 The fibre termination nodes shall have optical Small Form-factor Pluggable (SFP) uplink ports to support single mode fibre interconnection to adjacent fibre termination nodes for data transfer. The Bidder shall provide a datasheet indicating that the proposed nodes support single mode fibre optic cables. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.3 The fibre termination nodes shall support a minimum distance of 4km or greater between adjacent fibre nodes. The Bidder shall provide a datasheet to indicate compliance with this requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.4 Each fibre termination node shall have at least two optical SFP uplink ports and support 4 cores to create the ring that supports clockwise and anticlockwise routing of traffic. The Bidder shall provide a datasheet to indicate compliance with the ethernet access ports. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.5 The fibre termination nodes shall have sufficient ethernet access ports to provide connectivity to locally attached systems (e.g., VOR, DME, RADAR, VHF Radios). The quantity of ethernet ports required for each node is provided below in the relevant site specific sections. The Bidder shall provide a datasheet indicating compliance to this requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.6 The ethernet ports shall support Power over Ethernet (PoE). The Bidder shall provide a datasheet indicating compliance to PoE. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.7 The fibre termination nodes shall provide the capability to interface with equipment that uses serial interfaces (i.e., RS232). Where the proposed switch does not support serial data interfaces natively, the requirement shall be met by providing a dedicated serial to ethernet converter device at each node where serial interfaces are required (refer to Section 6 to 14). The full requirements for the proposed serial to ethernet converter device are detailed in Section 5.1. The Bidder shall provide a datasheet for the fibre termination node/serial to ethernet converter device indicating compliance with the serial interface requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.8 The fibre termination nodes shall provide the capability to interface with VHF radio equipment that uses 4 wire E&M. Where the proposed switch does not support 4 wire E&M interfaces natively, the requirement shall be met by providing a dedicated VoIP gateway at each node where the 4 wire E&M VHF radios are used (refer to Section 6 to 14) The full requirements for the proposed VoIP gateway are detailed in Section 5.2. The Bidder shall provide datasheet for the fibre termination node/VoIP gateway indicating compliance with this requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.9 The network formed by the fibre termination nodes shall support both single and dual ring topologies. The Bidder shall explain how this is achieved using the proposed system. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.1.10 The fibre termination nodes shall support at minimum 1 Gbps throughput. The Bidder shall provide a datasheet to indicate compliance with this requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.2 Switching

- 4.2.1 Each fibre termination node shall function as a transit point for ring traffic and an access point for locally connected equipment. The Bidder shall explain how this is achieved by the proposed fibre termination node and reference the datasheet. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.2 The fibre termination nodes shall support IEEE 802.1Q (Virtual Local Area Network) VLAN to allow each connected system to have its own VLAN isolated from other systems. The implementation shall support VLAN tagging and untagging on all relevant interfaces and shall ensure correct handling of tagged traffic across all trunk links. The Bidder shall explain in detail how the proposed fibre termination nodes meet this requirement and reference the datasheet in the response. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.3 The solution shall maintain VLAN integrity across all fibre termination nodes, ensuring consistent VLAN ID propagation end-to-end. It shall also support standard VLAN management functions including VLAN creation, modification, deletion, and assignment without service disruption. The Bidder shall explain how VLAN management is conducted on the proposed fibre termination nodes and reference a manual/technical document. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.4 The VLAN switching shall have a minimum of 256 active VLANs. The Bidder shall state the number of active VLANs supported by the proposed fibre termination nodes. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.5 The network created by the fibre termination nodes shall have a one-way point to point transmission time that does not exceed 1 millisecond over a 1km span. The Bidder shall explain in detail, supported by the datasheet, how this requirement will be met. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.6 The fibre termination nodes shall support Precision Time Protocol (PTP) to ensure timing accuracy. The Bidder shall provide a datasheet indicating compliance to the requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.7 The system shall be scalable to allow for the addition of ports when requirements change at the stations. The Bidder shall explain, supported by a datasheet, how this requirement is met. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.2.8 The fibre termination nodes shall maintain continuous signal integrity on all active fibre spans. The Bidder shall indicate how the proposed solution ensures this requirement is met. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.3 Ring Topology

- 4.3.1 Both single and dual ring topology configurations shall support clockwise and anticlockwise traffic flows. The Bidder shall provide detailed explanation on how this will be achieved using the proposed fibre termination nodes and provide schematic drawings showing a single ring topology and a dual ring topology including direction of traffic flow. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.3.2 Under normal operation the traffic flow shall be in one direction (e.g. clockwise). The other direction (e.g. anticlockwise) path will be held in standby and be maintained by the Ring Protection Link (RPL) owner. The RPL owner shall be the node that is installed in the equipment room at all the stations. The Bidder shall list standards that support this configuration and additionally provide datasheets as proof. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.4 Ring Protection

- 4.4.1 The nodes shall support ITU-T G.8032 v2 Ethernet Ring Protection Switching (ERPS) ring protection to ensure that the fibre ring is intact and if a breach is identified the system can reroute the traffic through other available paths (anticlockwise). The Bidder shall provide a datasheet indicating compliance to ERPS. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.4.2 In the event of a single span failure, ERPS protection switching shall restore full connectivity via the alternate/available path within 50 milliseconds as described in ITU-T G.8032. The Bidder shall explain how the proposed system meets this requirement with reference to the datasheet. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.4.3 The ring topology shall allow automatic network reconfiguration in error situations such as fibre breach or double fibre breach. The Bidder shall explain how the proposed system meets this requirement. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.4.4 The fibre termination nodes shall support IEEE 802.3ah Operations, Administration, and Maintenance (OAM) to enable detection of physical link failures between adjacent nodes. The fibre termination nodes shall provide continuous link monitoring and shall generate alarms upon detection of link degradation or failure conditions. The Bidder shall provide a datasheet indicating compliance with this requirement and explain how alarms are generated and managed within the system. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.4.5 The fibre termination nodes shall support wait-to-restore to prevent oscillation before reverting to normal operation after restoration of the link. The Bidder shall explain how this is achieved by the proposed system. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.5 Monitoring

- 4.5.1 Each station shall have a monitoring computer which will be used for the monitoring and configuration of the nodes. The alarms shall be sent to this monitoring computer. The Bidder shall provide details of the monitoring computer and its functions with reference to a technical document/datasheet/manual. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.2 The fibre termination nodes shall support SNMP v3 management to allow a central network management system to monitor and manage all devices from a single point. The Bidder shall explain how this requirement is met and provide a datasheet indicating compliance with SNMP v3 management. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.3 The fibre termination nodes shall support SSH v2 management to allow a central network management system to monitor and manage all devices from a single point. The Bidder shall explain how this requirement is met and provide a datasheet indicating compliance with SSH v2 management. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.4 The fibre termination nodes shall support HTTPS management to allow a central network management system to monitor and manage all devices from a single point. The Bidder shall explain how this requirement is met and provide a datasheet indicating compliance with HTTPS management. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.5 The system shall support Switched Port Analyser (SPAN) and Remote Switched Port Analyser (RSPAN) for traffic monitoring and troubleshooting. The Bidder shall explain how this requirement is met and provide a datasheet indicating compliance with SPAN and RSPAN. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.6** The monitoring computer shall display the full layout of the respective station's configuration supporting both single and dual node topologies. The Bidder shall indicate how this is achieved and provide a diagram of a currently functional network. The diagram shall show the following items, including but not limited to the layout of the proposed system, the nodes and the traffic flow direction. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.7** When an alarm is triggered, the monitoring computer shall be able to detect which fibre span is affected and indicate it on the fibre layout. The Bidder shall explain how this is achieved by the proposed system. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.5.8** The monitoring computer shall indicate each node and associated services on each node. The Bidder shall explain how this is achieved by the proposed system. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.6 Security Requirements

- 4.6.1 The ring network shall be physically isolated from public networks and the internet — no direct internet-routable path shall exist. The Bidder shall confirm that the fibre network ring can function without the need of internet. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.6.2 All management access to switches and serial/VoIP gateways shall use SSH v2 or HTTPS only. The Bidder shall provide datasheets to indicate compliance. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.6.3 The fibre termination nodes shall support IEEE 802.1X to act as a security gate at the ethernet access port. The Bidder shall provide a datasheet to indicate compliance. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 4.6.4 Default passwords on all equipment shall be changed prior to commissioning. The Bidder shall indicate compliance. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>

5 LEGACY INTERFACES REQUIREMENTS

The below requirements are for the serial to ethernet converter device and the VOIP gateway device. These requirements apply to the fibre termination nodes that do not come with these interfaces natively. Should the proposed fibre termination nodes make provision for the serial interface and/or the VoIP gateway interface, the points allocated to the requirements under the respective sections below will be awarded to the Bidder.

5.1 Serial Interface

- 5.1.1** Each fibre termination node, that is serving serial equipment (refer to Section 6 to 14), shall have a standalone serial to ethernet converter device, to convert from a serial interface to TCP/IP ethernet which will then connect to the fibre termination node. The Bidder shall provide a datasheet for the proposed device, additionally provide a diagram layout on how the fibre termination node and the serial to ethernet converter device will be connected. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 5.1.2** The proposed serial to ethernet converter device shall support baud rates, data bits, parity and stop bits configuration for each RS232 port. The Bidder shall provide a datasheet for the proposed device indicating compliance to this requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 5.1.3** The proposed device shall be mounted in a standard 19" equipment rack. The Bidder shall indicate compliance by providing a diagram of the equipment rack layout. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

5.2 VoIP Gateway

- 5.2.1 Each fibre termination node, that is serving 4 wire E&M analogue radio equipment (refer to Section 6 to 14), shall have a standalone VoIP gateway to convert 4 wire E&M to TCP/IP Ethernet which will then connect to the fibre termination node. The Bidder shall provide a datasheet for the proposed device, additionally provide a diagram layout on how the fibre termination node and VoIP gateway will be connected. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- 5.2.2 The converted analogue to IP signal shall be compliant to ED-137B Real-time Transport Protocol stream. The Bidder shall indicate compliance to ED-137B. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

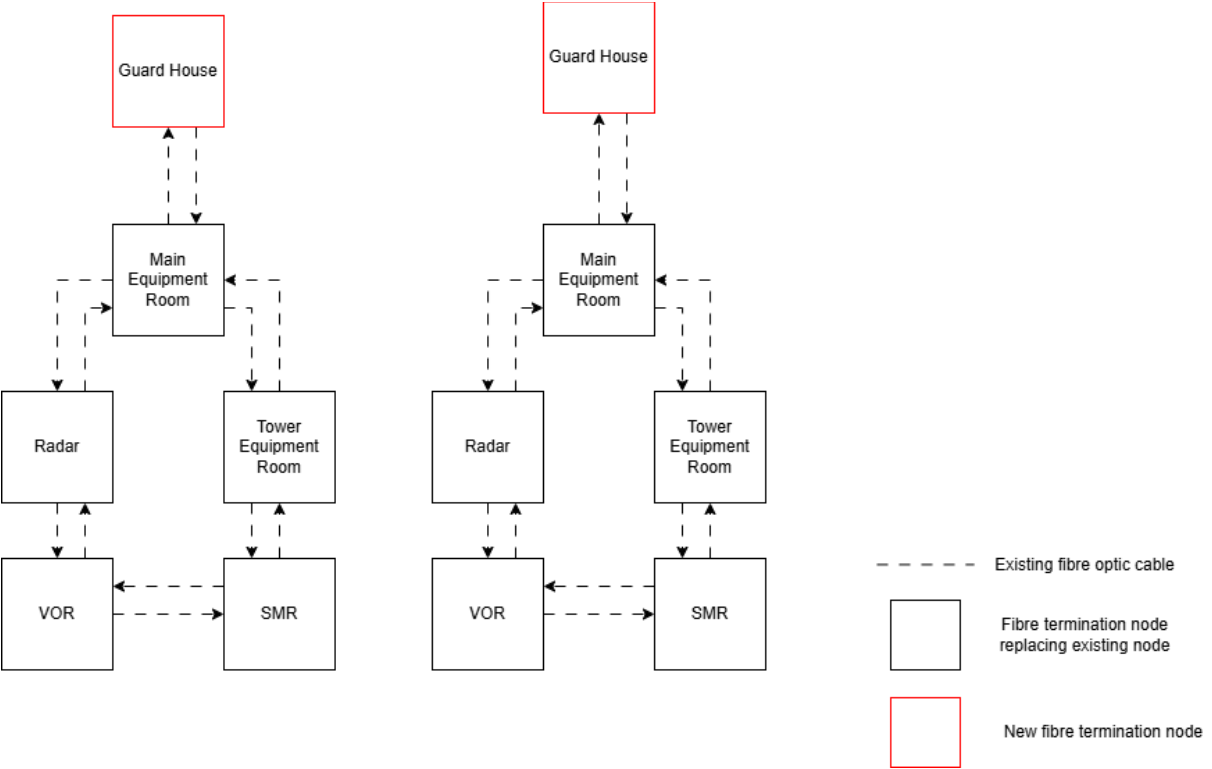
- 5.2.3 The proposed device shall be mounted in a standard 19" equipment rack. The Bidder shall indicate compliance by providing a diagram of the equipment rack layout. (D)**

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6 FALE SITE SPECIFIC REQUIREMENTS

6.1 Ring Configuration

6.1.1 Figure 1 below shows the FALE dual ring topology. Each ring shall consist of five (5) termination nodes with main and standby (making it 10 nodes). In addition to this, there shall be a link-to-link connection between the main equipment room and the guard house, increase the total to 12 nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 6.2 and make provision for the 12 nodes and interfaces in Volume 1C. (D)



COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6.1.2 The second ring shall be a duplicate of the first ring. The Bidder shall indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

6.1.3 The dual ring shall be connected to the existing single mode fibre optic cables. The Bidder shall indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6.1.4 Each site at FAL shall have a 3kVA rack mounted UPS to support the nodes for 10 minutes in an event of power failure. The Bidder shall provide a datasheet for the proposed UPS. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6.2 Site Requirements

6.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall provide costing for the below nodes and interface devices in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interface devices (ports)	Systems connected	Space availability
Main Equipment Room x 2	24 ports	2 x RS232	- ARINC - Radar RCMS - GNSS - SMS Beacons - VOR and DME	Space available for a new rack.

Tower Equipment Room x2	8 ports	2 x RS232	- VHF Radios - MARC	Space available for a new rack.
SMR x2	8 ports		- SMS transponder - GNSS	8U available on the current rack - Space available for a new rack.
VOR x2	8 ports		- VOR and DME - TSAT - Site computer	Limited space. Use the available 12U on the current rack.
RADAR x2	8 ports	2 x RS232	- Radar data - Radar RCMS - ARINC	Space available for a new rack.
Guard house x2	8 ports		- Telephone - CCTV - Access Control system	Limited space. Only a 9U equipment rack can be catered for.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6.2.1 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

7 FABL SITE SPECIFIC REQUIREMENTS

7.1 Ring Configuration

7.1.1 Figure 2 below shows the FABL single ring topology. The single ring shall consist of five (5) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 7.2 and make provision for the 5 nodes and interfaces in Volume 1C. (D)

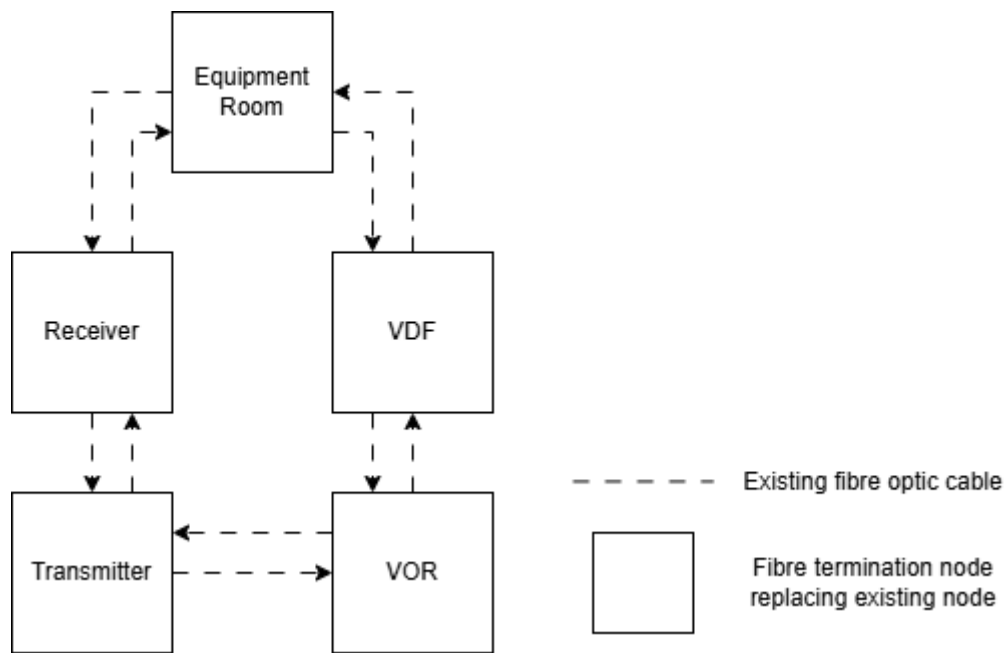


Figure 2: FABL Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.1.3 The fibre termination nodes at FABL shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.2 Sites Requirements

7.2.1 The project shall provide nodes with the following ethernet ports. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Systems connected	Space availability
Equipment Room	16 ports	- GNSS - VOR and DME - VDF	Space available for a new rack.
VOR Site	8 ports	VOR and DME	12U available on the current rack. - Space available for a new rack.
VDF Site	8 ports	- VDF - GNSS	Limited space.
Transmitter site	8 ports	Non currently	8U available on the current rack. - Space available for a new rack.
Receiver site	8 ports	Non currently	Space available for a new rack.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.2.2 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8 FAKM SITE SPECIFIC REQUIREMENTS

8.1 Ring Configuration

8.1.1 Figure 3 below shows the FAKM layout. The single ring shall consist of four (4) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 8.2 and make provision for the 4 nodes and interfaces in Volume 1C. (D)

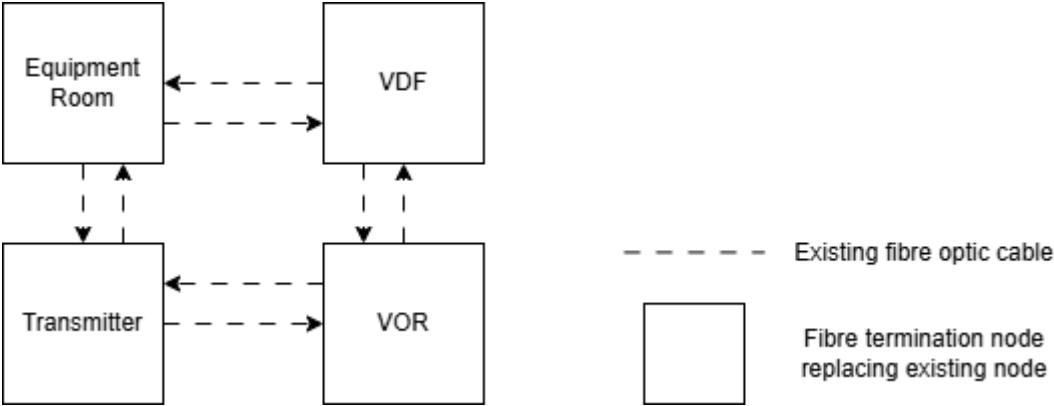


Figure 3: FAKM Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8.1.3 The fibre termination nodes at FAKM shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8.2 Site requirements

8.2.1 The project shall provide nodes with the following ethernet ports. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet	Systems connected	Space availability
Equipment Room	6 ports	- GNSS - VOR and DME - VDF	Limited space for a new rack. Space will be made available on the existing rack.
VOR Site	6 ports	VOR and DME	- Use current rack. 9U available.
VDF Site	6 ports	VDF	Space available for a new rack.
Transmitter site	6 ports	Non currently	Space available for a new rack.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8.2.2 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

9 FAUP SITE SPECIFIC REQUIREMENTS

9.1 Ring Configuration

9.1.1 Figure 4 below shows the layout. The single ring shall consist of four (4) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 9.2 and make provision for the 4 nodes and interfaces in Volume 1C. (D)

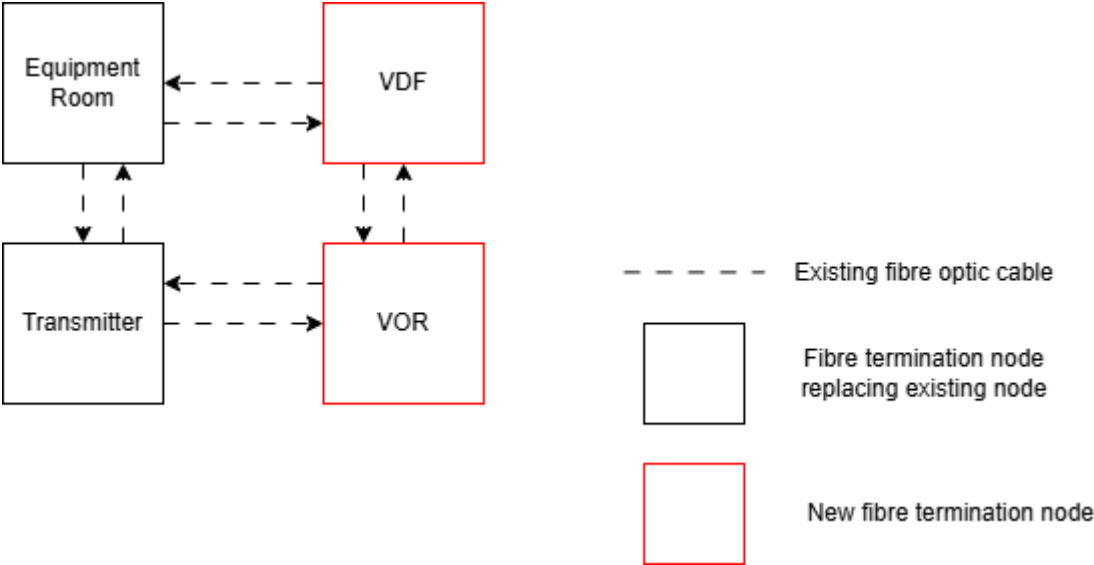


Figure 4: FAUP Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

9.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

9.1.3 The fibre termination nodes at FAUP shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

9.2 Site requirements

9.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interfaces devices (ports)	Systems connected	Space availability
Equipment Room	16 ports		• Transmitter VHF radios • GNSS • VOR and DME • VDF • MARC	• Space available for a new rack.
VOR Site	8 ports		VOR and DME	• Space available for a 24U rack.
VDF Site	8 ports		• VDF • GNSS	• Use current rack. • 12U available.
Transmitter Site	8 ports	• 2x RS232 • 4 x 4 wire E&M ports	• VHF Radios • MARC	• Use current rack. • 12U available.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

9.2.2 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

10 FAPE SITE SPECIFIC REQUIREMENTS

10.1 Ring Configuration

10.1.1 Figure 5 below shows the FAPE layout. The single ring shall consist of six (6) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 10.2 and make provision for the 6 nodes and interfaces in Volume 1C. (D)

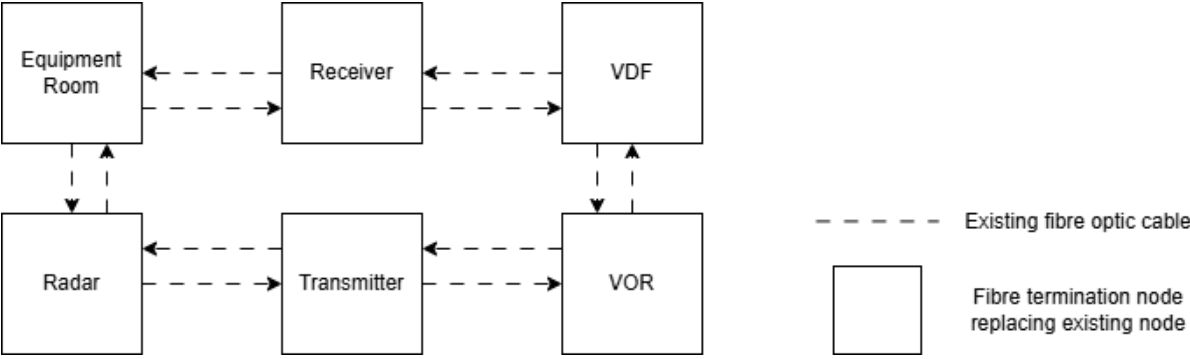


Figure 5: FAPE Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

10.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

10.1.3 The fibre termination nodes at FAPE shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

10.2 Site requirements

10.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interface devices (ports)	Systems connected	Space availability
Equipment Room	24 ports		• Transmitter VHF radios • Receiver VHF radios • GNSS • VOR and DME • VDF • MARC • VSAT	• Use current rack. • 16U available.
Receiver Site	8 ports	• 12 x 4 wire E&M ports	• VHF Radios • MARC	• Use current rack. • 13U available
VDF Site	8 ports		• VDF	• Use current rack. • 5U available.
VOR Site	8 ports	• 2x RS232 ports	VOR and DME	• Use current rack. • 7U available
Transmitter Site	8 ports	• 4 x 4 wire E&M ports • 1x RS232 port	• VHF Radios • VSAT • MARC	• Use current rack. • 5U and 6U available on two different cabinets.
Radar Site	8 ports	• 2x RS232 ports	• Radar	• Use current rack. • 10U available

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

11 FAEL SITE SPECIFIC REQUIREMENTS

11.1 Ring Configuration

11.1.1 Figure 6 below shows the layout. The single ring shall consist of four (4) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 11.2 and make provision for the 4 nodes and interfaces in Volume 1C. (D)

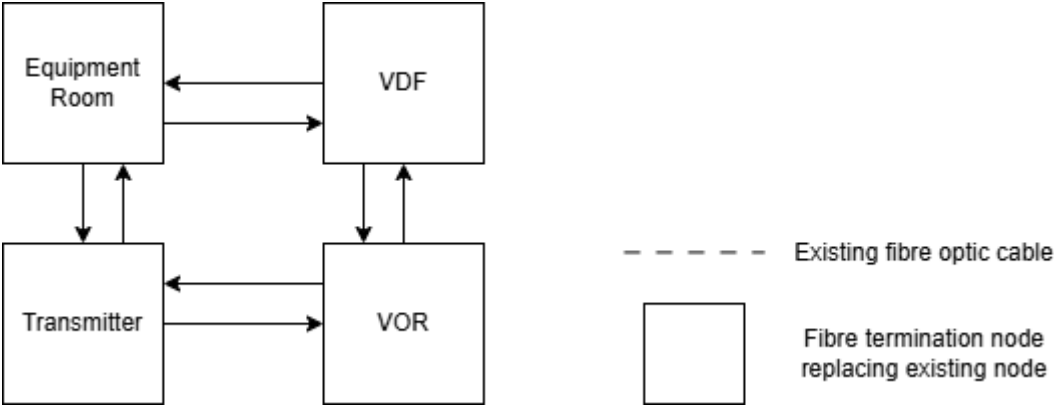


Figure 6: FAEL Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

11.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

11.1.3 The fibre termination nodes at FAEL shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
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[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

11.2 Site requirements

11.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Systems connected	Space availability
Equipment Room	16 ports	• Transmitter VHF radios • VOR and DME • VDF • Status Indicator Unit • Telephone	• Space available for a new rack.
Transmitter Site	8 ports	• VHF Radios	• Space available for a new rack.
VOR Site	8 ports	• VOR and DME • Status Indicator Unit • Telephone	• Space available for a new rack.
VDF Site	8 ports	• VOR and DME • Telephone	• Use current rack. • 5U available.

COMPLIANCE (C/PC/NC)

Only responding C/PC/NC/Noted will not be accepted without proof.

[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]

[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

11.2.2 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

12 FAGG SITE SPECIFIC REQUIREMENTS

12.1 Ring Configuration

12.1.1 Figure 7 below shows the FAGG layout. The single ring shall consist of six (6) termination nodes. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 12.2 and make provision for the 6 nodes and interfaces in Volume 1C. (D)

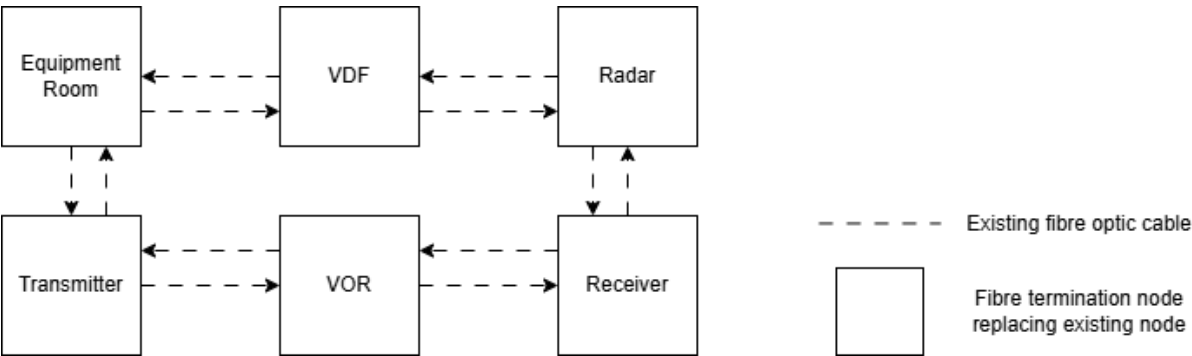


Figure 7: FAGG Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

12.1.2 The single ring shall be connected to the existing single mode fibre optic cable. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

12.1.3 The fibre termination nodes at FAGG shall be connected to the building UPS. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

12.2 Site requirements

12.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interfaces devices (ports)	Systems connected	Space availability
Equipment Room	24 ports		• Transmitter VHF radios • VOR and DME • VDF • Status Indicator Unit • Telephone	• Use current rack. • 10U available.
Transmitter Site	8 ports	• 2x RS232	• VHF Radios • MARC • UPS monitor	• Space available on the current rack.
VOR Site	8 ports		• VOR and DME • Telephone	• Use current rack. • 3U available
Receiver Site	8 ports	• 2x RS232	• VHF Radios • MARC	• Space available for a new cabinet.

Radar Site	8 ports	• 2x RS232	• Radar • Telephone	• Use current rack. • 20U available.
VDF Site	8 ports		• VDF • Telephone	• Use current rack. • 3U available.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

12.2.2 A 19-inch equipment rack shall be provided at sites where sufficient space is available (refer to the last column of the table above) to accommodate the fibre termination node, UPS, and associated interface devices. Where space is limited, the existing equipment rack shall be used. The Bidder shall indicate the size of the proposed rack, including a layout indicating each component on the rack considering the size available highlighted on the table above. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

13 FACT SITE SPECIFIC REQUIREMENTS

13.1 Ring Configuration

13.1.1 Figure 8 below shows the FACT ring topology. The ring shall consist of 14 termination nodes with main and standby nodes at each site. The Bidder shall provide a schematic diagram indicating the fibre ring layout including the interfaces required at each node as described in 13.2 and make provision for the 14 nodes and interfaces in Volume 1C. (D)

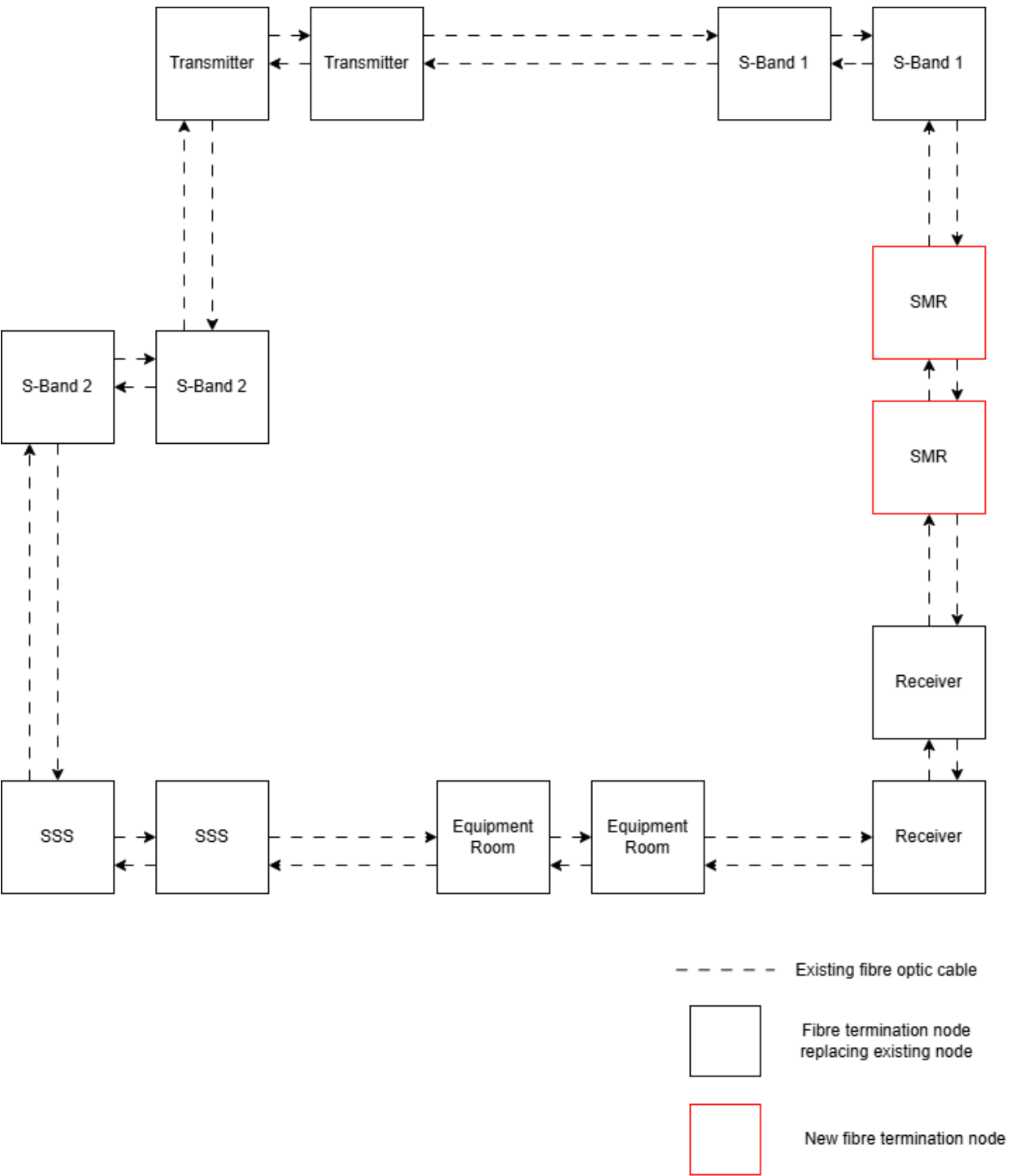


Figure 8: FACT Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

13.1.2 The two termination nodes at each site shall be connected in series. The Bidder shall indicate compliance with this requirement on the schematic diagram. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

13.1.3 The ring shall be connected to the existing single mode fibre optic cables. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

13.1.4 The fibre termination nodes at FACT shall be connected to the building UPSs. The Bidder shall indicate compliance with the requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

13.2 Site Requirements

13.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interfaces devices (ports)	Systems connected	Equipment rack space availability
Equipment Room x 2	32 ports	• 2x RS232	• VHF radios • Air conditioner • PABX • VSAT • CCTV • Radar • Voice recorder • Emergency VHF Radios • ARINC • SMR • M-LAT • NTP • DAID • VCS/SITTI	• Use current rack. • 5U available.
SSS x 2	22 ports	• 2x RS232	• VHF radios • Air conditioner • PABX • VSAT • CCTV • Radar • Voice recorder • Emergency VHF Radios • UPS • ATNS Network	• Use current rack. • 32U available.
S-Band 2 x 2	22 ports	• 2x RS232	• RCMS • Emergency VHF radios • UPS • Radar • Generator • Telephone • ATNS Network • DAID • AGL • I/O's- ILS/Crash Alarm/Legal Recording/Fire-station Hotline	• Use current rack. • 30U available.

Transmitter x 2	16 ports	• 2x RS232	• VHF radios • Telephone • Air conditioner • UPS • Access control system • CCTV	• Use current rack. • 32U available.
S-Band 1 x 2	12 ports	• 2x RS232	• RCMS • Radar • Vibration monitor • Telephone • Air conditioner • CCTV • UPS	• Use current rack. • 32U available.
Receiver x 2	8 ports	• 2x RS232	• VHF Radios • UPS • CCTV • Access Control system	• Use current rack. • 10U available.
SMR x 2	12 ports	• 2x RS232	• SMR data • Status PC • Air conditioner • Access control system • CCTV • UPS • ARINC	• Use current rack. • 9U available.

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14 ATA SITE SPECIFIC REQUIREMENTS

14.1 Ring Configuration

14.1.1 Figure 9 below shows the ATA layout. The single ring shall consist of three (3) termination nodes. The Bidder shall provide the costing for the 3 nodes in Volume 1C. (D)

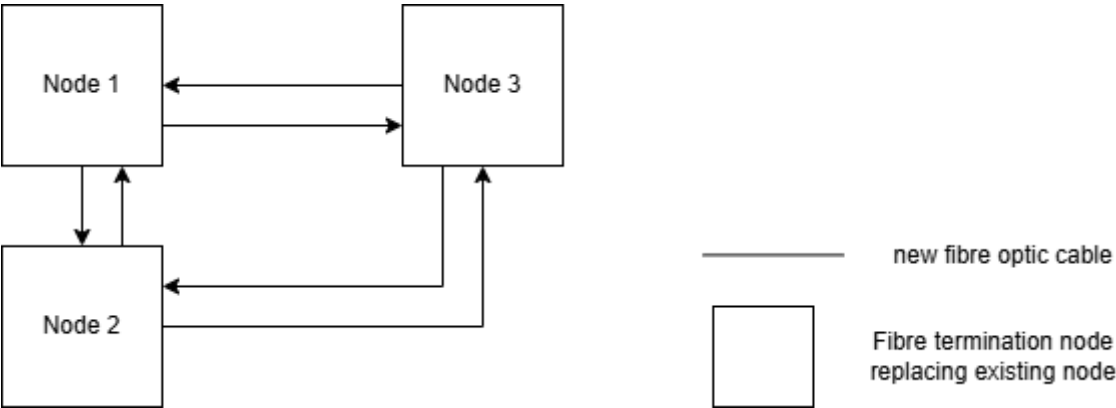


Figure 9: ATA Fibre Ring Layout

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.1.2 The ATA configuration shall consist of a single ring with 3 termination nodes. The Bidder shall indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.1.3 The ATA configuration does not connect directly to the single mode fibre optic cable; however, the three nodes shall connect to each other to create a three-node network via fibre. The fibre optic cable shall be provided as part of the project. The 3 nodes will be situated in the same rack (refer to 14.2). The Bidder shall provide a design document indicating the layout of the ATA ring. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.1.4 The fibre termination nodes shall be connected to the building UPS. The Bidder shall indicate compliance. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.2 Site requirements

14.2.1 The project shall provide nodes with the following ethernet ports and interface devices. The Bidder shall indicate compliance and provide costing for the below nodes in Volume 1C. (D)

Nodes (sites)	Ethernet (minimum ports)	Interfaces device	Systems connected
Node 1	8 ports	2x RS232 2x 4 wire E&M	Different systems based on the demonstration
Node 2	8 ports	1x RS232 1x 4 wire E&M	Different systems based on the demonstration
Node 3	8 ports	1x RS232 1x 4 wire E&M	Different systems based on the demonstration

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.2.2 The ATA shall be provided with a 19-inch equipment rack that will fit the 3 nodes in one rack. The rack shall be moveable between different rooms easily. The Bidder shall indicate the size of the proposed rack, including a layout diagram indicating each component on the rack. The layout shall be for all the nodes. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

14.2.3 The 19" rack provided shall also accommodate the monitoring/maintenance PC and the interface devices. The Bidder shall indicate compliance. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

CHAPTER 4: SUPPORTING SYSTEMS

15 SUPPORTING SYSTEMS

15.1 Equipment rack and Cabling

15.1.1 The project shall provide cables to route from the patch panel to the fibre termination node. The project shall make provision for 1-meter fibre patch cables for this purpose. Four cables will be required for each node. Connectors shall be compatible with the existing patch panel ST connectors and the new proposed SFP port. The Bidder shall provide details of the proposed SFP ports and patch cables and make provision for them in Volume 1C. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

15.1.2 The project shall make provision for all cables needed for the fibre termination nodes, including power cables from the circuit breaker. The project shall make provision for a 4-meter power cable from the circuit breaker to the equipment rack for each node. The Bidder shall indicate compliance and provide costing for the material in Volume 1C. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

15.1.3 All cabling shall be neatly routed and clearly labelled within the equipment rack and computer storage. The Bidder shall indicate the cable route on the technical drawings and indicate the suggested labelling style. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		

<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>

15.1.4 All auxiliaries required (i.e., krone blocks, cables, etc.) to install the system shall be provided. The Bidder shall indicate compliance and provide costing for the material in Volume 1C. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

15.1.5 All new equipment racks shall have an anti-static strap to reduce the risk of equipment being damaged by electrostatic shock. The Bidder shall indicate the anti-static strap used. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

15.1.6 All new equipment racks shall be accessible from the front and back for maintenance. The Bidder shall provide a datasheet to indicate compliance. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

15.1.7 All new equipment racks shall be designed to allow natural heat dissipation and cable management. The Bidder shall provide a datasheet to indicate compliance. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

15.1.8 The power plugs for the nodes and conversion devices (VoIP gateway and Serial Interfaces) shall be catered for in the equipment rack. The Bidder shall provide drawings indicating how the different equipment will fit within the equipment rack. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

15.2 Availability

15.2.1 The ring network end-to-end availability shall be no less than 99.9% per annum, excluding agreed planned maintenance windows in line with ICAO Annexure 10. The Mean-Time-Before-Failure of the proposed fibre termination node shall be provided. The Bidder shall explain compliance supported by test results. (D)

COMPLIANCE (C/PC/NC)	Only responding C/PC/NC/Noted will not be accepted without proof.	
[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]		
[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

15.3 Network Time Server

15.3.1 The system shall synchronise to the local time server clock. The Bidder shall explain how this requirement will be met. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC/Noted will not be accepted without proof.</i>	
<i>[THE BIDDER SHALL INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[THE BIDDER SHALL INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

----- **END OF VOLUME 2** -----