AIR TRAFFIC AND NAVIGATION SERVICES SOC. LTD

REQUEST FOR PROPOSAL - ATNS/RDI/RFP055/23.24/ RATS SERVICES

APPOINTMENT OF A SERVICE PROVIDER FOR THE REMOTE AIR TRAFFIC SERVICES – DIGITAL TOWERS

Volume 2, 3 and 4
Specifications, Project Management and Integrated Logistics Support

Version 2.0

March 2024

TABLE OF CONTENTS

INTRODUCTION

1.1. Document Contents

The document contains the consolidated specifications for the Remote Air Traffic Services RATS) project. The document is broken down into the following chapters:

[a] Chapter 1 – General Information;

[b] Chapter 2 – Functional Specifications;

[c] Chapter 3 – Hardware Specifications;

[d] Chapter 4 – Integrated Logistics Support Specifications;

[e] Chapter 5 – Project Management Specifications; and

1.2. Purpose of the Document

The purpose of the document is to define the specifications for the RATS system and supporting infrastructure.

GLOSSARY

1.3. Definitions of terms

1.3.1 Expression of requirements

The terms in the sense of expression of requirements in this document are used with the following meanings adapted from Internet Engineering Task Force (IETF) documents.

Shall

The use of the word "**Shall**" indicates a mandated criteria, i.e., compliance with the procedure or specification is mandatory and no alternative may be applied.

Shall not

The phrase "**Shall not**" indicates a procedure or criterion that is absolutely prohibited.

Should / Recommended

The use of the word "**Should**" or the adjective "**Recommended**" indicates that although the procedure or criterion is optional (but recommended), alternative procedures, specifications or criterion may be applied provided that the manufacturer, installer or tester can provide information or data to adequately support an justify the alternative.

Should not / Not recommended

The phrases "**Should not**" or "**Not recommended**" indicate that there may exist valid reasons in particular circumstances when the procedure or criterion is acceptable or even useful, but the full implications should be understood and weighed carefully before implementation.

May

The use of the word "May" indicates that the procedure or criterion is truly optional.

1.3.2 Fundamental Terms

Air Traffic Services (ATS)

A generic term meaning variously, flight information service, alerting service, air traffic advisory service, or air traffic control service (are control service, approach control service or aerodrome control service). (ICAO PANS-ATM Document 4444)

Operator

Throughout this document, the term operator is used to refer to personnel providing an ATS service to aerodrome customers, supported by surveillance information provided by a remote tower optical system (RTOS). Personnel providing a non-ATS service to aerodrome customers such as apron/ramp management and fire & rescue are also considered as operators.

Service provider

Throughout this document, the term “service provider” is used to refer to the organisation that provides aerodrome services through operators.

Remote Tower Module (RTM)

A module from which remote ATS and/or apron management can be provided. An RTM includes one or more working positions, including necessary ATS and/or apron management systems such as communications, aerodrome lighting control, etc., and visual presentation displays, as required.

Remote Tower Centre (RTC)

A facility housing one or more RTMs.

Out-the-Window (OTW) view

The view from a conventional aerodrome tower’s visual control room.

Remote Tower Optical System (RTOS)

A system that relays video images from optical sensors at the aerodrome, which could be visible spectrum as well as optical sensors beyond the visible spectrum (e.g., infrared), and present them to the operator via an OSP.

1.3.3 Detection and Recognition Terms

Area-of-Interest (AoI)

An area either on the ground or in the air, which is specified to be of interest by the operator.

Object

An object in the real-world.

Object Image

The image of a real-world object on the Optical Sensor Platform (OSP)

Object Class

A group of objects that share familiar size, behaviour and/or visual characteristics.

Object-of-Interest (OoI)

An aircraft, vehicle, person, animal, obstacle or any other object, either moving or temporarily stationary, on the ground or in the air, which is specified to be of interest by the operator in the requirements.

1.3.4 Sensor Terms

Optical Sensor

An imaging sensor sensitive to visible and near-visible (thermal, IR, near infrared, short-wave infrared, etc.) wavelength light that outputs a stream of video images digitised as pixels. Radiation from the scene is focused by a lens onto a sensor array of light-sensitive elements. Sensors include two-dimensional arrays of elements that capture whole frames simultaneously, and a line of elements that is mechanically swept over the scene to build up a 360-degree wide image (i.e., a linescan camera).

Pan/Tilt/Zoom (PTZ)

“Pan/Tilt/Zoom”: An optical sensor with a pan/tilt pointing capability (typically by mounting a camera on a two-axis “PTZ head” that mechanically orients the camera to point to a desired location) and a narrow, possibly variable, angle of view (typically by using a variable focal length “zoom” lens). The PTZ sensor and view emulate the function of binoculars in a conventional tower, and could also be used to assist, e.g., light gun operation.

Sensor Coverage Volume

The three-dimensional space which is “covered” by an optical sensor. The depth of the coverage volume is the range of distances within which objects of interest are resolvable and in sharp focus.

1.3.5 PTZ Object Following Function Terms

Object-to-be-followed

An object designated by the operator or a system function to be followed by the PTZ Object Following Function.

1.3.6 Presentation Terms

Visual Presentation

A visual display that shows real-time video images from the areas of responsibility of the ATS and/or apron management unit.

Visual Presentation comprises the following types of presentation:

a) Optical Sensor Presentation (OSP)
b) Augmented OSP
c) Virtual Presentation

Definitions below.

Note: The more general term “Visual Presentation” is used when both terms “OSP” and “Augmented OSP” are addressed.

Optical Sensor Presentation

A display of images from optical sensors.

Note: Implementation of the OSP typically comprise a wide-angle display (a) Panorama) that presents a wide field-of-view image derived from one or more fixed-vies optical sensors, and a b) PTZ view.

a) Panorama
   The term “Panorama” is used to refer to a wide-angle display typically used to show images from fixed-view optical sensors. However, use of this term does not preclude other implementations of the OSP.
b) PTZ View
   Show video images from a PTZ sensor. The PTZ view could be shown on a separate display device to the Panorama or integrated with the Panorama as a “picture-in-picture”.

Augmented OSP

An OSP on which information associated with real-world objects is presented as 2D/3D graphical elements, image data, symbols or text overlaid onto the OSP, either conformably or close to their optical images. Examples include runway/taxiway boundaries and stop bars, tracking boxes or labels.

Virtual Presentation

A computer-generated synthetic visual presentation of the aerodrome operational environment generated using object information derived from non-optical surveillance systems (e.g., multilateration, ADS-B, Approach radar), static environment information (e.g., aerodrome layout, GIS data) and other sensor

information (e.g., meteorological data). The virtual presentation may contain two-dimensional, three-dimensional, pictorial, symbolic or textual representations.

1.3.7 Visual Tracking Terms

Visual Tracking

Visual Tracking, also referred to as object motion indication or simply “tracking”, is an image processing-based function that identifies groups of pixels that correspond to moving objects and augments them on the Visual Presentation to support operator situational awareness by Object Indication (i.e., superimposing an Object Indicator).

Note: If available, non-optical surveillance sensors may be used to improve the visual tracking performance.

Object Indicator

A graphical cue or symbol associated with an object which is displayed on the OSP processed by the Virtual Tracking function. The Object Indicator, also referred to as “Visual Tracking Box”, can take one or more forms such as, but not limited to:

a) A geometric shape that encloses the pixels belonging to the object as recognised by the Visual Tracking functionality.
b) A symbol near the object.
c) An arrow pointing to the object.

Object Augmentation

The augmentation of the display of objects on the Visual Presentation.

To discuss the augmentation of moving objects by the Visual Tracking function, objects are divided into two classes:

a) Object-to-be-tracked

An aircraft, vehicle, person, animal, obstacle, or any other object, either moving or temporarily stationary, either on the ground or in the air, which is considered to be potentially of interest to the operator.

b) Object-not-to-be-tracked

An aircraft, vehicle, person, animal, obstacle, or any other object either moving or temporarily stationary, either on the ground or in the air, which is considered not to be potentially of interest to the operator.

Ideally, only objects-to-be-tracked should be augmented and objects-not-to-be-tracked should not be augmented, but the converse is possible. A “nuisance object indication” is the case when an object-not-to-be-tracked is augmented. The table below gives a classification scheme for defining Visual Tracking performance in terms of desired and undesired augmentations.

	Object augmented	Object not augmented
Object-to-be-tracked	Correct hit (wanted)	Missed (unwanted)
Object-not-to-be-tracked	Nuisance (unwanted)	Correct rejection (wanted)

1.3.8 Non-optical Surveillance Sensor Terms

Non-Optical Surveillance Sensor

The term “Non-optical surveillance sensor” used in this document refers to non-optical surveillance sensor(s), system(s) and/or flight data processor systems. It provides information on object positions and possibly other parameters such as transponder code, callsign, destination, stand number, track (history of motion), velocity vector or altitude.

Blip

A virtual symbol presenting the non-optical surveillance sensor(s) derived position of a real-world object.

Correlation

Correlation is the process and result of determining whether a non-optical surveillance sensor blip and an optical sensor object image (i.e., an Object-to-be-augmented being tracked by the Visual Tracker) correspond to the same real-world object (aircraft, surface vehicle, etc.). A correlation may have an associated probability.

Fusion

“Fusion” is a technical term used to refer to combining object state estimates from two or more different types of sensors (e.g., by weighted average or Kalman filter) to produce a single “synthetic” state estimate that can potentially have less error than the individual sources.

Label

“Label” used in this document means a data block augmented on the OSP giving information about an object.

Leader Line

The “Leader Line” used in this document defines a line in between an object position reference (e.g., a blip position, an object image position or a visual tracking box) and corresponding label information.

1.4. Abbreviations

ADS-B	Automatic Dependent Surveillance - Broadcast
AFIS	Aerodrome Flight Information Service

AoI	Area-of-Interest
A-SMGCS	Advanced Surface Movement Guidance and Control System
AOREQ	Area-of-Interest and Object-of-Interest REQuirements
ATC	Air Traffic Control
ATM	Air Traffic Management
ATCO	Air Traffic Control Officer
AFISO	Aerodrome Flight Information Officer
ATS	Air Traffic Services
CWP	Controller Working Position
DRRP	Detection and Recognition Range Performance
FMEA	Failure Mode and Effects Analysis
FMECA	Failure Mode, Effects and Criticality Analysis
FOV	Field Of View
fps	Frames per second
ft	Foot
FTA	Fault Tree Analysis
GIS	Geographical Information System
HMI	Human-Machine Interface
Hz	Hertz
ICAO	International Civil Aviation Organisation
ICD	Interface Control Document
IFR	Instrument Flight Rules
IMRT	Integrity Monitor Response Time
INT	Interoperability
IR	Infrared
K	Kelvin
km	Kilometre
m	Metre
MASPS	Minimum Aviation System Performance Standard
min	Minute
MLAT	Multilateration
MOPS	Minimum Operational Performance Standard
MRC	Minimum Resolvable Contrast
MRTD	Minimum Resolvable Temperature Difference
mm	Millimetre
ms	Millisecond

MSSR	Monopulse Secondary Surveillance Radar
MTBCF	Mean Time Between Critical Failures
MTTR	Mean Time To Repair
NM	Nautical Mile
NOI	Nuisance Object Indication
NOS	Non-Optical Sensor
NTP	Network Time Protocol
NUOI	Number of Unwanted Object Indications
NVM	Non-Volatile Memory
OAIT	Object Augmentation Initiation Time
OC	Operational Consideration
OITUR	Object Indication Tracking Update Rate
OoI	Object-of-Interest
OPCF	Object Position Containment Figure
OPRP	Object Position Reference Point
OSED	Operational Service and Environment Definition
OSP	Optical Sensor Presentation
OTW	Out-of-The-Window
Pano	Panorama
PANS-ATM	Procedures for Air Navigation Services – Air Traffic Management
PTZ	Pan Tilt Zoom
QNH	Altimeter setting to give height above mean sea level
RC	Recommendation
REQ	Requirement
RMA	Reliability, Maintainability and Availability
Rrec	Distance of recognition
RTC	Remote Tower Centre
RTM	Remote Tower Module
RTO	Remote TOwer
RTOS	Remote Tower Optical System
SMR	(Primary) Surface Movement Radar
ToIREQ	Tracking-of-Interest REQuirements
TWR	Tower
UTC	Coordinated Universal Time
VC	Video Chain
VCJ	Video Capture Jitter

VFR	Visual Flight Rules
VT-REQ	Visual Tracking REQuirements
XVS	eXternal Visibility System

CHAPTER 1 – GENERAL INFORMATION

PRELIMINARY

1.5. Background

The Remote Air Traffic Services (RATS) – Digital Tower program has been identified as one of the strategic projects at ATNS. In recognition of the critical role played by IR&D; the ATNS IR&D department, under the Infrastructure Research and Management, was established to consolidate the organization's research activities and maximize its research investment and outputs.

Aligned with the reviewed ATNS Research Strategy, the IR&D department have developed strategic actions until the year 2025 and Budget Requirements. The Remote Air Traffic Services Digital Tower Program was identified as one of the important projects to be implemented by the year 2025.

The Objective of the RATS Digital Tower Program is to investigate the feasibility of remoting tower services using digital towers. The results of the feasibility study will determine the modes of operations that suit ATNS's operations.

The RATS – Digital Tower Program will be implemented in phases:
Phase 1: FAOR Contingency Tower
Phase 2: Remote Air Traffic Services for identified Aerodromes.

PROJECT OVERVIEW

1.1 Project Goal

The goal of the Remote Air Traffic Services – Digital Tower program is to firstly provide a contingency tower for the FAOR air traffic control unit (Phase 1) and additionally determine the feasibility of remoting other air traffic services units which will be identified through a feasibility study and CONOPS (Phase 2).

1.2 Scope of work overview

The scope of work that needs to be done as part of phase 1 of the project. This includes, but not limited to,

[a] Plan and Analyse: Evaluate current infrastructure readiness in preparation for Remote Air Traffic Services Implementation. (Including datalinks)
[b] Detailed Design of FAOR Contingency Tower (Digital Tower) System.
[c] Supply, Delivery, Installation and Commissioning of the FAOR Contingency Tower Solution.
[d] Training of ATNS personnel,
[e] Change management,
[f] Maintenance and support for the provided System.

1.3 System description

When analysing the requirements of an RTOS, it is necessary to decompose the system into its conceptual building blocks, independent of the technical realisation. For phase 1, only a digital video system is considered.

An RTOS is composed of the following building blocks:

1.3.1 Optical sensors: capture images and output a video stream.

1.3.2 Encoder/Processing: applies processing (possibly including compression) to the video stream.

1.3.3 Network: transmits the video and other signals such as operator control commands.

1.3.4 Decoder/Processing: applies other processing (possibly including decompression) to the video stream, e.g., processing of optional Visual Tracking or PTZ Object Following processing.

1.3.5 Optical Sensor Presentation (OSP): display the video stream to the operator, optionally including augmented presentations.

1.3.6 Pan/Tilt/Zoom (PTZ) Function: An imaging sensor or sensors with a pan/tilt pointing capability and narrow (i.e., magnified) variable field-of-view (emulates binoculars).

1.3.7 Control HMI: interface for remotely operating sensors and other devices at the aerodrome.

1.3.8 Time source: time reference for synchronisation of components.

1.3.9 Non-optical surveillance sensors: a non-optical sensor or system that provides position and possibly other information on objects. This may be a sensor/system that covers the aerodrome and its immediate vicinity (e.g., A-SMGCS) or that covers a wider area that includes traffic associated with the aerodrome (e.g., terminal radar).

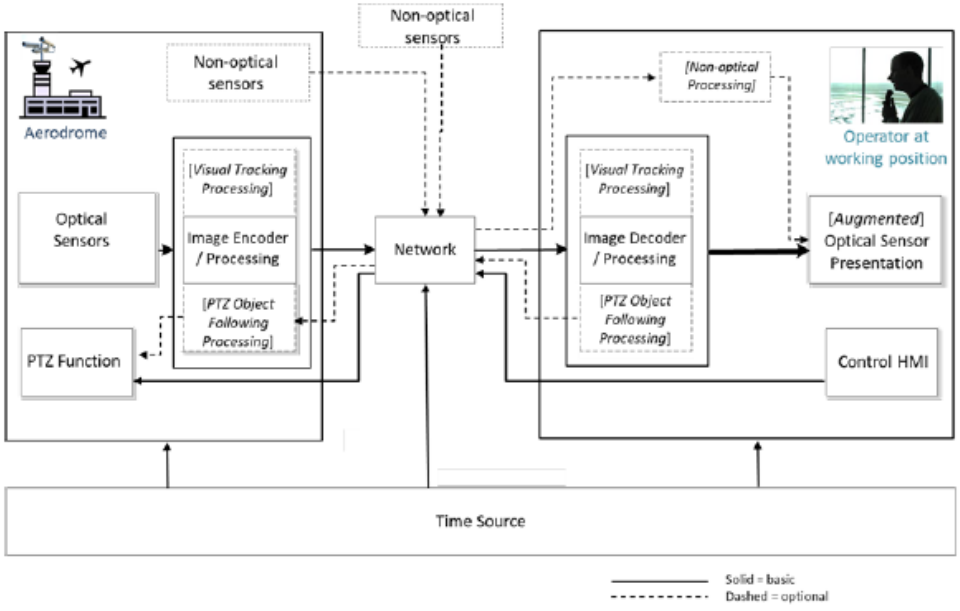

Figure 1 Remote Tower Optical System Conceptual Building Blocks

INSTRUCTIONS TO TENDERERS

The stipulated guidelines in the paragraphs to follow, are applicable to any party interested in the contents of this documents and are meant to provide a high-level overview of important aspects of the project and are recommended for addition to ATNS's standard instructions to tenderers.

[a] Any party interested in the contents of this document shall submit a comprehensive proposal to ATNS and the proposal shall give insight into the party's understanding of the scope of work for the project in line with the specifications contained herein.

[b] The interested party shall provide a detailed cost breakdown of the whole project costs (direct and indirect) for all items required to cover the entire project scope.

[c] The interested party shall be responsible for arranging all import permits, exchange control requirements; custom and duties, insurance and other legal and statutory requirements for procuring of the Reimagining Reality System.

[d] The interested party shall further supply all materials and supporting components that are not specified herein but are necessary to execute the contract and handover the complete Reimagining Reality system in a satisfactory working condition to the best quality standards achievable.

[e] The interested party shall restore, at their own cost, any items that are damaged, because of handling, packaging, storage and transportation, to its original state.

[f] The interested party shall be responsible for the security and storage of tools and equipment, required for implementation of the project, on-site and off-site during implementation.

[g] The interested party shall take into consideration environmental sustainability support and safety management requirements during the execution of the project.

[h] The interested party shall have the capability and experience to undertake the full scope of the project.

[i] The interested party shall provide the workforce and resources necessary for the successful completion of the project on time, within budget and to the required level of quality.

CHAPTER 2 – SYSTEM SPECIFICATIONS

GENERAL REQUIREMENTS

1.4 Capability Assessment

[a] The Tenderer shall provide details of a project/s where they supplied, delivered, installed, and commissioned Remote Air Traffic Services - digital towers. The Tenderer shall provide at least one reference letter as evidence to substantiate their compliance to this requirement.

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

[b] The Tenderer shall provide the curriculum vitae of the key personnel in their project team which will be responsible for the implementation of this project at ATNS. The key personnel shall have a minimum of 5 years' experience in Systems Engineering with a proven track record of being involved in implementing complex (Information and operational Technology) systems.

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

1.5 Design Life

[a] The system shall have a minimum design life of 10 years. All required service, equipment, and tools to support this design life (after the trial for 10 years) shall be provided. The Tenderer shall indicate the design life of the system and what additional items are required to ensure the fulfilment of this requirement.

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

[b] The system trial period shall extend for a duration of 12 months before being fully accepted by ATNS. Furthermore, the system shall receive ongoing support for a period of 10 years following the conclusion of the trial.

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

1.6 Environmental Conditions

[a] The system shall operate within the following environmental conditions:

Indoor Conditions	Ambient Temperature	0 °C to +55 °C
	Relative humidity	≤ 95% for temperatures ≤ +35 °C, and ≤ 60% for temperatures > + 35 °C
Outdoor Conditions	Ambient Temperature	-20 °C to +50 °C
	Temperature variations	Up to 20 °C within 24 hours
	Relative humidity	0% to 100%
	Annual rainfall range	400 mm to 2000 mm
	Wind speed	Up to 186 km/h

[b] The Tenderer shall provide specifications stipulating the environmental conditions of the system.

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

[c] Outdoor elements, structures and other components shall be designed to withstand the effects of rain, snow, storms and attacks of animals, as well as the outdoor environmental conditions stated herein. The Tenderer shall provide details on how outdoor components of the system will be protected against the effects of rain, snow, storms and animal attacks as well as the outdoor environmental conditions as stated herein.

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

[d] The outdoor elements, structures and other components shall be protected against corrosion and their protective casings/enclosures shall be at minimum Ingress Protection (IP) rating IP66. The Tenderer shall indicate how the outdoor elements, structures and components shall be protected against corrosion. The Tenderer shall also indicate the IP ratings for the casings/enclosures of these outdoor elements, structures and components.

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

[e] The system shall operate in environment congested with electrical devices/systems and as such the system shall be protected against electromagnetic interference and susceptibility. The Tenderer shall indicate that the system is EMC compatible.

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

1.7 Power Supply and Cabling

[a] The system shall operate from a 230 V ± 10% at 50 Hz ± 5% AC mains power supply. The Tenderer shall provide details on the power requirements of the system.

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

[b] All electrical cabling and connections to/with associated distribution boards shall strictly comply with approved standards and practices, such as SAN 10142, IEE522, and any other relevant regulations. The tenderer shall provide the details and standards used for all electrical cabling and connections that will be used.

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[c] The contractor shall be responsible for the supply of an Electrical Compliance Certificate as issued by a certified electrical contractor for all Distributed Boards (DBs) worked on and all electrical work completed.

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

[d] The system shall be protected from undervoltage and overvoltage supply. The Tenderer shall elaborate on how the system is protected from undervoltage and overvoltage.

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

[e]

[f] The system and its supporting infrastructure shall seamlessly transition to a backup power source, during any power failure. The backup power source shall be capable of sustaining uninterrupted operation for a minimum duration of 4 hours. The tendered shall provide a UPS with a suitable battery to support the requirement. The UPS shall be configured in an online mode. The supplier shall provide the specification of the UPS.

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

[g] All power and communication cabling shall be installed neatly, adhering to industry standards for cable management. Neat installation entails organising cables in a manner that minimizes clutter, prevents tangling, and facilitates easy access for maintenance and troubleshooting purposes.

Cables shall be securely fastened and routed along designated paths, avoiding obstructions and potential hazards.

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

[h] all cables shall be clearly labelled at regular intervals with information such as cable type, purpose, and destination. Labelling shall be legible, durable, and consistent across all cables to ensure ease of identification and maintenance. Labels should follow a standardised format specified by the tenderer, including unique identifiers and relevant information for each cable.

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

[i] The tenderer shall provide a detailed diagram illustrating the planned installation, labelling, and lightning protection measures for the cabling. The diagram should clearly depict the layout of cables, labelling locations, and placement of lightning protection devices. It should also include annotations or explanatory notes to ensure understanding by relevant stakeholders.

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

[j] A clear and detailed diagram depicting the flow of communication between systems and power within the system shall be provided. The Tenderer, upon completion of the installation of the system, shall provide the electrical reticulation and network diagrams for the system.

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

[k] All power and communication cabling shall be equipped with appropriate lightning protection measures in accordance with recognized standards and best practices. This includes the

installation of surge protectors, grounding systems, and other devices as necessary to mitigate the risk of damage from lightning strikes and electrical surges. The Tenderer shall provide details of lightning protection measures and standard that will be used to protect the system.

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

1.8 Modularity

[a] The system shall be modular in design to enable ease isolation of system components and the system expandability in the future. The Tenderer shall provide details on the system design taking into account the expansion of system in the future e.g., phasing of modes of operation (from single mode to multi-mode and then hybrid).

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

1.9 Workstations

[a] The Tenderer shall provide at least three (3) workstations (one maintenance and two operational), fitted with all supporting systems, to enable the functions of an Air Traffic Controller (ATC). (i.e.VCCS, ATM Display, Weather information and etc.)

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

[b] The workstations shall be ergonomically vetted to ensure that they create a conducive working environment for the ATC on position. The Tenderer shall provide the design and planned configuration of the workstations.

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

1.10 Infrastructure Readiness

[a] The supplier shall assess the current environment, taking into consideration systems, processes/ procedures and supporting infrastructure (i.e. datalinks etc), to establish the readiness of ATNS for RATS. The tenderer shall provide a draft methodology / plan elaborating how such an assessment will be conducted.

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

FUNCTIONAL REQUIREMENTS

1.11 Surveillance

[a] The system shall make provision for a surveillance capability that constitutes of multiple surveillance sources/sensors. The Tenderer shall provide details of the proposed surveillance capability for the system.

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

[b] The surveillance capability of the system shall have a minimum coverage area equivalent to the distance from an aerodrome's runway centre to the aerodrome's approach segment.

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

[c] The surveillance capability of the system shall provide a consolidated video feedback to the user that is formulated through the integration of the view of all surveillance sources.

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

[d] The surveillance capability of the system shall provide a high-quality video to the user. High-quality in the statement means that the user will be able to distinguish without error different objects represented or seen in the video.

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

[e] The surveillance capability of the system shall detect the presence of an object-of-Interest (i.e. aircraft, vehicles, etc) within the surveillance coverage volume. The tenderer shall provide a list of all objects of interest that the system can detect.

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

[f] The surveillance capability of the system shall detect other objects(e.g., foreign objects detection, obstacles etc) that are observable within the aerodrome environment, especially those within the movement area The tenderer shall provide the size of the smallest detectable object and a list of other objects that can be dected by the system.

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

[g] The surveillance capability of the system enable shall track the movements of objects of interest within the surveillance coverage volume. The tenderer shall provide a list with details of the system tracking capabilities..

- Ground moving objects
- Airbourne movement

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

[h] The system shall interface with other surveillance systems already available at the aerodrome (e.g., Primary Surveillance Radar, ADS-B, M-LAT, MSSR, SMR). The tender shall provide a list of surveillance systems compatible with the system for interfacing purposes.

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

1.12 Monitoring and Control

[a] The system shall be capable of monitoring critical components and parameters within the system. The Tenderer shall provide details on which critical components and how various critical parts of the system are monitored.

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

[b] The system shall flag any monitored component or parameter if it is faulty or erroneous. The Tenderer shall provide details on the alerts that the system can generate, their logic and life-cycle.

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

[c] The status of the system shall be derived based on the health status of the monitored components and parameters. The Tender provide details on how the operational status of the system is derived.

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

NON-FUNCTIONAL REQUIREMENTS

[a] The tenderer shall ensure that the system and all its components is delivered at FAOR.

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

1.13 Cybersecurity

[a] The system shall have a robust cybersecurity measure to protect communication systems from cyber threats, including intrusion detection and prevention systems. The Tenderer shall provide details of how this will be achieved.

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

[b] The Tenderer shall provide details of how regular security audits and updates to address vulnerabilities will be conducted.

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

1.14 Change Management Requirements

[a] The change management process to be followed in the FAOR Contingency Digital Tower project shall clearly identify the need for change. This involves assessing the current technology, identifying its limitations and the benefits that the new technology can provide. The tenderer shall provide a draft change management plan.

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

[b] The change management plan shall be a detailed plan that outlines how the change will be implemented and should include:

- Timeline.
- Milestones,
- Communication plan,
- Training plan,
- Risk management plan.
- Safety risk assessment.

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

[c] Throughout the r Project all essential changes shall be communicated through defined communication standards. This is very important as it affects the success of the project. The Tenderer shall provide a draft change management plan which includes a proposed communication plan to all stakeholders.

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

[d] As part of the change management process, training and support shall be provided to affected employees on how to use the digital tower technology effectively. This may involve providing classroom training, online resources, or on-the-job training. The Tenderer shall provide a draft change management plan which includes a proposed training and support plan to all stakeholders.

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[e] Once the digital tower has been successfully implemented (After the system trial period); The change management process shall continue to monitor and evaluate its effectiveness for a period of 3 years after the system trial.

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

1.15 Ergonomics engineering and human factors requirements

User-centered design:

[a] The design of the digital tower should prioritize the needs and capabilities of the human operators who will be using it. This includes considerations such as the operators' physical abilities, cognitive processes, and workload.The tenderer shall provide a draft plan that addresses this requirement.

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

Clear and intuitive interface:

[a] The system shall include a graphical user interface that is that is user friendly. This includes features such as consistent and simple iconography, logical grouping of information, and standardized procedures. The tenderer shall provide snippets or the design of the graphical user interface.

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

Adequate information display:

[a] The video wall (digital display) should display information in a way that is easy for operators to understand and interpret. This includes appropriate use of color-coding, clear and concise text, and

effective use of graphics and visual aids. The tenderer shall provide the specification of the video wall.

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

Minimization of cognitive load:

[a] The system should be designed to minimize cognitive load on the operators, reducing the likelihood of errors due to mental overload. This includes features such as clear and concise instructions, well-organized displays of information, and effective use of automation. The tenderer shall substantiate how this requirement will be supported.

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

1.16 Network Requirements

[a] Based on the infrastructure readiness assessment report. The tenderer shall detail and provide all necessary network infrastructure to ensure seamless transfer of information.

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

[b] The bandwidth of the system shall be sufficient to allow real-time data transfer to transmit large volumes of data (video data captured by cameras) with minimal delays. The Tenderer shall provide the network configuration and bandwidth requirements of the system to allow real-time data transfer to transmit large volumes of data (video data captured by cameras). (EUROCAE ED 138)

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[c] The system network shall have a low latency. This is to ensure that the data is transmitted quickly enough to be useful. (EUROCAE ED 138) The Tenderer shall indicate the average latency of the system.

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

[d] The system shall be able to operate locally on an independent network. The tenderer shall detail and provide all necessary network infrastructure to ensure seamless transfer of information.

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

[e] The tender shall provide minimum network requirements to operate the system remotely in a network with identified telecomms service provide to ensure seamless transfer of information.

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

[f] The system network shall have a Quality of Service (QoS) such that data captured by the cameras is prioritized. This is to ensure that the data is delivered timeously and reliably. The Tenderer shall provide details on how this requirement will be achieved. (EUROCAE ED 138)

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

[g] The digital tower network shall be on a reliable network to ensure that data is transmitted without errors or interruptions. The Tenderer shall provide details on how this requirement will be achieved.

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

[h] The network of the system shall be secure to prevent unauthorized access or data breaches. The Tenderer shall provide details on how this requirement will be achieved.

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

[i] The network of the system shall be a redundant network to ensure that real-time data transfer continues even in the event of a network outage or failure. The Tenderer shall provide details on how this requirement will be achieved.

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

CHAPTER 3 – SUPPORTING INFRASTRUCTURE SPECIFICATIONS

Supporting Infrastructure Requirements

1.17 System Acomodation

[a] The tenderer shall provide a safe and secure accommodation, preferably a dedicated container, fitted with all auxiliaries (e.g. skirting, lighting, air conditioners etc) for accommodating the system and all workstations. The tenderer shall provide the design and specification of the accommodation.

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

1.18 Otical Sensor (Cameras) Requirements

High-Resolution Imaging:

[a] The cameras shall provide high-resolution video and images to enable the monitoring of aircraft, runways, taxiways, and other critical areas within the aerodrome movement area. The tenderer shall provide a detailed specification of the proposed cameras and reference of where they are used for a similar purpose.

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

Camera Augmentation:

[b] The cameras shall be strategically placed to ensure that there is a complete out the window view represented. The tenderer shall propose a methodology to achieve this requirement.

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

[c] The camera augmentation shall be inclusive of all identifiable blind spots. The tenderer shall propose a methodology to achieve this.

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

Day-Light and Night Vision:

[d] The camera systemshall be operated during the e day- and be such that it eliminates glare and reflection and maintains picture and video quality. The tenderer shall provide a detailed specification of the cameras that they propose and reference of where they are used for a similar purpose.

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

[e]

[f] The camera system shall be operated during the night nd be such that it eliminates glare and reflection and maintains picture and video quality. The tenderer shall provide a detailed specification of the cameras that they propose and ref

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

Th**Wide Field of View:**

[g] The cameras should have the capability to capture a wide field of view, allowing operators to monitor large areas such as runways, aprons, and taxiways. The tenderer shall provide a detailed specification of the cameras that they propose and reference of where they are used for a similar purpose.

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

Pan-Tilt-Zoom (PTZ) Functionality:

[h] PTZ cameras are essential for tracking aircraft as they move across the airport. These cameras should be remotely controllable to focus on specific areas or aircraft as needed. The tenderer shall provide a detailed specification of the cameras that they propose and reference of where they are used for a similar purpose. (EUROCAE ED-240B)

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

The PTZ functionality shall have a quick “Reset to normal view” capability.

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

Remote Access and Control:

[i] The cameras shall have remote access and control from the digital tower room. Air traffic controllers often need the ability to remotely access and control camera systems from their workstations. This allows them to adjust camera angles and zoom levels as needed. Tenderer to provide details of how this will be achieved.

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

Interoperability with Surveillance and Other ATM Systems:

[j] The system shall allow inputs from other surveillance and air traffic management systems to provide a comprehensive view of aircraft movements and weather conditions. The Tenderer shall provide details of how this will be achieved and previous implemented projects as reference.

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

Data Security:

[k] The tenderer shall provide a methodology for protecting the data generated by these cameras such that only the relevant personnel have access to it. This is to ensure that the camera systems adhere to strict cybersecurity standards to prevent unauthorized access.

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

Compliance with Aviation Regulations:

[l] The system shall comply with relevant aviation regulations and standards, such as those outlined by the International Civil Aviation Organization (ICAO) Annex 11, ICAO Doc 4444, Doc 9426, ED 138, ED 240 A and B. The tenderer to provide evidence that the compliance of ICAO standards and regulations has been met.

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

Maintenance and Calibration:

[m] The tenderer shall provide a detailed maintenance and calibration plan to ensure that the system remain in optimal working condition.

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

Low Latency:

[n] The system shall have Low-latency video feeds which are critical for real-time decision-making to ensure that camera systems have minimal delay in transmitting video and data. The Tenderer shall provide details of the proposed video feeds. Please see EUROCAE ED 138

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

1.19 Digital Display

High-Resolution Displays:

[a] The digital display used shall be high-resolution displays to ensure that the visual information presented to air traffic controllers is clear, detailed, and easily readable. The tenderer shall provide detailed specification of the proposed digital display and reference where it is used for this purpose.

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

Multiple Displays:

[b] Multiple displays or screens shall be provided to allow controllers to view different aspects of the airspace simultaneously, such as radar displays, camera views, and weather information. The tenderer shall propose and provide reasoning to the number displays which will be required at FAOR.

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

Integration Capability:

[c] The tenderer shall ensure that the digital display system can integrate data from various sources, including radar, ADS-B, surveillance cameras, and weather sensors, to provide a comprehensive view of the airspace. Evidence of where this has been achieved shall be provided.

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

Real-Time Data:

[d] The digital Display shall display real-time data with minimal latency to provide controllers with up-to-date information on aircraft positions, altitudes, headings, and speeds. (EUROCAE ED 138, ED 240B)

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

Customizable Layouts:

[e] The tenderer shall provide displays that allow air traffic controllers to customize the layout of the data to suit their preferences and operational needs, such as arranging screens for optimal visibility.

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

Touchscreen or Cursor Control:

[f] The displays shall provide touchscreen capabilities or cursor control devices (e.g., trackballs or mice) to allow controllers to interact with the displays and select relevant information easily. The tender shall provide evidence through datasheet of the displays to ensure that this requirement is fulfilled.

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

Weather Information:

[g] The display shall Integrate weather data, including radar images, weather radar overlays, and METAR/TAF reports, to provide controllers with real-time weather information.

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

Conflict Detection Tools:

[h] The system shall display conflict detection tools that highlight potential conflicts and aid air traffic controllers in managing traffic safely. The tender shall provide details of the conflict detection tools that forms part of the system.

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

Data Recording and Playback:

[i] The tenderer shall provide details of how they've included data recording capabilities that allow controllers to review past air traffic events for incident analysis, training, and investigations.

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

Data Security:

[j] The tenderer shall provide details of how they'll Implement robust cybersecurity measures to protect the digital display system from cyber threats and unauthorized access.

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

Data Overlay:

[k] The system shall allow for overlay relevant data, such as aircraft identifiers, altitude, speed, and flight plan information, onto the visual displays for quick reference. The tenderer shall provide details of how this will be achieved.

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

1.20 Equipment Cabinet

[a] The system shall be packaged into a suitable equipment cabinet. The tenderer shall provide pictures of how the equipment will be packaged as part of the proposal.

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

[b] The equipment cabinet shall make provision for access to the system for maintenance purposes. The tenderer shall provide the design and specifications of the equipment cabinet.

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

INTERFACE REQUIREMENTS

1.21 External Systems

[a] The system shall interface to the below listed systems:

- NOVA display system (ASMGCS)
- Cameras placed at the FAOR Conventional Tower
- TopSky Controller Work Positions
- DATIS Clients
- Voice Communication and Control System (VCCS)
- Emergency Dittel Radios
- Aeronautical Ground Lighting / StopBars (ACSA)
- Crash Alarm (ACSA)
- CAMU/Web CTOT Workstation
- AFTN/AMHS/ANAIS Client
- IT Office Workstation
- DAID/AWOS
- Emergency Telephone

The tenderer shall provide details of how this will be achieved.

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

CHAPTER 4 – INTEGRATED LOGISTIC SUPPORT SPECIFICATIONS

LOGISTIC REQUIREMENTS

1.22 Reliability, Availability and Maintainability (RAM)

[a] The Reimagining Reality system shall achieve an Availability figure of 99.8%.

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

[b] The Reimagining Reality system shall achieve a Reliability (such as mean-time-to-repair for equipment). figure of 98.5%; and

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

[c] The system shall be maintainable (the ability to be easily serviced and repaired).

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

1.23 Integrated Logistic Support Plan

[a] A clearly defined contract (ILS plan) needs to be put in place.

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

[b] Further options to the maintenance contract must be discussed to cover:

- General support and maintenance
- Bug fixes
- Software version upgrades and evolution
- Refresher Training
- Spares

- Handling
- Packaging and Storage of spares
- Transportation

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

1.24 Configuration Management Plan

[a] Training on the equipment, application and operating software for operators and maintenance personnel is required. The following training should be considered:

- Operating System training
- Application training
- Installation training
- Recovery training
- Fault finding training
- Backup and restore training
- Database training
- LAN / WAN (How the SYSTEMS interfaces communicate/ operates and interacts) training
- Trouble shooting and solutions, patches and fixes, install modify and maintain training
- Basic maintenance that should be done, e.g. Disk space management training
- All documentation to be valid and up to date, must be checked before system accepted; and
- Any special operating procedures specific to the systems normal and un-usual operation training.

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

1.25 Maintenance and Support

[a] The system shall be maintained using the current ATNS maintenance concept based on O, I & D maintenance levels. O & I level maintenance should be performed by our Technical Services personnel (Technicians). D level maintenance will be provided by the OEM, through a maintenance and support agreement.

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

[b] The software shall be configured in such a way that after the system has been commissioned, experienced and qualified computer programmers are not required for the operation and maintenance of the system.

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

[c] ATNS shall be provided with specific maintenance tasks step by step, to be performed to maintain the system.

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

[d] Provision shall be made for all specialised tools, training aids, test equipment and spares required for the maintenance of the system until its end of life.

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

1.26 Installation and Transitioning

[a] All installation work shall be in a neat manner, labelled source-to-destination and tied with cable ties.

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

[b] A full transition plan detailing all procedures, processes and activities to be undertaken to ensure seamless transition.

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

1.27 Packaging Handling Storage and Transportation

[a] The system, including all auxiliary components, shall be delivered and installed at the ATA site and ATNS shall not take any responsibility for damaged items during delivery.

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

[b] All supporting infrastructure required for the functioning of the system shall either be provided, if not already available, otherwise, the current infrastructure shall be used.

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

[c] All spare items shall include instruction for packaging, handling, and storage

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

1.28 Training

[a] Basic and advanced training on the system shall be organised and provided to ATNS Staff (technical personnel, operational personnel, instructors, etc.). The training shall be at a level that trained technical personnel shall be able to train, service and maintain the system with minimal need of the Original Equipment Manufacturer (OEM).

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[b] All documentation necessary for ensuring the successful delivery of the project and assisting with the understanding and maintenance of the system shall be provided.

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

[c] All training course material necessary for ensuring continuous training to gain better understanding of the system shall be provided.

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

1.29 Spares

[a] Provision should be made for sufficient spares to ensure the system operates optimally for its design life span.

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

1.30 Documentation

[a] The following documents shall be provided as a minimum, and all documentation provided shall be in English language:

- As-built document;
- System/Segment design document;
- Spares Plan;
- Installation, testing and transition plan;
- Logistics support plan;
- Configuration management plan;

- Project management plan;
- Training plan and documentation;
- Service manuals;
- OEM and COTS documentation;
- Brochures;
- Equipment specific documentation;
- Maintenance support plan; and
- Training course material.

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

[b] The documents shall be written in English.

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

1.31 Warrantee and PBU

[a] A 12-month warranty period starting at the date of site acceptance shall cover all repairs and replacements of hardware, as well as all corrections or modifications to software required for reasons of non-compliance with specifications or errors not detected during acceptance tests.

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

[b] A PBU of 12 months, with tolerance of the system implementation period, shall be provided on the system provided. The PBU is intended to monitor the performance of the system. The PBU should run from the Site Acceptance Test (SAT) of the first installed site to the end of one year after the acceptance of the full system.

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

1.32 Support Contract

[a] A maintenance support agreement shall be provided for the entire system lifespan, including a Service Level Agreement (SLA), such that the system will run on the recommended/latest firmware and software version releases. Any computer hardware replacements, induced by these upgrades, will be covered by the maintenance agreement. The maintenance contract shall include the total costs of the future computer hardware procurement cycles, with applicable price escalations.

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

[b] The agreement shall indicate the total maintenance contract costs, explicitly showing LRU repair and upgrade (Hardware), Software/Firmware and any other costs, indicating escalation formulae if any.

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

[c] The agreement shall address poor performance, against the maintenance contract SLA, through the enforcement of financial penalties.

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

[d] The maintenance support contract shall come into effect at the end of the PBU.

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

CHAPTER 5 – PROJECT MANAGEMENT SPECIFICATIONS

PROJECT MANAGEMENT REQUIREMENTS

1.33 General

[a] Level 2 Monitoring as stipulated in ECSA regulations will be performed. This entails reviewing important work procedures and implementation material for compliance with the requirements of the plans and specifications.

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

[b] Visits to sites / project meetings will be once weekly or as agreed with the client and the client to be available to provide a technical interpretation of the plans and specifications.

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

[c] Site meetings shall be attended to as arranged by the project managers.

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

1.34 Draft Plans

[a] A comprehensive Project Management Plan (PMP) for the period of the contract shall be established. The PMP shall encompass draft plans that will be **refined as necessary during the execution of the contract. These plans shall include:**

- Project Management
- Resource management
- Risk management
- Quality management
- Communication management
- Installation, Transitioning and Commissioning; and
- Environmental Management Programme.

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

1.35 Project Management Plan

[a] A Project Management Plan (PMP) for the project shall be developed in consultation with the ATNS project manager.

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

[b] The Project Management Plan shall include at least the following:

- Project scope and overview
- Project deliverables
- Work Breakdown Structure (WBS) defining the scope of work and resources necessary to meet the contract requirements
- Project organization and responsibilities
- Master Time Schedule (Gantt Chart)
- Quality assurance activities shall be performed in the project
- Configuration and integration management activities (regarding hardware, software and documentation version changes); and
- Cost management.

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

1.36 **Project** Delivery Schedule and Scope Management

[a] A project delivery schedule shall be developed, the schedule should detail all project activities that need to be undertaken for the successful completion of the project scope.

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[b] A Work Breakdown Structure (WBS) illustrating the breakdown of project scope into activities that can be managed, monitored and measured in terms of duration, cost, and resources, shall be developed.

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

1.37 **Resource** Management

[a] A Resource Management Plan shall be developed, the plan should provide details of the team allocated to carry out the project scope.

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

[b] Roles and responsibility matrix shall be drawn up for each project team member to highlight their involvement in the project.

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

1.38 Risk Management

[a] A Risk Management Plan shall be developed, the plan should stipulate how project risks will be identified, assessed, and mitigated.

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[b] The plan shall articulate the assessment methodology to be used in quantifying risk ratings attached to each identified risk.

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

1.39 Quality Management

[a] A valid ISO 9001:2015 or equivalent Quality Management System Certificate shall be required.

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

[b] A Quality Assurance Plan for the project detailing how quality will be controlled, assured and maintained throughout the project lifecycle, shall be developed.

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

[c] The Quality Assurance Plan shall describe the organisation, processes, tasks, and responsibilities concerning quality assurance.

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

[d] The Quality Assurance Plan shall identify all documents to be produced in appropriate phases of the project and shall state how these documents are checked for adequacy.

COMPLIANCE (C/PC/NC)	*Only responding C/PC/NC will not be accepted without proof.*	

[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[e] The Quality Assurance Plan shall identify the standards, practices, conventions, and metrics to be applied and shall state how compliance with these items is to be monitored and assured.

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

1.40 Communications Management

[a] A communication plan shall be developed, the plan will include how the project team is going to meet, and which **communication medium will be used (e.g. email, call, etc.). For all formal meetings, an agenda shall be prepared in advance and be shared with the team, and minutes should be taken during the meetings.**

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

1.41 Installation, Transitioning and Commissioning

[a] The current systems installed in all thirteen (13) stations shall be decommissioned and disposed of. Some supporting infrastructure may be re-used depending on the conditions and the need.

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

[b] The system's components shall be delivered and installed in each of the thirteen (13) stations. ATNS shall take no responsibility for any damaged items during delivery.

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

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

[c] ATNS is not responsible for the security and safety of equipment, materials and tools during installation.

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

[d] A full transition plan detailing all procedures, processes and activities to be undertaken to ensure a seamless transition from the old system to the new system shall be developed and provided.

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

[e] ATNS is not responsible for cleaning garbage and debris caused because of installation work.

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

1.42 Environmental Management Programme

[a] An Environmental Management Programme detailing the approach to be taken for minimising negative environmental impacts through the project phases shall be provided and must be approved by ATNS before project implementation.

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

SYSTEMS ENGINEERING

1.43 Factory Acceptance Testing

[a] ATNS shall require a demonstration of compliance to specifications through a Factory Acceptance Test (FAT) prior to delivery of required items to the site, in line with an agreed FAT procedure, in the presence of ATNS team (technical personnel, operator and engineers).

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

[b] Should the system not comply with the specification requirements it will not be accepted.

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

[c] A test specification (FAT plan and procedures) shall be provided, and the following shall be included:

- A detailed description of the proposed test techniques and procedures to verify all equipment parameters
- Conditions under which the tests shall be conducted and approved
- The forms of documenting test results; and
- A schedule for such tests.

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

[d] The FAT plan and procedure shall be sent to ATNS and agreed upon before any FAT can be carried out.

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

[e] ATNS team reserves the right to request some further tests to be performed (which are not listed in the FAT specification) if deemed necessary. These tests shall be also noted in the FAT report.

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

[f] All failures that occur during the FAT shall be rectified at no cost to ATNS, and all relevant tests shall be repeated.

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

[g] A report stating all the successful completion or unsuccessful attempt of the FAT with all measurements and results shall be compiled. The FAT report shall be signed by both parties

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

[h] The FAT Certificate shall be issued to ATNS after the successful completion of the FAT. The FAT Certificate shall be prepared, signed and sent to ATNS within an agreed time according to the official communication procedure.

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

1.44 Site Acceptance Testing

[a] Upon delivery and installation of the required system and auxiliary on-site, an assessment of the functionality of the supplied system and auxiliary in line with an agreed Site Acceptance Test (SAT) procedure will be conducted to ensure that items still perform as per specifications.

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