AIR TRAFFIC AND NAVIGATION SERVICES SOC. LTD

Reimagining Reality
(Augmented, Virtual and Extended Reality)

Volume 2 and 3
Technical Specifications and Project Management

Version 4.0

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1 INTRODUCTION

1.1. Document Contents

The document contains the consolidated functional specifications for the Reimaging Reality (Augmented, virtual and Extended Reality) project. The document is broken down into the following chapters:

[a] Chapter 1 – General Information.
[b] Chapter 2 – Software Specifications.
[c] Chapter 3 – Hardware Specifications.
[d] Chapter 4 – Integrated Logistics Support Specifications.
[e] Chapter 5 – Project Management Specifications.
[f] Chapter 6 – Environmental Requirements; and
[g] Chapter 7 – Appendices.

1.2. Applicable Documents

Applicable documents used in compiling the specifications in this document include:

[a] Augmented Reality Software & Content Generation Tools Functional Requirements for Industrial Industry Use Cases.
[b] Augmented Reality Hardware Functional Requirements for Industrial Industry Use Cases.

1.3. Referenced Documents

[a] Reimagining Reality User Requirement Statement Ver 2.0

1.4. Purpose of the Document

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

2   GLOSSARY

2.1   Definitions

This section lists alphabetically and defines all words and expressions/terms used in the specification document, for which reliance on a dictionary meaning will not be appropriate:

a) **Shall** expresses a characteristic which is to be present in the item which is the subject of the specification, i.e. "shall" expresses a binding requirement.

b) **Should expresses a target or goal to be pursued, but not necessarily achieved.**

c) **May expresses permissive guidance.**

d) **Will** expresses a declaration of intent on the part of a party, usually the sponsoring or acquiring organization. "**Will**" does not express a binding requirement. "**Will**" may also be used in cases where the simple future tense is required, for example, "The operating system will be supplied by the Company". Any statement that employs the term "**will**", if used in the specifications, should be present as a note to be clearly distinguishable from requirements.

e) Student – Person that is utilizing the AR hardware to consume the AR software content.

f) User – Person using the software tools to generate the AR content.

2.2   Abbreviations & Acronyms

Table 1 - Abbreviations and Acronyms

Abbreviation	Description
AIM	Aeronautical Information Management
ANSP	Air Navigation Service Provider
AR	Augmented Reality
ATA	Aviation Training Academy
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATNS	Air Traffic and Navigation Services
ATSO	Air Traffic Service Officer
CBA	Cost Breakdown Analysis

Abbreviation	Description
AIM	Aeronautical Information Management
ANSP	Air Navigation Service Provider
AR	Augmented Reality
ATA	Aviation Training Academy
ATCO	Air Traffic Control Officer
EXCO	ATNS Executive Committee
FIS	Flight Information Services
HMI	Human Machine Interface
LRU	Line Replacement Unit
ICAO	International Civil Aviation Organisation
MANCOM	ATNS Management Committee
OJTI	On-The-Job Training Instruction
ATNS	Air Traffic and Navigation Services
ATS	Air Traffic Services
ATM	Air Traffic Management
R&D	Research and Development
RADSIM	Radar Simulator
SACAA	South African Civil Aviation Authority
SSO	Simulator Support Officer
VDF	Very High Frequency Direction Finder
VPN	Virtual Private Network
VR	Virtual Reality

CHAPTER 1 – GENERAL INFORMATION

3 PRELIMINARY

3.1 Background

3.2 System Overview

3.2.1 System Description

The purpose of this project is to introduce Re-Imagined Reality related technology (AR&VR and Mixed Reality technology) into ATNS Training and Operations environment. Furthermore, the purpose of the project is to reap the benefits that these technologies have to offer so that they may be Return on Investment and enhanced service provision. Additionally, this project strives to equip ATNS personnel with relevant skills and knowledge which are aligned with the incumbent 4IR Technologies.

3.2.2 Intended Use

The Reimagining Reality System is used mainly by the Aviation Training Academy instructors and Technical Services personnel to interactively enhance the training service provision and to interactively enhance maintenance /on the job training (OJTI).

4 PROJECT OVERVIEW

3.2.1. Problem Statement

ATNS strategy 2025 is highly focused on digital transformation and embracing 4th industrial revolution technologies with the respective benefits in service provision. Currently within the Aviation Training Academy there is no digitally interactive systems which has capabilities to enhance training service provision. Additionally, in the ATNS operations (Technical Services) there is currently no interactive system which can be used for maintenance training or any diagnostic skills transfer/refreshing. The benefits of the Augmented, Virtual and Extended reality (AR, XR and VR) systems is that they provide the user with a close to real life experience of the engagement of the actual system. These inherent benefits provide the need for ATNS to investigate the feasibility of investing in a reimagining reality system.

3.2.2. Project Goal

The goal of the reimagining reality project is to provide enhanced service provision at the aviation training academy and the technical services personnel.

3.2.3. Scope of work overview

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

[a] Design of Reimaging Reality (AR, VR, XR) System/Tool

[b] Delivery and Installation at ATNS,

[c] Commission and Training of ATNS personnel,

[d] Maintenance and support for the provided System/Tool.

5   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, as a result 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 – GENERAL / USER REQUIREMENTS

5.1   User Requirements

5.1.1   ATM Training

Training simulators are being used to assist in delivering content as realistic as possible to ATCs for rating and competency testing purposes. The current configuration involves two independent training simulators, namely, control tower simulator and approach or area control simulator. The separation of the two simulators has led to the requirement for more resources (e.g. space, power, funds, etc.). The company could save up on some of these resources if the simulators were integrated. Further to this, the augmentation of pseudo pilots with techniques like speech recognition and synthesis or the replacement of classroom-based courses with virtual-based learning platforms should be considered as an improvement to training 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]		

5.1.2   Technical Training

The company has installed and commissioned physical systems to enable the training of technical personnel. This meant that, replacements of operational systems need to consider the replacement of the training systems to ensure alignment. However, should technical training be virtualised, a replacement of a physical operational system will just require a modification of the virtual system. If this form of training could suffice for delivering competency-based training to technical personal it could serve as the norm going into the future.

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]		

5.1.3   Leadership Training

The company aims to develop and implement a Virtual Reality (VR) leadership training program tailored specifically for the air traffic management environment. This program will address the unique needs of air traffic management, delivering significant benefits in leadership development, decision-making, and overall operational efficiency. Through immersive and realistic simulations, VR can enhance leadership skills, improve decision-making, and reduce the risks associated with traditional training methods. ATNS can leverage VR to create a training program that meets the specific demands of air traffic management, resulting in substantial improvements in leadership, decision-making, and operational performance.

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]		

5.1.4   ATM Operations

Computers are used to aid ATCs with situational awareness and processing of various information such as weather data and flight data. However, AR and VR (e.g. smart binoculars, smart glasses, virtual displays, etc.) have the potential to disrupt the current status quo. These technologies could be used to improve the visualisation of content for ATCs, through visibility enhancement, so that the same level of service could either be maintained or improved.

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]		

5.1.5 Technical Operations

Maintenance activities are conducted on a regular basis or ad-hoc basis on Communication, Navigation and Surveillance (CNS) systems. Technicians undergo training for them to acquire the relevant knowledge for maintaining these systems. Further to this, sometimes establishing new sites requires a proper design process to be followed. This maintenance and design processes could be improved through the use of AR and VR technologies. Digital reference manuals could be used to assist even inexperienced personnel to conduct maintenance. Furthermore, being able to view and modify a system designs instantly within the confines of an identified site without having to go back to the drawing board will result in an effective design process.

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 - SYSTEM SPECIFICATIONS

6   SOFTWARE REQUIREMENTS

6.1   Authoring Augmented Reality Content

6.1.1   Adding API Links

[a]   The software and content generation tool shall allow the user to utilize API links to other databases and websites to display 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]		

6.1.2   Ease of Use

[a]   The software and content generation tool shall have a user interface that can be learned by non-software literate personnel (Not a Computer Science or Software Engineering Major ex. Technical Writer)

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]		

6.1.3   Output to Branded Application

[a]   The software and content generation tool shall output to an application that the user will define the branding of.

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 and content generation tool should NOT force its Brand to be displayed in the final application.

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 software and content generation tool shall support displaying PDF files to the student.

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]		

6.1.4   Display HTML

[a]   The software and content generation tool shall support displaying HTML files to the student.

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]		

6.1.5   Display Slide Show

[a]   The software and content generation tool shall support displaying animated Slide Show files to the student.

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 and content generation tool shall support displaying PowerPoint files to the student.

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]		

6.1.6 Display MP4.

[a]   The software and content generation tool shall support displaying video MP4 files to the Student.

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]		

6.2   Creating 3D Content

6.2.1   Automatic generation of ultra-light 3D models from engineering CAD drawings

6.2.2   The software and content generation tool should accept the following 3D model and animated 3D model input formats:

[a]   Creo (PVZ, C3DIs)

[b]   AutoDesk (OBJ, FBX)

[c]   Siemens PLM (JT)

[d]   Catia (CAT Parts or Products, 3D Via)

[e]   SAP Visual Enterprise (RH)

[f]   STP Files

[g]   Deployment of Augmented Reality Content

[h]   Deployed Content shall be Device Agnostic

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]		

6.2.3 The software and content generation tool shall output an application that can be used by AndroidOS, iOS, and Windows OS devices.

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]		

6.2.4   Content Storage

6.2.4.1   The software should NOT require a custom version of OS, for the content to be utilized. The software should install on a standard OS version for the smart device.

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]		

6.2.4.2   The software and content generation tool should output an application that can be used by a user selected smart device including:

[a]   Phones.

[b]   Tablets.

[c]   Binocular Head Mounted Displays.

[d]   Monocular Head Mounted Displays.

[e]   Projection System.

[f]

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]		

6.2.4.3 The software and content generation tool shall allow the user to select the content storage by supporting all the below.

[a]   Local (on the smart device).

[b]   Secured Server (hosted by a company behind firewalls).

[c]   SD card and SSD/HDD

[d]   Cloud-Based:

- The software generated shall support 128bit encryption in transit at a minimum.
- The software generated shall support 128bit encryption at rest.
- The software generated shall support federation.
- The software generated shall support two factor authentication, for the cloud service provider.

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]		

6.2.5 Visual Tracking Method

[a]   The software and content generation tool shall NOT require the use of a visual tracking tag, if the AR hardware supports other tracking methods (ex. SLAM).

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 and content generation tool should require the use of a specific type or style of visual tracking tag.

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]		

6.2.6 Zoom

6.2.6.1 The software and content generation tool shall allow the student (content) to zoom into and out of 3D content.

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]		

[a] For smart devices with touch screens, the student shall be allowed to pinch finger-tips together to zoom in.

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] For smart devices with touch screens, the student shall be allowed to pull finger-tips apart to zoom 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]

[c] For wearable head mounted displays, the student should be allowed to pinch finger-tips (right and left hands) and then pull hands together to zoom in.

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] For wearable head mounted displays, the student shall be allowed to pinch finger-tips (right and left hands) and then pull hands apart to zoom 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]		

6.2.7   Geometry Rotation

6.2.7.1   The software and content generation tool shall allow the student (content) to rotate 3D content.

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]		

6.2.7.2   For smart devices with touch screens, the student shall be allowed to:

[a] Rotate finger-tips to rotate 3D content.

[b] Utilize a single finger sliding left/right/up/down to rotate 3D content.

[c] For wearable head mounted displays, the student shall be allowed to pinch finger-tips (right and left hands) and then rotate hands to rotate 3D content.

[d] The software and content generation tool shall support the ability for the user to lock the 3D AR content view (Not allow the student to modify location, position, 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]		

6.2.8 Snapshots

[a] The software and content generation shall support the ability for the students to take a snapshot of their smart device (wearable and touch display) display. Allowing them to share that snapshot with others.

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]		

6.2.9 Record Video

[a] The software and content generation shall support the ability for the students to record a video of their smart device (wearable and touch display) session. Allowing them to share that video with others.

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]		

6.2.10 Remote Guidance

[a] The software and content generation tool shall support the ability for the students to "phone a friend" and obtain guidance from a remote expert, sharing with them the content and vision of what they are seeing.

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 and content generation tool shall support the ability for the Students and SME to annotate the display (both sides of communication).

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 software and content generation tool shall support the ability for the Administrator to assign a Subject Matter Expert (SME) to a localization tag (The list of SMEs can be managed within the tool or imported from an external source.).

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 software and content generation tool shall support the ability for the Administrator to assign SMEs to a specific notification. The software shall be able to receive notifications from a 3rd party data source via APIs, OPC-DA, and OPC-UA.

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 software and content generation tool shall support the ability for the student to be able to determine the online status of the SME.

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 software and content generation tool should support the ability for the SME to receive video calls from the Student on both Desktop and Mobile platforms.

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 software and content generation tool shall support the ability for the SME to be notified when they are being "called" by a Student. This notification shall be pushed to the SMEs desktop and mobile device (registered devices). The push notification shall function even if the software is not in the foreground.

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 software and content generation tool shall support the ability to show the SME any calls missed with the student id, and time/date.

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 software and content generation tool shall support the ability for the SME and the Student to annotate within the field of view of the student. The software shall provide the SME with an annotation / drawing toolbar. The tools on the toolbar shall include, but not be limited to: free-hand drawing tool, arrows, highlighted orbs and text blocks. The SME shall be able to select colours for the drawings tools.

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 – HARDWARE SPECIFICATIONS

7. Reimagining Reality Hardware Functional Requirements:

7.1. Battery Life

7.1.1. Under typical use, the device battery life shall be at minimum 12 hours.

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]		

7.1.2. Alternatively, if the battery can be "hot swapped" (changed without the device losing power or having to be reset) device battery life shall be a minimum of 6 hours.

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]		

7.1.2.1. The period to swap the device batteries should take less than 5 minutes

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]		

7.1.2.2. The device batteries must be swappable while wearing gloves

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]		

7.1.2.3.   The device batteries must be swappable while in the working industrial environment.

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]		

7.1.3. The device shall be wireless. (It should not be tethered to a battery pack, or processing pack)

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]		

7.2.   Connectivity

7.2.1. The device shall support the latest low power Bluetooth wireless connectivity standard.

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]		

7.2.2. The device shall support the latest low power Wi-Fi wireless 802.11 standard.

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]		

7.2.3. The device should support the latest GSM cellular device standard, including LTE and 5G.

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]		

7.2.4. The device shall support person to person communication while working in the industrial environment.

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]		

7.3.   Field of View

7.3.1. The device shall provide a 3D view (the images for both eyes are fully overlapping, just offset to provide the perception of 3D).

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]		

7.3.2. The device should provide a minimum 85-degree field of vision in both directions (vertical and horizontal) where AR content can be displayed.

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]		

7.3.3. The device should have the ability to automatically adjust to the users Inter Pupillary Distance (IPD).

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]		

7.3.4. The device shall NOT obscure the user's peripheral vision (side, and up/down).

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]		

7.4. 6.4 On-board Storage

7.4.1. The device shall have a minimum on-board memory storage of 128Gb.

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]		

7.4.2. The device shall support memory storage encryption, for security of the content.

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]		

7.5. On-board OS

7.5.1. The device shall support a web browser.

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]		

7.5.2. The device shall require the student to authenticate.

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]		

7.5.3. The device shall support federation.

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]		

7.6. Environmental

7.6.1. The device should work in ambient temperatures 0oC to 50oC.

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]		

7.6.2. The device displays shall provide visible (easy to read) displays while in full ambient light conditions.

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]		

7.6.3. The device should be able to auto adjust brightness from a full ambient light condition to a dark condition, and vice versa in 1 seconds.

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]		

7.6.4. The device shall work in environmental requirements documented in IP 64f.

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]		

7.7.   Inputs / Outputs

7.7.1. Accelerometer

7.7.2. The device should have an accelerometer that provides information to the software about gaze, and position.

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]

7.7.3. Button

7.7.4. The device should support connection to a wearable Bluetooth button.

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]		

7.7.5. Eye Tracking

7.7.5.1. The device shall support eye tracking as a method of gaze, for software user interface commands.

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]		

7.7.6. GPS

7.7.6.1. The device shall have a GPS that provides information to the software about position.

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]		

7.7.7. Mouse / Touch Pad

7.7.7.1.   The device shall support connection to a Bluetooth mouse / Touch Pad style device.

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]		

7.7.7.2.   The device shall support an independent device for pointer control (for example, a smart device acting as a track pad).

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]		

7.7.8. Microphone

7.7.8.1.   The device microphone shall be wireless

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]		

7.7.8.2.   The device microphone shall be directional (including jawbone, throat, ear canal).

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]		

7.7.8.3.   The device microphone shall have background noise cancelling

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]		

7.7.8.4.   The device microphone should be intrinsically safe

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]		

7.7.8.5.   The device microphone shall work in ambient temperatures 0°C to 50oC.

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]		

7.7.9. Sound

7.7.9.1.   Shall be available in wired or wireless

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]		

7.7.9.2.   Shall serve as hearing protection for the wearer, complying with OSHA standards.

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]		

7.7.10.   Display

7.7.10.1.   The device shall support a minimum resolution of 1920x1080.

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]		

7.7.10.2.   The device shall support full colour.

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]		

7.7.10.3.   The device shall deliver 120Hz refresh rate.

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]		

7.7.11. Safety

7.7.12. The device shall be intrinsically safe.

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]		

7.7.13. The device shall meet OSHA and MSHA requirements for safety glasses.

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]		

7.7.14. The device shall have an option to meet side shield safety requirements.

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]		

7.8. Visual Tracking

7.8.1. The device AR objects shall be scaled and anchored to the physical world without the requirement for an image target. Note: For example, enable the use of SLAM or other environment tracking solutions.

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]		

7.8.2. The device AR object positioning accuracy shall be within +5mm.

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]		

7.8.3. The device should be able to scan QR code (of 2 by 2 inches) from a minimum of 5 feet from a + 60 degree off-axis. Note: Optical and/or software zooming utilized.

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]		

7.9.   Wear Ability / Comfort

7.9.1. The device weight worn on the head shall not exceed 125 grams.

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]		

7.9.2. The device external temperature shall not exceed 35 degC against the user's skin.

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]		

7.9.3. The device shall support the addition of prescription lenses.

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 – INTEGRATED LOGISTIC SUPPORT SPECIFICATIONS

8 LOGISTIC REQUIREMENTS

8.1. Reliability, Availability and Maintainability (RAM)

8.1.1. 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]		

8.1.2. 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]		

8.1.3. 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]		

8.2. Integrated Logistic Support Plan

8.2.1. A clearly defined contract 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]		

8.2.2. Further options to the maintenance contract must be discussed to cover:

[a] General support and maintenance

[b] Bug fixes

[c] Software version upgrades and evolution

[d] Refresher Training

[e] Spares

[f] Handling

[g] Packaging and Storage of spares

[h] 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]		

8.3. Configuration Management Plan

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

[a] Operating System training

[b] Application training

[c] Installation training

[d] Recovery training

[e] Fault finding training

[f] Backup and restore training

[g] Database training

[h] LAN / WAN (How the SYSTEMS interfaces communicate/ operates and interacts) training

[i] Trouble shooting and solutions, patches and fixes, install modify and maintain training

[j] Basic maintenance that should be done, e.g. Disk space management training

[k] All documentation to be valid and up to date, must be checked before system accepted; and

[l] 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]		

8.4. Maintenance and Support

8.4.1. 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]		

8.4.2. 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]		

8.4.3. 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]	

8.4.4. 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]		

8.5. Installation and Transitioning

8.5.1. 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]		

8.5.2. 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]		

8.6. Packaging Handling Storage and Transportation

8.6.1. 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]	

8.6.2. 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]		

8.6.3. 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]		

8.7. Training

8.7.1. 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]		

8.7.2. 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]

8.7.3. 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]		

8.8. Spares

8.8.1. 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]		

8.9. Documentation

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

[a] As-built document;

[b] System/Segment design document;

[c] Spares Plan;

[d] Installation, testing and transition plan;

[e] Logistics support plan;

[f] Configuration management plan;

[g] Project management plan;

[h] Training plan and documentation;

[i] Service manuals;

[j] OEM and COTS documentation;

[k] Brochures;

[l] Equipment specific documentation;

[m] Maintenance support plan; and

[n] 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]		

8.9.2. 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]		

8.10. Warrantee and PBU

8.10.1. 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]		

8.10.2. 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]*

8.11. Support Contract

8.11.1. 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]		

8.11.2. 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]		

8.11.3. 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]		

8.11.4. 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 6 – PROJECT MANAGEMENT SPECIFICATIONS

7   PROJECT MANAGEMENT REQUIREMENTS

9.1.   General

9.1.1. 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]		

9.1.2. 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]		

9.1.3. 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]		

9.2.   Draft Plans

7.2.1. 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:

[a] Project Management

[b] Resource management

[c] Risk management

[d] Quality management

[e] Communication management

[f] Installation, Transitioning and Commissioning; and

[g] 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]		

9.3.   Project Management Plan

7.3.1. 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]		

7.3.2. The Project Management Plan shall include at least the following:

[a] Project scope and overview

[b] Project deliverables

[c] Work Breakdown Structure (WBS) defining the scope of work and resources necessary to meet the contract requirements

[d] Project organization and responsibilities

[e] Master Time Schedule (Gantt Chart)

[f] Quality assurance activities shall be performed in the project

[g] Configuration and integration management activities (regarding hardware, software and documentation version changes); and

[h] 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]	

9.4. Project Delivery Schedule and Scope Management

7.4.1. 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]		

7.4.2. 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]		

9.5. Resource Management

9.5.1. 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]		

9.5.2. 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]		

9.6. Risk Management

9.6.1. 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]		

9.6.2. 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]		

9.7. Quality Management

9.7.1. 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]		

9.7.2. 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]		

9.7.3. 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]		

9.7.4. 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]		

9.7.5. 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]		

9.8. Communications Management

9.8.1. 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]		

9.9. Installation, Transitioning and Commissioning

9.9.1. 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]		

9.9.2. 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]		

9.9.3. 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]	

9.9.4. 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]		

9.9.5. 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]		

9.10. **Safety, Health and Environment**

9.10.1. A Waste Management Plan detailing the approach to be taken for minimizing negative environmental impacts during product usage phase (disposal of batteries) and at end-of-life of the computer hardware component (e-waste) 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]		

Section 37(2) (Legal) Agreement

A section 37(2) agreement must be signed between ATNS and the appointed contractor at the time of awarding the contract. The appointed contractor must ensure that a section 37(2) agreement is compiled between the principal contractor and all their appointed contractors for the contract, if any. The original copy of the section 37(2) agreement must be retained by the contractor and a copy retained by the responsible manager. A copy of the agreement must form part of the respective contractor's SHE files.

Note: The agreement must be signed by both parties i.e ATNS Project Manager and the appointed contractor. The safety file authorization letter shall not be issued to the appointed contractor without the signed 37(2) document.

COID

The appointed principal contractor and all his/her appointed sub-contractors shall be registered with an appropriate employment compensation commissioner and have available a valid letter of good standing (LoG) from such commissioner. The obligation lies with the contractors to ensure that the LoG remain valid throughout the contract period. A copy of the LoG must be filed in the contractor SHE files.

Costing for SHE within the Project

The SHE costing must be itemized and must take into consideration the scope of work. The appointed principal contractor must make sure that he/she made adequate provision for the cost of health and safety measures during tendering process.

SHE Policy

SHE policy is a statement of intent and a commitment by the organization's CEO and senior management in relation to the relevant SHE roles and responsibilities, the achievement of their strategic objectives, values of integrity, customer satisfaction, excellence, and innovation.

The principal contractor and all appointed contractors, if already not in place, will be required to compile an organizational SHE policy in line with their SHE responsibilities. The policy must be signed by the organization's CEO or the appointed assistant to the CEO OHS Act Section 16(2).

10. SYSTEMS ENGINEERING

10.1. Factory Acceptance Testing

10.1.1. 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]		

10.1.2. 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]		

10.1.3. A test specification (FAT plan and procedures) shall be provided, and the following shall be included:

[i] A detailed description of the proposed test techniques and procedures to verify all equipment parameters

[j] Conditions under which the tests shall be conducted and approved

[k] The forms of documenting test results; and

[l] 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]		

10.1.4. 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]		

10.1.5. 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]		

10.1.6. 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]		

10.1.7. 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]		

10.1.8. 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]		

10.2. Site Acceptance Testing

10.2.1. 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]		