AIR TRAFFIC AND NAVIGATION SERVICES SOC. LTD
REPUBLIC OF SOUTH AFRICA

REQUEST FOR PROPOSAL:

ATNS/TPQ/RPF46/2024/25/ HF REPLACEMENT

HF REPLACEMENT PROJECT

Volume 2

TECHNICAL SPECIFICATIONS

JANUARY 2025

TABLE OF CONTENTS

ABBREVIATIONS

ACSA	Airports Company South Africa
ATC	Air Traffic Controller
ATNS	Air Traffic and Navigation Services Company
COTS	Commercially off the shelf
FAJO	Johannesburg Oceanic
FAOR	O.R. Tambo International Airport
FIR	Flight Information Region
HF	High frequency
INO	Indian Ocean
LRU	Line Replacement Unit
OJT	On-the-Job Training
PC	Personal Computer
QA	Quality Assurance
RCMMS	Remote Control, Maintenance and Management System
RX	Receiver
SAT	South Atlantic Ocean
SELCAL	Selective Calling
SLA	Service Level Agreement

GENERAL INSTRUCTIONS TO BIDDERS

The Bidder shall submit all responses, diagrams, documentation, and drawings according to the GENERAL INFORMATION AND INSTRUCTIONS TO BIDDER'S document and in English.

To assist Bidders only, each paragraph or article has been appended throughout with the letters "(M)", "(D)", "(O)" or "(I)", to indicate whether the requirement is **M**andatory, **D**esirable, **O**ptional or for **I**nformation only.

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

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

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

Bidders shall declare compliance to each and every paragraph of this document, based on the paragraph classification, in the response block provided opposite the column labelled "Compliance". Bids will be evaluated as follows:

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

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

Bidders shall, for paragraphs declared "PC" or "NC", include a statement as to the nature of the variation and may supply additional supporting information in the space provided to demonstrate how the proposal may still meet the needs of ATNS.

Paragraphs marked "(M)" indicate that the requirement is mandatory and Bidders that do not comply with the requirement **shall** be disqualified for further evaluation.

Paragraphs marked "(D)" indicate that the requirement is desirable, and the Bidder is expected to declare their level of compliance, provide a formal response and reference supporting documents.

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

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

CHAPTER 1: GENERAL SPECIFICATIONS

1 PROJECT INTRODUCTION

ATNS currently has HF equipment and structures which are now obsolete. This equipment is located at the Isando and Bapsfontein sites which serve as Transmitter and Receiver stations respectively. A new HF Transmitter station is being developed at Delmas. The purpose of this project is to replace the current aged equipment with a reliable HF system located at Delmas and Bapsfontein, which are used by air traffic controllers to communicate with aircraft in the INO and SAT oceanic regions to ensure ATNS maintains its SLA with its stakeholders. (I)

2 CONTROLLER WORKING POSITION

This section indicates a high-level description of a typical shift for an ATC working on the Oceanic position:

- Perform regular checks if any aircraft are in the airspace.
- Check which frequencies those aircraft are monitoring, and which frequency had been used to perform the SELCAL check. This information is found on the paper 'flight monitoring form', which is completed for each flight. The flight monitoring form contains details of the flight and is used to write down estimates of waypoints which the aircraft cross. This is an in-house created form.
- Check that the HF transmitters and receivers are working.
- Check that the correct frequencies are set for the specific time of day according to the position of the sun.
- Check that HF receivers are set to the same frequencies as HF transmitters and that it is appropriate for the time of day and position of the sun. If not and aircraft are in airspace, change frequencies for those aircraft and repeat SELCAL on new frequencies.
- Check for flight plans that have already been written out and see if they are still valid on the estimated times.
- Check and continue to monitor the AMATIS system for new flight plans that will go through Oceanic airspace.
- Write out the flight plans for any aircraft which will enter FAJO on flight monitoring forms and work out the estimated time at the FAJO boundary from the estimated entry time (EET) for FAJO and estimated departure time.
- Receive estimates for aircraft from neighbouring FIRs. This is via PCUG/External lines.
- Advise those FIRs which frequencies are currently being used in FAJO airspace, which the inbound aircraft must use to make initial contact with Johannesburg Oceanic.
- When the aircraft calls for the first time - First contact and monitor of aircraft:
    - Do SELCAL check.
    - If able connect to ADS/CPDLC.
    - Monitor aircraft estimates and crossing times at each point.
    - Annotate the times and levels on the flight monitoring form.
    - Pass estimate (time, level, boundary point) to next FIR/s.
    - Monitor estimate and revise if needed.
    - Hand over aircraft to neighbouring FIR at boundary point.
    - File flight monitoring form.
- Give handover at end of shift to next person. Including:
    - Aircraft on frequency and estimate pass for them or not.
    - Aircraft estimates received but not in airspace yet.
    - Equipment serviceable or not. (I)

3 PROJECT OVERVIEW

3.1 Scope of Work

The scope of work of this project spreads across the following locations:

- ATC Working Position.
- Bapsfontein (Receiver site)
- Emergency (Disaster Recovery site)
- Delmas (Newly planned transmitter site).
- FAOR technical centre.
- Isando (Current transmitter site).

The scope of the project is to supply, install and commission a turnkey HF system to be used for communication between aircraft and air traffic controllers in the South Atlantic and Indian Ocean regions, and for search and rescue purposes. The scope of work includes, at least the following:

- Environment Impact Assessments (EIAs).
- Installation of new transmitters and receivers at the stations.
- Civil works.
- Installation of system components and auxiliaries.
- Installation of Remote Control, Maintenance and Management System (RCMMS) at Delmas, Bapsfontein and the FAOR technical centre.
- Installation of a fallback system at the ATC working position.
- Installation of a system duplication which shall be located at another building which is used for disaster recovery purposes. This system duplication shall include another RCMMS, SELCAL, Computer application and fallback system.
- Decommissioning and disposal of the existing HF equipment.
- Maintenance and support agreement for the lifespan of the HF equipment.

[A] The bidder shall describe their understanding of the required scope of works as indicated above.

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

3.2 System Interconnection Diagram

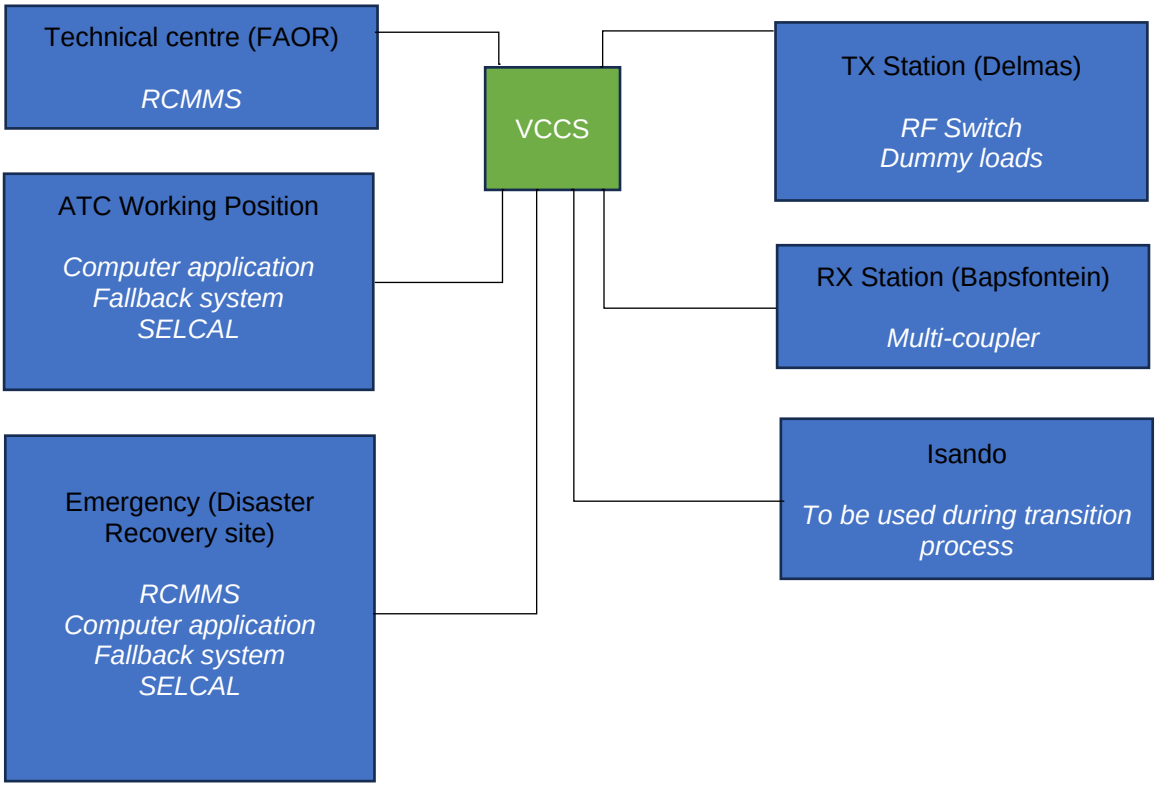

Figure 1: System Interconnection Diagram
The blue blocks shown in figure 1, indicate the locations which involve the required scope of works.

3.3 Environmental Conditions

[A] The bidder shall describe how their offered systems shall operate within specifications under the following environmental conditions and tolerances:

INDOOR CONDITIONS	**AMBIENT TEMPERATURE**	-5°C TO +55° C
	RELATIVE HUMIDITY	≤ 95% FOR TEMPERATURES ≤ 35° C AND ≤ 60% FOR TEMPERATURES > 35° C
OUTDOOR CONDITIONS	**HIGH AND LOW TEMPERATURES**	-20°C TO +60° C
	RELATIVE HUMIDITY (MEAN - MAX	60% - SATURATION
	ALTITUDE	0 – 2500 M
	AVERAGE RAINFALL	400MM – 2000MM
	WIND SPEED	UP TO 186 KM/H

TABLE 1: ENVIRONMENTAL PARAMETERS

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

[B] The outdoor elements, structures and other auxiliary components shall be hermetically sealed and protected against corrosion. Their protective casings/enclosures shall be at minimum International Protection Rating IP65. The bidder shall provide proof how their offered system complies with this requirement.

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

3.4 Reference Documents

The bidder shall show proof of compliance of their system with the following documents:

- ICAO Annex 10 Aeronautical Telecommunications - Volume III - Communication Systems
- SANS 10142: Low voltage installations

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

3.5 Power Requirements

The bidder shall describe how their offered systems complies with the following power requirements:

[A] A 400/230V, 50 Hz, 3 phase, 4 wire power supply with grounded neutral or single phase 230 V AC, with the following specifications:

- Maximum voltage fluctuations shall be ± 10%.
- Frequency shall be 50 Hz.
- Maximum frequency deviations shall be ± 2 Hz.

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

[B] In the event of a mains power failure, the HF system and supporting infrastructure per site shall be powered from a backup power supply:

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

[C] The HF systems shall be provided with an under and over voltage or current protection.

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

[D] Power interruptions or interruptions due to lightning surges shall not damage or degrade the equipment.

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

[E] All volatile system data and other essential equipment required for the continued operation of the system upon restoration after a power failure shall be provided with an internal back-up supply.

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

[F] Equipment shall automatically restart in ready mode for normal operations on the restoration of power after a power failure.

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

3.6 System Lifespan

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The HF system and its auxiliary systems shall be designed to operate within specifications under the stated environmental conditions for a period of 15 years.

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

[B] The system components and supporting infrastructure shall support the system throughout the 15-year lifespan.

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

3.7 Modularity and Technology

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The HF system shall be based on a modular design and solid-state technology.

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

3.8 Redundancy

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] To ensure a high level of availability, the HF system shall be installed as a dual system (main and standby).

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

[B] The system shall enable the HF system to switch between the main and the standby radio(s) in case of main radio failure or vice versa, without requiring any equipment external to the system.

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

3.9 Operational Concept

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] Full details on how the system design will support the ATNS Operational Concept, as indicated under chapter 1-2 Controller Working Position, shall be provided.

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

[B] A wideband HF system which can support up to 240kbps data rates and up to 48 kHz bandwidth is desired. Full details on how the system will adhere to this specification is required.

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

3.10 SELCAL System

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The HF system shall be installed together with a SELCAL system to permit the selective calling of individual aircraft over radiotelephone channels linking the ground station with the aircraft.

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

[B] The following parameters of the SELCAL system shall be in accordance with the specifications in ICAO Annex 10 Volume 3

1. Transmitted tones.

- Tone codes shall be made up of various combinations of the tones as indicated on the amended ICAO Annex 10 Volume 3 table and as designated by colour and letter.

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

2. Transmitted code.

- Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones.

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

- The pulses shall be of 1.0 ±0.25 seconds duration, separated by an interval of 0.2 ±0.1 second.

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

3. Frequency stability of the transmitted tones.

- The frequency stability of transmitted tones shall he held to ±0.15% tolerance to ensure proper operation of the airborne decoder.

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

4. Distortion

- The overall audio distortion present on the transmitted RF signal shall not be more than 15 percent (15%).

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

5. Percent modulation of the RF signal.

- The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones.

- The combination of tones shall result in a modulation envelope having a nominal modulation percentage as high as possible and in no case less than 60 per cent (60%).

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

[C] When the SELCAL tones are transmitted, the selected transmitter shall automatically change to the H2B transmission mode.

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

[D] There shall be 16 new audio tones, in addition to the existing 16 tones, to create SELCAL codes from a total of 32 available audio frequencies (called SELCAL 32). This will result in up to 200,000 new unique SELCAL codes being available for assignment, mitigating the duplicate code issue for the foreseeable future.

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

[E] As this solution uses the existing 16 audio tones, it is backwards compatible with all existing aircraft avionics, while providing benefits to new aircraft with the updated SELCAL 32 standard.

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

3.11 Control Unit

The bidder shall provide proof how their offered systems comply with the following requirements:

The HF system shall have a control unit which shall be installed at the FAOR technical centre which shall have the following functionalities:

- Frequency and mode selection.

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

- Channel selection.

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

- Configuration of the system.

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

3.12 Antenna

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The system shall be connected to the existing omni-directional antenna structures which are available at the Bapsfontein receiver site and the Delmas transmitter site.

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

3.13 Antenna Coupler System

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] Two antenna coupler systems are required to enable the system to share an antenna.

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

3.14 Built-In-Test Equipment (BITE)

The bidder shall provide proof how their offered systems comply with the following requirements:

The BITE should at least be able to perform tests for the following:

- Receiver and transmitter performance.

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

- Selcal operation.

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

- Syllabic mute operation.

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

- VCO operation.

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

- Serial communications port viability.

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

3.15 System Interface Requirements

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] Interface control documents shall be provided.

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

[B] Maintenance Position and Interface system for Remote Control Monitor and Maintenance purposes shall be provided.

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

[C] The output of the HF system which shall serve as an interface and input for the VCCS shall be on the VOIP ED137 protocol.

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

[D] The output of the HF system which shall serve as an interface and input for the VCCS shall be an ethernet RJ45 type connection.

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

[E] The system shall have an IP connection which shall interface the datalink at site.

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

[F] The system shall work on the SNMP protocol for control signals between the current SITTI VCCS and the newly installed equipment.

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

3.16 Maintenance Position

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] Maintenance Position and Interface system for Remote Control Monitor and Maintenance purposes shall be provided.

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

3.17 Fallback system

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] An emergency radio fallback system shall be installed at the ATC working position for continuous communication in the event of the VCCS system failure.

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

The proposed system must be able to support at least the following functions:

[B] Receiver audio shall be available on the VCCS and Fallback system.

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

[C] A common volume control for the receiver audio levels shall be provided. This setting shall not affect the main system.

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

[D] Individual volume controls shall be provided for each of the receivers.

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

[E] The transmitter and receiver channel frequencies related to the SAT region, INO region, Search and Rescue, AFI Region and 7E Region shall be accessible at any one time.

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

[F] Channel selection of a transmitter from the emergency system, shall automatically follow the receiver channel selected for that service, whether it be SAT region, INO region or Search and Rescue.

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

[G] The system shall have the functionality to select either transmitter.

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

[H] It shall be possible to tune any transmitter or receiver to another frequency other than its pre-selected frequency from the Technical Maintenance position.

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

[I] The system shall be provided with its own dedicated SELCAL unit.

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

3.18 Training system

The bidder shall provide proof how their offered systems complies with the following requirements:

Training system shall be installed at the Aviation Training Academy (ATA) which shall achieve the following tasks:

[A] Exposure to the technical staff to evaluate and demonstrate competence in fault finding.

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

[B] Training to the technical staff to analyse and perform corrective maintenance on the system.

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

[C] The training system shall include all LRUs of the real system such as a transmitter, receiver and RCMMS.

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

3.19 Emergency

The bidder shall provide proof of compliance with the following requirement:

[A] There shall be a system duplication which shall be located at another building which is used for disaster recovery purposes.

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

[B] The system duplication shall include another RCMMS, SELCAL, Computer application and fallback system.

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

[C] The system shall be configured such that the equipment required at the emergency location (Disaster and recovery purposes) shall not be operational simultaneously as that of the current ATC working position.

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

3.20 Equipment Cabinet

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The equipment shall be installed in a 19" rack. The equipment rack(s) shall allow for natural heat dissipation and a proper cable management system.

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

[B] The equipment racks shall be supplied with the equipment and shall make provision for access to the HF system for maintenance purposes.

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

[C] Details of the proposed equipment layouts at the various sites, i.e., transmitter, receiver and FAOR Control Centre, shall be provided.

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

3.21 Transition Plan

[A] The bidder shall describe their approach towards ensuring an effective transition can take place, to migrate to the new systems. The transition plan will make use of the existing Isando transmitter station and the Bapsfontein receiver station.

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

[B] A transition plan shall be in place to support the replacement of the current system with a minimal disruption of service.

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

3.22 Software

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The System design shall incorporate the principle of least functionality by identifying any unused/ unnecessary operating system and OS functionality, including protocols, ports, and services that could potentially be disabled or uninstalled to meet the ATNS Cyber Security Policy requirements. The disabling or uninstallation shall only be done in consultation with ATNS.

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

[B] The following principles regarding physical security shall be adhered to:

- The System design shall cater for and ensure that, the installation is behind the firewall and intrusion prevention systems.

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

- The System design shall ensure that all applications are only accessible publicly via the firewall.

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

- The System design shall ensure that remote access to the application is only accessible via the VPN.

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

- The network installation security requirements: for example, within a DMZ, on a specific subnet, as required, shall be defined for the System.

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

- The System shall apply network protections, including, TLS, IPSEC.

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

- If access from mobile devices is catered for, the System shall incorporate mobile device security.

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

[C] The following principles regarding secure protocols and ports shall be adhered to:

- The System shall utilise Secure Services and ports, including, DNS over port 53.

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

- The System shall implement Secure Network protocols; including, NetBIOS, IPv6 and network interfaces; including Bluetooth, IEEE 802.11, and infrared.

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

- The System shall implement secure methods of remote access via SSL, SFTP, SCP, VPN, SSH, and IPSEC.

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

[D] The following principles regarding user account security shall be adhered to:

- The System shall implement Secure Management of identifiers/accounts; including, changing default account names, determining length of time until inactive accounts are disabled, using unique usernames, establishing user groups.

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

- The System shall implement Secure Authentication controls: including, password length, use of special characters, minimum password age, multifactor authentication/use of tokens.

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

- The System shall implement access rights to enable role-based access control at application and device level.

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

[E] The following principles regarding file security shall be adhered to:

- The System shall implement access control to control permissions to files, directories, registry keys, and restricting user activities such as modifying system logs or installing applications.

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

- The System shall implement Secure Audit settings, including, capturing key events such as failures, logons, permission changes, unsuccessful file access, creation of users and objects, deletion and modification of system files, registry key and kernel changes.

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

- The System shall implement Secure System settings, including, session timeouts, number of remote connections, session lock.

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

- The System shall implement safeguards through software to protect end-user machines against attack,

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

- The System shall use approved, signed software, if supported.

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

[F] The following principles regarding data protection shall be adhered to:

- The System shall use Cryptography - use only FIPS 140-3 validated cryptographic protocols and algorithms to protect data in transit and in storage.

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

- The System shall include, antivirus, antispyware, anti-adware, personal firewalls, host-based intrusion detection systems.

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

- Data loss prevention requirements shall be defined for the System, i.e., Classify the data traversed across the LAN as Public or Private. This will allow ATNS Security to ensure that Private information is not shared outside the network.

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

[G] The following principles regarding security/software updates shall be adhered to:

- The System shall allow for vendor-released patches in response to identified vulnerabilities, including, software updates to be installed.

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

- The technical specification and design documentation, system security documentation, system procedures, etc. shall be maintained and updated throughout the life of the System.

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

3.23 ICAO Requirements

The bidder shall provide proof how their offered systems comply with the following requirements:

[A] The offered system should also be currently used in ICAO member states.

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

3.24 Computer application for ATC display

[A] A computer application which shall indicate in real time the most suitable frequency that can be used to communicate with aircraft in the INO and SAT oceanic regions shall be proposed. The software shall consider ionospheric conditions as part of its calculation and recommendation process.

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

CHAPTER 2: SPECIFICATIONS FOR TRANSMITTER STATIONS

4 Transmitter Stations

4.1 Isando Site

The bidder shall describe their understanding of the following requirements at the Isando site.

[A] Decommission and dispose of the existing antenna structures in line with ATNS processes and procedures.

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

[B] The current Isando transmitter site shall be used during the transition process and the existing equipment shall be decommissioned and disposed of when the new HF system is commissioned at the new Delmas site.

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

4.2 Delmas Site

The bidder shall describe their understanding of the following requirements at the Delmas site.

[A] The Delmas site has two TCI-540 antennas. There shall be a dummy load installed capable of handling at least 4kW.

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

[B] An RF switch shall be installed which shall aid with fault finding.

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

[C] The transmitter frequency range shall be from 2 MHz to 30 MHz.

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

[D] The Exciter and subsequently the transmitter shall have the capability of pre-selected channels to each of the operational frequencies that will be used.

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

[E] The transmitter shall be able to operate in multiple emission modes, for example, single side band (SSB) and continuous wave (CW) mode.

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

[F] The transmitter shall have a capability to be controlled locally on the local control computer and remotely via RCMMS for status monitoring of the transmitters using an IP protocol.

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

[G] The transmitter shall have a Built-In Test Equipment (BITE) facility.

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

[H] Transmitter Power Amplifier Function:

- A power amplifier to power the system in different modes shall be provided.

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

- Loss of the power amplifier shall not shut down the system.

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

- The Transmitter Power Amplifier shall have fail-soft and fail-safe capabilities such that when the output power drops by more than 3dB, the transmitter will automatically shut down.

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

- The frequency change time shall be equal or less than 100 milliseconds.

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

[l] Transmitter Power Amplifier Specifications:

- The third order Inter Modulation Products shall be at least 32dB below peak envelope power (PEP).

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

- The harmonics shall be -63dbc or better into a 50-ohm load.

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

- The spurious transmissions shall be -60dbc or better within +/- 5% of operating frequency.

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

- The spurious transmissions shall be -80dbc or better > 5% of operating frequency.

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

- The RF noise shall be greater than 75dbc/Hz (>75dbc/Hz) below full rated power.

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

- The output power shall be 36 dBW (+/- 0,5 dB) i.e. 4 kW (+/- 500 watt) PEP and average.

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

- The frequency range shall be within the band 2 to 30 MHz.

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

- The gain shall not vary more than 2dB over the entire frequency range.

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

[J] Transmitter Power Amplifier Protection:

- The transmitter shall be capable of operating in full power mode into a 1.3:1 VSWR load and reduced power between 1.3:1 and 3.1 VSWR. The transmitter shall be protected for any VSWR > 3.1.

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

- The transmitter shall have an indication of the Forward and Reflected Power.

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

[K] Transmitter Amplifier System Power Requirements

- The transmitter shall be able to accept a 400 / 230-volt, 50 Hz 3 phase supply.

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

[L] The transmitter shall utilise forced air internal fan cooling. Full details on the associated heat load of the equipment shall be provided.

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

[M] The transmitter shall be modular design and mounted in one rack with built in power supply.

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

[N] Automatic Level Control shall be employed to ensure maximum power during transmission (speech) periods.

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

[O] The transmitter shall have automatic monitoring of Over Temperature and poor VSWR conditions.

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

[P] The carrier shall be suppressed by at least 50 dB relative to the PEP.

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

[Q] The hum level shall be less than -60 dB relative to PEP.

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

[R] The transmitter keying shall function independently with respect to Normal Operating mode (J3E) and SELCAL (H2B).

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

[S] The system shall be capable of feeding into a 50 ohm, 1 ⅝ inch low loss coaxial feeder via an appropriate flange.

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

[T] Each transmitter system shall be independent with respect to each transmitting path to the VCCS system in the control centre, i.e., there shall be no common equipment between any of the transmitters or their transmitting paths.

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

[U] Block diagram with detailed description of the proposed system configuration shall be provided.

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

[V] The proposed transmitter systems shall not cause interference to standard radio navigation, telecommunication, and radar facilities (including airborne equipment).

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

4.3 RCMMS

The bidder shall submit proof of how their offered systems comply with the following requirements:

[A] Each transmitter shall be independently accessible via RCMMS remotely. The RCMMS shall be capable of performing at least control, monitoring and reporting.

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

[B] The RCMMS connections shall be protected against lightning and voltage surges.

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

[C] Each transmitter shall have a capability to be controlled locally on the local control computer and remotely via RCMMS. Local control shall at least be provided for the following functions:

- Frequency changing

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

- Transmitter keying

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

- Selecting mode of Emission

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

- BITE

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

CHAPTER 3: SPECIFICATIONS FOR RECEIVER STATION

5 BAPSFONTEIN RECEIVER STATION

5.1 Receivers

The bidder shall submit proof of how their offered system complies with the following requirements:

[A] There shall be an ATNS provided IP connection at site for which the received communication link from the receivers will be transferred to the technical centre.

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

[B] There shall be new cable trays installed.

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

[C] There shall be seven (7) receivers for the South Atlantic (SAT) region, plus one (1) spare.

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

[D] There shall be five (5) receivers, for the Indian Ocean (INO) region, plus one (1) spare.

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

[E] The receiver frequency range shall be from 2 MHz to 30 Mhz.

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

[F] Tuning and frequency stability shall adhere to ICAO requirements. The tuning resolution shall be equal to or less than 10Hz. The frequency stability shall be at least +/- 1 ppm.

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

[G] The receiver shall be able to operate in at least the following modulation modes:

- Single Sideband suppressed carrier (J3E mode)

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

- Single Sideband with reduced carrier (H2B)

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

- Amplitude Modulation (A3E)

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

- Carrier Wave (A1A)

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

- Independent single side band (SSB) operation mode shall be possible.

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

[H] The receiver selectivity shall comply with the modulation mode and associated bandwidth characteristics as defined by the ITU Regulations Volume 2 Appendix 1, Edition of 2016.

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

[I] The IF filter shape factor for the input range of 3db to 60db, shall be equal or better than 2:1.

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

[J] The receiver sensitivity in mode J3E shall be equal to or less than -113dbm, which is equivalent to 0,5µV or 0dbµV.

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

[K] The Image and IF rejection shall be equal to or greater than 80db.

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

[L] The third order intercept point shall be equal to or better than + 5dbm.

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

[M] A reliable squelch system suitable for a noise free environment and guaranteed 100% capturing reliability is required.

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

[N] The receiver shall have a Built-In-Test Equipment (BITE) facility. All the software and associated hardware shall be supplied to have remote access to the BITE.

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

[O] The receiver systems shall be independent with respect to each receiving path to the VCCS system in the control centre, i.e., there shall be no common equipment between any of the receiving paths.

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

[P] The receiver shall have fast attack and slow decay time capabilities. Decay times shall be adjustable. There shall be less than 3 dB change in output levels for an increase of 10 dB in the input levels above -113 dBm.

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

[Q] The audio output shall be 600 ohms, balanced and transformer isolated.

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

[R] The audio output level shall be adjustable within the range -20 dBm and +10 dBm.

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

[S] The receiver shall have an internal speaker with front panel volume control.

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

[T] All audio and receiver control lines shall be protected against lightning and voltage surges.

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

[U] The receivers shall have inherent cooling system to accommodate any increase in room temperature.

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

[V] A Block diagram with a detailed description of the proposed system configuration shall be provided.

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

5.2 HF Receiver Multi-coupler

The bidder shall submit proof of how their offered system complies with the following requirements:

[A] The HF multi-coupler shall operate in the HF band.

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

[B] The HF multi-coupler shall have 16 outputs.

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

5.3 RCMMS

The bidder shall submit proof of how their offered system complies with the following requirements:

[A] The receiver shall have a capability to be controlled locally on the local control computer and remotely via RCMMS.

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

[B] The RCMMS for the status of the receivers shall be capable of performing at least the following:

- Remote frequency control function, which is one of the main requirements

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

- Control, monitoring, and fault reporting.

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