



SEYCHELLES TECHNICAL STANDARDS

STS-CNS

**Communication, Navigation and/or
Surveillance Standards**

Seychelles Technical Standards

STS-CNS

**Communication, Navigation and/or
Surveillance Standards**

Issue 01

July 2017

CONTENTS (general layout)

STS-CNS

Communication, Navigation and/or Surveillance Standards

FOREWORD

AMENDMENT RECORDS

SPECIFIC REQUIREMENTS FOR THE PROVISION OF COMMUNICATION, NAVIGATION AND/OR SURVEILLANCE SERVICES

SECTION 1 – GENERAL REQUIREMENTS

SUBPART A — APPLICABILITY

SUBPART B — ORGANISATION REQUIREMENTS

SECTION 2 – TECHNICAL REQUIREMENTS

SUBPART A – ADMINISTRATIVE PROVISION RELATING OF COMMUNICATION NAVIGATION AND/OR SURVEILLANCE SERVICES

SUBPART B – COMMISSIONING OF NEW FACILITY AND EQUIPMENT

SUBPART C – OPERATIONS AND MAINTENANCE PLAN

SUBPART D – COMMUNICATION SERVICES

SUBPART E – NAVIGATION SERVICES

SUBPART F – SURVEILLANCE SERVICES

SECTION 3 – ACCEPTABLE MEANS OF COMPLIANCE AND INTERPRETATIVE/EXPLANATORY MATERIAL (AMC & IEM)

ACJ/AMC/IEM A

ACJ/AMC/IEM B – Reserved

CONTENTS (details)

FOREWORD.....F-1

AMENDMENT RECORDS.....A-1

SPECIFIC REQUIREMENTS FOR THE PROVISION OF COMMUNICATION, NAVIGATION AND/OR SURVEILLANCE SERVICES

SECTION 1 – GENERAL REQUIREMENTS

SUBPART A — APPLICABILITY AND DEFINITION OF TERMS

CNS.001 Applicability 1-A-1

CNS.005 Definition of terms 1-A-1

SUBPART B — ORGANISATION REQUIREMENTS

CNS.010 Quality of services..... 1-B-1

SECTION 2 – TECHNICAL REQUIREMENTS

SUBPART A – ADMINISTRATIVE PROVISION RELATING OF COMMUNICATION NAVIGATION OR SURVEILLANCE SERVICES

CNS.2001 Division of service 2-A-1

CNS.2005 Telecommunication - access2-A 1

CNS.2010 Hours of service 2-A-1

CNS.2015 Supervision 2-A-1

CNS.2020 Super fluous transmissions..... 2-A-1

CNS.2025 Interference..... 2-A-1

CNS.2030 Notification of CNS facility status..... 2-A-1

CNS.2035 Facilities and equipment malfunctions/failures reporting and investigation 2-A-2

CNS.2040 Duty cycle – Power supply units 2-A-2

CNS.2045 Management of aeronautical radio spectrum 2-A-2

SUBPART B — COMMISSIONING OF NEW FACILITY

CNS.2050 Commissioning procedures 2-B-1

CNS.2055 Safety case 2-B-1

CNS.2060 Human factors..... 2-B-1

SUBPART C — OPERATIONS AND MAINTENANCE PLANS

CNS.2065 Safety requirement for overall operation and maintenance plan..... 2-C-1

CNS.2070 Details of operation and maintenance plan for each facility and equipment 2-C-1

CNS.2075 Test equipment 2-C-1

CNS.2080 Interface arrangement for support services 2-C-1

SUBPART D — COMMUNICATION SERVICES

CNS.2085 ICAO standards compliance 2-D-1

CNS.2090 Voice/Data recording equipment requirements 2-D-1

CNS.2095 Establishment of radio communication 2-D-2

CNS.2100 VHF and HF Aeronautical Radio Stations 2-D-2

CNS.2105 Voice Communications Control Systems (VCCS) 2-D-3

CNS.2110 Data link communication 2-D-5

CNS.2115 Automatic Terminal Information Service (ATIS) 2-D-5

CNS.2120 UHF radio equipment and systems 2-D-6

SUBPART E — NAVIGATION SERVICES

CNS.2125 Standard radio navigation aid 2-E-1

CNS.2130 Instrument Landing System (ILS) 2-E-1

CNS.2135 VHF Omni-Directional Range (VOR) 2-E-2

CNS.2140 Distance measuring equipment (DME) 2-E-3

CNS.2145 Area Navigation (RNAV) Global Navigation Satellite System (GNSS) 2-E-4

SUBPART F — SURVEILLANCE SERVICES

SECTION 3 – ACCEPTABLE MEANS OF COMPLIANCE AND INTERPRETATIVE/EXPLANATORY MATERIAL (AMC & IEM)¹

ACJ/AMC/IEM A **3-A-0**

AMC CNS.2070 (b) 3-A-1

AMC CNS.2090 (c) (6) 3-A-1

ACJ/AMC/IEM B **3-B-1**

FOREWORD

- 1 STS-CNS is derived from Annex VIII of Commission Implementing Regulation (EU) 2017/373 of 1st March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight of the European Aviation Safety Agency and CAP 670 Air Traffic Safety Requirements of the UK.
- 2 STS-CNS addresses the Standards and Recommended Practices of ICAO Annex 10, as it pertains to the provision of communication, navigation and/or surveillance services. It is intended by these set of requirements that both international and domestic provision of communication, navigation and/or surveillance services follow a common standard.
- 3 The basic organisation of STS-CNS (Subparts and rules numbers) follows strict conformance with that adopted for other European standards.
- 4 STS-CNS will only be distributed electronically by the Authority as a complete document and as such a list of effective pages is not considered necessary.
- 5 Amendments to STS-CNS will be in accordance with Chapter 2, 2.4 and 2.5 of the Manual for processing ICAO State Letters and Other Correspondences and Chapter 2, 2.3, 2.4, 2.5 and 2.6 of TP ANS 02, ANS Safety Oversight Manual. Amendment to the initial issue will be distributed as a complete revised document with deleted text indicated by a strikethrough and new text highlighted with grey shading until a subsequent amended issue is published. Each page will also indicate the amendment date and amendment number. For clarity and simplification, all pages of the respective section will have the same amendment status upon amendment of one or more rules. The Amendment Records page will detail each amendment.

AMENDMENT RECORDS

Amendment No.	Subject	Source	Section affected	Entered by (Date)	Effective Date
-	Initial issue				01 July 2017
01	<p>AIR TRAFFIC SERVICES REQUIREMENTS FOR COMMUNICATIONS:</p> <p>Aeronautical mobile service (air-ground communications)</p> <p>GM on GNSS performance assessment, in particular for the purpose of enabling States to take informed decisions with regard to approval of the use of new GNSS elements in their airspace;</p> <p>Protection of ILS signals from signal blockage and multipath interference caused by large reflecting objects located within the ILS coverage volume.</p>	<p>Regulation Making and Amendment Proposal Form</p> <p>Adoption of Amendment 91 to Annex 10, Volume I</p>	<p>Subpart D, CNS.2090</p> <p>Subpart E: CNS.2130; CNS.2145.</p>	Joseph G. Lajoie (21 June 2019)	01 Nov 2019

SPECIFIC REQUIREMENTS FOR THE PROVISION OF COMMUNICATION, NAVIGATION AND/OR SURVEILLANCE SERVICES

SECTION 1 – GENERAL REQUIREMENTS

SUBPART A – APPLICABILITY AND DEFINITION OF TERMS

CNS.1001 Applicability

STS-CNS prescribes specific requirements applicable to providers of communication, navigation and/or surveillance services, providing such services both for national and international air navigation.

CNS.1005 Definition of terms

- (a) The following terms shall apply to all subparts of this STS. In this STS, where a term is not defined in this section, but is defined in ICAO Annex 10, especially where reference to specification standards is required, that definition shall apply.
- (1) **‘accuracy’** means a degree of conformance between the estimated or measured value and the true value.
Note: For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.
- (2) **‘aeronautical broadcasting service’** means a broadcasting service intended for the transmission of information relating to air navigation.
- (3) **‘aeronautical fixed telecommunication network (AFTN)’** means a worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.
- (4) **‘aeronautical fixed service’** means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.
- (5) **‘aeronautical mobile service’ (RR SI.32)** means a mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.
- (6) **‘aeronautical mobile (R) service’ (RR SI.33)** means an aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.
- (7) **‘aeronautical radio station’** means a radio station on the surface, which transmits or receives signals for the purpose of assisting aircraft.
- (8) **‘aeronautical station’** means a land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.
- (9) **‘aeronautical telecommunication service’** means a telecommunication service provided for any aeronautical purpose. For the purpose of this STS, communication, navigation and/or surveillance services is used and have the same meaning.
- (10) **‘aeronautical telecommunication station’** means a station in the aeronautical telecommunication service.
- (11) **‘aircraft station’ (RR SI.83)** means a mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft.
- (12) **‘air-ground communication’** means two-way communication between aircraft and stations or locations on the surface of the earth.
- (13) **‘altitude’** means the vertical distance of a level, a point or an object considered as a point, measured from mean sea level.
- (14) **‘area navigation (RNAV)’** means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.
Note: Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.
- (15) **‘automatic terminal information service (ATIS)’** means the automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

- Data link-automatic terminal information service (D-ATIS) means the provision of ATIS via data link.
 - Voice-automatic terminal information service (Voice-ATIS) means the provision of ATIS by means of continuous and repetitive voice broadcasts.
- (16) **'availability'** means the ability of a system to perform within specified limits a required function under given conditions at a given time.
- (17) **'designated operational coverage (DOC) (RR S)** means that volume of airspace needed operationally in order to provide a particular service and within which the facility is afforded frequency protection.
- The DOC is quantified by operational range in nautical miles and height in flight level or feet above ground level and defines the limit of the service area associated with the frequency assignment for a particular service. See Radio Service Area.
- (18) **'emergency equipment'** means equipment which is operationally independent of the main and standby equipment, rapidly available for use when required, and used exclusively for the controlled shutdown of an air traffic service in a safe manner.
- (19) **'human factors principles'** means principles which apply to design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.
- (20) **'ground-ground communication'** means two-way communication between or with air traffic services facilities located on the surface of the earth.
- (21) **'integrity'** means that quality which relates to the confidence that can be placed in the validity of the information provided by a system.
- (22) **'radio navigation service'** means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.
- (23) **'specification'** means a precise technical definition of the required parameters or performance to be achieved.
- (24) **'system failure'** means the inability of a system to fulfil its operational requirements. Failure may be systematic or due to a physical change.

SUBPART B – ORGANISATION REQUIREMENTS

CNS.1005 Quality of services

A communication, navigation and/or surveillance services provider shall confirm the quality level of the services it provides in terms of availability, continuity, accuracy and integrity.

SECTION 2 – TECHNICAL REQUIREMENTS**SUBPART A – ADMINISTRATIVE PROVISION RELATING OF COMMUNICATION NAVIGATION OR SURVEILLANCE SERVICES****CNS.2001 Division of service**

- (a) The communication, navigation and/or surveillance services provider shall provide the following services:
- (1) Aeronautical Fixed Service;
 - (2) Aeronautical Mobile Service;
 - (3) Aeronautical Radio Navigation Service;
 - (4) Aeronautical Broadcasting Service.

CNS.2005 Telecommunication - Access

The communication, navigation and/or surveillance services provider shall ensure that all aeronautical telecommunication stations, including end systems and intermediate systems of the Aeronautical Telecommunication Network (ATN), are protected from unauthorized direct or remote access.

CNS.2010 Hours of service

- (a) The communication, navigation and/or surveillance services provider shall give notification of the normal hours of its service in the Seychelles Aeronautical Information Publication (AIP).
- (b) Whenever necessary and practicable, the communication, navigation and/or surveillance services provider shall give notification of any change in the normal hours of service, before such a change is effected. Such changes shall, whenever necessary, be promulgated in NOTAM.
- (c) If a station of the communication, navigation and/or surveillance services provider, or an aircraft operating agency, requests a change in the hours of service of another station, such change shall be requested as soon as possible after the need for change is known. The station or aircraft operating agency requesting the change shall be informed of the result of its request as soon as possible.

CNS.2015 Supervision

- (a) Occasional infringements of the standards and procedures contained in this STS, when not serious, shall be dealt with by direct communication between the parties immediately interested either by correspondence or by personal contact.
- (b) When a station commits serious or repeated infringements of the standards and procedures in this STS, representations relating to them shall be made to the Authority by the communication, navigation and/or surveillance services provider.

CNS.2020 Superfluous transmissions

The communication, navigation and/or surveillance services provider shall ensure that there is no willful transmission of unnecessary or anonymous signals, messages or data by any station within the Seychelles. Procedures shall be established with the Department of Information, Communication and Technology (DICT) to address occurrences of anonymous transmissions. Any such transmission shall be reported, investigated and follow-up actions taken to prevent recurrence.

CNS.2025 Interference

Before authorizing tests and experiments in any station, the communication, navigation and/or surveillance service provider, in order to avoid harmful interference, shall prescribe the taking of all possible precautions, such as the choice of frequency and of time, and the reduction or, if possible, the suppression of radiation. Any harmful interference resulting from tests and experiments shall be eliminated as soon as possible.

CNS.2030 Notification of CNS facility status

The communication, navigation and/or surveillance services provider shall:

- (a) provide the area control centre, aerodrome control towers and unit providing approach control service information on the operational status of radio navigation services, as applicable, on a timely basis consistent with the use of the service(s) involved.
- (b) as soon as possible, notify the aeronautical information service provider:

- (1) of information on the operational status details of any new facility for publication in the Seychelles Aeronautical Information Publication; and
- (2) of information concerning any change in the operational status of any existing facility, for the issue of a NOTAM;
- (3) ensure that the such information are accurately published.

CNS.2035 Facilities and equipment malfunctions/failures reporting and investigation

The communication, navigation and/or surveillance services provider shall report facilities and equipment malfunctions and failures and safety incidents, and investigate such malfunctions, failures and safety incidents in accordance with the technical standards set out in STS-ANS, ANS.1035 - Occurrence Reporting.

CNS.2040 Duty cycle – Power supply units

- (a) The communication, navigation and/or surveillance services provider shall ensure that main and back-up power supply units are provided and are appropriate for all facilities and equipment to ensure continuity of the services being provided.
- (b) The power supply for emergency equipment shall be independent of that for the main equipment.
- (c) The power supply units shall provide an indication of system failure that may have an effect on the service being provided, in a timely manner, so that actions can be taken to ensure the safe continued provision, or if necessary, the controlled withdrawal of the service.

CNS.2045 Management of aeronautical radio spectrum

The communication, navigation and/or surveillance services provider shall have a procedure in place to manage and protect aeronautical radio spectrum. Any frequency allocation within the radio spectrum shall be centrally controlled by a designated person to ensure no conflict and interference to any radio stations or facility. Updated records shall be kept of all allocated frequencies.

SUBPART B – COMMISSIONING OF NEW FACILITY AND EQUIPMENT**CNS.2050 Commissioning procedures**

- (a) The communication, navigation and/or surveillance services provider shall establish procedures to ensure that each new facility and equipment is commissioned to meet the specification standards for that facility and equipment in accordance with ICAO Annex 10, Vol. I, III, IV and V, as applicable.
- (b) The communication, navigation and/or surveillance services provider shall validate the system performance of the new facility and equipment by necessary tests and ensure that all parties involved with its operations and maintenance, including any contractors have accepted and are satisfied with the test results.
- (c) The communication, navigation and/or surveillance services provider shall include as part of procedures, documentation of tests conducted on the facility and equipment prior to commissioning, inclusive of those tests compliance with applicable ICAO Annex 10 specification standards and any ground or flight test, as required, in conformance with ICAO Doc 8071 – *Manual on Testing of Radio Navigation Aids*.

CNS.2055 Safety case

- (a) The communication, navigation and/or surveillance services provider shall ensure that for safety critical facility and equipment, the commissioning and any change thereafter, include the conduct of a safety cases for risk assessment and mitigation in accordance with STS-ANS, ANS.1050 and ANS.1055 and the procedures of the SCAA Integrated Safety Management System.
- (b) The safety case shall be submitted to the Authority for comments and acceptance at least one month prior to commencement of operation of the safety critical system.

CNS.2060 Human factors

The communication, navigation and/or surveillance services provider shall observe that human factor principles in the design, operation and maintenance of the communication, navigation and/or surveillance facilities

SUBPART C – OPERATIONS AND MAINTENANCE PLAN**CNS.2065 Safety requirement for overall operation and maintenance plan**

- (a) The communication, navigation and/or surveillance services provider shall establish an overall operation and maintenance plan for all facilities and equipment. All facilities shall be tested for normal operations on a routine basis in line with the general guidance of ICAO Doc 8071 – *Manual on Testing of Radio Navigation Aids* and shall meet the required level of integrity, reliability and availability.
- (b) The overall operation and maintenance plan shall:
 - (1) provide for the timely and appropriate detection and warning of system failures and degradations;
 - (2) include documentation on the consequences of system, sub-system and equipment failures and degradations;
 - (3) include measures to control the probability of failures and degradations.

CNS.2070 Details of operation and maintenance plan for each facility and equipment

- (a) The communication, navigation and/or surveillance services provider shall establish an operation and maintenance plan for each facility and equipment which shall include:
 - (1) detailed procedures for periodic inspections, ground and flight tests, as necessary, to verify that the facility and equipment meet their operational and performance specifications;
 - (2) the intervals between periodic inspections, ground and flight tests, and the basis for the intervals. Whenever the interval is changed, reason(s) for such change shall be documented;
 - (3) the operation and maintenance instructions;
 - (4) an analysis of the number of personnel required to operate and maintain the facility taking into account the workload required;
 - (5) the corrective action plan and procedures, including whether the repairs of modules and components are carried out in-house or by manufacturers; and
 - (6) the spare parts support plan.
- (b) Details of the operation and maintenance of each facility and equipment shall be recorded in a logbook and preserved for a period of one year, or longer as directed by the Authority.

CNS.2075 Test equipment

The communication, navigation and/or surveillance services provider shall make available to its personnel appropriate inspection, measuring and test equipment for maintenance of each facility. Those equipment shall be controlled, calibrated and maintained as necessary to ensure their precision and accuracy.

CNS.2080 Interface arrangement for support services

The communication, navigation and/or surveillance services provider shall formalize interface arrangements, where applicable, with external organisations in the form of service level agreements, detailing the following:

- (a) interface and functional specifications of the support service;
- (b) service level of the support service such as availability, accuracy, integrity and recovery time of failure of service; and
- (c) monitoring and reporting of operational status of the service.

SUBPART D – COMMUNICATION SERVICES

CNS.2085 ICAO standards compliance

The communication, navigation and/or surveillance services provider shall ensure that communications services, including fixed, mobile and broadcast services, in addition to the technical standards of this Subpart, comply with the procedures of ICAO Annex 10 Volume II – *Communication Procedures*, including those with PANS status and specification standards of Volume III – *Communication Systems*, Vol. V – *Aeronautical Radio Frequency Spectrum Utilization* and with the applicable International Telecommunications Union (ITU) radio regulations.

CNS.2090 Voice/Data recording equipment requirements

(a) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure recording equipment provide a complete, identified, intelligible and accurate record of the communications to be recorded which may be used, in the event of an incident, in any investigation by the Authority.

(b) GENERAL REQUIREMENTS

- (1) The communication, navigation and/or surveillance services provider shall provide recording equipment at each aeronautical radio station of its service except that an aircraft station, when using radiotelephony in direct communication with an aeronautical station, need not maintain a telecommunication log.
- (2) The recording equipment shall be:
 - (i) capable of recording and replaying the terms or content of any messages or signals transmitted, received, or conveyed through the equipment at the station and identifying the time the communication took place;
 - (ii) compatible with the replay facilities and working practices in use at air traffic control units; and
 - (iii) operational at all times when an air traffic control service is being provided.

(c) PERFORMANCE SPECIFICATION

- (1) The communication, navigation and/or surveillance services provider shall ensure that the recording equipment is designed with appropriate options to ensure the un-interrupted availability of communications recording.
- (2) The recording equipment shall be capable of providing complete, accurate and verifiable copies of the recorded data on removable media. Guidance on the handling and storage of removable media shall be provided, as appropriate, with the equipment documentation.
- (3) Where an option to interconnect main and standby equipment is available, an automatic changeover function shall be provided, which operates the main and standby equipment in parallel to ensure continuity of recordings, for an adjustable time period with a recommended minimum of 10 minutes.
- (4) The equipment shall provide appropriate local and remote alarm/status indications including an output to indicate the overall operational status of the equipment.
- (5) The remote alarm/status indications shall enable positive intervention to check that the recording equipment is operating correctly before the alarm can be cancelled and shall not be affected by any loss and/or subsequent restoration of power supply to the equipment
- (6) Recordings shall be retained for at least ninety days from the date of the last recorded message except that recordings pertinent to inquiries or investigations shall be retained for longer periods until it is evident that they will be no longer required.

(d) TIME RECORDING DEVICES

- (1) Voice/Data recording equipment shall include time-recording devices or techniques to ensure the 'time-stamping' of air traffic services communications and UTC shall be used, expressed in hours, minutes and seconds of the 24 hour day beginning at midnight.
- (2) The time-recording device or technique shall be checked as necessary to ensure that the time-stamps are maintained within ± 2 seconds of UTC from the Global Positioning System (GPS).
- (3) Where data link communications are in operation, time recording devices shall be accurate to within ± 1 second of UTC.

(e) LINE INTERFACE

Line interfaces shall be provided which are compatible with:

- (i) telephone connections made via the public switched telephone network or private lines; and
- (ii) radio connections made via the public switched telephone network or private lines to transmitter, receiver and associated control equipment.

(f) HUMAN MACHINE INTERFACE

(1) *Audio Output*

- (i) A front panel loudspeaker, volume control and on/off switch shall be provided on the recording equipment or on a separate remote control panel if this option is provided.
- (ii) A front panel standard headphone socket and volume control shall be provided on the recording equipment or on a separate remote control panel if this option is provided.

(2) *Copy Output*

- (i) A front panel or easily accessible output connector for making copy recordings shall be provided.
- (ii) The output shall comprise one audio channel, which shall be the selected recorded channel, and another audio channel which shall have either a voice synthesised (spoken) time output or tone coded time markers from, or derived from, the time and date information of the original recording.

(3) *Security of Recordings*

Techniques shall be used to reduce the possibility of inadvertent erasure and intentional manipulation of recorded information

(g) REPLAY FUNCTIONS

The recording equipment shall be capable of replaying the original recorded communications on archival media in a continuous real time mode and presenting the time and date information separately from, but synchronised with, the recorded communications.

(h) COMMUNICATIONS TO BE RECORDED

The following communications shall be recorded:

(1) *Air-ground communication (aeronautical mobile service):*

Direct pilot-controller communications between aircraft stations and aeronautical stations.

(2) *Ground-ground communications (aeronautical fixed service):*

- (i) Direct communications between air traffic services units and between air traffic services units and appropriate military units, where applicable.
- (ii) Communications with appropriate emergency services and adjacent air traffic services units with which co-ordination is necessary should also be considered.
- (iii) Direct communications between adjacent area control centres or flight information centres.
- (iv) Direct communications between aerodrome control towers, approach control unit and the area control centre.
- (v) Surface movement control communications, used for the control of vehicles and personnel on the manoeuvring.

CNS.2095 Establishment of radio communication

The communication, navigation and/or surveillance services provider shall provide for all stations to answer calls directed to them by other stations in its service and shall exchange communications on request. The communication, navigation and/or surveillance services provider shall ensure that all stations radiate the minimum power necessary to ensure a satisfactory service.

CNS.2100 VHF and HF Aeronautical Radio Stations

(a) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure that equipment and systems at aeronautical radio stations provide complete, identified, accurate and uncorrupted voice and data link communications.

(b) GENERAL REQUIREMENTS

- (1) The communication, navigation and/or surveillance services provider shall install, operate and maintain equipment and systems in compliance with the terms of specific location dependent or general frequency assignment(s) and the terms and conditions of the Authority acceptance, as applicable.
- (2) The designated operational coverage (DOC) associated with the frequency assignments for communications facilities and radio navigation and landing aids at aerodromes, shall be published in the Seychelles AIP.
- (3) Frequencies for en-route navigation facilities shall have their DOCs published in the Seychelles AIP section ENR 4.1 under the associated Remarks column.

(c) BROADCAST & TELECOMMUNICATION ACT AERONAUTICAL RADIO LICENCE

- (1) The communication, navigation and/or surveillance services provider shall ensure that all aeronautical radio stations are suitably licensed under the Broadcast & Telecommunication (B&T) ACT in accordance with established procedures, prior to any transmissions being made.
- (2) For new installations that operate on aeronautical frequency assignments, initial applications to establish an aeronautical radio stations shall be made to the Authority which will trigger the process of issuing a B&T ACT aeronautical radio licence by the Seychelles Licensing Authority (SLA) in liaison with the Department of Information, Communication and Technology (DICT).
- (3) For established aeronautical radio stations, Aeronautical Radio Licence under the B&T ACT renewal shall be arranged between the communication, navigation and/or surveillance services provider and the SLA within the period of time established by the SLA.
- (4) If the communication, navigation and/or surveillance services provider does not renew an aeronautical radio licence within the period of time established by the SLA, the licence will become invalid and the associated frequency assignment will be withdrawn. Renewal after the withdrawal will be subject to the SLA's established procedure following any withdrawal.

(d) INSPECTION OF AERONAUTICAL RADIO STATIONS

The communication, navigation and/or surveillance services provider shall make available for inspection by the ANS Inspector (CNS), equipment and systems at aeronautical radio stations, associated records and B&T ACT, Aeronautical Radio Licence.

(e) COMMUNICATIONS AVAILABILITY

- (1) The communication, navigation and/or surveillance services provider shall perform adequate safety assurance, risk assessment and mitigation to ensure that the equipment and system design, installation, operation and maintenance ensures availability of communications appropriate for the aeronautical radio station and environment in which it is being provided.
- (2) Communications of a specified quality of service shall be provided within the radio service area appropriate to the services being provided.
- (3) The radio service area shall be published in the Seychelles AIP to provide users with information on the anticipated service volume within which reliable communications may be expected
- (4) The maximum field strength outside the DOC, as specified in the frequency assignment, shall not be exceeded.

(f) EQUIPMENT CONFIGURATION

- (1) The communication, navigation and/or surveillance services provider shall ensure that equipment configuration is such as to ensure the availability of communications appropriate to the service being provided.
- (2) The equipment type shall be appropriate for the service being provided and be compatible with the equipment configuration.
- (3) The planned temporary or permanent simultaneous withdrawal of main and emergency radiotelephony equipment shall be considered a significant safety related change to current operations and the requirements for safety assurance and change notification shall apply.

CNS.2105 Voice Communications Control Systems (VCCS)

(a) This section covers VCCS providing communications facilities for the following categories of service:

- (1) Aeronautical mobile service (air-ground communications) which uses radiotelephony and/or digital data interchange for radio communications in the VHF and HF Aeronautical Mobile Band';
- (2) Aeronautical fixed service (ground-ground communications) which uses direct-speech communications

and/or digital data interchange over radio communications links and other telecommunications media such as optical fibre and land lines'; and

- (3) Surface movement control service which uses two-way radiotelephony communications to provide aerodrome control service for the control of vehicles on manoeuvring areas, except where communication by a system of visual signals is deemed to be adequate.

(b) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure that VCCS enable direct, rapid, continuous and intelligible two-way voice communications for aeronautical radio stations.

(c) GENERAL REQUIREMENT

The communication, navigation and/or surveillance services provider shall ensure that equipment, systems, services and facilities comply with the technical standards of STS-ATS, Subpart E and the specifications standards of ICAO Annex 10 Vol. III, Part 2, Chapter 2 – *Aeronautical Mobile Service*, as applicable.

(d) COMMUNICATIONS FACILITIES

- (1) The communication, navigation and/or surveillance services provider shall provide for the ability to select or deselect independently lines of communication or facilities in any combination, without affecting the operation of other lines of communication or facilities available at operating positions of aeronautical radio stations.
- (2) Where the system configuration can be changed, a means of quickly restoring the last set option configuration before any failure shall be provided.
- (3) Headsets shall be provided except at aeronautical radio stations with very low density operations where loudspeaker and free-standing or handheld microphone may be authorised.
- (4) Operating positions shall have:
 - (i) a loudspeaker which allows selected lines of communication to be monitored; provision for the connection of at least two headsets enabling instructor/student dual operator and supervisor monitoring facilities, direct communications and instructor interruption of any student communications at any time; and
 - (ii) provision for at least two momentary action press-to-talk controls for radiotelephony communications, one of which shall permit 'hands-free' operation.
- (5) The audio level of each audio outlet shall be independently adjustable and any communications shall still remain audible and intelligible to the operator when the minimum level is selected.
- (6) The design and implementation of the voice switch shall be such that any input can be connected to any output without the possibility of blocking occurring.
- (7) The return path of each communication function shall incorporate an automatic gain control function to ensure an acceptable signal to noise level and to minimize the possibility of hearing damage (acoustic shock) by preventing extremely loud signals from being delivered into a headset.
- (8) Where a system provides the capability for instant replay of communications this shall be separate from and not interfere with RTF communication channel.

(e) RADIOTELEPHONY COMMUNICATIONS

- (1) The communication, navigation and/or surveillance services provider shall provide air-ground communications on appropriate frequencies as allocated by the DICT for aeronautical mobile service.
- (2) The communication, navigation and/or surveillance services provider shall provide two-way radiotelephony communication facilities for aerodrome surface movement control for the purpose of controlling vehicles on the manoeuvring area, except where communication by a system of visual signals is deemed to be adequate.
- (3) Where conditions warrant, separate communication channels shall be provided for the control of aircraft and vehicles on the manoeuvring area as follows:
 - (i) UHF two-way radiotelephony communications shall be used for the control of vehicle operating on the active runway and shall be cross-coupled with VHF air-ground communications used for the control of aircraft to provide situational awareness for aircrew, air traffic controller and vehicle operator.
- (4) Radiotelephony communications which have been selected shall always be available irrespective of the state of other lines of communication.
- (5) The communication, navigation and/or surveillance services provider shall provide vehicle operators with

- (i) a degree of assurance that air-ground communications transmissions have been successful;
 - (ii) the facility to select the state of any available radio channel and appropriate visual/aural indications to indicate the status of available radio channels and selection made.
- (f) GROUND-GROUND COMMUNICATIONS
- (1) Aeronautical fixed service provided by the communication, navigation and/or surveillance services provider for ground-ground communication shall comprise the following systems and applications:
 - (i) Air traffic services direct speech circuits and networks;
 - (ii) meteorological operational circuits, networks and broadcast systems;
 - (iii) the aeronautical fixed telecommunications network;
 - (iv) the common ICAO data interchange network;
 - (v) the air traffic services message handling services; and
 - (vi) the inter-centre communications.
 - (2) The communication, navigation and/or surveillance services provider shall ensure the provision of aeronautical fixed services in accordance with the standards of ICAO Annex 10, Vol. II, Chapter 4 – *Aeronautical Fixed Service*, for the systems and applications in (1) above, as applicable
 - (3) The communication, navigation and/or surveillance services provider shall satisfy the Authority that the aeronautical fixed services equipment is adequate for the task for which it is to be used. Among other things, consideration shall be given to reliability, integrity, levels of redundancy, hours of service, classification of airspace and complexity of traffic.

CNS.2110 Data link communication

- (a) The communication, navigation and/or surveillance services provider shall apply the standard procedures of ICAO Annex 10, Vol. II, Chapter 8 – *Aeronautical Mobile Service – Data Link Communication*, including those with PANS status, the standard specifications of Vol. III, Part I – *Digital Data Communication Systems* and procedures of Doc 9694 – *Manual of Air Traffic Services Data Link Applications*, as applicable, to ensure that the level of safety in the provision of data link communication, including data link flight information service, where applicable, is maintained or improved during installation, transition and operation of datalink system/application.
- (b) A comprehensive safety assessment of the datalink application/system and its interfaces with existing air traffic services equipment, personnel and procedures shall be performed by the communication, navigation and/or surveillance services provider in accordance with the SCAA Integrated SMS.
- (c) The datalink application/system shall be demonstrably compliant with its operational requirement, produced by the communication, navigation and/or surveillance services provider. This operational requirement shall form the basis for the collection of evidence that the stable implementation of the application/system is suitable for operational service.
- (d) The communication, navigation and/or surveillance services provider shall ensure that the datalink system/application is compatible with all levels of aircraft equipment normally expected to be present in the Seychelles flight information region.

CNS.2115 Automatic Terminal Information Service

(a) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure that ATIS equipment and system provide complete, identified, accurate and uncorrupted voice/data communication of meteorological and other aeronautical information.

(b) GENERAL REQUIREMENTS

The communication, navigation and/or surveillance services provider shall, without prejudice to the technical standards of this STS, ensure that ATIS equipment, systems and facilities comply with the applicable standards of ICAO Annex 10, Vol. III, Part I – *Digital Data Communication Systems* and Part II – *Voice Communication Systems*.

(c) INTERFACE TO VOICE/DATA RECORDING EQUIPMENT

The communication, navigation and/or surveillance services provider shall ensure that equipment and systems used in the provision of a Voice-ATIS provide all the necessary signals and information to the voice recording equipment in accordance with CNS.2090.

CNS.2120 UHF radio equipment and systems**(a) SAFETY OBJECTIVE**

The communication, navigation and/or surveillance services provider shall ensure that UHF radio equipment and systems provide complete, identified, accurate and uncorrupted voice communications for aerodrome surface movement control service for the purpose of controlling vehicles on the manoeuvring area, to address the technical standards of CNS.2105, (e) (2) and (3)

(b) NATIONAL STANDARDS COMPLIANCE

In addition to the complying with technical standards set out in CNS.2085, the communication, navigation and/or surveillance services provider shall ensure that the UHF equipment, systems, services and facilities meet operational requirements for the purpose of ensuring the following are met:

- (1) the standards set out in STS-ATS, Section 2, ATS.2175 Control of persons and vehicle at aerodromes; and
- (2) satisfactory two-way radio communication with the aerodrome control tower is established by a driver of a radio-equipped vehicle before entering the manoeuvring area; and
- (3) a continuous listening watch on the assigned frequency is maintained by a driver when on the movement area.

(c) GENERAL REQUIREMENTS

The communication, navigation and/or surveillance services provider shall apply the technical standards of CNS.2100 (c) as they apply for obtaining an aeronautical radio station licence for the UHF equipment and systems.

(d) RADIO SPECTRUM MANAGEMENT

The communication, navigation and/or surveillance services provider shall ensure that the equipment and systems are designed to operate within the land mobile service frequency allocation 450 MHz to 470 MHz with a channel spacing of 12.5 kHz using frequency modulation with ITU emission designator 11K0F3EJN using semi-duplex operation.

(e) EQUIPMENT SPECIFICATIONS

The minimum equipment requirements comprising the parameters for the licensing of the equipment, shall be in accordance with requirement prescribed by the DICT for UHF equipment and systems.

(f) ALARM/STATUS INDICATIONS

The communication, navigation and/or surveillance services provider shall ensure that the UHF system provides an obvious indication to the user, of system failure that may have an effect on the air traffic control service being provided in a timely manner, so that actions can be taken to ensure the safe continued provision of the service or if necessary the controlled withdrawal and replacement system. Consideration should be given to providing a power supply to the alarm indication that is not dependent upon the system it is monitoring.

(g) UNINTENTIONAL OR CONTINUOUS TRANSMISSIONS

- (1) The communication, navigation and/or surveillance services provider shall ensure that the UHF equipment and systems do not fail in a manner such as to cause unintentional or continuous transmissions. New equipment and systems shall incorporate features to prevent unintentional or continuous transmissions.
- (2) The equipment and systems should conform to the minimum operational performance specification for devices that prevent unintentional or continuous transmissions (*Ref: EUROCAE document ED- 67 April 1991*), so far as it is appropriate for ground based systems.

SUBPART E – NAVIGATION SERVICES

CNS.2125 Standard radio navigation aid

- (a) The communication, navigation and/or surveillance services provider shall provide standard radio navigation aids as follows:
- (1) the instrument landing system (ILS);
 - (2) the global navigation satellite system (GNSS);
 - (3) the VHF omnidirectional radio range (VOR); and
 - (4) the distance measuring equipment (DME).
- (b) Wherever there is installed a radio navigation aid that is not an ILS, but which may be used in whole or in part with aircraft equipment designed for use with the ILS, full details of parts that may be so used shall be published in the Seychelles AIP by the communication, navigation and/or surveillance services provider.

CNS.2130 Instrument Landing System (ILS)

(a) SAFETY OBJECTIVE

The ILS provides precision guidance signals to aircraft in the last stages of approach and landing. For this purpose the communication, navigation and/or surveillance services provider shall ensure the equipment provides a complete, identified, accurate and uncorrupted source of guidance information to aircraft, with a high level of integrity, accuracy, reliability and continuity of service which is consistent with the category of service provided.

(b) SYSTEM REQUIREMENTS

The ILS in operation at the SIA is uncategorized, however the communication, navigation and/or surveillance services provider shall ensure the system conforms, without prejudice to this section, to the standards of ICAO Annex 10, Vol. I, Chapter 2 - *General Provisions for Radio Navigation Aids* and the general ILS specification standards and specific Category II ILS specification standards of Chapter 3, section 3.1.

(c) RADIATED FREQUENCY

The communication, navigation and/or surveillance services provider shall ensure that the SIA operate only on the frequency assigned by the Authority and as appears in the schedule to the radio licence issued under the B&T ACT.

(d) STATUS INFORMATION

- (1) The communication, navigation and/or surveillance services provider shall provide status information notification of the SIA ILS in accordance with CNS.2030.
- (2) Where status information is reliant upon a visual status indicator, an audible alarm shall be provided which indicates that the visual indicator has changed state.
- (3) Permitting a status communications failure to shut down the ILS without a warning could unnecessarily remove the ILS signal when an aircraft is in a critical phase of the approach. The communication, navigation and/or surveillance services provider shall provide for an immediate visual and audible alarm at the remote indicators for failure of status communication between the SIA ILS and the remote status indicators.
- (4) The failure of the status communication shall not cause an immediate shut down of the SIA ILS.
- (5) Following failure of the status communications, only aircraft on final ILS approach shall be permitted to complete the approach. The SIA ILS shall then be withdrawn from service in accordance with established procedure.
- (6) If the SIA ILS is configured to shut down the system after a delay following status communications failure, the delay shall be long enough for the actions in paragraph (3) to be completed.
- (7) In the event of a status communication failure, a suitably trained technician shall be stationed at the SIA ILS building with a suitable means of communication to air traffic control unit concerned. The equipment shall then operate in local control, supervised by the system monitors.

(e) POWER SUPPLY

- (1) The communication, navigation and/or surveillance services provider shall provide power supply for the SIA ILS in accordance with CNS.2040.
- (2) Standby power supply for the SIA ILS, including the remote control equipment, interlock and status displays shall be capable of sustaining the normal ILS operation for a minimum of 20 minutes.

- (3) The communication, navigation and/or surveillance services provider shall have a procedure for managing the withdrawal of the SIA ILS from and return to operations when standby power supply have been in use. Where battery is used as standby power supply, consideration shall be given to the designed battery capacity and the fact that discharged batteries may take a significant time to recharge to full capacity following a failure.

(f) FIELD MEASUREMENTS

The communication, navigation and/or surveillance services provider shall take alignment measurements on runway centreline and as close to threshold as practicable as soon as possible after commissioning and flight inspections on all transmitters and at monthly intervals or as agreed with Authority in advance on all transmitters.

(g) FIELD TEST EQUIPMENT

In the event of an accident or incident the communication, navigation and/or surveillance services provider shall do all that is reasonable to ascertain that the SIA ILS is operating correctly. For this reason the communication, navigation and/or surveillance services provider shall have equipment suitable for making field measurements available within 12 hours.

(h) GLIDEPATH MEASUREMENTS

Glidepath field measurements are not mandatory, however it is recommended that the communication, navigation and/or surveillance services provider conduct monthly field checks on null reference and sideband reference glidepaths to ensure equipment stability.

(i) FIELD TEST POINTS

The communication, navigation and/or surveillance services provider shall ensure that points at which field measurements are made are clearly and permanently marked. These marks shall not present a hazard to aircraft and shall be immune to disturbance by such operations as grass cutting.

(j) CRITICAL AREAS

The communication, navigation and/or surveillance services provider shall ensure that the localizer and glidepath critical areas are clearly marked and identified. The marking shall be visible day and night and shall help ensure that no person or vehicle may enter the areas without the permission of air traffic control. Details of the localizer and glidepath critical areas shall be included in the SIA Station Standing Instruction together with any appropriate procedures.

(k) SENSITIVE AREAS

- (1) The communication, navigation and/or surveillance services provider shall set the localizer and glidepath sensitive areas in relation to the aircraft type that causes the greatest dynamic bends to the course structure, whilst operating at the SIA during low visibility procedures. Details of the localizer and glidepath sensitive areas shall be included in the SIA SSI together with any appropriate procedures.
- (2) When defining the sensitive area the communication, navigation and/or surveillance services provider shall be mindful of any static bends.

(l) GRASS HEIGHT

When considering the grass height around the localizer and glidepath, the communication, navigation and/or surveillance services provider should refer to guidance documentation on potential effect of grass height on navigational and visual aids, such as the UK CAP 772 *Bird Strike Risk Management for Aerodromes*, Chapter 4.

(m) GROUND AND FLIGHT TEST

Ground and flight test requirements shall be planned in accordance with CNS.2095.

CNS.2135 VHF Omni-Directional Range (VOR)

(a) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure that the PRA VOR system does not radiate a signal which falls outside standard operating tolerances and provide false guidance over its designated operational coverage area.

(b) SYSTEM REQUIREMENTS

The communication, navigation and/or surveillance services provider shall, without prejudice to the technical standards of this section, ensure that the VOR system comply with the standard of ICAO Annex 10, Vol. 1 Chapter 2 - *General Provisions for Radio Navigation Aids* and Chapter 3, section 3.3 - *Specification for VHF Omnidirectional Radio Range (VOR)*.

(c) RADIATED FREQUENCY

The communication, navigation and/or surveillance services provider shall ensure that the PRA VOR operate only on the frequency assigned by the Authority and as appears in the schedule to the radio licence issued under the B&T ACT.

(d) EFFECTIVE COVERAGE OF THE VOR

The operational coverage area shall be as determined as part of a standard flight check during the commissioning of the PRA VOR.

(e) IDENTIFICATION AND NAVIGATION COMPONENTS

The communication, navigation and/or surveillance services provider shall ensure that the identification of the PRA VOR is suppressed when it is not available for operational purposes, e.g. under maintenance.

(f) STANDBY POWER SUPPLY

The communication, navigation and/or surveillance services provider shall provide standby power supply for the PRA VOR in accordance with CNS.2040 and commensurate with the service being supported.

(g) STATUS INFORMATION

(1) The communication, navigation and/or surveillance services provider shall provide status information notification of the PRA VOR in accordance with CNS.2030.

(2) Where status information is reliant upon a visual status indicator, an audible alarm shall be provided which indicates that the visual status indicator has changed state.

(h) FLIGHT TEST

Flight test requirements shall be planned in accordance with CNS.2065 (a) and CNS.2070 (a) (1) and (2).

CNS.2140 Distance Measuring Equipment (DME)

(a) SAFETY OBJECTIVE

The communication, navigation and/or surveillance services provider shall ensure that the SIA and PRA DME do not radiate signals which falls outside their standard operating tolerances or provide false information over its DOC area.

(b) SYSTEM REQUIREMENTS

The communication, navigation and/or surveillance services provider shall, without prejudice to the technical standards of this section, ensure that the SIA and PRA DME shall comply with the standards of ICAO Annex 10 Vol. I, Chapter 2 - *General Provisions for Radio Navigation Aids* and Chapter 3, section 3.3 - *Specification for UHF DME*.

(c) RADIATED FREQUENCY

The communication, navigation and/or surveillance services provider shall ensure that the SIA DME and PRA DME operate only on the frequencies assigned by the Authority and as appears in the schedule to the radio licence issued under the B&T ACT.

(d) IDENTIFICATION

The communication, navigation and/or surveillance services provider shall ensure the identification code is suppressed when the SIA and PRA DME are not available for operational service.

(e) STANDBY POWER SUPPLY

The communication, navigation and/or surveillance services provider shall provide standby power supply for the SIA and PRA DME in accordance with CNS.2040 and commensurate with the services being supported.

(f) STATUS INFORMATION

The communication, navigation and/or surveillance services provider shall provide status information notification of the SIA and PRA DME in accordance with CNS.2030.

Where status information is reliant upon a visual status indicator, an audible alarm shall be provided which indicates that the visual indicator has changed state.

(g) FLIGHT TEST

Flight test requirements shall be planned in accordance with CNS.2095.

(h) DME AS A RANGING ELEMENT WITH PRECISION APPROACH

The communication, navigation and/or surveillance services provider shall ensure the SIA DME limits

specification comply with the standards of ICAO Annex 10, Vol. I, Chapter 3, Section 3.5.2.6 - *Collocation limits for a DME facility associated with an ILS, MLS or VOR facility.*

CNS.2145 Area Navigation (RNAV) Global Navigation Satellite System (GNSS)

The communication, navigation and/or surveillance services provider shall ensure that, without prejudice to the technical standards of this section, the GNSS comply with the specification standards of ICAO Annex 10, Vol. I, Chapter 3, Section 3.7 – *Requirements for the GNSS* and Appendix B – *Technical specifications for the GNSS*, as applicable to the provision of time and data to aircraft operating in the Seychelles flight information region.

SUBPART F – SURVEILLANCE SERVICES

Reserved

SECTION 3 – ACCEPTABLE MEANS OF COMPLIANCE AND INTERPRETATIVE AND EXPLANATORY MATERIAL (AMC & IEM)

1 GENERAL

1.1 This Section contains Acceptable Means of Compliance and Interpretative/Explanatory Material that has been agreed for inclusion in STS-CNS.

1.2 Where a particular STS paragraph does not have an Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

2 PRESENTATION

2.1 The Acceptable Means of Compliance and Interpretative/Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue[and/or the Amendment number under which it is amended or reissued.]

2.2 A numbering system has been used in which the Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the STS paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the STS itself.

2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Acceptable Means of Compliance (AMC) illustrates a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC which may be additional to an existing AMC will be amended into the document following consultation under the NPA procedure.

Interpretative/Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

2.4 Explanatory Notes not forming part of the AMC or IEM text appear in a smaller typeface.

2.5 New, amended or corrected text is enclosed within heavy brackets.

ACJ/AMC/IEM A**AMC CNS.2070 (b)**

The air traffic controller or an engineering watch logbook may be used as an alternative to a separate recording equipment logbook if appropriate.

AMC CNS.2090 (c) (6)

This may be achieved by means of suitably resilient internal storage, e.g. Hard Disk Drives or Solid State Drives, network Storage, removable archive media or by a combination of these.

ACJ/AMC/IEM B

Reserved

