

**CNS/SG/1 – REPORT**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**



**FIRST MEETING OF THE  
AFI COMMUNICATIONS, NAVIGATION AND SURVEILLANCE SUB-GROUP  
(CNS/SG/1)**

**(Dakar, 7 - 8 April 2005)**

**REPORT**

*Prepared by the ICAO Eastern and Southern African Office*

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## Glossary of Terms

ACC	Area Control Centre
ADS	Automatic Dependent Surveillance
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AIC	Aeronautical Information Circular
AIDC	ATS interfacility data communications
AIRAC	Aeronautical information regulation and control
AIS	Aeronautical Information Service
ACP	Aeronautical Communications Panel
AMHS	ATS message handling system
AMS(R)S	Aeronautical Mobile-Satellite (R) Service
AMSS	Aeronautical Mobile-Satellite Service
APANPIRG	ASIA/PAC Air Navigation Planning and Implementation Regional Group
AR	Area of Routing
ASECNA	Agency for the Safety of Aerial Navigation in Africa and Madagascar
ATC	Air Traffic Control
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATNP	Aeronautical Telecommunication Network Panel
ATS	Air Traffic Services
BIS	Boundary Intermediate System
BBIS	Backbone Boundary Intermediate System
CIDIN	Common ICAO Data Interchange Network
CNS	Communications, Navigation, and Surveillance
CPDLC	Controller pilot data link communications
CSP	Communication Service Provider
DME	Distance Measuring Equipment
EGNOS	European Geostationary Navigation Overlay System
ES	End System
EUROCONTROL	European Organization for the Safety of Air Navigation
FAA	Federal Aviation Administration
FIR	Flight Information Region
FM	Frequency Modulation
FMC	Flight Management Computer
FMS	Flight Management System
GLONASS	Global Orbiting Navigation Satellite System (Russian Federation)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System (United States)
HF	High Frequency
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
INS	Inertial Navigation System
IRS	Inertial Reference System
IS	Intermediate System
ISO	International Organization for Standardization
ITU	International Telecommunication Union
JAA	Joint Aviation Authorities

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LAAS	Local Area Augmentation system
LEO	Low Earth Orbit
MLS	Microwave Landing System
MODE S	Mode S - SSR Data Link
MSAW	Minimum safe altitude warning system
MTSAT	Multi-Functional Transport Satellite (Japan)
OSI	Open Systems Interconnection
RAIM	Receiver Autonomous Integrity Monitoring
RD	Routing Domain
RNAV	Area Navigation
RNP	Required Navigation Performance
SARPs	Standards and Recommended Practices
SATCOM	Satellite Communication
SITA	Société Internationale de Télécommunications Aéronautiques
SSR	Secondary Surveillance Radar
TCP/IP	Transport Control Protocol/Internet Protocol
TMA	Terminal Control Area
VDL	VHF Data Link
VHF	Very High Frequency
VOR	VHF Omnidirectional Radio Range
WAAS	Wide Area Augmentation System
WGS-84	World Geodetic Reference System - 1984
WRC	World Radiocommunication Conference

## History of the meeting

### 1. Duration and Venue of the Meeting

1.1 The first meeting of the AFI Communications, Navigation and Surveillance Sub-group (CNS/SG/1) was held in Dakar, Senegal from 7 to 8 April 2005. It was convened pursuant to Conclusion 14/62 of the APIRG.

1.2 The meeting observed a minute of silence in memory of the late Tharcisse Masabarakiza, Regional Technical Officer Communications, Navigation and Surveillance (RO/CNS) of ICAO Eastern and Southern African Office, Nairobi, who passed away in June 2004.

### 2. Officers and Secretariat

2.1 Mr. Amadou Sene, Regional Technical Officer Communications, Navigation and Surveillance (RO/CNS) of ICAO Eastern and Southern African Office, Nairobi, was the Secretary of the Sub-group. He was assisted by Mr. Prosper Zo'o – Minto'o, RO/CNS and Mrs. Mary A. Obeng, RO/CNS, both from the ICAO Western and Central Office, Dakar.

2.2 Mr. Simon Allotey from Ghana was unanimously elected Chairman of the Sub-group and chaired the meeting.

2.3 Mr. Amadou Cheiffou, ICAO Regional Director for Western and Central Africa, opened the meeting. In his address he emphasized the expectations of the APIRG from the work of the CNS Sub-group, the need to find solutions to the deficiencies in the field of communications, navigation and surveillance. He highlighted recent achievements by States regarding aeronautical fixed service implementation and the extension of VHF coverage. He reminded the meeting of the need to implement quality assurance in the CNS field. Finally, he informed the participants of his forthcoming retirement from ICAO.

2.4 Mr. Andrew K. Mensah, ICAO Deputy Regional Director also attended the meeting.

### 3. Attendance

3.1 The meeting was attended by 57 delegates from 19 States and 3 international organizations.

3.2 The list of participants is at **Appendix A** to this part of the Report.

### 4. Working Languages

4.1 English and French were used as the working languages and documentation was issued in these languages.

## 5. **Agenda**

### 5.1 The Meeting adopted the following Agenda:

- Agenda Item 1: Election of Chairman and Vice-Chairman of the Sub-Group
- Agenda Item 2: Terms of reference, work programme and composition of the Communications, Navigation and Surveillance Sub-group as defined by APIRG/14
- Agenda Item 3: Follow up of APIRG/14 and COM/SG/6 Conclusions and Decisions
- Agenda Item 4: Aeronautical Fixed Service (AFS)
- Review of the Report of the Second Meeting of the ATN Planning Task Force.
  - Review of the implementation and performance of the Aeronautical fixed telecommunication network (AFTN) in the AFI Region, identification of deficiencies and remedial action for their elimination
  - Review of the implementation and performance of the Air Traffic Services Direct Speech (ATS/DS) network in the AFI Region, identification of deficiencies and remedial action for their elimination
- Agenda Item 5: Aeronautical mobile service (AMS)
- Review of the implementation and performance of the Aeronautical Mobile Service in the AFI Region, identification of deficiencies and remedial action for their elimination
  - Extension of VHF Radio coverage in the AFI Region - Related issues
- Agenda Item 6: Aeronautical radio navigation service (ARNS)
- Review of the implementation and performance of the Aeronautical radio navigation service in the AFI Region, identification of deficiencies and remedial action for their elimination
- Agenda Item 7: Surveillance
- Review of the status of implementation of the current aeronautical surveillance plan
  - ADS-B implementation issues
- Agenda Item 8: Review of ICAO position and preparations for the ITU WRC-2007
- Agenda Item 9: Future work programme and composition of the CNS/SG
- Agenda Item 10: Any other business



## 6. Conclusions and Decisions

6.1 The Meeting records its action in the form of draft Conclusions and draft Decisions with the following significance:

### 6.2 Draft Conclusions

6.2.1 Draft Conclusions deal with matters which directly merit the attention of States, or on which ICAO will initiate further action in accordance with established procedures after approval by APIRG.

### 6.3 Draft Decisions

6.3.1 Draft Decisions deal with matters of concern to the CNS Sub-group and the APIRG.

### 6.4 List of Draft Conclusions

<b>No.</b>	<b>Title</b>	<b>Page</b>
1/1:	Participation of members in the meetings of the CNS Sub-group	2-1
1/2:	Implementation of the AFI AFTN Routing Directory	4-1
1/3:	Synchronization of AFTN switch clocks	4-1
1/5:	Draft AFI ATN routing architecture	4-3
1/6:	Implementation of the AIDC application in the AFI Region	4-3
1/7:	Interoperability of VSAT networks	4-4
1/8:	Implementation of ATS/DS circuits	4-6
1/9:	Air/ground communications in Luanda FIR	5-2
1/10:	Air/ground communications in Tripoli FIR	5-2
1/11:	Amendment to AFI FASID, Table CNS-3	6-1
1/12:	ADS-C/CPDLC trials	7-2
1/14:	Initial ADS-B data link in the AFI Region	7-2
1/15:	ICAO position and preparations for the ITU WRC-2007	8-1

### 6.5 List of draft Decisions

<b>No.</b>	<b>Title</b>	<b>Page</b>
1/4:	Membership in the AFI ATN Planning Task Force	4-2
1/13:	FANS1/A operational manual	7-2
1/16:	Future work programme and composition of the CNS Sub-group	9-1

1/17:	Future work programme and composition of the ATN planning Task Force	9-1
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**Appendices to the Report of the First Meeting of the  
AFI Communication, Navigation and Surveillance Sub-group  
(CNS/SG/1)**

<b>Agenda Item</b>	<b>Appendix</b>	<b>Title</b>
Introduction	A	List of Participants
2	2A	Terms of reference, work programme and composition
3	3A	Follow-up action on APIRG/14 Meeting Conclusions and Decisions
4	4A	AFI rationalized AFTN: Implementation specifications
4	4B	List of AFTN deficiencies
4	4C	ATS/DS Circuits Plan : Status of implementation
4	4D	List of ATS/DS deficiencies
5	5A	List of AMS deficiencies
6	6A	List of deficiencies in ARNS field
7	7A	Table CNS 4A – Surveillance Plan
7	7B	Table CNS 4B – ATS automation systems
9	9A	Future work programme and composition of the CNS Sub-group
9	9B	Future work programme and composition of the ATN Planning Task Force

**INTERNATIONAL CIVIL AVIATION ORGANIZATION  
WESTERN AND CENTRAL AFRICAN OFFICE**

**First Meeting of the APIRG Communications, Navigation and  
Surveillance Sub-group (CNS/SG/1)**  
(Dakar, 7-8 April 2005)

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**Agenda Item 1 : Election of the Chairperson and the Vice-Chairperson of the CNS Sub-group**

1.1 The meeting unanimously elected Mr. Simon C. Allotey from Ghana as chairperson of the CNS Sub-group. The Sub-group did not elect a Vice-chairperson.

**Agenda Item 2 :           Review of the terms of reference , work programme and composition of the CNS/SG Sub-group**

2.2       Under this Agenda Item, the Sub-group reviewed its terms of reference, work programme and composition as established by APIRG/14 and shown in **Appendix 2A** to this report.

2.3       In reviewing its work programme, the Sub-group noted that Item 8 concerned the digital flight information service (D-FIS) ATN application. The meeting agreed that the requirements for this application are to be identified by the ATM and/or MET Sub-groups. The role of the CNS/SG was to plan for the implementation of the ATN infrastructure. The meeting agreed that Work Programme Item 8 should be referred to ATM and MET Sub-groups. The sub-group then amended Item 9 of the work programme to the effect that coordination with the ATM Sub-group was necessary for this task. The changes are reflected in the future work programme (cf. Agenda Item 9).

2.4       The meeting then reviewed a survey of attendance at past meetings by members of the sub-group. It showed a steady decline of effective participation by members since 1998. The meeting adopted the following draft conclusion urging members to discharge their responsibilities with the CNS Sub-group.

**Draft Conclusion 1/1:           Participation of members in the meetings of the CNS Sub-group**

**That members of the CNS Sub-group that have attended less than 50 % of the previous meetings be urged to participate in future meetings.**

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## APPENDIX 2A

**TERMS OF REFERENCE, WORK PROGRAMME AND COMPOSITION OF THE APIRG  
COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS) SUB- GROUP**

**1. Terms of reference**

- a) Ensure the continuing and coherent development of the AFI Regional Air Navigation Plan in the fields of aeronautical communications, navigation and surveillance (CNS), including the development of CNS elements of the AFI CNS/ATM Implementation Plan in the light of new developments, in harmony with the Global Air Navigation Plan for CNS/ATM Systems and the plans for adjacent regions;
- b) Identify, review and monitor deficiencies that impede or affect the provision of efficient aeronautical telecommunications and recommend appropriate corrective action;
- c) Prepare, as necessary, CNS/ATM cost/benefit analyses for the implementation options of C, N and S elements; and
- d) Study, as necessary, institutional arrangements for the implementation of C, N and S systems in the AFI Region.

**2. Work programme**

<b>Item</b>	<b>Task description</b>	<b>Priority</b>	<b>Target date</b>
1	Analyze, review and monitor the implementation and operation of the aeronautical fixed service (AFTN, ATS/DS), mobile service (AMS) and radio navigation service (ARNS), identify deficiencies affecting aeronautical telecommunications and propose measures for their elimination, as required.	A	Continuing
2	Follow-up the interconnection of VSAT networks in the AFI Region	A	Continuing
3	Follow up and monitor the implementation of VHF coverage in the AFI region in accordance with AFI/7 Rec. 5/12.	A	APIRG/15
4	Analyze and review the report of the ATN Planning Task Force on the transition from the AFTN to the ATN.	B	APIRG/15
5	Follow-up the upgrading of the transmission speed and the implementation of bit-oriented protocols for main AFTN circuits.	A	APIRG/15
6	Coordinate and follow-up the ICAO position for the ITU-WRC meetings.	A	Continuing
7	Continue, in co-ordination with the ATM Sub-group, the evolutionary development of the AFI CNS/ATM Systems Implementation Plan (AFI/7 Concl. 13/1).	A	Continuing
8	In co-ordination with the ATM Sub-group, identify requirements for digital flight information service (D-FIS) and develop appropriate implementation worksheets for the concerned areas of routing (AFI/7 Concl. 13/1).	B	Continuing

Item	Task description	Priority	Target date
9	Develop, as necessary, comprehensive business cases for competing CNS/ATM elements implementation options for the routing areas.	B	Continuing
10	Co-ordinate plans developed by States, international organizations, airlines and industry for the implementation of the regional CNS/ATM systems implementation plan.	B	Continuing
11	Update on a regular basis, Chapter 2 and the tables of Part. II of the Global Plan (Doc 9750).	B	Continuing
12	Review work being done by MIDANPIRG on the Egyptian initiative for a multi-mission satellite based system dedicated to CNS/ATM services and provide advice thereon.	B	APIRG/15
13	Monitor CNS/ATM systems research and development, trials and demonstrations within the AFI Region and information from other regions.	B	Continuing
14	Give further consideration, as necessary, to the concept of multinational ICAO AFI air navigation facility/service addressed in the AFI/7 Report under Agenda Item 14 (AFI/7, Conclusion 10/6c).	B	Continuing
15	Establish and maintain current a database on CNS elements of CNS/ATM planning and implementation in the AFI Region.	B	APIRG/15
16	Continue the development of the AFI Aeronautical Surveillance Plan, and monitor its implementation	A	APIRG/15

**Priority:**

- A:** High priority tasks on which work should be speeded up;
- B:** Medium priority tasks, on which work should be undertaken as soon as possible, but without detriment to priority A tasks; and
- C:** Lesser priority tasks, on which work should be undertaken as time and resources permit, but without detriment to priority A and B tasks.

**3. Composition:**

*Algeria, Angola, Cameroon, Congo, Côte d'Ivoire, D.R. of Congo, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Kenya, Malawi, Mauritius, Morocco, Niger, Nigeria, Senegal, South Africa, Spain, Sudan, Tanzania, Tunisia, Zambia, ACAC, ASECNA, IATA, and IFALPA.*

**Agenda Item 3: Follow up of APIRG/14 and COM/SG/6 Conclusions and Decisions**

3.1 Under this agenda item, the meeting reviewed and noted the follow up actions on APIRG/14 and COM/SG/6 Conclusions and Decisions as shown in **Appendix 3A** to this report.

**FOLLOW-UP ACTION ON APIRG/14 MEETING CONCLUSIONS AND DECISIONS**

Conclusion No.	Title	Comments
<b>Conclusions</b>		
14/7	Use of PDNs and ISDNs to meet AFTN requirements	States advised of the conclusion. Kenya has tried to implement it. However, the corresponding parties have consistently recommended using of 64-kbps leased circuits. X.25 is gradually becoming obsolete.
14/8	Implementation requirements for the AFTN circuits	States advised of the conclusion.
14/9	AFTN transit time statistics	Implemented
14/10	Use of the Internet	State letter 2005/7 advises States of the adoption of the ICAO guidelines on the use of the public Internet for aeronautical uses. IP/7 of this meeting reports on this item.
14/11	ATS/COM coordination meeting between the Accra, Brazzaville, Dakar Oceanic, Kano, Kinshasa and Luanda FIRs	Meeting held November 2003. WP/6 reports on the matter.
14/12	Planning meeting on the integration of sub-regional VSAT networks	Meeting held 30 March – 1 April 2004 in Johannesburg. Followed by several other meetings. Migration implemented during 4 <sup>th</sup> quarter 2004
14/14	Information on the planning by States of the implementation of the ATS message handling system (AMHS)	Data collection to be pursued by the Secretariat.
14/15	Focal points for the preparation of ITU WRCs	States advised of the conclusion.
14/16	Need for a permanent liaison with State telecommunication regulatory authorities	States advised of the conclusion.
14/17	Seminars on the regulations and management of the radio frequency spectrum	Seminar held from 17 to 19 February 2004.
14/44	Use of GPS from en-route to NPA	States advised of the conclusion. A survey of States indicates very slow implementation. Only 7 States have published AIC on the matter.

Conclusion No.	Title	Comments
14/45	States support for the funding of the GNSS implementation	Part a) EU-ACP funding delayed until next funding cycle. Part b) implemented by States supporting the EGNOS Test bed
14/46	Implementation of a GNSS SBAS operational system	States advised of the conclusion.
14/48	Assistance with GNSS procedures design	Two PANS-OPS GNSS workshop, one GNSS flight checking and GNSS NOTAMs organized with FAA assistance
14/49	GNSS legislation	A seminar has been organized with support of the FAA
14/50	Update of the AFI CNS/ATM Implementation Plan (Doc 003)	Completed.
14/57	Elimination of deficiencies in the field of Aeronautical Telecommunications	States advised of the conclusion.
<b>Decisions</b>		
14/6	Survey on availability and usage costs of PDNs and ISDNs	Survey conducted. In view of comments on Concl. 14/7, PDNs and ISDNs are likely not to be used by the AFS .
14/47	GNSS implementation task force	Implemented. The Task Force has held 2 meetings.



**Agenda Item 4: Aeronautical Fixed Services****4.1 Review of performance and implementation status of the aeronautical fixed telecommunication network (AFTN) in the AFI Region, and identification of deficiencies and remedial action for their elimination****Review of AFTN performance**

4.1.1 In reviewing AFTN performance, the meeting recalled the critical analysis of the current AFTN carried out by Sixth Meeting of the Communications Sub-group (COM/SG/6, Nairobi, 24-26 September 2002) and noted that it was still affected by a number of weaknesses such as:

- low circuits availability rates in some areas (e.g. circuits within core AFISNET area);
- low-speed main circuits and interregional circuits: Addis-Ababa/Nairobi, Addis Ababa/Niamey, Cairo/Nairobi, Cairo/Tunis, Johannesburg/Nairobi, Addis-Ababa/Jeddah (AFI/MID) and Nairobi/Mumbai (AFI/ASIA-APAC);
- low level of implementation of bit-oriented protocols: only 4 out of 10 main centres (40%), and 8 out of 20 main circuits (40%) (including interregional circuits) are using bit-oriented protocols (X.25 or X.25 CIDIN); and
- long transit times as a consequence.

4.1.2 When analyzing AFTN performance, the CNS Sub-group recalled that the 14<sup>th</sup> Edition of the AFI AFTN Routing Directory had been issued in March 2004 and circulated to the States for applicability as from 8 July 2004. It underscored the importance for all AFTN centres to implement the routing requirements therein and therefore urged those AFI COM centres that had not yet done so to comply. Another issue of importance was the need to harmonize time reference by synchronizing AFTN switch clocks on the Global Positioning System (GPS) time, considering its global coverage. The following draft Conclusions were adopted:

**Draft Conclusion 1/2: Implementation of the AFI AFTN Routing Directory**

**That AFI COM centres that have not yet done so, urgently implement the AFI AFTN Routing Directory (14<sup>th</sup> Edition, 2004).**

**Draft Conclusion 1/3: Synchronization of AFTN switch clocks**

**That States and air navigation service providers that have not yet done so, synchronize the clocks of their automated AFTN switches with Global Positioning System (GPS) time.**

**Status of implementation of AFTN**

4.1.3 The CNS Sub-group reviewed and updated *AFI AFTN Implementation Specifications* as defined by APIRG/14 under its Conclusion 14/8, as per **Appendix 4A** to this part of the Report based on the information provided by the States.

4.1.4 The CNS Sub-group also reviewed the status of implementation of AFTN circuits since the last meeting of the former COM Sub-group (COM/SG/6, Nairobi, 24-26 September 2002) and noted little progress concerning the implementation of the main circuit Brazzaville/Nairobi. Concerning interregional circuits, it noted that the circuit Johannesburg/Brisbane (AFI/ASIA-PAC) had been implemented whilst the circuit Johannesburg/Ezeiza (AFI/SAM) was expected to be implemented as soon as a CAFSAT node is installed by Argentina in Ezeiza (likely in 2005). In total, 16 AFTN circuits including both main circuits and tributary circuits were yet to be implemented.

### **Identification of AFTN deficiencies and remedial actions**

4.1.5 The CNS Sub-group updated the list of AFTN deficiencies in the AFI Region, including ANP unimplemented requirements and low performance circuits in terms of availability, reliability and transmission speed (namely for main circuits). The updated list of AFTN deficiencies is shown at **Appendix 4B** to this part of the Report.

4.1.6 Among the remedial actions considered by the CNS/SG for the elimination of AFTN deficiencies, were:

- enhancing maintenance capabilities in identified areas where circuits availability and reliability were considered as critical issues, so as to prevent these circuits from unsafe degradation (e.g. some AFISNET circuits in the Gulf of Guinea);
- making use of VSAT technology. 8 AFTN circuits, of which 3 main circuits, would be implemented using VSAT networks: Brazzaville/Sao Tome, Bissau/Dakar (AFISNET), Johannesburg/Ezeiza (CAFSAT), Brazzaville/Luanda (SADC/2), Addis Ababa/Asmara, Addis Ababa/Khartoum, Brazzaville/Nairobi (NAFISAT);
- achieving interoperability between aeronautical VSAT networks in accordance with APIRG Conclusion 14/12, as a cost-effective means of interconnecting sites without adding antennae, optimizing bandwidth requirements and introducing more flexibility for new services.

4.1.7 The meeting was informed of a short-term VSAT project to be implemented by Algeria and ASECNA in order to restore Algiers/Niamey main circuit, and of the effort by both Kenya and South Africa (ATNS) in upgrading the main circuit Johannesburg/Nairobi (a 50 baud circuit) to the higher digital circuit speed required. (*Note of the Secretariat: the VSAT project was implemented on 26 April 2005: AFTN Algiers/Niamey is implemented*).

## **4.2 Review of the Report of the Second Meeting of the ATN Planning Task Force (Dakar, Senegal from 5 to 6 April 2005)**

### **Work programme and composition**

4.2.1 When reviewing the terms of reference of the ATN Planning Task Force as defined by the COM/SG/6 Meeting (Nairobi, 24-26 September 2002), the CNS Sub-group was of the view that each of the assigned tasks (ATN routing architecture, ground-ground applications, addressing plan, guidance material, system management, directory service, security service) will encompass the generation of several documents. It noted that based on the experience of the ASIA/Pacific Region, the ATN Task Force identified a number of sub-tasks to be achieved in order to complete the elements of the work programme, and decided to address ATN routing architecture, ground-ground transition plan, FASID router plan and NSAP addressing plan. The remaining sub-tasks would be addressed in subsequent meetings.

4.2.2 The CNS Sub-group agreed to the request of Cameroon, DR Congo, Ghana, Mauritius and Morocco to be members of the AFI ATN Planning Task Force. The following decision was adopted.

### **Decision 1/4: Membership in the AFI ATN Planning Task Force**

**That Cameroon, DR Congo, Ghana, Mauritius and Morocco be members of the AFI ATN Planning Task Force.**

## **Description of the AFI ATN topology**

### *ATN routing architecture*

4.2.3 The ATN Planning Task Force reduced the number of backbone centres from 11 centres as proposed at its first meeting to 6 centres, and agreed on a draft AFI ATN Architecture to be circulated to AFI States. The description of the ground-ground ATN architecture will comprise a table for the backbone BIS interconnections and the routing domain BIS connections to the backbone in the AFI Region. The ATN Backbone BIS and BIS circuits implementation Table will be the basis for development of the AFI ATN Transition Plan. The following Draft Conclusion was adopted:

#### **Draft Conclusion 1/5: Draft AFI ATN routing architecture**

**That the draft ATN routing architecture as developed by the ATN Planning Task Force be circulated to States for comments and completion of the tables**

*Note: The Draft AFI ATN routing architecture has been appended to the Report of the Second Meeting of the ATN Planning Task Force (ATN/TF/2) to be made available to States on the ICAO public website (<http://www.icao.int>).*

### **ATN addressing plan for the AFI Region**

4.2.4 The Task Force reviewed a draft NSAP ATN addressing plan, whose objectives are to provide guidance in the specifications of NSAP addresses; and of routing domain identifiers (RDI) for Routing Domains (RD) and Routing Domain Confederations (RDC). However, the Task Force felt that more guidance was needed on the assignment of the ARS, LOC and SYS fields of the NSAP address, in the form of examples and a flow chart. A working group (of members from Ghana, South Africa, Tunisia and ASECNA, ICAO) was established to prepare the additional guidance.

### **Description of ATN ground/ground applications**

#### **AIDC implementation in AFI**

4.2.5 The meeting recalled that in accordance with the AFI CNS/ATM Implementation Plan (Doc 003), AIDC shall progressively be progressively introduced in the Region from 2005 to 2008. It recognized that AIDC would not be properly implemented without major improvements to the current communication infrastructure, which is adversely affected by serious deficiencies in some areas. In this connection, it recalled APIRG Conclusion 13/72 recommending a step-by-step approach in the implementation of CNS/ATM systems in the AFI Region. The following draft Conclusion was adopted:

#### **Draft Conclusion 1/6: Implementation of the AIDC application in the AFI Region**

**That, when considering the implementation of the AIDC application, States :**

- a) be reminded of the need for a step-by-step approach in implementing CNS/ATM systems, by giving priority to solving the deficiencies and upgrading the performance of the current communication infrastructure;**
- b) implement automation in their ATS systems as soon as practicable; and**
- c) take the necessary steps to implement an ATN infrastructure capable of supporting the AIDC application.**

### 4.3 Use of VSAT technology to cater for AFS requirements

#### **Communications between Accra, Brazzaville, Dakar Oceanic (Abidjan Sector), Kinshasa and Luanda FIRs**

4.3.1 The CNS Sub-group reiterated the concerns expressed by COM/SG/6 and APIRG/14 about communication problems experienced between Accra, Brazzaville, Dakar Oceanic (Abidjan Sector), Kinshasa and Luanda FIRs, and urged States and Organizations concerned to implement the required VSAT facilities. The meeting welcomed the implementation of a VSAT network established on INTELSAT Satellite 10-02 in the Democratic Republic of the Congo.

#### **Network developments**

##### *Consolidation of VSAT networks*

4.3.2 The CNS Sub-group noted the successful migration of AFISNET network (a 55 - earth station network covering Ghana, Nigeria, Mauritius, La Reunion Island, Sao Tome and Principe, South Africa, ASECNA States, Roberts FIR States) onto Satellite IS 10-02 in October/November 2004 in accordance with APIRG Conclusion 14/12. It recognized the countless and encouraging effort by AFISNET members that contributed to a successful implementation of the migration project. Mindful of the potential benefits and savings that would be derived from the consolidation of existing and planned VSAT networks, the Sub-group confirmed the necessity for the other VSAT networks (namely CAFSAT, NAFISAT and SADC/2) to be established as planned on the same satellite/transponder as soon as possible. It accordingly recommended that concerned States and the Secretariat take the necessary steps with INTELSAT to have the required bandwidth secured.

##### *Interoperability of VSAT networks*

4.3.3 The CNS Sub-group agreed that “interoperability” between VSAT networks was necessary to achieve an integrated and seamless network. Furthermore, it stressed the need for a common understanding of the “interoperability” and “seamlessness” concepts with respect to the future ATM system based on the ATM operational concept as defined by *ATMCP*, and noted ATNP (now ACP)’s definition of “interoperability as the ability of the ATN to provide, as a minimum, a transparent data transfer service between end systems even though the ATN comprises various subnetworks”.

4.3.4 After thorough discussions and taking into consideration peculiarities inherent to satellite-based systems, the CNS Sub-group adopted the following draft conclusion:

#### **Draft Conclusion 1/7: Interoperability of VSAT networks**

##### **That the States concerned:**

- a) **Agree to pursue the process of establishing CAFSAT, MID VSAT, NAFISAT, SADC/2 networks on Satellite IS 10-02@359°E, Transponder 20/20 EHA;**
- b) **Be encouraged to take advantage of new VSAT Technology platform functionalities in terms of network spectrum usage, flexibility, quality of service management, etc.;**
- c) **Make effort to achieve interoperability at baseband level where access techniques differ due to the application of emerging VSAT technologies, taking cognizance of agreed performance and quality of service requirements for the aeronautical fixed and mobile services (including data link services); and**
- d) **Carry out necessary coordination on a case-by-case basis in order to anticipate end-**

**to-end interoperability requirements prior to implementing VSAT systems.*****Networks project updates***

4.3.5 South Africa (ATNS), Spain, ASECNA and the Secretariat presented the CNS Sub-group with updated information on the implementation status and plans for the development of AFISNET, SADC, CAFSAT and NAFISAT VSAT networks. The Sub-group noted that issues associated with *interconnection* and *interoperability* between VSAT networks were being considered in the AFI Region, a multi-vendor environment.

- ***AFISNET Network***

4.3.6 The CNS Sub-group was apprised on the implementation of new VSAT stations within Accra FIR (Benin, Ghana, Sao Tome and Togo) to support AFS and AMS (extended VHF coverage). Algeria and ASECNA also informed the CNS Sub-group that a VSAT station was being installed in Algiers to support AFS links with Dakar and Niamey (*Note of the Secretariat: the VSAT station in Algiers was implemented on 26 April 2005*). It was noted that AFISNET members were considering a collective approach to auditing and re-engineering the network.

- ***CAFSAT Network***

4.3.7 Spain informed the CNS Sub-group that a number of air navigation service providers had developed plans to implement CAFSAT nodes with a view to improve communications with CAFSAT member States. In this connection, it was noted that Argentina was in the process of installing a CAFSAT node in Ezeiza to be connected to Johannesburg and Canary Islands, and that Morocco was developing a national VSAT network to be established on CAFSAT operated Satellite IS-801@328,5 East. A projected connectivity matrix for SAT ACCs required to be supported by CAFSAT was also provided to the meeting.

- ***SADC and NAFISAT Networks***

4.3.8 The Secretariat reported on the establishment of the North Eastern AFI VSAT network (NAFISAT) in furtherance of APIRG/13 Conclusion 13/15. The CNS Sub-group noted that participating States had accepted a proposal by ATNS and IATA to provide the NAFISAT (Network Provider). A memorandum of understanding (MoU) on the implementation of the NAFISAT was developed and was signed by Djibouti, Egypt, Eritrea, Libya, Kenya, Somalia (CACAS), Uganda, Tanzania and Yemen, Seychelles, Sudan, ATNS and IATA. Two States are still to sign the NAFISAT MoU: Ethiopia and Saudi Arabia. Ethiopia has confirmed its participation and will soon sign the MoU. Information provided to the Secretariat indicates that Saudi Arabia is going to join the NAFISAT.

*Note of the Secretariat: Libya signed the NAFISAT MoU in June 2005, after the CNS/SG/1 meeting.*

4.3.9 The NAFISAT implementation process has started in February 2005. It is planned that the NAFISAT business case will be ready by the end of June 2005, for adoption by the Supervisory Committee in July/August 2005. This will allow the tendering process to be launched in September 2005. Since the SADC VSAT-2 and NAFISAT have the same network provider, it is planned that one single acquisition process will be conducted in order to reduce costs, and that both NAFISAT and SADC VSAT-2 will be operational in the first quarter of 2007.

#### **4.4 Review of the implementation and performance of the Air Traffic Services Direct Speech (ATS/DS) network in the AFI Region, identification of deficiencies and remedial action for their elimination**

##### **Implementation status**

4.4.1 The CNS Sub-group reviewed the implementation efforts since the last meeting of the former COM Sub-group (Nairobi, 24-26 September 2002), and noted that 22 ATS/DS circuits have been implemented by 27 States, whilst 1 State has not yet implemented any of 3 required ATS/DS circuits. Out of 227 ATS/DS circuits required in the AFI air navigation plan (ANP), there are 37 non-implemented circuits, or 17.2% of the required circuits. The results of the review are at **Appendix 4C** to this part of the Report.

##### **Identification of deficiencies**

4.4.2 The CNS Sub-group therefore updated the list of ATS/DS deficiencies in the AFI Region as shown in **Appendix 4D** to this part of the Report.

4.4.3 The Sub-group noted that several VSAT solutions are being considered by States to implement AFS requirements using existing or planned VSAT networks (AFISNET, CAFSAT, SADC and NAFISAT), and encouraged States concerned to implement these systems as soon as possible. Meanwhile, it recommended the use of satellite telephone or public switched telephone network (PSTN) to satisfy the requirements in accordance with APIRG Conclusion 12/15.

4.4.4 The following draft Conclusion was adopted:

##### **Draft Conclusion 1/8: Implementation of ATS/DS circuits**

**That the following centres use, as a temporary measure, satellite telephones for ATS coordination with relevant adjacent centres, pending the availability of the planned VSAT connections: Abidjan, Accra, Brazzaville, Khartoum, Kinshasa, Luanda and N'djamena.**

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**AFI RATIONALIZED AFTN – IMPLEMENTATION SPECIFICATIONS/RSFTA RATIONALISE –  
SPECIFICATIONS DE MISE EN OEUVRE**

Explanation of the table/Explication du tableau

Col. No.	Explanations
1	Terminal I and Terminal II. Each circuit appears once in the Table./ <i>Terminal I et Terminal II. Chaque circuit n'apparaît qu'une fois dans le Tableau</i>
2	Category of circuit/ <i>Catégorie de circuit</i> : M - main circuit/ <i>circuit principal</i> T - tributary circuit/ <i>circuit tributaire</i> S - AFTN station circuit/ <i>circuit de station RSFTA</i>
3 and 8	Circuit type/ <i>Type de circuit</i> : NIL - not implemented/ <i>Non mis en oeuvre</i> LTT/A - landline teletypewriter, analogue (eg cable, microwave/ <i>circuit télétype terrestre, analogue (i.e. câble, faisceau hertzien)</i> ) LTT/D - landline teletypewriter, digital (e.g. cable, microwave/ <i>circuit télétype terrestre, numérique (i.e. câble, faisceau hertzien)</i> ) LDD/A - landline data circuit, analogue (e.g. cable, microwave/ <i>circuit de données terrestre, analogue (i.e. câble, faisceau hertzien)</i> ) LDD/D - landline data circuit, digital (e.g. cable, microwave/ <i>circuit de données terrestre, numérique (i.e. câble, faisceau hertzien)</i> ) RTT - radio teletype circuit (HF)/ <i>circuit radiotélétype (HF)</i> SAT/A/D - satellite circuit /a digital or/d digital/ <i>circuit par satellite /a analogue ou /d numérique</i>
4 and 9	Circuit signalling speed/ <i>Rapidité de modulation du circuit</i>
5 and 10	Circuit protocol / <i>Protocol de circuit</i>  NONE: No protocol/ <i>Aucun protocol</i> FR : Frame relay X.25: ITU X.25 protocol/ <i>Protocol X.25 de l'UIT</i>
6 and 11	Data transfer code (syntax)/ <i>Code alphabétique</i>  ITA-2: International Telegraph Alphabet No.2/ <i>Alphabet international No.2</i> IA-5: International Alphabet No.5/ <i>Alphabet international No.5</i>
7 and 12	Aeronautical network served (AFTN or ATN)/ <i>Réseau aéronautique desservi (RSFTA ou ATN)</i>
13	Implementation target date/ <i>Date cible pour la mise en oeuvre</i>
14	Remarks/ <i>Observations</i>





Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implem. entation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Bangui	T	SAT/D	1200	X.25	ITA-2	AFTN	SAT/D	1200	X25	ITA-2	AFTN		
Dakar	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X-25	IA-5	AFTN		
Douala	T	SAT/D	1200	X.25	ITA-2	AFTN	SAT/D	1200	X.25	ITA-2	AFTN		
Kinshasa	T	MW/V	50	TTY	ITA-2	AFTN	LTT/D	9600	X.25	IA-5	AFTN	May 2005	
Johannesburg	M	SAT/D	1200	FR	IA-5	AFTN	SAT/D	1200	FR	IA-5	AFTN		
Libreville	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Luanda	T	NIL					SAT/D	1200	X.25	ITA-2	AFTN		
Nairobi	M	NIL					SAT/D	1200	X.25	IA-5	AFTN		Nairobi/ Dakar/ Brazzaville
N'Djamena	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Niamey	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Sao Tome	T	NIL				AFTN	SAT/D	1200	X.25	ITA-2	AFTN		
<b>CAIRO (CIDIN Centre)</b>													
Khartoum	T	SAT/A	50	TTY	ITA-2	AFTN	SAT/D	1200	TTY	ITA-2	AFTN		NAFISAT

Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implem. entation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Nairobi	M	SAT/A	50	TTY	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		9600 bps proposed by Egypt
Tunis	M	SAT/A	100	TTY	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		
EUR(Athens)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
MID(Beirut)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
MID(Jeddah)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
<b>CASABLANCA</b> (CIDIN Centre)													
Dakar	M	SAT/D	1200	FR	IA-5	AFTN	SAT/D	9600	TTY/FR	IA-5	AFTN		
Las Palmas	T	LTT/A	9600	FR	ITA-2	AFTN	SAT/D	9600	X25	IA-5	AFTN		
EUR(Madrid)	M	SAT/A	4800 50+1X200	CIDIN AFTN	IA-5	AFTN	SAT/D	4800	CIDIN	IA-5	AFTN		
<b>DAKAR</b>													
Abidjan	T	SAT/D	2400	X-25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Bamako	T	SAT/D	2400	X-25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Banjul	T	LLT	75	TTY	ITA-2	AFTN	LTT/D	2400	X.25	ITA-2	AFTN		
Bissau	T	NIL					SAT/D	2400	X-25	ITA-2	AFTN		

Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implem.entation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Johannesburg	M	LTT	9600	FR	IA-5	AFTN	SAT/D	9600	FR	IA-5	AFTN		
Niamey	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Nouakchott	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Conakry (Robertsfield)	T	SAT	2400	TTY	IA-5	AFTN	SAT/D	2400	TTY	IA-5	AFTN		
Sal	T	SAT/D	9600	TTY	IA-5	AFTN	SAT/D	9600	X-25	IA-5	AFTN		
SAM(RIO)	M	SAT	9600	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
<b>JOHANNES-BURG</b>													X25 planned/ IA-5 capable
Antananarivo	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	X.25	IA-5	AFTN		
Beira	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	FR	IA-5	AFTN		
Bujumbura	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	FR	IA-5	AFTN		
Gaborone	T	SAT/D	2400	TTY	ITA-2	AFTN	SAT/D	9600	FR	IA-5	AFTN		

Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implem. entation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Harare	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Kigali	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Lilongwe	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Lusaka	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Maputo	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Maseru	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Manzini	T	LTT/A	2400	TTY	IA-5	AFTN	SAT/D	9600	TTY	IA-5	AFTN		
Nairobi	M	LTT/A	50	TTY	ITA-2	AFTN	SAT/D	9600	X.25	IA-5	AFTN		NAFISAT
Windhoek	T	SAT/D	2400	TTY	IA-5	AFTN	SAT/D	9600	NONE	IA-5	AFTN		
ASIA/PAC (Brisbane)	M	SAT/D	64 kpbs	X.25	IA-5	AFTN	SAT/D	64 kpbs	X.25	IA-5	AFTN		
SAM (Buenos Aires)	M	NIL					SAT/D	1200	X.25	IA-5	AFTN		2005
<b>NAIROBI</b>													
Dar es Salaam	T	LTT/A	50	NONE	ITA-2	AFTN	LTT/A	9600	X.25	IA-5	AFTN		NAFISAT
Entebbe	T	LTT/A	50	“	ITA-2	AFTN	LTT/A	9600	X.25	IA-5	AFTN		NAFISAT

Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implem.entation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mauritius	T	SAT/A	50	“	ITA-2	AFTN	SAT/A	9600	X.25	IA-5	AFTN		SADC2 NAFISAT
Mogadishu FIC	T	LTT/A	50	NONE	ITA-2	AFTN	SAT/A	9600	X.25	IA-5	AFTN		NAFISAT
Seychelles	T	SAT/A	50	“	ITA-2	AFTN	SAT/A	9600	X.25	IA-5	AFTN		NAFISAT
ASIA (Mumbai)	M	LTT/A	50	“	ITA-2	AFTN	LTT/A	1200	X.25	IA-5	AFTN		
<b>NIAMEY</b>													
Accra	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	FR	IA-5	AFTN		
Kano	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	FR	IA-5	AFTN		
N'Djamena	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Ouagadougou	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X25	IA-5	AFTN		
<b>TUNIS</b>													
Tripoli	T	LTT/A	50	TTY	ITA-2	AFTN	LTT/A	1200	V.24	IA-5	AFTN		
EUR(Rome)	M	SAT/A	1200	V.24		AFTN	SAT/A	1200	V.24	IA-5	AFTN		
<b>ACCRA</b>													
Cotonou	S	SAT/D	2400	X.25	IA-5	AFTN	LTT/A	2400	X.25	IA-5	AFTN		
Lome	S	SAT/D	240050	X.25	IA-5	AFTN	LTT/A	2400	X.25	IA-5	AFTN		
<b>ANTANANARIVO</b>													
Dzaoudzi	S	SAT/D	2400	FR	IA-5	AFTN	SAT/D	2400	FR	IA-5	AFTN		



Terminal I/ Terminal II	Circuit category/ Catégorie de circuit	Current/Existant					Planned/Prévu					Target date of implementation/ Date cible de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau	Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Freetown	S	SAT/D	1200	X25		AFTN	SAT/D	1200	X25	IA-5	AFTN		

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## *List of AFTN deficiencies*

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Angola</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Luanda AFTN centre	Circuit Luanda/Brazzaville	1998	Not implemented	To implement VSAT	Angola, ASECNA		U
<i>Congo</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Brazzaville AFTN centre	Circuit Brazzaville/Luanda	1998	Not implemented	To implement VSAT	ASECNA, Angola		A
	AFTN Plan, AFI/7 Rec. 9/7	Brazzaville AFTN centre	Main circuit Brazzaville/Nairobi	1998	Not implemented	VSAT NAFISAT in project	ASECNA, Kenya	2007	U
	AFTN Plan, AFI/7 Rec. 9/7	Brazzaville AFTN centre	Circuit Brazzaville/Sao Tome	1998	Not implemented	VSAT to be installed at Sao Tome	ASECNA, Sao Tome & Principe		U
<i>Eritrea</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Asmara AFTN centre	Circuit Asmara/Addis	1998	The circuit has been disconnected	To be restored. NAFISAT	Eritrea, Ethiopia	2007	U
<i>Ethiopia</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Asmara	1998	This circuit has been disconnected	To be restored. NAFISAT	Ethiopia, Eritrea	2007	U
	AFTN Plan, AFI/7 Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Khartoum	1996	Not implemented	VSAT NAFISAT in project	Ethiopia, Sudan	2007	A
	AFTN Plan, AFI/7 Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Niamey operates at low speed	2003	Causes congestion and traffic delays	Upgrade to at least 1200 bps. NAFISAT	Ethiopia, ASECNA	2007	U
<i>Guinea Bissau</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Bissau AFTN centre	Circuit Bissau/Dakar	1998	Not implemented	VSAT planned	ASECNA, Guinea Bissau		U



<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Kenya</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Nairobi AFTN centre	Main circuit Nairobi/Brazzaville	1998	Not implemented	VSAT NAFISAT in project	Kenya, ASECNA	2007	U
	AFTN Plan, AFI/7 Rec. 9/7	Nairobi AFTN centre	Nairobi/Cairo circuit operates at low speed	2002	Causes congestion and traffic delays	Upgrade to at least 1200 bps. NAFISAT	Kenya, Egypt	2007	U
	AFTN Plan, AFI/7 Rec. 9/7	Nairobi AFTN centre	Nairobi/Johannesburg circuit operates at low speed	2002	Causes congestion and traffic delays	Upgrade to at least 1200 bps. NAFISAT	Kenya, South Africa	2007	U
	AFTN Plan, AFI/7 Rec. 9/7	Nairobi AFTN centre	Nairobi/Mumbai circuit operates at low speed	2002	Causes congestion and traffic delays	Upgrade to at least 1200 bps	Kenya, India		U
<i>Niger</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Niamey AFTN centre	Main circuit Niamey/Addis Ababa operates at low speed	2003	Causes congestion and traffic delays	Upgrade to at least 1200 bps. NAFISAT	ASECNA, Ethiopia	2007	U
<i>Sao Tome &amp; Principe</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Sao Tome AFTN centre	Circuit Sao Tome/Brazzaville	1998	Not implemented	VSAT to be installed at Sao Tome	Sao Tome & Principe, ASECNA		U
<i>Senegal</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Dakar AFTN centre	Circuit Dakar/Bissau	1998	Not implemented	VSAT planned	ASECNA, Guinea Bissau		U
<i>South Africa</i>									
	AFTN Plan, AFI/7 Rec. 9/7	Johannesburg AFTN centre	Inter-regional circuit Johannesburg/SAM (Buenos Aires)	1996	Not implemented	CAFSAT VSAT implemented in Johannesburg	South Africa, Argentina	2005	U

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<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Sudan</i>	AFTN Plan, AFI/7 Rec. 9/7	Khartoum AFTN centre	Circuit Khartoum/Addis Ababa	1996	Not implemented	VSAT NAFISAT in project	Ethiopia, Sudan	2007	A

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**TABLE CNS 1B - ATS DIRECT SPEECH CIRCUITS PLAN/Status of implementation  
EXPLANATION OF THE TABLE**

Column 1:	Terminal I:	State and ATS centres to be considered are sequenced in alphabetical order.
Column 2:	Terminal II:	Stations to be connected in alphabetical order.
Column 3:	Type : "A"	indicates a requirement for direct-speech communications capable of establishment in less than 15 seconds (to be used principally for the exchange of updated flight plan data with adjacent units and for co-ordination between air traffic controllers).
	"d"	indicates a requirement for communications which effectively provide for immediate access between controllers (to be used principally for transfer of control between radar controllers).
Column 4:	Status of implementation:	
	NI:	Not implemented
	D:	Implemented with deficiency
	OP:	Implemented and operates satisfactorily
Column 5:	Remarks	

**TABLEAU CNS 1B DES CIRCUITS ATS EN PHONIE DIRECTE/Etat de mise en oeuvre**

**EXPLICATION DU TABLEAU**

Colonne 1 :	Terminal I	États et centres ATS à prendre en considération énumérés par ordre alphabétique.
Colonne 2 :	Terminal II:	Les stations qui doivent être reliées sont classées par ordre alphabétique.
Colonne 3 :	Type : "A"	Indique un besoin de communications en phonie directe pouvant être établies en moins de 15 secondes (ces communications servent principalement à l'échange de données actualisées de plan de vol avec les organes voisins ainsi qu'à la coordination entre contrôleurs de la circulation aérienne).
	"d"	indique un besoin de communications instantanées, assurant un accès immédiat entre contrôleurs (principalement pour le transfert de contrôle entre contrôleurs radar).
Colonne 4 :	État de mise en oeuvre:	
	NI:	Non mis en oeuvre
	D:	Mis en oeuvre mais déficient
	OP:	Mis en oeuvre et fonctionne correctement
Colonne 5:	Remarques	

<b>ATS requirements for speech communications Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I Terminal I</b>	<b>Terminal II Terminal II</b>	<b>Type Type</b>		
1	2	3	4	5
<b>ALGERIA</b> ALGER ACC-FIC	BARCELONA CASABLANCA DAKAR MARSEILLE NIAMEY TRIPOLI TUNIS	A A A A A A A	OP OP OP OP OP NI OP	VSAT implemented.  VSAT implemented. To implement LTF circuit
<b>ANGOLA</b> LUANDA APP-FIC	ACCRA  ATLANTICO BRAZZAVILLE GABORONE JOHANNESBURG KINSHASA LUSAKA WINDHOEK	A  A A A A A A A	NI  NI NI OP OP OP OP OP	.
<b>BENIN</b> COTONOU	ACCRA LAGOS LOME	A A A	OP OP OP	NEW VSAT implemented  NEW VSAT implemented
<b>BOTSWANA</b> GABORONE ACC  FRANCISTOWN TWR	FRANCISTOWN HARARE JOHANNESBURG LUANDA LUSAKA WINDHOEK  BULAWAYO  GABORONE	A A A A A A  A  A	OP OP OP OP OP OP  NI  OP	

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I</b> <b>Terminal I</b>	<b>Terminal II</b> <b>Terminal II</b>	<b>Type</b> <b>Type</b>		
1	2	3	4	5
<b>BURKINA FASO</b> BOBO DIOULASSO APP  OUAGADOUGOU APP	ABIDJAN	A	OP	VSAT being considered
	ACCRA	A	NI	
	BAMA KO	A	OP	
	OUAGADOUGOU	A	OP	
	ABIDJAN	A	OP	VSAT being considered
	ACCRA	A	NI	
	BAMA KO	A	OP	
	BOBO DIOULASSO	A	OP	
NIAMEY	A	OP		
NIAMTOUGOU	A	NI		
<b>BURUNDI</b> BUJUMBURA APP	DAR-ES-SALAAM	A	OP	
	GOMA	A	NI	
	KIGALI	A	OP	
	KINSHASA	A	NI	
<b>CAMEROON</b> DOUALA APP	BATA	A	NI	To improve maintenance
	BRAZZAVILLE	A	OP	
	KANO	A	D	
	LAGOS	A	D	To improve maintenance
	LIBREVILLE	A	OP	
	MALABO	A	D	To improve maintenance
	N'DJAMENA	A	OP	
<b>CAPE VERDE</b> SAL ACC	DAKAR	A	OP	
	LAS PALMAS	A	OP	
	SANTA MARIA	A	OP	
<b>CENTRAL AFRICAN REPUBLIC</b> BANGUI APP	BRAZZAVILLE	A	OP	
	GBADOLITE	A	NI	
	N'DJAMENA	A	OP	

ATS requirements for speech communications Besoins en communications vocales			Status of implementation/ Etat de mise en oeuvre	Remarks Observations
Terminal I Terminal I	Terminal II Terminal II	Type Type		
1	2	3	4	5
<b>CHAD</b> N'DJAMENA APP/FIC	BANGUI	A	OP	To improve maintenance
	BRAZZAVILLE	A	OP	
	DOUALA	A	OP	
	GAROUA	A	OP	
	KANO	A	D	
	KHARTOUM	A	NI	
	MAIDUGURI	A	D	
	NIAMEY	A	OP	
TRIPOLI	A	NI	To improve maintenance	
<b>COMOROS</b> DZAOUDZI APP	ANTANANARIVO	A	OP	
	MORONI APP	ANTANANARIVO	A	
<b>CONGO</b> BRAZZAVILLE APP-FIC	ACCRA	A	D	To improve maintenance
	BANGUI	A	OP	To improve maintenance
	DOUALA	A	OP	
	KANO	A	D	
	KHARTOUM	A	NI	
	KINSHASA	d	OP	
	LIBREVILLE	A	OP	
	LUANDA	A	NI	
	N'DJAMENA	A	OP	
SAO TOME	A	NI		
<b>COTE D'IVOIRE</b> ABIDJAN APP	ACCRA	d	D	To improve maintenance
	BAMAKO	A	OP	To improve maintenance
	BOBO DIULASSO	A	OP	
	DAKAR	A	D	
	NIAMEY	A	OP	
	OUAGADOUGOU	A	OP	
	ROBERTSFIELD	A	OP	
<b>DJIBOUTI</b> DJIBOUTI APP	ADDIS ABABA	A	OP	
	ASMARA	A	OP	
	DIRE DAWA	A	OP	
	HARGHEISA	A	NI	
	MOGADISHU	A	OP	
	SANA'A	A	OP	

ATS requirements for speech communications Besoins en communications vocales			Status of implementation/ Etat de mise en oeuvre	Remarks Observations
Terminal I Terminal I	Terminal II Terminal II	Type Type		
1	2	3	4	5
<b>D.R of CONGO</b> BUKAVU  GBADOLITE  GOMA  LUBUMBASHI APP  KINSHASA APP/FIC	KIGALI	A	NI	
	BANGUI	A	NI	
	BUJUMBURA KIGALI	A A	NI NI	
	NDOLA	A	NI	
	BRAZZAVILLE	d	OP	
	BUJUMBURA	A	NI	
	DAR-ES-SALAAM	A	OP	
	ENTEBBE KHARTOUM KIGALI	A A A	NI NI NI	
	LUANDA	A	OP	
	LUSAKA	A	OP	
<b>EGYPT</b> CAIRO ACC	AMMAN	A	OP	
	ATHENS	A	OP	
	BEIRUT	A	OP	
	JEDDAH	A	OP	
	KHARTOUM	A	NI	
	NICOSIA	A	OP	
	TEL AVIV	A	OP	
	TRIPOLI	A	OP	
<b>EQUATORIAL GUINEA</b> BATA APP  MALABO APP	DOUALA	A	NI	
	LIBREVILLE	A	NI	
	MALABO	A	NI	
	BATA	A	NI	
	DOUALA	A	OP	
	LIBREVILLE	A	OP	Implemented via Douala

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I</b> <b>Terminal I</b>	<b>Terminal II</b> <b>Terminal II</b>	<b>Type</b> <b>Type</b>		
1	2	3	4	5
<b>ERITREA</b> ASMARA ACC/FIC	ADDIS ABABA DJIBOUTI JEDDAH KHARTOUM SANA'A	A A A A A	NI OP OP OP OP	
<b>ETHIOPIA</b> ADDIS ABABA ACC/FIC	ASMARA DJIBOUTI JEDDAH KHARTOUM MOGADISHU NAIROBI SANA'A	A A A A A A A	NI OP OP OP OP OP OP	
DIRE DAWA TWR	DJIBOUTI	A	OP	Via Addis Ababa
<b>FRANCE (REUNION)</b> SAINT-DENIS APP	ANTANANARIVO MAURITIUS	A A	OP OP	
<b>GABON</b> LIBREVILLE ACC	ACCRA BATA BRAZZAVILLE DOUALA KANO LAGOS MALABO  SAO TOME	A A A A A A A  A	OP NI OP D OP D OP  NI	To improve maintenance  To improve maintenance Implemented via Douala  VSAT being considered
<b>GAMBIA</b> BANJUL APP	BISSAU DAKAR	A A	NI OP	VSAT being considered



ATS requirements for speech communications Besoins en communications vocales			Status of implementation/ Etat de mise en oeuvre	Remarks Observations		
Terminal I Terminal I	Terminal II Terminal II	Type Type				
1	2	3	4	5		
<b>GHANA</b> ACCRA APP/FIC	ABIDJAN	d	D	To improve maintenance		
	BOBO DIOULASSO	A	NI			
	BRAZZAVILLE	A	D	To improve maintenance		
	COTONOU	A	OP	New VSAT implemented		
	KANO	A	OP			
	LAGOS	d	OP			
	LIBREVILLE	A	D	To improve maintenance		
	LOME	A	OP	New VSAT implemented		
	LUANDA	A	NI			
	NIAMEY	A	OP			
	NIAMTOUGOU	A	OP	New VSAT implemented		
OUAGADOUGOU	A	NI	VSAT being considered			
SAO TOME	A	NI	New VSAT being installed			
<b>GUINEA</b> CONAKRY APP/FIC	BISSAU	A	NI	Amendment for addition		
	DAKAR	A	OP			
	FREETOWN	A	OP			
	ROBERTSFIELD	A	OP			
<b>GUINEA-BISSAU</b> BISSAU APP	BANJUL	A	NI			
	CONAKRY	A	NI			
	DAKAR	A	NI			
<b>KENYA</b> MOMBASA APP	DAR-ES-SALAAM	d	OP			
	KILIMANJARO	A	OP			
	NAIROBI	d	OP			
	ADDIS ABABA	A	OP			
	DAR-ES-SALAAM	A	OP			
	ENTEBBE	A	OP			
	KHARTOUM	A	OP			
	KILIMANJARO	d	OP			
	MOGADISHU	A	OP			
	MOMBASA	d	OP			
	SEYCHELLES	A	OP			
	<b>LESOTHO</b> MASERU APP	BLOEMFONTEIN	A		OP	

<b>ATS requirements for speech communications Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I Terminal I</b>	<b>Terminal II Terminal II</b>	<b>Type Type</b>		
1	2	3	4	5
<b>LIBERIA</b> ROBERTSFIELD APP	ABIDJAN BAMAKO CONAKRY DAKAR FREETOWN	A A A A A	OP OP OP NI OP	Operated from Conakry “ Amendment for deletion
<b>LIBYAN ARAB JAMAHIRIA</b> BENGHAZI APP  TRIPOLI ACC/FIC	ATHENS MALTA  ALGIERS CAIRO KHARTOUM MALTA N'DJAMENA NIAMEY TUNIS	A A  A A A A A A A	OP OP  NI OP NI OP NI NI OP	
<b>MADAGASCAR</b> ANTANANARIVO ACC/FIC	BEIRA DAR-ES-SALAAM DZAOUZDI JOHANNESBURG MAURITIUS MORONI SAINT-DENIS SEYCHELLES	A A A A A A A A	OP OP OP OP OP OP OP OP	
<b>MALAWI</b> LILONGWE ACC/FIC	BEIRA DAR-ES-SALAAM HARARE LUSAKA	A A A A	OP OP OP OP	

<b>ATS requirements for speech communications Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>	
<b>Terminal I Terminal I</b>	<b>Terminal II Terminal II</b>	<b>Type Type</b>			
1	2	3	4	5	
<b>MALI</b> BAMAKO APP	ABIDJAN BOBO DIULASSO DAKAR GAO MOPTI OUAGADOUGOU ROBERTSFIELD	A A A A A A A	OP OP OP NI NI OP NI	To implement LTF circuit	
GAO APP	BAMAKO MOPTI NIAMEY	A A A	NI NI NI		
MOPTI TWR	GAO BAMAKO	A A	NI NI		
<b>MAURITANIA</b> NOUADHIBOU APP	DAKAR LAS PALMAS NOUAKCHOTT	A A A	OP OP OP		Via Nouakchott/Dakar
NOUAKCHOTT APP	DAKAR NOUADHIBOU	A A	OP OP		
<b>MAURITIUS</b> MAURITIUS ACC/FIC	ANTANANARIVO BOMBAY COCOS JOHANNESBURG PERTH SAINT-DENIS SEYCHELLES	A A A A A A A	OP OP OP OP OP OP OP		
<b>MOROCCO</b> CASABLANCA ACC/FIC	ALGER DAKAR LAS PALMAS LISBOA SEVILLA VILLA CISNEROS	A A A A A A	OP OP OP OP OP OP		

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I Terminal I</b>	<b>Terminal II Terminal II</b>	<b>Type Type</b>		
1	2	3	4	5
<b>MOZAMBIQUE</b> BEIRA ACC/FIC     MAPUTO APP	ANTANANARIVO	A	OP	
	DAR-ES-SALAAM	A	OP	
	HARARE	A	OP	
	LILONGWE	A	OP	
	LUSAKA	A	OP	
	MAPUTO	A	OP	
	BEIRA	A	OP	
	DURBAN	A	OP	
	JOHANNESBURG	A	OP	
	MANZINI	A	OP	
<b>NAMIBIA</b> WINDHOEK ACC/FIC	BLOEMFONTEIN	A	OP	
	CAPETOWN	A	OP	
	GABORONE	A	OP	
	JOHANNESBURG	A	OP	
	LUANDA	A	OP	
<b>NIGER</b> NIAMEY ACC/FIC	ABIDJAN	A	OP	VSAT implemented
	ACCRA	A	OP	
	ALGER	A	OP	
	DAKAR	A	OP	
	GAO	A	NI	
	KANO	A	OP	
	N'DJAMENA	A	OP	
	OUAGADOUGOU	A	OP	
	TRIPOLI	A	NI	

ATS requirements for speech communications Besoins en communications vocales			Status of implementation/ Etat de mise en oeuvre	Remarks Observations
Terminal I Terminal I	Terminal II Terminal II	Type Type		
1	2	3	4	5
<b>NIGERIA</b> KANO ACC/FIC	ACCRA BRAZZAVILLE DOUALA LAGOS LIBREVILLE MAIDUGURI N'DJAMENA NIAMEY	A A A A A A A A	OP OP OP OP OP OP OP OP	
LAGOS ACC	ACCRA COTONOU DOUALA KANO LIBREVILLE NIAMEY	A A A A A A	OP OP OP OP D OP	Newly implemented
MAIDUGURI APP	KANO N'DJAMENA	A A	D D	To improve maintenance To improve maintenance
<b>RWANDA</b> KIGALI APP	BUJUMBURA BUKAVU DAR-ES-SALAAM  ENTEBBE GOMA KINSHASA	A A A  A A A	OP NI OP  OP NI NI	
<b>SAO TOME AND PRINCIPE</b> SAO TOME TWR	ACCRA BRAZZAVILLE LIBREVILLE	A A A	OP NI NI	VSAT installed VSAT planned VSAT planned

<b>ATS requirements for speech communications Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I Terminal I</b>	<b>Terminal II Terminal II</b>	<b>Type Type</b>		
1	2	3	4	5
<b>SENEGAL</b> DAKAR ACC/FIC	ABIDJAN ALGER BAMAKO BANJUL BISSAU CASABLANCA FREETOWN LAS PALMAS NIAMEY NOUADHIBOU NOUAKCHOTT RECIFE ROBERTSFIELD ROCHAMBEAU SAL	A A A A A A A A A A A A A A A A	OP NI OP OP NI OP OP OP OP OP OP OP OP OP OP	VSAT planned/ prévue              PSTN in use
<b>SEYCHELLES</b> SEYCHELLES APP	ANTANANARIVO BOMBAY DAR-ES-SALAAM MAURITIUS MOGADISHU NAIROBI	A A A A A A	OP OP OP OP OP OP	
<b>SIERRA LEONE</b> FREETOWN APP	DAKAR CONAKRY ROBERTSFIELD	A d d	NI OP NI	Amendment for deletion  Amendment for deletion
<b>SOMALIA</b> MOGADISHU ACC/FIC	ADDIS ABABA BOMBAY DJIBOUTI NAIROBI SANA'A SEYCHELLES	A A A A A A	OP OP OP OP OP OP	
HARGEISA APP	DJIBOUTI	A	NI	

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/</b> <b>Etat de mise en oeuvre</b>	<b>Remarks</b> <b>Observations</b>	
<b>Terminal I</b> <b>Terminal I</b>	<b>Terminal II</b> <b>Terminal II</b>	<b>Type</b> <b>Type</b>			
1	2	3	4	5	
<b>SOUTH AFRICA</b> BLOEMFONTEIN APP	CAPETOWN	A	OP		
	DURBAN	A	OP		
	JOHANNESBURG	A	OP		
	MASERU	A	OP		
	PORT ELIZABETH	A	OP		
	WINDHOEK	A	OP		
	CAPETOWN ACC	BLOEMFONTEIN	A		OP
		JOHANNESBURG	A		OP
		PORT ELIZABETH	A		OP
		WINDHOEK	A		OP
	DURBAN APP	BLOEMFONTEIN	A		OP
		JOHANNESBURG	A		OP
		MANZINI	A		OP
		MAPUTO	A		OP
		PORT ELIZABETH	A		OP
	JOHANNESBURG ACC/FIC	ANTANANARIVO	A		OP
		ATLANTICO	A		OP
		BEIRA	A		OP
		BLOEMFONTEIN	A		OP
		CAPETOWN	A		OP
		DURBAN	A		OP
		EZEIZA	A		NI
		GABORONE	A		OP
		HARARE	A		OP
		LUANDA	A		OP
		MANZINI	A		OP
		MAPUTO	A		OP
MAURITIUS		A	OP		
PERTH		A	OP		
PORT ELIZABETH	A	OP			
WINDHOEK	A	OP			
PORT ELIZABETH APP	BLOEMFONTEIN	A	OP		
	CAPETOWN	A	OP		
	DURBAN	A	OP		
	JOHANNESBURG	A	OP		
PORT ELIZABETH	DURBAN	A	OP		
	JOHANNESBURG	A	OP		

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I</b> <b>Terminal I</b>	<b>Terminal II</b> <b>Terminal II</b>	<b>Type</b> <b>Type</b>		
1	2	3	4	5
<b>SPAIN</b> LAS PALMAS ACC/FIC	CASABLANCA DAKAR LISBOA NOUADHIBOU SAL SANTA MARIA	A A A A A A	OP OP OP OP OP OP	Via Dakar/Nouakchott
<b>SUDAN</b> KHARTOUM ACC/FIC	ADDIS ABABA ASMARA BRAZZAVILLE CAIRO ENTEBBE JEDDAH KINSHASA NAIROBI N'DJAMENA TRIPOLI	A A A A A A A A A A	OP OP NI NI OP NI NI OP NI NI	
<b>SWAZILAND</b> MANZINI APP	DURBAN JOHANNESBURG MAPUTO	A A A	OP OP OP	
<b>TOGO</b> LOME APP	ACCRA COTONOU NIAMTOUGOU	A A A	OP OP OP	New VSAT implemented
NIAMTOUGOU TWR	ACCRA LOME OUAGADOUGOU	A A A	OP OP NI	New VSAT implemented
<b>TUNISIA</b> TUNIS ACC/FIC	ALGER MALTA MARSEILLE ROMA TRIPOLI	A A A A A	OP OP OP OP OP	



ATS requirements for speech communications Besoins en communications vocales			Status of implementation/ Etat de mise en oeuvre	Remarks Observations
Terminal I Terminal I	Terminal II Terminal II	Type Type		
1	2	3	4	5
<b>UGANDA</b> ENTEBBE ACC/FIC	DAR-ES-SALAAM	A	OP	
	KHARTOUM	A	OP	
	KIGALI	A	OP	
	KINSHASA	A	NI	
	NAIROBI	A	OP	
<b>UNITED REPUBLIC OF TANZANIA</b> DAR-ES-SALAAM ACC/FIC	ANTANANARIVO	A	OP	
	BEIRA	A	OP	
	BUJUMBURA	A	OP	
	ENTEBBE	A	OP	
	KIGALI	A	OP	
	KILIMANJARO	A	OP	
	KINSHASA	A	OP	
	LILONGWE	d	OP	
	LUSAKA	A	OP	
	MOMBASA	A	OP	
	NAIROBI	A	OP	
	SEYCHELLES		OP	
	ZANZIBAR	A	OP	
		A		
	KILIMANJARO APP	DAR-ES-SALAAM MOMBASA NAIROBI	A  A	
ZANZIBAR	DAR-ES-SALAAM		OP	
<b>WESTERN SAHARA</b> EL AIOUN	LAS PALMAS	A	NI	
	DAKHLA	NOUADHIBOU	A	
<b>ZAMBIA</b> LUSAKA ACC/FIC	BEIRA	A	OP	
	DAR-ES-SALAAM	A	OP	
	GABORONE	A	OP	
	HARARE	A	OP	
	KINSHASA	A	OP	
	LILONGWE	A	OP	
	LUANDA	A	OP	
	NDOLA	A	OP	
NDOLA	LUBUMBASHI LUSAKA	A A	NI OP	

<b>ATS requirements for speech communications</b> <b>Besoins en communications vocales</b>			<b>Status of implementation/ Etat de mise en oeuvre</b>	<b>Remarks Observations</b>
<b>Terminal I</b> <b>Terminal I</b>	<b>Terminal II</b> <b>Terminal II</b>	<b>Type</b> <b>Type</b>		
1	2	3	4	5
<b>ZIMBABWE</b>				
BULAWAYO	FRANCISTOWN	A	NI	
APP	HARARE	A	OP	
HARARE	BEIRA	A	OP	
ACC/FIC	BULAWAYO	A	OP	
	GABORONE	A	OP	
	JOHANNESBURG	A	OP	
	LILONGWE	A	OP	
	LUSAKA	A	OP	

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## *List of ATS/DS deficiencies*

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Algeria</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Algiers ACC-FIC	Circuit Algiers/Tripoli			Implement LTF circuit	Algeria, Libya		U
<i>Angola</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Luanda FIC	Circuit Luanda/Accra	1998	Inmarsat phone used from Luanda. Inmarsat Phone also available in Accra	VSAT under consideration	Angola, Ghana		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Luanda FIC	Circuit Luanda/Atlantico	1998	Not implemented	Implement circuit	Angola, Brazil		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Luanda FIC	Circuit Luanda/Brazzaville	1998	PSTN used via Inmarsat	To implement LTF circuit	Angola, ASECNA		A
<i>Botswana</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Francistown TWR	Circuit Francistown/Bulawayo	2002	Not implemented	Implement facility	Botswana, Zimbabwe		A
<i>Burkina Faso</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bobo Dioulasso	Circuit Bobo Dioulasso/Accra	1998	PSTN in use	VSAT planned by ASECNA	ASECNA, Ghana		A
<i>Burundi</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bujumbura APP	Circuit Bujumbura/Goma	1998	Not implemented		Burundi, DR Congo		U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bujumbura APP	Circuit Bujumbura/Kinshasa	1998	Not implemented	VSAT implemented at Bujumbura and Kinshasa	Burundi, DR Congo		U
<i>Cameroon</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Douala APP	Circuit Douala/Bata	1998	Not implemented	VSAT planned at Bata	ASECNA		A
<i>Chad</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	N'Djamena APP/FIC	Circuit N'Djamena/Khartou	1998	Not implemented	VSAT NAFISAT. PSTN proposed by ASECNA.	ASECNA, Sudan	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	N'Djamena APP/FIC	Circuit N'Djamena/Tripoli	1998	Not implemented	VSAT NAFISAT. PSTN and Satphone proposed by ASECNA	ASECNA, Libya	2007	U
<i>Congo</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Brazzaville APP/FIC	Circuit Brazzaville/Khartou	1998	Not implemented	VSAT AFISNET proposed by ASECNA	ASECNA, Sudan	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Brazzaville APP/FIC	Circuit Brazzaville/Luanda	1998	PSTN used via Inmarsat phone	To implement LTF circuit	Angola, ASECNA		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Brazzaville APP/FIC	Circuit Brazzaville/Sao Tome	1998	Not implemented	VSAT to be installed at Sao Tome	ASECNA, Sao Tome & Principe	2005	U
<i>Dem. Rep. of Congo</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Goma APP	Circuit Goma/Bujumbura	1998	Not implemented		DR Congo, Burundi		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Goma APP	Circuit Goma/Kigali	1998	Not implemented		DR Congo, Rwanda		U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kinshasa FIC	Circuit Kinshasa/Bujumbura	2002	Not implemented	VSAT implemented both centres	DR Congo, Burundi		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kinshasa FIC	Circuit Kinshasa/Entebbe	1996	Not implemented	VSAT SADC2 and NAFISAT in project	DR Congo, Uganda	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kinshasa FIC	Circuit Kinshasa/Khartoum	1996	Inmarsat phone available at	VSAT NAFISAT in project	DR Congo, Sudan	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kinshasa FIC	Circuit Kinshasa/Kigali	1996	Not implemented	VSAT operational in Kinshasa, also being installed in Kigali	DR Congo, Rwanda		U
<i>Egypt</i>	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Cairo ACC	Circuit Cairo/Khartoum	1996	Not implemented	LTF circuit via PTTs proposed by Egypt until VSAT NAFISAT implemented.	Egypt, Sudan		U
<i>Equatorial Guinea</i>	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bata & Malabo APP	Circuit Bata/Malabo	2002	Not implemented	VSAT planned	ASECNA		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bata APP	Circuit Bata/Douala	1996	Not implemented	VSAT planned	ASECNA		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bata APP	Circuit Bata/Libreville	1996	Not implemented	VSAT planned	ASECNA		U
<i>Eritrea</i>	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Asmara ACC	Circuit Asmara/AddisAbaba	1998	This circuit has been disconnected	To be restored	Eritrea, Ethiopia		U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Ethiopia</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Addis Ababa ACC/FIC	Circuit Addis Ababa/Asmara	1998	This circuit has been disconnected	To be restored	Ethiopia, Eritrea		U
<i>Gabon</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Libreville ACC	Circuit Libreville/Bata	1996	Not implemented	VSAT planned at Bata	ASECNA		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Libreville ACC	Circuit Libreville/Sao Tome	1996	Not implemented	VSAT to be installed by Sao Tome	ASECNA, Sao Tome & Principe	2005	U
<i>Gambia</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Banjul APP	Circuit Banjul/Bissau	1996	Not implemented	VSAT being considered	Gambia/Guinea Bissau		A
<i>Ghana</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Accra APP/FIC	Circuit Accra/Bobo Dioulasso	1998	PSTN in use	VSAT planned at Bobo Dioulasso	Ghana, ASECNA		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Accra APP/FIC	Circuit Accra/Luanda	1998	Inmarsat phone used from Luanda. Inmarsat also available in Accra	VSAT under consideration	Ghana, Angola		U
<i>Guinea</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Conakry APP	Circuit Conakry/Bissau	1996	Not implemented	Implement LTF circuit	Guinea, Guinea Bissau		U
<i>Guinea Bissau</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bissau APP	Circuit Bissau/Banjul	1996	Not implemented	VSAT being considered	Gambia, Guinea Bissau		A

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bissau APP	Circuit Bissau/Conakry	1996	Not implemented	Implement LTF circuit	Guinea, Guinea Bissau		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bissau APP	Circuit Bissau/Dakar	1996	Not implemented	VSAT being considered	ASECNA, Guinea Bissau		U
<i>Libya</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Tripoli ACC/FIC	Circuit Tripoli/Algiers	1998	Not implemented	Implement LTF circuit. Algiers to contact PTT Libya.	Libya, Algeria		U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Tripoli ACC/FIC	Circuit Tripoli/Khartoum	1998	Not implemented	VSAT NAFISAT in project.	Libya, Sudan	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Tripoli ACC/FIC	Circuit Tripoli/Niamey	1998	Not implemented	VSAT NAFISAT in project	Libya, ASECNA	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Tripoli ACC/FIC	Circuit Tripoli/N'Djamena	1998	Not implemented	VSAT NAFISAT in project. PSTN and Satphone proposed by ASECNA	Libya, ASECNA	2007	U
<i>Niger</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Niamey ACC/FIC	Circuit Niamey/Tripoli	1998	Not implemented	VSAT NAFISAT in project	ASECNA, Libya	2007	U
<i>Rwanda</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kigali APP	Circuit Kigali/Goma	1996	Not implemented		Rwanda, DR Congo		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kigali APP	Circuit Kigali/Kinshasa	1996	Not implemented	VSAT operational in Kinshasa and in Kigali	Rwanda, DR Congo		U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Sao Tome &amp; Principe</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Sao Tome TWR	Circuit Sao Tome/Brazzaville	1998	Not implemented	VSAT to be installed at Sao Tome	Sao Tome & Principe, ASECNA	2005	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Sao Tome TWR	Circuit Sao Tome/Libreville	1998	Not implemented	VSAT to be installed at Sao Tome	Sao Tome & Principe, ASECNA	2005	U
<i>Senegal</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Dakar ACC/FIC	Circuit Dakar/Bissau	1998	Not implemented	VSAT being considered	ASECNA, Guinea Bissau		U
<i>South Africa</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Johannesburg ACC/FIC	Circuit Johannesburg/Ezeiza	1998	Not implemented	CAFSAT VSAT implemented in Johannesburg.	South Africa, Argentina	2005	U
<i>Sudan</i>									
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/Brazzaville	1996	Not implemented	VSAT AFISNET proposed by ASECNA	Sudan, ASECNA	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/Cairo	1996	Not implemented	LTF circuit via PTTs proposed by Egypt until implementation of VSAT NAFISAT	Egypt, Sudan	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/Jeddah	1996	Not implemented	VSAT NAFISAT in project	Sudan, Saudi Arabia	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/Kinshasa	1996	Not implemented	VSAT NAFISAT in project	Sudan, DR Congo	2007	U
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/N'djamena	1996	Not implemented	VSAT NAFISAT in project. PSTN proposed by ASECNA	Sudan, ASECNA	2007	U



<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Khartoum FIC	Circuit Khartoum/Tripoli	1996	Not implemented	VSAT NAFISAT in project	Sudan, Libya	2007	U
<i>Uganda</i>	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Entebbe FIC	Circuit Entebbe/Kinshasa	1996	Not implemented	VSAT SADC2 and NAFISAT in project	DR Congo, Uganda		U
<i>Zimbabwe</i>	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bulawayo TWR	Circuit Bulawayo/Francistown	2002	Not implemented	Implement facility	Zimbabwe, Botswana		A

**Agenda Item 5: Review of the implementation and performance of the Aeronautical Mobile Service in the AFI Region, identification of deficiencies and remedial action for their elimination**

**Extension of VHF coverage**

5.1 The CNS Sub-group acknowledged the efforts made by a number of States to extend VHF coverage on ATS routes using remote VHF stations, in accordance with AFI/7 Recommendation 5/12. It particularly noted recent achievements in the following FIRs:

- Accra FIR: Three (3) VHF relay stations using VSAT implemented at Tamale, Niamtougou, and Sao Tome.
- FIR Algiers: Sixteen (16) VHF relay stations using VSAT implemented at Adrar, Algiers, Annaba, Bechar, Constantine, Djanet, El Golea, Ghardaia, Illizi, In Salah, Hassi Messaoud, Oran, Tamanrasset, Tiaret, Tindouf and Zarzaitine.
- FIR Antananarivo: Three (3) VHF relay stations are being tested at Moroni, Toamasina and Tolagnaro.
- FIR Brazzaville: Two (2) remote VHF relay stations are being tested at Bria, Makokou and Pointe Noire.
- FIR Dakar: Two remote VHF relay stations are being tested at Nema and Taoudenit
- FIR Khartoum: Ten (10) remote VHF stations using VSAT implemented at Damazin, Dongola, El Fasher, El Obeid, Juba, Khartoum, Malakal, Nyala, Port Sudan and Wau. This programme covers all the ATS routes in FIR Khartoum, except for a 300 NM segment from ORNAT to El Obeid in the northwest part of the FIR.
- FIR Kinshasa: Six (6) remote VHF stations using VSAT implemented at Ilebo, Kamina, Kinshasa, Lubumbashi, Mbandaka and Mbujimayi. Seven (7) other stations are to be implemented between July 2005 and February 2006 at Bukavu, Bunia, Buta, Gbadolite, Kalemie, Kisangani and Tshikapa. When the project is completed, three (3) ACCs will be established at Kinshasa, Kisangani and Lubumbashi.
- FIR Lusaka: Three remote VHF stations implemented at Lusaka, Mongu and Ndola. Two other stations are being implemented at Chipata and Kasama.
- FIR N'djamena: One remote VHF relay station is being tested at Bria.
- FIR Niamey: Two (2) VHF relay stations are being tested at Taoudenit and Tombouctou.

5.2 The CNS Sub-group reviewed the VHF coverage charts prepared by the Secretariat and noted that the areas where VHF coverage was critically needed are FIR Luanda and FIR Tripoli. IATA informed the meeting that a survey of AMS communications will be conducted in the AFI Region during the third quarter of 2005. The meeting welcomed the information as it would allow an assessment of the effectiveness of VHF coverage in the Region.

**Identification of deficiencies**

5.3 The CNS Sub-group was informed of ATS incidents due to lack of HF communications in the oceanic part FIR Luanda. It reviewed the list of AMS deficiencies and updated it as shown in **Appendix 5A** to this part of the report. The following draft Conclusions were adopted:

**Draft Conclusion 1/9:                    Air/ground communications in Luanda FIR**

**That, in view of the increasing number of ATS incidents in its airspace, Angola, as a matter of urgency, assign the highest priority to extend VHF coverage over continental FIR and the provision of efficient HF communications over the oceanic part of Luanda FIR.**

**Draft Conclusion 1/10:                Air/ground communications in Tripoli FIR**

**That Libya assign a high priority to extend VHF coverage in Tripoli FIR.**

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## *List of AMS Deficiencies*

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Angola</i>									
	AMS AFI/7 Rec. 9/12	Luanda ACC	Inadequate VHF coverage of busy ATS routes	1998	Implement remote VHF stations	5 VHF stations to be installed	ENANA		U
	AMS AFI/7 Rec. 9/12	Luanda FIC	HF poor quality and unavailable in oceanic area	2004	Improve facilities	Install adequate equipment	ENANA		U
<i>Dem. Rep. of Congo</i>									
	AMS AFI/7 Rec. 9/12	Kinshasa FIR	Inadequate VHF coverage of busy ATS routes	1998		Extension of VHF coverage in	DR Congo	2006	U
	AMS AFI/7 Rec. 9/12	Kinshasa FIR	HF poor quality. Selcal not available	1998	FIC Kinshasa operational April 2005	New equipment being installed at Kinshasa, Kisangani and Lubumbashi	DR Congo	2006	U
<i>Libya</i>									
	AMS AFI/7 Rec. 9/12	Tripoli FIR	Inadequate VHF coverage of busy ATS routes	2004	Implement remote VHF stations		Libya		U
<i>Malawi</i>									
	AMS AFI/7 Rec. 9/12	FIR Lilongwe	VHF coverage incomplete	2001	Install additional VHF relay stations at Muzuzu and Zomba.	Extension VHF coverage in progress. Equipment in place.	Malawi	2003	U
<i>Somalia</i>									
	AMS AFI/7 Rec. 9/12	Mogadishu ACC	Lack of VHF coverage of busy ATS routes	1998		Install VHF relays	Somalia		U

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**Agenda Item 6: Aeronautical Radio Navigation Service****6.1 Review of the implementation status and performance of the aeronautical radio navigation service, and identification of deficiencies and remedial action for their elimination.**

6.1.1 The CNS Sub-group reviewed the implementation efforts since the last COM/SG/6 Meeting (Nairobi, 24-26 September 2002), and noted that 41 navigational aids (of which 24 VORs, 13 DMEs and 4 ILSs) required in the AFI Air navigation Plan (ANP) had not yet been implemented, whereas 14 installed facilities (8 VORs, 5 DMEs and 1 ILS) were to be repaired. Most of the reported deficiencies (84%) were related to en-route operations.

6.1.2 The CNS Sub-group therefore updated the list of ARNS deficiencies in the AFI Region as shown in **Appendix 6A** to this part of the Report, and urged States and Organizations concerned to endeavour to implement remedial solutions as soon as possible. The effort by the Democratic Republic of the Congo in implementing new navigation aids (VOR, DME, ILS) at Kinshasa Ndjili and Lubumbashi airports was noted. Concerning Cameroon, it was agreed that the AFI FASID should be amended to replace the VOR/DME of Foumban with that of Bafoussam. The following draft Conclusion was formulated:

**Draft Conclusion 1/11 : Amendment to AFI FASID, Table CNS-3**

**That the AFI FASID be amended to replace the VOR/DME of Foumban with that of Bafoussam.**

**6.2 Review and update of the database on implementation of communications, navigation and surveillance elements of the AFI CNS/ATM Plan**

6.2.1 The CNS Sub-group reviewed and updated the CNS elements of the database developed on the implementation of the AFI CNS/ATM Plan (Doc 003, Volume II). Detailed information was also provided by the Secretariat on the AFI EGNOS Test Bed trials in progress in Central Africa (Zone A), Southern Africa (Zone B) and Eastern Africa (Zone C).

**EGNOS Test Bed in Central Africa (Zone A)**

6.2.2 This test bed was implemented in June 2003 with the cooperation between ASECNA, European Space Agency (ESA), European Commission (EC), France, Cameroon, Congo, Gabon, Nigeria and Chad. It was composed of 4 mobile reference and integrity monitoring stations (RIMS) located at Brazzaville, Douala, Lome and N'djamena. The AFISNET was used to transfer the data from the RIMS to the processing centre in Honefoss, Norway. The processed data was then uplinked to the Inmarsat IOR satellite for broadcasting to receivers in the coverage area.

6.2.3 Prior and during the APIRG/14 meeting, GNSS APV I approach and landing trials were conducted in Abuja, Douala and Libreville. APV I provides 16 m accuracy in the horizontal plane with a 20 m vertical accuracy. The tests proved that APV I signal quality could be provided over the area of the tests, even with a simple infrastructure.

6.2.4 Following the flight trials, data have been collected at Douala for further study of the ionosphere effects in the equatorial regions. A presentation on the Zone A EGNOS test bed trials can be downloaded from the ICAO website on the page of the GNSS Task Force at <http://www.icao.int/>

**EGNOS Test Bed in Southern Africa (Zone B)**

6.2.5 The test bed in Southern Africa is the result of cooperation between ATNS, Namibia, Zambia, ESA, EC and CAA South Africa. The Zone B test bed is composed of RIMS installed at Windhoek,

East London, Johannesburg and Lusaka. The communications infrastructure used to relay data to Honefoss is provided by ATNS. The test bed is providing APV-I signal quality over the area. An image of the coverage area can be seen at <http://esamultimedia.esa.int/docs/egnos/estb/results.htm>. For the moment, only static test are being conducted.

#### **EGNOS Test Bed in Eastern Africa (Zone C)**

6.2.6 The test bed in Eastern Africa involves Ethiopia, France, Kenya, ESA, EC and ASECNA. The Zone C test bed is composed of three RIMS installed at Addis Ababa, Bangui (Central African Republic) and Nairobi. The communication system at each site is provided by its administration. Ethiopia is using a leased frame relay data circuit. ASECNA and Kenya are using VSATs. The test bed is planned to be operational during the last week of March 2005. The performance of the Zone C test bed can also be seen in the same website as for the Zone B test bed at <http://esamultimedia.esa.int/docs/egnos/estb/results.htm>. Flight trials were conducted in Nairobi with the ASECNA ATR 42 aircraft on 19 May 2005.

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## *Deficiencies in ARNS field*

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Angola</i>									
	Nav aids AFI/7, Rec. 10/4	Cuito Cuanavale	VOR/DME	1998		Implement facility	ENANA		U
	Nav aids AFI/7, Rec. 10/4	Huambo	VOR/DME	1998		To repair	ENANA		A
	Nav aids AFI/7, Rec. 10/4	Kuito	VOR/DME	1998		Implement facility	ENANA		A
	Nav aids AFI/7, Rec. 10/4	Saurimo	VOR/DME	1998		Implement facility	ENANA		U
<i>Cameroon</i>									
	Nav aids AFI/7, Rec. 10/4	Foumban	VOR	1998	Not implemented	Amend AFI Plan to replace facility with Bafoussam VOR/DME	Cameroon		U
	Nav aids AFI/7, Rec. 10/4	Maroua	VOR	1998	Not implemented	Implement facility	Cameroon		U
<i>Dem. Rep. of Congo</i>									
	Nav aids AFI/7, Rec. 10/4	Kalemie	VOR/DME	1998	Unserviceable	New equipment to be installed	DR Congo	2005	U
	Nav aids AFI/7, Rec. 10/4	Kindu	VOR	1998	Unserviceable	New equipment to be installed	DR Congo	2005	U
	Nav aids AFI/7, Rec. 10/4	Kisangani	VOR/DME	1998	Unserviceable	New equipment being installed	DR Congo	2005	A
<i>Gabon</i>									
	Nav aids, AFI/7 Rec. 10/4	Port Gentil	ILS RWY 21	2001	Equipment at site	Installation in progress	ASECNA		U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
<i>Guinea</i>									
	Nav aids AFI/7, Rec. 10/4	Kankan	VOR	1998	Not implemented	Implement facility	Guinea		A
	Nav aids AFI/7, Rec. 10/4	Labe	VOR	1998	Not implemented	Implement facility	Guinea		A
	Nav aids AFI/7, Rec. 10/4	Nzerekore	VOR	1998	Not implemented	Implement facility	Guinea		A
<i>Kenya</i>									
	Nav aids AFI/7, Rec. 10/4	Mandera	VOR/DME	1998	Not implemented	Implement facility	Kenya		U
<i>Lesotho</i>									
	Nav aids AFI/7, Rec. 10/4	Maseru	VOR/DME	2002	Not implemented	To implement	Lesotho		U
<i>Liberia</i>									
	Nav aids AFI/7, Rec. 10/4	Robertsfield	ILS 04	1998	Not implemented	Implement facility	Liberia		A
<i>Libya</i>									
	Nav aids AFI/7, Rec. 10/4	Sarir	VOR/DME	1998	Not implemented	Implement facility	Libya		U
<i>Madagascar</i>									
	Nav aids AFI/7, Rec. 10/4	Antsiranana	VOR	1998	Unserviceable	To repair	Madagascar		U
	Nav aids AFI/7, Rec. 10/4	Maintirano	VOR	2002	Unserviceable	To repair	Madagascar		U
	Nav aids AFI/7, Rec. 10/4	Morondava	VOR	1998	Not implemented	Implement facility	Madagascar		U
	Nav aids AFI/7, Rec. 10/4	Sainte Marie	VOR	1998	Not implemented	Implement facility	Madagascar		A



<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	Nav aids AFI/7, Rec. 10/4	Toliara	VOR	1998	Not implemented	Implement facility	Madagascar		U
<i>Mali</i>									
	Nav aids AFI/7, Rec. 10/4	Tessalit	VOR	1998	Not implemented	Implement facility	Mali, ASECNA		U
<i>Sao Tome &amp; Principe</i>									
	Nav aids AFI/7, Rec. 10/4	Sao Tome	ILS 01	1998	Not implemented	Implement facility	Sao Tome & Principe		A
<i>Sierra Leone</i>									
	Nav aids AFI/7, Rec. 10/4	Freetown/Lungi	ILS	1999	Unserviceable	To repair	Sierra Leone		U
	Nav aids AFI/7, Rec. 10/4	Freetown/Lungi	VOR/DME	1999	Unserviceable	To repair	Sierra Leone		U
<i>Somalia</i>									
	Nav aids AFI/7, Rec. 10/4	Hargeisa	VOR/DME	1998	Not implemented	Implement facility	Somalia		U
	Nav aids AFI/7, Rec. 10/4	Mogadishu	VOR/DME	1998	Not implemented	Implement facility	Somalia		U
<i>Sudan</i>									
	Nav aids AFI/7, Rec. 10/4	Geneina	VOR	1998	Not implemented	Implement facility	Sudan		U
	Nav aids AFI/7, Rec. 10/4	Juba	ILS 13	1998	Not implemented	Implement facility	Sudan		A
	Nav aids AFI/7, Rec. 10/4	Karina	VOR/DME	1998	Not implemented	Implement facility	Sudan		U
<i>Tanzania</i>									
	Nav aids AFI/7, Rec. 10/4	Dodoma	VOR/DME	1998	Not implemented	Implement facility	Tanzania	31/12/2005	U

<i>StateName</i>	<i>Requirements</i>	<i>Facilities or Services</i>	<i>Description of Deficiency</i>	<i>Date first reported</i>	<i>Comments on Deficiency</i>	<i>Description of Corrective action</i>	<i>Executing Body</i>	<i>Target date for implement</i>	<i>Priority</i>
	Nav aids AFI/7, Rec. 10/4	Mbeya	VOR/DME	1998	Not implemented	Implement facility	Tanzania	June 2006	U
	Nav aids AFI/7, Rec. 10/4	Mwanza	DME	1998	Not implemented	Implement facility	Tanzania	June 2005	U
	Nav aids AFI/7, Rec. 10/4	Zanzibar	VOR/DME	1998	Not implemented	Implement facility	Tanzania	June 2006	A
<i>Zambia</i>									
	Nav aids AFI/7, Rec. 10/4	Mongu	VOR	1998	Not implemented	Implement facility	Zambia		U
	Nav aids AFI/7, Rec. 10/4	Solwezi	VOR	1998	Not implemented	Implement facility	Zambia		U

**Agenda Item 7: Surveillance**

7.1. Under this Agenda Item, the CNS Sub-group reviewed the status of implementation of the AFI aeronautical surveillance plan, ADS/CPDLC trials and implementation and ADS-B data link issues.

**Status of implementation of the current aeronautical surveillance plan**

7.2. The meeting was provided with information on surveillance implementation by Algeria, ASECNA, Ghana and South Africa.

7.3. Algeria informed the Sub-group of the implementation of radar coverage in the northern part of FIR Algiers, on-going ADS/CPDLC trials in the southern part of the FIR. Five monopulse SSR radars and one primary radar have been implemented at Algiers, Annaba, El Bayadh, El Oued and Oran.

7.4. Ghana updated the meeting on its radar facilities and advised of the implementation of the MSAW alerting function.

7.5. ASECNA informed the meeting on its surveillance implementation and planning activities:

FIR Antananarivo:	ADS/CPDLC implemented in 2001, with flight plan correlation.
FIR Brazzaville:	SSR and ADS/CPDLC to be implemented in 2006;
FIR Dakar:	ADS/CPDLC to be implemented in 2005.
FIR Dakar Oceanic:	
FIR N'djamena:	SSR and ADS/CPDLC implemented in 2004.
FIR Niamey:	SSR and ADS/CPDLC to be implemented in 2006.
TMA Abidjan:	SSR to be implemented in 2006.

7.6. South Africa informed the Sub-group of the completion of its radar improvement project. Three new Primary/SSR radars and five en-route monopulse SSR radars have been implemented with a national remote controlling system.

**Update of the AFI surveillance plan**

7.7. The meeting, based on the information provided and its discussions, updated Table CNS 4A – *Surveillance Systems* and Table CNS 4B – *ATS Automation Systems* as shown in **Appendix 7A** and **Appendix 7B** to this part of the report.

**ADS/CPDLC trials and implementation in the AFI Region**

7.8. The meeting was informed of on-going ADS/CPDLC trials in Algiers FIR. The objectives are to evaluate with FANS1/A equipped aircraft ground systems, the communication system and on-board equipment. The system will be used to improve air-ground communications and to provide surveillance in the southern part of FIR Algiers, which is not covered by radar. An operating manual has been prepared and sent to users, and is available at [www.enna.dz](http://www.enna.dz). Six airlines are participating on a regular basis in the trials.

7.9. South Africa informed the meeting that, following successful trials, ADS/CPDLC is being used as a primary means of surveillance and communication in the Johannesburg Oceanic airspace. Mandatory carriage, however, was not yet being promulgated.

7.10. During the discussions, the meeting noted the need for more participation by airlines in the ADS/CPDLC trials and the development by the AFI ATM Sub-group of an ADS/CPLC operation manual. The following draft conclusion and decision were adopted.

**Draft Conclusion 1/12: ADS-C/CPDLC trials**

**That operators that are already ADS-C equipped participate in the various ADS-C/CPDLC trials underway in the AFI Region.**

**Draft Decision 1/13: FANS1/A operational manual**

**That the ATM/SG prepare a FANS1/A operational manual for use in the AFI Region.**

**ADS-B data link in the AFI Region**

7.11. The meeting was apprised of the functions and operational benefits of automatic dependent surveillance broadcast (ADS-B). ASECNA advised the meeting of its plans to conduct ADS-B trials. The Sub-group discussed the ADS-B data links: Mode S extended squitter, VHF data link (VDL) Mode 4 and universal access transceiver (UAT). The Sub-group was informed of Recommendation 7/1 of the Eleventh Air Navigation Conference. After extensive discussions, taking into account the need for global interoperability, the meeting decided to recommend the adoption of Mode S extended squitter as the initial data link for introduction of ADS-B in the AFI Region. The following draft conclusion was adopted.

**Draft Conclusion 1/14: Initial ADS-B data link in the AFI Region**

**That the SSR Mode S extended squitter be the initial data link the introduction of ADS-B in the AFI Region.**

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**Table CNS 4A - SURVEILLANCE***EXPLANATION OR THE TABLE**Column*

1	Name of country and location of radar head facility or FIR
2	Area of routing
3	Air traffic services unit served by the facility or FIR
4	PSR - primary surveillance radar
5	Coverage of primary surveillance radar in nautical miles
6	SSR - secondary surveillance radar and modes implemented will be indicated within brackets, namely Modes A, C and S
7	Coverage of secondary surveillance radar in nautical miles
8	ADS-B - automatic dependent surveillance broadcast *
9	ADS-C - automatic dependent surveillance contract
10	Remarks

## Note:

The following codes are used in columns 4, 6, 8-10

I - Required and implemented. For column 6,

I stands for implementation using conventional SSR, while

MI stands for implementation using Monopulse SSR.

X - Required but implementation status not determined

N - Required but not implemented

A - existing facility provided to supplement or substitute the requirement

F - Future Plan

< - Year: planned commissioning year to be used as appropriate in conjunction with "F" and "N"

> - Year: planned commissioning year to be used as appropriate in conjunction with "A" and "I"

\* Under development

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>ALGERIA</b>	AR4								ADS trials/Essais ADS
Alger		Alger ACC			MI(A/C)	250		I	
Annaba		Alger ACC			MI(A/C)	250			
El Bayad		Alger ACC			MI(A/C)	250			
El Oued		Alger ACC			MI(A/C)	250			
Oran	Alger ACC				MI(A/C)	250			
<b>ANGOLA</b>	AR2 AR4								MSSR planned/prévu
Luanda		Luanda ACC			F<- 2003			N	
<b>BOTSWANA</b>	AR4								
Gaborone		Gaborone ACC						N	
<b>CAPE VERDE</b>	AR1								
Sal		Sal ACC						F<- 2004	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>CHAD/TCHAD</b> N'Djamena	AR4 AR5	N'Djamena ACC			I			I	
<b>CONGO</b> Brazzaville	AR4	Brazzaville ACC			F<2006			F<- 2006	
<b>CONGO (Dem. Rep. of)</b> Kinshasa	AR4	Kinshasa ACC						N	
<b>COTE D'IVOIRE</b> Abidjan	AR5	Abidjan ACC			F<2006			N	
<b>EGYPT</b> Cairo 300715N 312354E  300621N 312439E 300621N 312439E  Hurghada 270319N 335025E	AR3     AR3	Cairo ACC    Cairo ACC			MI(A/C)  MI(A/C)	250  250		I	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
Mersa Matruh 311810N 270831E		Cairo ACC			MI(A/C)	250			
Aswan 235830N 324636E		Cairo ACC			MI(A/C)	250			
Asyut 270332N 310108E		Cairo ACC			MI(A/C)	250			
<b>ERITREA</b> Asmara	AR3	Asmara ACC						N	
<b>ETHIOPIA</b> Addis Ababa	AR3	Addis Ababa ACC						F<- 2002	
<b>GHANA</b> Accra	AR5	Accra ACC			MI(A/C)	250		N	
Tamale		Accra ACC			MI(A/C)	250			
<b>GUINEA/ LIBERIA/ SIERRA LEONE</b> Robertsfield	AR5	Roberts FIC/ACC						N	



Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>KENYA</b> Nairobi	AR3	Nairobi ACC			I(A/C)	200		N	
<b>LIBYAN ARAB JAMAHIRIYA</b> Tripoli	AR3 AR4	Tripoli ACC						N	
<b>MADAGASCAR</b> Antananarivo	AR3 AR10	Antananarivo ACC						I--2001	
<b>MALAWI</b> Lilongwe	AR4	Lilongwe ACC						N	
<b>MAURITIUS</b> Mauritius	AR3 AR6	Mauritius ACC						N<- 2001	
<b>MOROCCO</b> Casablanca 332124.12N 073642.99W Agadir 301908.96N 092440.75W Ifrane 333151.87N 050926.95W Safi 321904.94N	AR1	Casablanca ACC			MI(A/C)	250		N	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
091444.078W									
<b>MOZAMBIQUE</b> Beira	AR4	Beira ACC						N	
<b>NAMIBIA</b> Windhoek	AR4	Windhoek ACC						N	
<b>NIGER</b> Niamey	AR4 AR5	Niamey ACC			F<2006			F<- 2006	
<b>NIGERIA</b> Kano	AR4 AR5	Kano ACC			F(A/C)	250		F<- 2005	
		Lagos ACC			F<2003	250		F<- 2005	
<b>SENEGAL</b> Dakar	AR1 AR5	Dakar ACC						F<- 2005	
<b>SEYCHELLES</b> Seychelles	AR3 AR6	Seychelles ACC						N	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>SOMALIA</b> Mogadishu	AR3	Mogadishu FIC						N	
<b>SOUTH AFRICA</b> Cape Town	AR2 AR4 AR6	Cape Town ACC			MI(A/C)				
Johannesburg		Johannesburg ACC			MI(A/C)				
		Johannesburg Oceanic						I	
<b>SPAIN (Canarias)</b> Gran Canaria	AR1	Canarias ACC			I(A/C)	200		I	5 radars on multi radar system
Lanzarote		Canarias ACC			I(A/C)	220		N	
Las Palmas		Canarias ACC			I(A/C)	150			
La Palma		Canarias ACC			I(A/C)	170*			<i>*Between/Entre 005°-210°</i>
Tenerife		Canarias ACC			I(A/C)	120		N	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>SUDAN</b> Khartoum	AR3	Khartoum ACC						N	
<b>TUNISIA</b>  Tunis PSR: 365135.417N 0101428.9293E Sidi Zid: 362829.0381N 0101929.0568E  Akouda 035 53 37N 010 33 46E	AR4	Tunis ACC			MI(A/C)	250		N	
		Tunis ACC			MI(A/C)	250			
<b>UGANDA</b>  Entebbe	AR3	Entebbe ACC						N	
<b>UNITED REP. OF TANZANIA</b>  Dar Es Salaam	AR3	Dar Es Salaam ACC						N	
<b>ZAMBIA</b>  Lusaka	AR4	Lusaka ACC						N	

Appendix 7A Agenda Item 7

State/Location Etat/Emplacement	AR	ATS unit served/ Organe ATS desservi	PSR	Coverage/ Couverture of/du PSR (NM)	SSR (A/C/S)	Coverage/ Couverture of/du SSR (NM)	ADS-B*	ADS-C	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10
<b>ZIMBABWE</b>  Harare	AR4	Harare ACC			I(A/C)				

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## Table CNS 4B - ATS AUTOMATION SYSTEMS

### *EXPLANATION OR THE TABLE*

*Column*

1	Name of country and location of radar head facility or FIR
2	Area of routing
3	Air traffic services unit served by the ATS automation systems. The abbreviations for this column are: ACC-Area control            AACC-Area/approach control centre APP-Approach control    EC-En-route centre            FIS-Flight information service SMC-Surface movement control    TCU-Terminal control unit TMA-Terminal control area        TWR-Tower control
4	Surveillance sensor linked to the ATS automation systems, 4-letter FIR identifier, enclosed in brackets, shall be shown for sensors outside the FIR
5	RDPS - Radar data processing system
6	FDPS - Fight data processing system
7	MSAW - Minimum safe altitude warning system
8	ADS - Automatic Dependent Surveillance
9	CPDLC - Controller-pilot data link communications
10	AIDC - ATS inter-facility data link communications
11	PA/RDPS - Processing area of the radar data processing system in (nautical miles) <sup>2</sup>
12	Npos - Number of ATS positions
13	Remarks

Note:

The following codes are used in columns 5 to 12:

I - Required and implemented.

X - Required but implementation status not determined

N - Required but not implemented

A - Existing facility provided to supplement or substitute the requirement

F - Future plan

The number of systems provided for each type of process and the year of commissioning and decommissioning:

< - Year:            planned commissioning year to be used as appropriate in conjunction with "F" and "N"

> - Year:            planned decommissioning year to be used as appropriate in conjunction with "A" and "I"

## Appendix 7B –Report on Agenda Item 7

## CNS - ATS AUTOMATION SYSTEMS/SYSTEMES D'AUTOMATISATION ATS

7B-2

State/Location Etat/Emplacement	AR	ATS unit served Organe ATS desservi	Data Source Source de données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/RDPS (NM) <sup>2</sup>	Npos	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>ALGERIA</b> Alger	AR4	Alger ACC		I	I	I	I	I	N			
<b>ANGOLA</b> Luanda	AR2 AR4	Luanda ACC			N		N	N	N			
<b>BOTSWANA</b> Gaborone	AR4	Gaborone ACC			F<- 2001		N	N	N			
<b>CAPE VERDE</b> Sal	AR1	Sal ACC			N		N	N	N			
<b>CHAD/TCHAD</b> N'Djamena	AR4 AR5	N'Djamena ACC		N	N	N	N<- 2002	N<- 2002	N			
<b>CONGO</b> Brazzaville	AR4	Brazzaville ACC			N		N	N	N			
<b>CONGO (Dem. Rep. of)</b> Kinshasa	AR4	Kinshasa ACC			N		N	N	N			
<b>COTE D'IVOIRE</b> Abidjan	AR5	Abidjan ACC			N		N	N	N			

## Appendix 7B –Report on Agenda Item 7

## CNS - ATS AUTOMATION SYSTEMS/SYSTEMES D'AUTOMATISATION ATS

7B-3

State/Location Etat/Emplacement	AR	ATS unit served Organe ATS desservi	Data Source Source de données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/RDPS (NM) <sup>2</sup>	Npos	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>EGYPT</b> Cairo	AR3	Cairo ACC		I	I	N	I	I	N			
<b>ERITREA</b> Asmara	AR3	Asmara ACC			N		N	N	N			
<b>ETHIOPIA</b> Addis Ababa	AR3	Addis Ababa ACC			I		F<- 2002	F<- 2002	N			
<b>GHANA</b> Accra	AR5	Accra ACC		I	I	I	N	N	N		3	
<b>GUINEA/LIBERIA</b> <b>/SIERRA LEONE</b> Robertsfield	AR5	Robertsfield ACC			N		N	N	N			
<b>KENYA</b> Nairobi	AR3	Nairobi ACC	Mua Hills Eldoret Poror Wajir Mombasa	I	I	N	N	N	N		4	
<b>LIBYAN ARAB</b> <b>JAMAHIRIYA</b> Tripoli	AR3 AR4	Tripoli ACC			N		N	N	N			



Appendix 7B –Report on Agenda Item 7

CNS - ATS AUTOMATION SYSTEMS/SYSTEMES D'AUTOMATISATION ATS

7B-4

State/Location Etat/Emplacement	AR	ATS unit served Organe ATS desservi	Data Source Source de données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/RDPS (NM) <sup>2</sup>	Npos	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>MADAGASCAR</b> Antananarivo	AR3 AR6	Antananarivo ACC			I-2001		I-2001	I-2001	N			
<b>MALAWI</b> Lilongwe	AR4	Lilongwe ACC					N	N	N			
<b>MAURITIUS</b> Mauritius	AR3 AR6	Mauritius ACC			N		N<- 2001	N<- 2001	N			
<b>MOROCCO</b> Casablanca Rabat	AR1	Mohamed V Radar Casablanca Radar	Casablanca Agadir Ifrane Safi	I I	I I	I I	N	N	N	11310 <sup>2</sup> 375330 <sup>2</sup>	1 5	
<b>MOZAMBIQUE</b> Beira	AR4	Beira ACC			N		N	N	N			
<b>NAMIBIA</b> Windhoek	AR4	Windhoek ACC			N		N	N	N			
<b>NIGER</b> Niamey	AR4 AR5				F<- 2004		F<- 2004	F<- 2004	N			
<b>NIGERIA</b> Kano	AR4 AR5	Kano ACC		N	N	N	N	N	N			

Appendix 7B –Report on Agenda Item 7

CNS - ATS AUTOMATION SYSTEMS/SYSTEMES D'AUTOMATISATION ATS

7B-5

State/Location Etat/Emplacement	AR	ATS unit served Organe ATS desservi	Data Source Source de données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/RDPS (NM) <sup>2</sup>	Npos	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10	11	12	13
Lagos		Lagos ACC		N	N	N	N	N	N			
<b>SENEGAL</b> Dakar	AR1 AR5	Dakar ACC			F<- 2002		F<- 2002	F<- 2002	N			
<b>SEYCHELLES</b> Seychelles	AR3 AR6	Seychelles ACC			N		N	N	N			
<b>SOMALIA</b> Mogadishu	AR3	Mogadishu ACC			N		N	N	N			
<b>SOUTH AFRICA</b> Cape Town	AR2 AR4 AR6	Cape Town ACC		I	I	N			N			
Johannesburg		Johannesburg ACC		I	I	N	I	I	N			
<b>SPAIN (CANARIAS)</b> Gran Canaria	AR1	Canarias ACC		I	I	N	I	I	N	200	ACC-8	
Lanzarote		Canarias ACC		I	I	N	N	N	N	220		
Las Palmas		Canarias ACC		I	I	I	N	N	N	150		
La Palma		Canarias ACC		I	I	N	I	I	N	170*		<i>*Between/Entre 005°-210°</i>

Appendix 7B –Report on Agenda Item 7

CNS - ATS AUTOMATION SYSTEMS/SYSTEMES D'AUTOMATISATION ATS

7B-6

State/Location Etat/Emplacement	AR	ATS unit served Organe ATS desservi	Data Source Source de données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/RDPS (NM) <sup>2</sup>	Npos	Remarks/ Remarques
1	2	3	4	5	6	7	8	9	10	11	12	13
Tenerife		Canarias ACC		I	I	I	N	N	N	120	GCTS-1	
<b>SUDAN</b> Khartoum	AR3	Khartoum ACC			F<- 2001		N	N	N			
<b>TUNISIA</b> Tunis	AR4	Tunis ACC		I	I	I	N	N	N		4 3 3	
<b>UGANDA</b> Entebbe	AR3	Entebbe ACC			N		N	N	N			
<b>UNITED REP. OF TANZANIA</b> Dar Es Salaam	AR3	Dar Es Salaam ACC			N		N	N	N			
<b>ZAMBIA</b> Lusaka	AR4	Lusaka ACC			N		N	N	N			
<b>ZIMBABWE</b> Harare	AR4	Harare ACC		I	I	N	N	N	N			

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**Agenda Item 8:           Review of ICAO position and preparations for the ITU-WRC-2007**

8.1 Under this agenda item, the meeting reviewed the *Draft ICAO position for WRC 2007* which was developed by Working Group F of the Aeronautical Communication Panel (ACP) and the Navigation Systems Panel (NSP). The Draft position was submitted to ICAO Contracting States for comments. Attention was drawn to Resolutions 415 and 416 and their direct effect on expansion of ICAO CNS/ATM systems. States were urged to participate in country and regional ITU WRC preparatory meetings (namely those of the African Telecommunications Union (ATU)) in order that ICAO position is reflected in their country's and the ATU submissions to the ITU. The following draft Conclusion was formulated:

**Draft Conclusion 1/15:           ICAO position and preparations for the ITU WRC-2007****That States and air navigation service providers:**

- a) **continue their efforts on implementation of the relevant elements of ICAO Assembly Resolution A32-13 and in particular, participate in the preparatory work of the ITU and the ATU for WRC-07;**
- b) **continue to assign high priority to the tasks relating to the protection and availability of radio frequency spectrum allocated to aeronautical services and in particular actively participate in the relevant activities of the ITU-R and the ATU; and**
- c) **that have not yet done so, provide their focal contact person for ITU matters.**

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**Agenda Item 9: Future work programme and composition of the CNS/SG**

9.1 Under this Agenda Item, the CNS Sub-group reviewed and updated its work programme and composition as shown in **Appendix 9A** to this part of the report. The following draft decision was formulated:

**Draft Decision 1/16: Future work programme and composition of the CNS Sub-group**

**That the work programme and composition of the CNS Sub-group be as shown at Appendix 9A to the report.**

9.2 The CNS Sub-group also reviewed and updated the future work programme and composition of the ATN Planning Task Force as shown in Appendix 9B to this part of the report. The following decision was adopted:

**Decision 1/17: Future work programme and composition of the ATN Planning Task Force**

**That the work programme and composition of the ATN Planning Task Force be as shown at Appendix 9B to the report.**

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## **TERMS OF REFERENCE, WORK PROGRAMME AND COMPOSITION OF THE APIRG COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS) SUB-GROUP**

### **1. Terms of reference**

- a) Ensure the continuing and coherent development of the AFI Regional Air Navigation Plan in the fields of aeronautical communications, navigation and surveillance (CNS), including the development of CNS elements of the AFI CNS/ATM Implementation Plan in the light of new developments, in harmony with the Global Air Navigation Plan for CNS/ATM Systems and the plans for adjacent regions;
- b) Identify, review and monitor deficiencies that impede or affect the provision of efficient aeronautical telecommunications and recommend appropriate corrective action;
- c) Prepare, as necessary, CNS/ATM cost/benefit analyses for the implementation options of C, N and S elements; and
- d) Study, as necessary, institutional arrangements for the implementation of C, N and S systems in the AFI Region.

### **2. Work programme**

<b>Item</b>	<b>Task description</b>	<b>Priority</b>	<b>Target date</b>
1	Analyze, review and monitor the implementation and operation of the aeronautical fixed service (AFTN, ATS/DS), mobile service (AMS) and radio navigation service (ARNS), identify deficiencies affecting aeronautical telecommunications and propose measures for their elimination, as required.	A	Continuing
2	Follow-up the integration/interoperability of VSAT networks in the AFI Region	A	Continuing
3	Follow up and monitor the implementation of VHF coverage in the AFI region in accordance with AFI/7 Rec. 5/12.	A	APIRG/16
4	Analyze and review the report of the ATN Planning Task Force on the transition from the AFTN to the ATN.	A	APIRG/16
5	Follow-up the upgrading of the transmission speed and the implementation of bit-oriented protocols for main AFTN circuits.	A	APIRG/16
6	Coordinate and follow-up the ICAO position for the ITU-WRC meetings.	A	Continuing
7	Continue, in co-ordination with the ATM Sub-group, the evolutionary development of the AFI CNS/ATM Systems Implementation Plan (AFI/7 Concl. 13/1).	A	Continuing

Item	Task description	Priority	Target date
8	In co-ordination with the ATM Sub-group, develop, as necessary, comprehensive business cases for competing CNS/ATM elements implementation options for the routing areas.	B	Continuing
9	Co-ordinate plans developed by States, international organizations, airlines and industry for the implementation of the regional CNS/ATM systems implementation plan.	B	Continuing
10	Update on a regular basis, Chapter 2 and the tables of Part. II of the Global Plan (Doc 9750).	B	Continuing
11	Review work being done by MIDANPIRG on the Egyptian initiative for a multi-mission satellite based system dedicated to CNS/ATM services and provide advice thereon.	B	APIRG/16
12	Monitor CNS/ATM systems research and development, trials and demonstrations within the AFI Region and information from other regions.	B	Continuing
13	Give further consideration, as necessary, to the concept of multinational ICAO AFI air navigation facility/service addressed in the AFI/7 Report under Agenda Item 14 (AFI/7, Conclusion 10/6c).	C	Continuing
14	Maintain current the database on CNS elements of CNS/ATM planning and implementation in the AFI Region.	B	Continuing
15	Continue the development of the AFI Aeronautical Surveillance Plan, and monitor its implementation	A	APIRG/16

**Priority:**

- A:** High priority tasks on which work should be speeded up;
- B:** Medium priority tasks, on which work should be undertaken as soon as possible, but without detriment to priority A tasks; and
- C:** Lesser priority tasks, on which work should be undertaken as time and resources permit, but without detriment to priority A and B tasks.

**3. Composition:**

*Algeria, Angola, Cameroon, Congo, Côte d'Ivoire, D.R. of Congo, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Kenya, Malawi, Mauritius, Morocco, Niger, Nigeria, Senegal, South Africa, Spain, Sudan, Tanzania, Tunisia, Zambia, ACAC, ASECNA, IATA, and IFALPA.*

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<b>TERMS OF REFERENCE, WORK PROGRAMME AND COMPOSITION OF THE AFI AERONAUTICAL TELECOMMUNICATION NETWORK PLANNING TASK FORCE (ATN/TF)</b>		
<b>TERMS OF REFERENCE</b>		
To plan for the implementation of the aeronautical telecommunication network (ATN) in the AFI Region in order to meet CNS/ATM system performance requirements and capacity.		
<b>WORK PROGRAMME</b>		
<b>TASK No.</b>	<b>SUBJECT</b>	<b>TARGET DATE</b>
<b>1</b>	<b>Refinement of the ATN routing architecture</b>	CNS/SG/2
1.1	Finalize backbone architecture and BIS interconnection Plan	CNS/SG/2
1.2	Draft ATN ground/ground Transition Plan	CNS/SG/2
1.3	Develop ATN router plan for inclusion in AFI FASID	CNS/SG/2
1.4	Develop ATN ground/ground interface control document (G/G ICD)	CNS/SG/3
1.5	Develop ATN air/ground interface control document (A/G ICD)	TBD
1.6	Finalize the ATN NSAP addressing plan	CNS/SG/2
1.7	Develop the ATN NSAP Address Registration Form	CNS/SG/2
<b>2</b>	<b>Description of the ATN ground-ground applications (AMHS, AIDC)</b>	CNS/SG/2
2.1	Develop the AMHS Naming Plan	CNS/SG/2
2.2	Develop the AMHS ICD	CNS/SG/2
2.3	Draft the AMHS Routing Plan for inclusion in AFI FASID	CNS/SG/3
2.4	Draft AMHS Message Transfer Agent Routing Policy	CNS/SG/3
2.5	Develop AMHS Address Registration Form	CNS/SG/3
2.6	Develop AIDC Circuit Plan for inclusion in AFI FASID	CNS/SG/3
<b>3</b>	<b>Preparation of guidance material to assist States, as necessary</b>	CNS/SG/2
3.1	Finalize AFI ATN Architecture Document	CNS/SG/2
3.2	Develop guidance on ground elements ATN Transition	CNS/SG/3



3.3	Overview of the ATN	CNS/SG/3
4	<b>Update of the guidelines on ATN in the CNS/ATM Implementation Plan (Doc 003)</b>	CNS/SG/2
<b>COMPOSITION</b>		
<i>Algeria, Angola, Burundi, Cameroon, DR Congo, Egypt, Ethiopia, Ghana, Guinea, Kenya, Malawi, Mauritius, Morocco, Niger, Nigeria, Senegal, South Africa, Tunisia, ASECNA and IATA.</i>		

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**Agenda Item 10 : Any other business****CNS aspects of the ICAO Universal Safety Oversight Audit Programme (USAOP) Systems Approach**

10.1 The meeting took cognizance of Assembly Resolution 35-6 on the expansion of the ICAO Universal Safety Oversight Audit Programme (USOAP) to include the safety-related provisions in all safety-related Annexes to the Convention on International Civil Aviation (Doc 7300) and the transition to a comprehensive systems approach for safety audits under USOAP, as of January 2005. It also recalled State letter AN 19/9-04/102 of 30 November 2004 containing a tentative plan of safety oversight audits to be conducted in 2005 and 2006 under the new comprehensive systems approach in the following AFI States: Gambia and Cape Verde (September 2005), Niger and Senegal (ASECNA)(March 2006), Democratic Republic of the Congo (June 2006), Benin and Togo (September 2006), Ghana, Nigeria and Sudan (November 2006), and Ethiopia (December 2006).

10.2 The meeting noted that two major tools had been developed to address the safety oversight audit process relating to the comprehensive systems approach of the ICAO Universal Safety Oversight Audit Programme. These are:

- a) the State Aviation Activity Questionnaire (SAAQ) to be completed by States and submitted to ICAO for proper evaluation and recording; and
- b) the Compliance Check List to assist States in ascertaining exhaustively the status of implementation of SARPs and in identifying any differences that may exist between the national regulations and the relevant ICAO Annex provisions.

10.3 The CNS Sub-group called upon States to submit the required information within the determined period to ensure a better coverage of CNS aspects through the new comprehensive systems approach for safety audits under ICAO USOAP.

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