FOURTEENTH MEETING OF AFI SATELLITE NETWORK (AFISNET) MANAGEMENT COMMITTEE

(SNMC/14)

(Accra, Ghana, 17 – 21 January 2005)

SUMMARY REPORT

February 2005

1. GENERAL

1.1. Introduction

1.1.1. The Fourteenth Meeting of the AFI Satellite Network (AFISNET) Management Committee was held at the Conference Room of M.Plaza Hotel, Accra, from 17 to 21 January 2005, at the kind invitation of Ghana Civil Aviation Authority (GCAA).

1.2 Objectives

1.2.1 The main objectives of the meeting were to review AFISNET Network performance against AFI Air navigation plan (ANP) requirements for AFTN and ATS/DS communications, evaluate monitoring and maintenance capabilities – including human resources -, discuss issues related to the re-engineering of the network, and exchange views on the process of transferring AFISNET services from previous Satellites IS9-03 and IS7-07 onto new generation Satellite IS10-02 completed in October/November 2004 as a first step towards the implementation of a consolidated, optimized and interoperable VSAT network in the AFI Region as recommended by APIRG/14.

1.3 Opening

1.3.1 The welcome address was given by Mr. Simon Allotey. This was followed by an opening address by the acting Director-General of GCAA, Nii Adumansa-Baddoo. The representative of the Honorable Minister of Roads and Transport, Ghana, read the minister's address. The Minister stressed on the need to re-engineer the whole network in line with current technological advancements as the current network has now aged. He further urged participants to put aside all self-interest and "in the spirit of regional cooperation come out with what will best serve the needs of humanity in general and Africa in particular" so as "to build and sustain a regional airspace that will be the safest anywhere in the world, the pride of Africa and the envy of the rest of the world.
The Board Chairman of the GCAA as well as other Board members and GCAA Management were present.

1.4 Secretariat and Officers

1.4.1 Mr. Simon Allotey, Director of Engineering, GCAA Ghana, was elected as Chairman of the meeting. He was assisted by Mr. Santigui Bangura, Deputy Secretary General, Roberts FIR and Mr. Hilaire Tchicaya, Aeronautical Telecommunications Manager, ASECNA Headquarters. Mr. Samuel T. Banfro, Deputy Manager Electronics, GCAA Ghana, acted as Secretary. Mr. Prosper Zo'o Minto'o, Regional Technical Officer, Communications, Navigation and Surveillance (CNS) from the Western and Central African Office of ICAO, assisted them as the meeting Coordinator.

1.5 Attendance

1.5.1 The meeting was attended by 44 participants from 4 States (Ghana, Liberia, Nigeria and Sao Tome and Principe and Togo), 2 international organizations (ASECNA and Roberts FIR representing 16 and 3 AFI States respectively) and 4 representatives from industry (ALCATEL and CORIS (France), COMSAT (India) and GILAT (Israel)). A list of participants is attached at **Appendix A** to this Summary Report.

1.6 Agenda of the meeting

1.6.1 The meeting's agenda is shown at **Appendix B** to this Summary Report.

2. REPORT ON DISCUSSIONS

2.1. A Summary of SNMC/14 Conclusions is given at **Appendix C** to this Summary Report**.** The following issues were of particular interest to ICAO.

AFISNET projects update

2.2 The meeting noted the with appreciation the successful cooperation between GCAA, Ghana and Benin, Sao Tome and Principe and Togo for the improvement of aeronautical communications (AFS and AMS/extended VHF radio coverage) within Accra FIR, through an important GCAA-sponsored VSAT project that will be fully implemented by end of February 2005.

2.3 GCAA also proposed to install a VSAT station in Burkina Faso to implement the ANP link Accra/Ouagadougou, subject to further coordination with CAA, Burkina Faso and ASECNA.

2.4 The meeting similarly recommended close cooperation between Sao Tome and Principe and ASECNA to solve communications deficiencies within Brazzaville FIR by implementing VSAT links between Sao Tome and ASECNA managed ATS units (Brazzaville, Douala and Libreville).

Network performance and maintenance

2.5 The meeting reviewed statistical data for 2004 on the network circuits' availability provided by Ghana, GCAA, Nigeria, NAMA and ASECNA, confirming the continued degradation of performance over the past three years, calling for an urgent implementation of corrective measures. In this connection, concerned Administrations and Organizations were requested to update their inputs to the Short-Term Enhancement Programme (STEP), the implementation of which would restore the network nominal performance and ensure its sustainability as was agreed upon at the May 2003 coordination meeting initiated by the ICAO Regional Office.

Network joint technical audit and re-engineering

2.6 Mindful of AFISNET ageing technologies pointed out by the evaluation mission carried out in July/August 2003 in Ghana, Nigeria and Senegal (ASECNA Headquarters, ICAO Regional Office) by the European Union (EU), and having noticed Administrations/Organizations' propensity to implement modifications and/or new services using proprietary equipment/systems without coordination, the meeting re-iterated the need for a *joint technical audit and re-engineering of the entire network* with the main objectives of ensuring interoperability, sustainability and full compliance with ANP requirements for aeronautical communications, including ATN elements.

2.7 Presentations were made by GILAT Satellite Networks and ALCATEL on the re-engineering of the network. Their contributions were very positive. It is expected that they, together with other manufacturers and vendors would contribute towards achieving the goals of AFISNET.

2.8 The draft terms of reference of the required network audit and re-engineering developed by the ICAO Regional Office, are shown at **Appendix D** to this Summary Report.

2.9 On the *audit management*, it was agreed that Administrations/Organizations should send their inputs, including a description of current standard and proprietary technologies they are using to ICAO for a better appreciation of interoperability requirements to be addressed within the audit and re-engineering processes with the full involvement of Administrations.

2.10 Moreover, ICAO was requested to consider managing the process of sourcing for consultancy with the expertise and appropriate technology to handle the re-engineering process, and also to investigate possible sources of funding for the project. The search should be extended to international financial institutions worldwide so as to get the best for the network.

Migration of AFISNET Network to Satellite IS 10-02

2.11 The meeting noted the successful transfer of AFISNET Network services onto Satellite INTELSAT IS 10-02 in October/November 2004, and congratulated all AFISNET members for the tremendous efforts made to implement APIRG Conclusion 14/12. However, it recognized that some stations did not properly coordinate migration operations with their correspondents and INTELSAT IOC, including frequency lining-up, and therefore requested that further coordination be carried out to implement the necessary adjustments/refinements.

Any other business

2.12 The need to define commonly used terms and abbreviations for AFISNET was raised and agreed upon. ICAO Regional Office will compile the definitions for further study by member Administrations and Organizations.

Venue and date for the next meeting

2.13 The meeting welcomed NAMA’s (Nigeria) offer to host the next meeting of the AFISNET Satellite Network Management Committee (SNMC/15). The exact date and venue for SNMC/15 will be subject to further coordination through the Secretariat and will be communicated to all SNMC members in due course.

APPENDIX A

SNMC/14 MEETING, ACCRA, GHANA, 17 – 21 JANUARY 2005

LIST OF PARTICIPANTS

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APPENDIX B

FOURTEENTH MEETING
OF THE AFI SATELLITE NETWORK MANAGEMENT COMMITTEE
(SNMC/14)

(Accra, Ghana, 17 – 21 January 2005)

AGENDA

1. Matters arising from previous meetings
2. AFISNET projects update
3. Performance of stations and contractors systems
4. Submission of turnaround times statistics by concerned organizations
5. Evaluation of the adequacy of engineering manpower resources and engineering plant to support stations
6. Discussion of operational statistics from Administrations
7. Rehabilitation of the SATCOM stations
8. Re-engineering of AFISNET by Administrations and Industry
9. Transition of AFISNET from IS9-03/IS7-07 to IS10-02 – Reports and discussions by Administrations
10. Any other business

APPENDIX C

FOURTEENTH MEETING OF THE AFI SATELLITE NETWORK (AFISNET) MANAGEMENT COMMITTEE (SNMC/14)

(Accra, Ghana, 17 – 21 January 2005)

CONCLUSIONS

Agenda item 1: Follow up of Conclusions from previous SNMC Meetings

Conclusion 14/1: Follow-up of SNMC/12 and SNMC/13 Conclusions

That concerned AFISNET member States and Organizations implement within the timeframes indicated at ***Appendix B*** the following outstanding Conclusions:

a) *12/10 - Exchange of personnel*[1] *;*

b) *13/2 - Approval of SNMC Form of Agreement ;*

c) *13/3 - Development of common software tool for statistics and adoption of common monitoring forms ;*

d) *13/4 - Technical audit of the network ;*

e) *13/5 - Establishment of SNMC Technical Working Group – STEP update ;*

f) *13/8 - Bandwidth requirements ; and*

g) *13/9 - Feed-back to the European Union-.*

Agenda item 2: AFISNET Project Update

Conclusion 14/2: Integration/Interoperability of Installed Facilities

That, in cooperation with Industry, AFISNET member States and Organizations come out with innovative solutions to identify and integrate the different technologies/proprietary equipment they have installed or are installing, to facilitate interoperability within AFISNET Network by 31 October 2005.

Agenda item 3: Performance of stations and contractors' systems

Conclusion 14/3: Development of a Common Software Tool for Statistics

That the development of a common software tool for statistics for use by all COM centres be addressed within the framework of AFISNET network re-engineering.

[1] *In coordination with ICAO, Ghana will finalize a model cooperation agreement thereon for consideration by Administrations/Organizations on a bilateral basis.*

Agenda item 4: Submission of turnaround times statistics

Conclusion 14/4: Reporting Format for Turnaround Times Statistics

That ASECNA should:

a) Develop a common Reporting format for the submission of turnaround times statistics to be circulated through the ICAO Regional Office, WACAF to all AFISNET Administrations and Organizations for their comments and prior approval by 30 April 2005; and

b) Advise AFISNET Administrations and Organizations by 30 April 2005 on common equipment parts they are capable of repairing, with a view to boosting cooperation and further cutting turnaround times down.

Agenda item 5: Evaluation of adequacy of engineering manpower resources/plants

Conclusion 14/5: Short-term Enhancement Programme (STEP)

That AFISNET Administrations and Organizations update their respective inputs to the Short-term Enhancement Programme (STEP) using the form shown at ***Appendix C***, and send the completed forms to the ICAO WACAF Regional Office by 15 March 2005.

Conclusion 14/6: AFS Survey

That AFISNET COM centres carry out a three-day survey on AFS (AFTN and ATS/DS) performance from 15 to 17 March 2005 (inclusive) using the forms developed by the meeting, and send the completed AFS survey to the ICAO WACAF Regional Office by 30 March 2005.

Agenda item 6: Discussion of operational statistics

Conclusion 14/7: Repair/Maintenance of malfunctioning systems

That ASECNA take the necessary steps to ensure that Abidjan and Brazzaville stations are rehabilitated by 31 August 2005 to complete the network migration unto Satellite IS 10-02, in coordination with Intelsat and all concerned correspondents.

Conclusion 14/8: Operational statistics

That, as from 28 February 2005, technical statistics be submitted alongside end-user statistics when presenting operational statistics. Statistical graphs should be presented in color to the maximum extent possible.

Conclusion 14/9: Periodicity of statistical information exchange

That Administrations and Organizations exchange information on technical faults and problems as well as operational statistics on a monthly basis, and designate their focal points of contact for this purpose. In so doing, any available channels for such information exchange, including the public Internet should be used.

Conclusion 14/10: AFTN re-routing arrangements

That when considering re-routing of AFTN traffic via other centres, AFISNET Administrations coordinate with the concerned correspondents and provide reasons for such an action.

Agenda Item 7: Rehabilitation of SATCOM Stations

Conclusion 14/11: Repair of faulty NAMA AFTN Message Switch (AMS)

That NAMA ensure that the faulty AMS equipment in Lagos is replaced by 31 October 2005 to restore AFTN traffic flow with correspondent stations. Meanwhile, continuity of service is ensured via Kano facility.

Agenda Item 8: Re-engineering of AFISNET

Conclusion 14/12: Terms of reference/Requirements

That AFISNET Administrations and Organizations study and endorse the draft terms of reference for the technical audit and re-engineering of the network shown at ***Appendix D***, and send their comments to the ICAO Regional Office WACAF by 28 February 2005.

Agenda Item 9: Migration to satellite IS 10-02

Conclusion 14/13: AFISNET Migration and Steps Forward

That concerned AFISNET Administrations/Organizations:

a) Coordinate post-migration activities as required;

b) Provide no later than 10 February 2005 their inputs to the consolidated Report/working paper on AFISNET migration to IS 10-02 to be presented to APIRG CNS/SG, including performance assessment using the format to be developed by ICAO Regional Office and sent to them by 25 January 2005; and

c) Call for the early migration of other sub-regional VSAT networks to IS 10-02 to expedite implementation of interoperability requirements between aeronautical VSAT networks at regional level as recommended by APIRG.

Agenda Item 10: Any other business

Conclusion 14/14: CNS Deficiencies

That AFISNET Administrations and Organizations:

a) take immediate corrective measures to restore all identified AFS non-operational links ; and

b) amend the list of CNS deficiencies in preparation for the forthcoming APIRG CNS/SG meeting (Dakar, 7-8 April 2005).

Conclusion 14/15: AFS links between Sao Tome and adjacent ASECNA managed ATS Units

That, as a matter of urgency, the ICAO Regional Office, WACAF convene a coordination meeting in Dakar, in order to find out ways and means of expediting the implementation of AFS links between Sao Tome and its adjacent ASECNA managed ATS units in Brazzaville, Douala, Libreville and Malabo, based on traffic analysis.

Conclusion 14/16: Protection/Management of Aeronautical Radio Frequency Spectrum

That Administrations and Organizations:

a) Provide their comments on draft ICAO position on items of interest to aviation on the agenda of ITU WRC-2007 by 31 January 2005, as requested in ICAO State Letter E 3/5-04/99 of 30 November 2004;

b) Support the ICAO final position for the ITU WRC-2007; and

c) Take all necessary steps at national, regional and international levels, to ensure that the aviation interests are safeguarded and that the required radio frequency spectrum is protected against harmful interference.

APPENDIX D

AFI SATELLITE TELECOMMUNICATION NETWORK (AFISNET)

Technical Audit and Re-engineering of the Network

Draft Terms of Reference

1 –Objectives :

1.1 The main objectives of the network audit are to:

a) identify its deficiencies and non-ICAO, WMO and ITU compliant elements/features;

b) make recommendations and proposals concerning the short-term, mid-term and long-term solutions and strategies to be implemented using appropriate modern technologies for achieving an enhanced, efficient, high performance, secure, CNS/ATM capable and cost-effective network, meeting interoperability and seamlessness requirements ; and

c) evaluate the anticipated costs in view of a comprehensive project document to support a collective financing mechanism.

2 - Network presentation and functionalities

Presentation

2.1 The network was designed as a closed user group network. Before it is established on Intelsat Satellite IS 10-02 at 359 degrees East, the continental part of the network was established on Intelsat Satellite IS 903 located at 325.5 degrees East, using the IBS operating mode on Transponder 105/105, zone beam, in B-polarization. Thereafter, as a result of a multi-vendor environment during its expansion phase, proprietary features have progressively been introduced by Administrations and Organizations as shown at **Appendix**…

Functionalities

2.2 The network was originally designed to support the following communication services in accordance with the Air navigation plan for the Africa-Indian ocean (AFI) Region:

1) ATS Direct Speech between adjacent FIRs;
2) Aeronautical Fixed Telecommunications Network (AFTN);
3) Operational meteorological data exchanges (OPMET);
4) Operational Aeronautical Information Services exchanges.
5) Support for remote VHF voice;
6) Aeronautical Administrative support (AAC);

2.3 In addition to these services, the following communications will also be progressively supported by the network:

1) Aeronautical Telecommunications Network (ATN)
2) GNSS augmentation data transmission.

3) Computer-to-computer data exchanges (ICC) between ATS Flight Data Processing Systems (FDPS); and

4) Air/ground data link applications (ADS/CPDLC, ADS-B, DFIS) (VDL or SSR Extended Squitter - ES1090).

3 – Reference documentation

3.1 The technical audit shall be conducted using relevant provisions contained in ICAO, WMO and ITU standards, recommendations, regulations, manuals and procedures (ICAO Annex 10, WMO Technical manual on GTS – Doc 386, ITU Radio regulations), AFI Air navigation plan (Doc 7474), AFI CNS/ATM plan (Doc 003), APIRG Reports, SNMC meeting Reports and European Union Evaluation Mission Report (2003).

4 – Expectations

4.1 The audit shall provide a detailed description and analysis of the current network features, performance and operating/maintenance costs. The following constituents shall addressed:

a - Technical

- Availability, continuity and reliability requirements;
- System maintainability;
- Frequency plan;
- Adequacy of available bandwidth for AFTN, ATS/DS, service channels and other voice services;
- Architecture, satellite access techniques, protocols;
- Configuration management;
- Interoperability requirements;
- Ability to accommodate CNS/ATM emerging technologies (ATN applications) and SADIS operations;
- Bit-oriented protocols (BOPs).

b - Operational

This part of the audit shall clearly show up the advantages and disadvantages associated with the current network. In this connection, the following issues shall particularly be analyzed:

- Quality of service for ground-to-ground applications and air-to-ground applications, based on ICAO and WMO requirements;
- Network security, confidentiality and data integrity;
- AFTN transit times against the agreed requirements;
- Implementation of TCP/IP protocol stack.

The audit shall clearly establish the extent to which the network performances are SARPs-compliant and meet users' needs.

c - Economic/Financial

This part of the audit shall include comparative cost-effectiveness, value for money and cost-benefit analyses related to systems acquisition, installation, operating and maintenance costs, together with proposals taking due account of the quality of the services rendered to users. A cost-recovery mechanism together with appropriate institutional arrangements shall also be studied based on existing examples in the Region.

System configuration and performance assessment

4.2 The auditor shall assess and provide advice on the following:

AFTN	ATS/DS	CNS/ATM
• Suitability of network topology taking into consideration ICAO specifications concerning continuity of services; • X25 links routing tables; • Message switch/X25 switch/Frame relay combination: performance assessment (dialogue, conflicts, etc.); • X25 encapsulation using Frame Relay; • Congestion, loss of AFTN messages, propagation times and quality of service (QoS).	• Topology conformance to ICAO specifications to ensure continuity of services • Implementation of voice links using Frame relay protocol stack. • Priority management, connection time, and QoS.	• Possibility of implementing a number of CNS/ATM functionalities (AMHS, AIDC, ADS/CPDLC, D-FIS, etc.) and meeting availability, reliability integrity and continuity performance criteria using the network infrastructure.

Enhancements

4.3 After a critical analysis of the network, showing the network capabilities and limitations, the audit shall propose corrective measures and/or adequate solutions to rectify any Reported deviations (as required), and formulate proposals for the network re-engineering. These shall include use of appropriate technologies, suitable topologies for ATS communications (ATSC) and aeronautical administrative correspondence (AAC), system reliability, data integrity, as well as network management, administration, monitoring and maintenance policies, including development of a common software tool for statistics.

5 – Audit requirements

Duration:

5.1 The audit shall be completed within three (3) months.

Audit management:

5.2 The auditor shall prepare a work programme for the conduct of the audit. Technical proposals from the auditor shall include the methods of work, need for resources, site visits and planning.

Audit Report:

5.3 The draft Report on the audit shall be compiled within thirty (30) days following the end of the audit, and circulated to the States and Organizations through the ICAO Regional Office, Dakar for their prior comments before it is finalized.

6 – Auditor's profile

6.1 The auditor to be selected with the assistance of ICAO, shall have the following references and experience:

- Solid references in the field of satellite telecommunications, including the types of the network operated earth stations;
- Sound knowledge of ICAO, WMO and ITU standards, recommendations and procedures;
- Excellent command of satellite networks management, administration, operations and maintenance; and
- Good experience with the INTELSAT system and knowledge of INMARSAT system.

FIRS/ STATES	SATELLITE		SATELLITE ACCESS TECHNIQUE		TRANSPONDER/ COVERAGE		FREQUENCY BAND		POLARI-ZATION		OPERATIONS MODE	
	Before Migration	After Migration	Before Migra-tion	After Migra-tion	Before Migration	After Migration	Before Migra-tion	After Migra-tion	Before Migra-tion	After Migra-tion	Before Migration	After Migration
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
ACCRA FIR Benin, Ghana, Sao Tome and Principe, Togo												
ANTANANARIVO FIR Comoros, Madagascar, La Reunion Island												
BRAZZAVILLE FIR Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, Sao Tome and Principe												
DAKAR FIR Cote d'Ivoire, Gambia, Guinea Bissau, Mali, Mauritania, Senegal,												
JOHANNESBURG FIR South Africa												
KANO FIR Nigeria												
MAURITIUS FIR Mauritius												
NDJAMENA FIR Cameroon, Chad, Central African Republic, Niger												
NIAMEY FIR Mali, Niger, Benin, Burkina Faso												
ROBERTS FIR Guinea, Liberia, Sierra Leone												
