INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
TWENTEENTH MEETING (APIRG/20)**

Yamoussoukro, Cote d'Ivoire (30 November – 2nd December 2015)

Agenda Item 2: Performance Framework for Regional Air Navigation Planning and Implementation

2.4 Communications, Navigation and Surveillance (CNS)

COMMUNICATIONS SYSTEMS:
AERONAUTICAL FIXED SERVICE, AERONAUTICAL MOBILE SERVICE

(Presented by the Secretariat)

SUMMARY
This working paper presents the report of the Sixth Meeting of APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/6, Dakar, Senegal, 18-22 May 2015) on Communications Systems for aeronautical fixed and mobile services for consideration by APIRG/20.
Action by the meeting is at paragraph 3.
REFERENCES : ▪ ICAO SP AFI RAN 2008, Report (Doc 9930) ▪ APIRG/19 Report ▪ APIRG Extraordinary Report ▪ CNS/SG/6 Report

Strategic Objective(s)	This working paper related to the Strategic Objectives **A**: ***Safety; B: Air Navigation Capacity and Efficiency*** Related **ICAO ASBU Performance Improvement Areas and Block0 Modules**: **PIA1 (*B0-FICE*); PIA2 (*B0-DATM, B0-AMET*) PIA3 (*B0-FRTO, B0-NOPS, B0-ASEP, B0-OPFL, B0-SNET*);**

1. INTRODUCTION

1.1 The Sixth Meeting of the APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/6) was held in Dakar, Senegal from 18 to 22 May 2015. It was attended by fifty two (52) participants from Seventeen (17) Contracting States, three international organizations namely AFCAC, ASECNA and the Roberts FIR. This working paper presents the report of the APIRG Communications Navigation and Surveillance Sub Group sixth meeting on Aeronautical Fixed Service (AFS) and Aeronautical Mobile Service (AMS).

2. DISCUSSION

2.1 The meeting examined the status of implementation of the Conclusions and Decisions of the CNS/SG/5 meeting held in Nairobi, Kenya from 16 to 19 September 2013 and endorsed by APIRG 19th meeting, Dakar, Senegal, 28- 31 October 2013.

Implementation and performance of the Aeronautical Fixed Service (AFS)

2.2 Examining the status of implementation of the AFI Plan, the meeting noted the effort made by AFI States to comply with the AFI ATS/DS implementation plan with significant improvements, notably with the implementation of aeronautical satellite telecommunications networks.

2.3 The meeting identified the ATS/DS deficiencies reported in the AFI Region, in respect of international standards and recommended practices (SARPs) and requirements in the air navigation plan (ANP) and agreed that in the framework of the implementation of ATN Ground/Ground application, the emerging IP based technology is reaching its status of maturity; trials on Voice over IP (VoIP) have been conducted successfully in AFI neighboring regions.

2.4 In order to improve the availability and Quality of Service, the AFI Region should implement Conclusion 19/25 of APIRG 19 which calls upon States to consider VoIP as an alternative to the current point to point based ATS/DS with respect to the reference to guidelines for the implementation of VoIP as ATN Ground Application provided in ICAO Manual for the ATN using IPS Standards and Protocols (Doc 9896) Part III (Guidance Section).

2.5 The meeting also reviewed the status of implementation of AFTN, identified its deficiencies and encouraged State/Organizations to conduct the appropriate actions aiming to restoring the performance of the Aeronautical Fixed Services (ATS/DS-AFTN) with regard to the identified deficiencies presented in **Appendixes 1&2** to this Working Paper.

The following Draft Conclusion was formulated:

DRAFT CONCLUSION 20/XX: RESTORATION OF THE PERFORMANCE OF AFS CIRCUITS

That:

As a matter of urgency, concerned Administration/Organizations endeavor to restore the performance of Aeronautical Fixed Services (ATS/DS & AFTN) circuits as presented in Appendixes 1 and 2.

2.6 The meeting examined the work conducted by the Task Forces on the ATS Message Handling System (AMHS/TF). In this regard the meeting reviewed the planning and implementation activities by AFI States and noted the progress made in the implementation of AMHS in the AFI Region as reflected in the table developed by the Secretariat in **Appendix 3**.The meeting applauded the draft **AFI AMHS Manual** attached in **Appendix 4** as well as the AFI **AMHS Manual and IP Infrastructure Test Guidelines** developed by the study group tasked by the AFI/AMHS/TF 2nd meeting en presented at **Appendix 5** to this working paper. The meeting proposed to adopt these basic documents in order to provide the region with harmonized scheme and guidance for the implementation of AMHS.

2.7 Trials were reported to have been conducted in the region in particular by ATNS (South Africa) and by ASECNA. It was agreed that States/organizations shall develop/revise their AMHS implementation plans and establish bilateral Memoranda of Understanding (**MoUs**) for the interconnection of AMHS systems and inform the Secretariat for the update of the AFI AMHS implementation table. The following draft Conclusion was formulated:

DRAFT CONCLUSION 20/XX: IMPLEMENTATION OF AMHS

That:

Administration/Organizations develop AMHS implementation plans and establish bilateral Memoranda of Understanding (MoUs) for the interconnection of AMHS systems and inform the Secretariat for the update of the AFI AMHS implementation table.

2.8 It was reported to the meeting that during the trials the limitation of the speed of the current ground/ground circuits was experienced. It was agreed to upgrade the VSAT Backbone to support the interconnection and operation of AMHS. The following Draft Conclusion was formulated:

DRAFT CONCLUSION 20/XX: UPGRADE OF VSAT BACKBONE TO SUPPORT THE INTERCONNECTION AND OPERATION OF AMHS

That:

Based on the results of the trials undertaken by ANSPs (ATNS, ASECNA), the current VSAT based ground/ground communication backbone be upgraded to support the interconnection and operation of AMHS.

Implementation and performance of Aeronautical Mobile Service (AMS)

2.9 The meeting discussed issues related to Aeronautical Mobile Service and recalled **Recommendation 6/20** of the Special AFI/RAN meeting (held in Durban, South Africa from 24 to 29 November 2008) calling upon States and Air Navigation Service Providers (**ANSPs**) utilizing high frequency (**HF**) for air-ground communications to develop procedures for selection of operational frequencies taking into account ionospheric propagation forecasts in order to improve HF analogue communications in the AFI Region. Although some ANSPs such as ASECNA reported to have purchased software on HF propagation forecast, the meeting noted a low pace of implementation of this Recommendation.

2.10 The meeting also noted that HF Data Link (**HF DL**) has been identified by the ICAO Global Air Navigation Plan (**GANP- Doc. 9750 4th Ed**.) as a technology candidate for the provision of a more reliable bidirectional air ground communication. However in the AFI region the implementation of HF Data Link for air ground communication is not formally scheduled although this Region comprises huge oceanic and remote continental airspaces. The meeting agreed that it would be advisable to envisage the introduction of HF Data Link within the region as part of sub infrastructure components to support ATN ground/air applications. This implementation should be based on the provision of the ICAO GANP in the framework of the ICAO Aviation systems blocks Upgrade (**ASBU**) concept and methodology and should inter alia take into consideration:

- Traffic characteristics (*volume, flow, profiles, growth*…) within AFI homogeneous Areas of Routing (A-R);
- Users requirements (PBN constraints);
- Fleet equipage (current and trend); and
- Cost/benefit analysis.

2.11 The meeting reviewed the status of implementation of VHF coverage and noted continuous effort and initiative undertaken by States and Organizations to increase the VHF coverage of the remote continental airspaces and ensure the reliability of the VSAT extended VHF stations. The meeting noted that within the continental airspaces, the satellite C-Band VSAT based remote VHF networks implemented since the early 2000 seems to have reached its maturity cycle of life. Most of the AFI ANSPs have successfully implemented remote stations ensuring extended VHF coverage in their FIRs and some of them such as ASECNA and Roberts FIR are about to implement redundant VHF remote facilities to increase service availability. However some ANSPs were reported to be experiencing difficulties on the reliable operation of the new remote VHF stations namely:

- **NAMA** (Nigeria) is experiencing lack of coverage in the center portion of the Kano FIR.
- **RVA** (DRC) encountered power supply hurdles that were programmed to be solved by the installation of solar cells and;
- **ENANA** (Angola) is facing many barriers related to power supplies, adapter interfacing the facilities on the ATCs desks, human factors affecting technical and operational staff.

Table in the attached **Appendix 6** which needs to be updated by States/Organizations provides a list of deficiencies for VHF communications identified by CNS/SG/6.

2.12 The meeting reviewed the status of implementation of CPDLC in the AFI Region and noted the progress made by States/Organizations (Thirteen (13) ANSPs have implemented ADS-C/CPDLC systems in the region and nine (9) are in advanced stage to carry out this system). However those data link services were implemented without proper coordination of systems performance, monitoring and reporting of anomalies/deficiencies. Many events have been reported where causes of technical dysfunctions could not be identified either by ANSPs or operators.

2.13 The meeting noted that although it is the responsibility of States as part of implementing data link services to monitor operations performance and analyze problem reports, the APIRG Conclusion 19/30 requesting stakeholders to explore available options to establish a Data Link Central Monitoring and Reporting Agency (**DL/CMRA**) for the AFI region in the view to ensure effective operations, monitoring and reporting of ATS data link applications, was not implemented.

2.14 Taking into account three options proposed by the users (IATA) for the funding of the DL/CMRA, the meeting established an Ad'hoc Study Group composed of Cape Verde, Ghana, and ASECNA tasked to identify and propose the main functions of an AFI DL/CMRA, the appropriate organizational framework and the cost effective funding mechanisms. The following Draft Conclusion was formulated:

DRAFT CONCLUSION 20/XX: ESTABLISHMENT OF AN AD'HOC STUDY GROUP FOR THE IMPLEMENTATION OF A DATA LINK CENTRAL MONITORING AND REPORTING AGENCY (DL/CMRA)

That;

An Ad'hoc Study Group is established with the mandate to identify and propose:

1. **the main functions of an AFI DL/CMRA.**
2. **the appropriate organizational framework.**
3. **the cost effective funding mechanisms.**

The Ad'hoc Study Group composed of the following Administration & Organizations: Cabo Verde, Ghana, ASECNA will carry out its mandate through electronic conferences and report to the Secretariat of CNS/SG for submission to APIRG/20.

3. CONCLUSION

The meeting is invited to:

a) Note the information presented in this working paper; and

b) Review and take Conclusions and Decisions on Aeronautical Fixed (ATS/DS/VoIP; AFTN/AMHS) and Mobile (HF/VHF-CPDLC) services planning implementation and operation in the AFI Region, in line with the information given in this working paper.

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