INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
NINETEENTH MEETING (APIRG/19)
Dakar, Senegal (28 – 31 October 2013)

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.4 Communications, Navigation and Surveillance (CNS)

COMMUNICATIONS SYSTEMS:

AERONAUTICAL FIXED SERVICE, AERONAUTICAL MOBILE SERVICE, AERONAUTICAL SPECTRUM AND GENERAL CNS ISSUES

(Presented by the Secretariat)

SUMMARY	
This working paper presents the report of the Fifth Meeting of APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/5, Nairobi, Kenya, 16-19 September 2013) on Communications Systems for aeronautical fixed and mobile services, Aeronautical Spectrum issues and general CNS issues, for consideration by APIRG/19.	
Action by the meeting is at paragraph 3.	
REFERENCES : ICAO SP AFI RAN 2008, Report (Doc 9930) APIRG/18, Report	
Strategic Objective(s)	This working paper related to the Strategic Objective C

1. INTRODUCTION

The Fifth Meeting of the APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/5) was held in Nairobi, Kenya from 16 to 19 September 2013. It was attended by twenty two (22) delegates from ten (10) Contracting States and one (1) international Organization representing 16 other Contracting States.

This working paper presents the report of the APIRG Communications on Aeronautical Fixed Service, Aeronautical Mobile Service, Aeronautical Spectrum and General CNS related issues.

2. DISCUSSION

Review of APIRG previous conclusions and decisions pertaining to CNS

2.1 In accordance with APIRG Decision 18/01(Review and Update of APIRG Conclusions and Decisions), the CNS Sub-Group reviewed the conclusions and decisions of APIRG previous meetings (from APIRG/13 to APIRG/17) related to CNS, as shown in **Appendix 3.4A** to this working paper. Table 1 below provides a summary of the assessment carried out by the CNS Sub-Group, showing that, out of a total of 137 conclusions and decisions, 74 are no longer valid or redundant, 37 remain valid and 26 which are related to more than one discipline (e.g. CNS/ATM related) need further coordination with other APIRG sub-groups.

Table 1

Status	APIRG/13	APIRG/14	APIRG/15	APIRG/16	APIRG/17	Total
No longer Valid or Redundant	29	14	14	10	7	74
Valid	03	03	05	08	18	37
Status to be coordinated with ATM and/or other Sub-Groups	12	06	01	05	02	26
Total	44	23	20	23	27	137

2.2 The following draft decision was formulated

DRAFT DECISION 19/XX: REVIEW AND UPDATE OF THE CONCLUSIONS AND DECISIONS FROM PREVIOUS APIRG MEETINGS

That:

APIRG conclusions and decisions related to CNS be updated as shown at Appendix 3.4A to this working paper.

Status of implementation and performance of the Aeronautical Fixed Service (AFS)

2.3 The CNS Sub-Group reviewed the status of implementation and performance of AFS requirements, as contained in the AFI Air Navigation Plan (ANP), FASID Tables CNS 1A (AFTN Rationalized Plan) and CNS 1D (ATS/DS Plan). It noted that most of the requirements had been implemented by the States. However, some of the required AFTN circuits (such as Addis-Ababa/Asmara, Addis-Ababa/Djibouti) and ATS/DS circuits (such as Addis-Ababa/Asmara, Bujumbura/Kinshasa, Djibouti/Hargeisa, Kigali /Kinshasa) were yet to be implemented.

Aeronautical Fixed Telecommunication Network (AFTN)

2.3.1 The meeting noted that the implementation of aeronautical satellite telecommunications networks had significantly improved AFTN circuits' availability in the Region. The specified minimum of 97% stated in the AFI Air Navigation Plan (AFI/7 Recommendation 9/3) was met by most of the circuits.

Addressing Missing flight plans

2.3.2 The CNS Sub-group discussed the longstanding issue of missing flight plans in the AFI Region, in coordination with the ATM/AIM/SAR Sub-group. Mindful on the inherent safety risks, the two Sub-Groups identified a number of contributing factors which are reflected in WP/14 of this meeting.

2.3.3 The CNS Sub-Group noted a study conducted by ASECNA on missing flight plans in twelve (12) ATS centres from August 2012 to April 2013, as a follow up to APIRG Conclusions 18/17 and 18/18. Out of a total of 49594 flights which had been monitored during this period, 41887 flight plans (84%) were received and 7707 flight plans (16%) were missing. The analysis showed the breakdown of received/missing flight plans according to ICAO regions, ATS centres and air operators. 61.09% of the missing flight plans were not sent to appropriate ATS units due to lack of knowledge of airspace structure/ATS responsibilities, 38.57% were not investigated due to lack of information from ATS centres, and 0.34% were not filed by operators.

2.3.4 The CNS Sub-Group was presented with the investigation procedure and mitigation measures developed and implemented by ASECNA at its managed centres, with positive results. The CNS Sub-Group requested the Secretariat to circulate these investigation procedures and mitigation measures to AFI States. The meeting also noted that South Africa (ATNS) has developed and successfully implemented a similar procedure.

Air Traffic Services Direct Speech circuits

2.3.5 The CNS Sub-Group recognized that in the AFI Region, the ATS/DS network is based on point to point circuits, and that the implementation of ATS voice switching and signaling system would facilitate the automation of backup links for ATS/DS which are currently provided through satellite telephone or public telephone switched network (PSTN) links. The CNS Sub-Group therefore encouraged the States to gradually implement ground-ground communications using Voice over Internet Protocol (VoIP), and conduct coordinated trials prior to operational implementation. The following draft conclusion was formulated:

DRAFT CONCLUSION 19/XX: IMPLEMENTATION OF VOICE OVER IP FOR ATS/DS

That:
AFI States implement Voice over IP-VoIP as an evolution of the current point-to-point ATS/DS system, and conduct coordinated trials on VoIP prior to operational use.

Review of the report of the Second Meeting of the AFI AMHS Implementation Task Force

2.4 The CNS Sub-Group reviewed the report of Second Meeting of the AFI ATS Message Handling System Implementation Task Force (AFI AMHS/I/TF/2), which was held at the ICAO Western and Central Regional office, Dakar, Senegal from, from 30 to 31 May 2013, back to back with a Regional Workshop on ATS Message Handling System which took place from 28 to 29 May 2013.

2.4.1 The CNS Sub-Group noted that AFI States had been implementing AMHS on a national basis only, although implementation guidelines for international AMHS links were already available. It accordingly reiterated the need for AFI States to conclude bilateral and/or multilateral agreements using the model developed by the AMHS Task Force, and conduct trials to ascertain interoperability of their implemented AMHS systems. The entire report on AFI AMHS/I/TF/2 is accessible on the ICAO public website *(http://www.icao.int)*.

AFI AFTN Routing Directory

2.4.2 The CNS Sub-Group noted that Task Force reviewed and updated the AFI Routing Directory. The last Edition of the Routing Directory was published in 2004. The Secretariat is coordinating further updates from the States that have not yet provided the required data**.**

Future Work of the AMHS Implementation Task Force

2.4.3 The CNS Sub-Group discussed further work to be carried out by the AMHS Implementation Task Force, including the development of an AFI AMHS Manual as well as Guidelines for Internet Protocol (IP) tests and AMHS Training. These guidelines are intended to facilitate interconnection and interoperability of States' AMHS and the development and implementation of States' training programmes and training plans. States were encouraged to take advantage of the available training in the AFI Region, training activities conducted by ICAO as well as the EUR ATS Messaging Management Centre (AMC) online training platform. The following draft decision was formulated:

DRAFT DECISION 19/XX : DRAFT GUIDELINES FOR THE IMPLEMENTATION OF AMHS SYSTEMS IN THE AFI REGION

That:

The AMHS Implementation Task Force should complete its work on the Draft AFI AMHS Manual, Draft Guidelines on Internet Protocol (IP)–based Infrastructure Tests and Draft AMHS Training Guidelines by 30 March 2014; and

The Secretariat circulate the above Draft Guidelines to be developed by the AMHS Task Force (when available), as an interim measure to facilitate their early implementation by States; pending their submission to the next APIRG meeting for formal adoption.

2.4.4 Following discussions, the CNS Sub-Group agreed to amend the terms of reference, composition and work programme of the AFI AMHS Implementation Task Force as shown in **Appendix 3.4B** to this working paper.

Aeronautical Mobile Service (AMS)

Very High Frequency Communications (VHF)

2.5 The CNS Sub-Group acknowledged the significant improvement in the extension of VHF radio coverage in most flight information regions (FIRs). However, there was still poor VHF radio coverage in some FIRs such as Luanda and Kinshasa FIRs. The CNS Sub-Group urged the concerned States to expedite AMS improvements within these FIRs, preferably using existing aeronautical VSAT networks. The following draft conclusion was formulated:

DRAFT CONCLUSION 19/XX: IMPROVEMENT OF AMS IN KINSHASA AND LUANDA FIRs

That:

Angola and the Democratic Republic of the Congo should expedite the implementation of AMS improvements using existing VSAT networks by no later than 30 June 2014, and report progress made to the relevant ICAO Regional Offices and to next meeting of the APIRG.

Controller-Pilot Data Link Communications (CPDLC)

2.6 The meeting noted that thirteen (13) AFI States[1] have implemented controller-pilot data link communications (CPDLC) procedures, and nine (9) other States have plans to implement the same in 2014 and 2015, in order to enhance air-ground communications in oceanic and remote continental airspace, and to mitigate the geographical challenges limiting VHF radio coverage extension, as well as the limitations inherent to HF radio communications.

*Review of the Report of the Third Meeting of the AFI Frequency Management Group (AFI/FMG/3***)**

2.7 The meeting reviewed the Report of the Third Meeting of the AFI Frequency Management Group which took place in Nairobi, Kenya, from 18 to 19 July 2013. After considering the terms of reference of the FMG as defined by APIRG/18, and the relevant activities of ICAO Aeronautical Communication Panel Working Group F, the FMG assessed progress made in the implementation of the Conclusions and Decisions from its previous meetings and from APIRG/18 meeting. The Group also reviewed the outcome of the ITU WRC-2012. The entire report of AFI/FMG/3 can be downloaded from the ICAO public website (*www.icao.int/esaf*, *www.icao.int/wacaf*).

2.8 The CNS Sub-group reiterated the need for a permanent coordination framework between national Civil Aviation and Telecommunications Authorities. It also discussed the implementation of WRC-12 Resolution 154 on the protection of the Frequency Band 3.400 – 4.200 MHz (C-Band) operated by aeronautical VSAT in the AFI Region and other ICAO Regions. The following draft conclusions were formulated:

DRAFT CONCLUSION 19/XX: COORDINATION BETWEEN CAAS AND NATIONAL TELECOMMUNICATION REGULATORY AUTHORITIES

That:
States establish a coordination framework and procedures between national Civil Aviation Authorities and Telecommunications Authorities with the assistance of the ICAO Regional Offices as required, in order to facilitate efficient provision, operation and protection of aeronautical frequency spectrum.

DRAFT CONCLUSION 19/XX: MONITORING AND REPORTING OF CASES OF INTERFERENCE TO AERONAUTICAL SPECTRUM

That:
States support the studies called for under ITU WRC-12 Resolution 154 by:

a) ensuring that their operated aeronautical frequencies are duly registered in the ITU Master International Frequency Register through Telecommunications Authorities and notified to the ICAO Regional Offices for inclusion in the global and regional frequency databases; and
b) monitoring and reporting to ITU all cases of interference caused to aeronautical frequencies, such as interference from International Mobile Telecommunications (IMTs) in the frequency band 3.4 – 4.2 GHz (C-Band) used by aeronautical VSATs, for consideration by ITU WRC Working Parties.

2.9 The proposed AFI FMG terms of reference, composition and future work programme are provided at **Appendix 3.4C** to this working paper. *(See Appendix A Draft Decision 5/24)*

Review of ICAO position, including updates and preparations for the ITU-WRC -2015

[1] CPDLC procedures are operational in Accra, Antananarivo, Brazzaville, Dakar Terrestrial, Dakar Oceanic, Johannesburg, Mauritius, Ndjamena, Niamey, Sal Oceanic, and Seychelles flight information regions.

2.10 The meeting was informed that the ICAO Council, at the 4th meeting of its 199 Session on 27 May 2013, had approved the ICAO position on issues of critical concern to aviation which are on the agenda of the International Telecommunication Union (ITU) World Radiocommunication Conference (2015) (WRC-15). The ICAO position was sent to ICAO Contracting States under a State letter E 3/5.15-13/57 dated 2 July 2013, requesting States to consider the ICAO position when developing their national positions, and to support the ICAO position during ITU WRC-15.

2.11 The meeting's attention was drawn to the fact that the ICAO position would be submitted to the ITU WRC-15 as an information paper. As such, active support from States was deemed to be the only means to ensure that the results of the WRC-15 reflect civil aviation's need for spectrum (ICAO Assembly Resolution A36-25-*Support of the ICAO Policy on radio frequency spectrum matters* refers[2]).

2.12 The meeting was briefed on WRC-15 preparatory activities undertaken by ICAO and within the Region, including AFI Frequency Management Group activities, the 1st African Telecommunication Union (ATU) Preparatory Meeting and the ICAO Regional Preparatory Workshop and the 29th Meeting of the Aeronautical Communication Panel Working Group F (ACP-WG/F/29) held in Nairobi, Kenya from 3 to 11 September 2013. The CNS Sub-Group discussed further action to be taken to promote ICAO position for WRC-15, mindful of ICAO Assembly Resolution A36-25. The following draft conclusion was formulated:

DRAFT CONCLUSION 19/XX: Support to ICAO position for WRC-15

That:

States support the ICAO position for ITU WRC-15 by:

a) Incorporating the ICAO position in the national position to WRC-15;
b) Coordinating this position with all aviation stakeholders (CAAs, ANSPs, Air Operators, Airport Operators, etc.); and
c) Ensuring regular and active participation of Civil Aviation Representatives dealing with aeronautical spectrum issues (such as AFI FMG focal points) in WRC-15 preparatory activities at regional/global level and during the Conference.

Development of a Regional Air Navigation Implementation Action Plan (AN-Conf/12, Recommendation 6/1)

2.13 The CNS Sub-group reviewed the outcome of the Twelfth Air Navigation Conference in 2012 (AN-Conf/12), which included a revised edition of the Global Air Navigation Plan (GANP), containing the ICAO Aviation System Block Upgrades (ASBU) Methodology and Technology Roadmaps for communications, navigation, surveillance, information management and avionics to ensure compatibility between air navigation systems.

2.14 The CNS Sub-Group discussed the draft material developed by the Secretariat for the CNS component of an AFI Air Navigation System Implementation Action Plan aligned with the ASBU Methodology, in accordance with AN-Conf/12 Recommendation 6/1 - . States were requested to further review the draft material presented to the meeting, and provide their comments as required for consideration in finalizing the Draft Regional Action Plan to be submitted to APIRG/19 Meeting. States were also encouraged to participate in the ICAO Regional Workshop on ASBU which was scheduled for 21 – 25 October 2013. The workshop was organized by ICAO to assist the AFI Region

[2] As amended by the 38th Session of the ICAO Assembly.

and States in developing a regional action plan and coordinated national action plans. Following discussions, the meeting agreed that the work programme of the CNS Sub-group should include the implementation of ASBU Block 0 Modules pertaining to CNS.

2.15 The CNS Sub-Group encouraged partnership within the aviation industry for developing and implementing integrated solutions for CNS infrastructure components, according to agreed performance targets and priorities within the ATM areas of routing and major traffic flows, and called on ICAO, AFCAC and other relevant regional economic and financial institutions to facilitate the funding arrangements necessary for integrated programmes aimed at enhancing the regional infrastructure, including human resource aspects, based on the CNS technology roadmaps. The following draft decision was formulated:

DRAFT CONCLUSION 19/XX: DEVELOPMENT OF INTEGRATED PROGRAMMES BASED ON MAJOR ATM ROUTING AREAS AND AIR TRAFFIC FLOWS

That:

a) The ICAO Regional Offices should coordinate with States the identification and development of integrated programmes for the CNS infrastructure, aligned with the ASBU methodology, and based on major ATM routing areas and air traffic flows in the AFI region; and

b) ICAO, AFCAC and other relevant regional economic and financial institutions should facilitate the funding arrangements for such integrated programmes.

Global survey on aircraft equipage

2.16 With respect to avionics, the meeting was presented with the results from a global survey conducted by IATA in 2012, 283 airline fleets and 4874 aircraft, showing the level of equipage and global trends for airborne systems. Only 2 out of 86 airspace users contributed equipage data. CNS Sub-Group reiterated the necessity for AFI States, Air Navigation Service Providers and Airport Operators to support and participate in global and regional surveys conducted on airborne systems and air navigation systems' capabilities, in accordance with APIRG Conclusions 17/59 and 18/23.

Review of the conclusions and decisions of the Eighteenth Informal Meeting on the improvement of air traffic services over the South Atlantic (SAT/18) pertaining to CNS

2.17 The CNS Sub-Group was informed of the outcome of the SAT/18 meeting of relevance to the Sub-group. It particularly noted cooperative initiatives taken by SAT States to ensure a coordinated and harmonized implementation of CNS systems (such as AHMS, CPDLC, ADS-C) through memoranda of understanding, and recommended that AFI States participating in SAT activities should promote such initiatives in the AFI Region.

Communications Deficiencies

2.18 The CNS Sub-Group reviewed the list of deficiencies affecting communications systems in the AFI Region and proposed remedial action as shown at **Appendix 3.4D** to this working paper.

Review of the future Work Programme and Composition of the CNS Sub-group

2.19 The CNS Sub-group reviewed and proposed its future work programme and composition as shown in **Appendix 3.4E** to this working paper.

3. CONCLUSION

The meeting is invited to:

Note the information presented in this working paper;

Review and adopt the draft conclusions and decisions contained in this working paper; and

Adopt the future work programme and composition of the CNS Sub-Group at Appendix 3.4E to this working paper.

AGENDA ITEM 3.4 - Appendix 3.4A

REVIEW OF APIRG PREVIOUS CONCLUSIONS AND DECISIONS PERTAINING TO CNS

TO BE INSERTED

AGENDA ITEM 3.4 - Appendix 3.4B
AFI AMHS Implementation Task Force

TERMS OF REFERENCE OF THE AFI AMHS IMPLEMENTATION TASK FORCE

Terms of Reference:

1) Conduct a comprehensive review of ICAO Standards and Recommended Practices for the Aeronautical Message Handling System (AMHS) application as specified in Annex 10 Volume II[3], chapter 4.6 and Annex 10 Volume III, Part I[26], chapter 3.5.3), ICAO Doc.9880 Part II[5] and Doc 9896;

2) Collect and analyze information on the status of AFI ANSP Aeronautical Message Handling System plan processing systems including ongoing upgrades to existing systems;

3) On the basis of the above, based on ICAO Global Air Navigation Plan and in accordance with relevant additional ICAO provisions, develop a coordinated AFI transition strategy and plan with associated timelines to enable the streamlined coordinated implementation of AMHS.

Considerations:

In addressing these terms of reference, the Task Force should consider, inter alia, the following aspects:

a) The implemented systems in the AFI Region could differ from systems in other ICAO Regions and accordingly provide recommendable Regional action with global goals;
b) Inter and intra-regional issues taking into consideration ICAO Aviation System Block Upgrades (ASBU) planning requirements;
c) Personnel training for operational migration from AFTN to AMHS;
d) AFS network backbone capability as defined by the AFI APIRG CNS/SG Task Force on integrated VSAT infrastructure;
e) Contingency arrangements for States that cannot comply by the due date;
   - Way to handle staged implementations by States,
   - Expectations across ANSPs with different implementation dates, and
f) Systems that transition early will need to be capable of handling both new and current instructions.
g) Inter-system exchanges need to take account of differing automation capabilities in order to avoid excessive message rejection;
h) Establishment of an Information Management system to track implementation timelines for various States/systems;
i) Impacts to users;
j) Appropriately timed withdrawal of existing systems specific requirements to ensure consistency with new instruction; and
k) Existing ICAO guidance material.

WORK PROGRAMME

Task No.	ASBU Performance Improvement Area and Block() Modules	Subject	Target Date
1	PIA-2: Globally interoperable systems and data; B0-FICE: Increased interoperability through ground/ground integration; B0-DATM: Service improvement through digital information Management.	Review of ICAO SARPs and Guidance Material Team Leader: Secretariat Team members: All Task Force Core members References: • ICAO Annex 10 (Vol. 2 and Vol.3) • ICAO Doc 9880, 9896	CNS/SG/6 Deliverable:
2	PIA-2: Globally interoperable systems and data; B0-FICE: Increased interoperability through ground/ground integration; B0-DATM: Service improvement through digital information Management	Conduct of a Regional and Interregional (direct connection) Survey on: 1.AFS circuits specifications (circuit type, modulation rate, protocol, ITU code, VSAT network) 2. AMHS implementation status (implementations, plans, levels of service, protocols, implementation challenges, level of knowledge on AMHS and ATN, etc.) Team Leader: Secretariat Team members: All Task Force Core members References: • APIRG/15,16,17 and 18 Report • ICAO Annex 10 (Vol. 2 and Vol.3) • ICAO Doc 9880 • ICAO Doc 9896	CNS/SG/6 Deliverable
3	PIA-2: Globally interoperable systems and data; B0-FICE:Increased interoperability through ground/ground integration; B0-DATM: Service improvement through digital information	Finalize the revised AFI AMHS Implementation Strategy Team Leader: ASECNA Team members: Botswana, Burkina Faso, Madagascar, South Africa (ATNS), Tanzania and ASECNA	CNS/SG/5 Deliverable: August 2013

Task No.	ASBU Performance Improvement Area and Block() Modules	Subject	Target Date
	Management	References: • CAR/SAM AMHS Implementation Strategy	
4	PIA-2: Globally interoperable systems and data; B0-FICE: Increased interoperability through ground/ground integration; B0-DATM: Service improvement through digital information Management	Redraft the AFI AMHS Implementation Plan 1.Draft AFI AMHS Architecture 2.Draft AFI AMHS Network Service Access Point Addressing Plan 3.Draft AFI AMHS Implementation Plan a. AFI FASID CNS1B Table b. AFI FASID CNS1C Table Team Leader: Nigeria Team members: Angola, Ethiopia, Kenya, Mozambique, Rwanda, Sudan, Uganda, Zimbabwe and ASECNA. References: • Report of the fith meeting of APIRG CNS/SG • AFI Air Navigation Plan, FASID (CNS) • ICAO Annex 10 (Vol. 2 and Vol.3)	CNS/SG/5 Deliverable: August 2013
5	PIA-2: Globally interoperable systems and data; B0-FICE: Increased interoperability through ground/ground integration; B0-DATM: Service improvement through digital information Management	Revised AFI AMHS Manual and the Appendixes 1. AFI IP AMHS infrastructure test guidelines 2. AFI AMHS training guidelines Team Leader: South Africa (ATNS) Team members: Somalia (CACAS), South Africa, Tanzania, Uganda and ASECNA References: • ICAO EUR AMHS Manual (Doc 020) • ICAO Annex 10 (Vol. 2 and Vol.3) • ICAO Doc 9880 • ICAO Doc 9896	CNS/SG/5 Deliverables: August 2013

COMPOSITION

Core members: Algeria, Angola, Botswana, Burkina Faso, Burundi, Egypt, Ethiopia, Ghana, Guinea, Kenya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, South Africa (ATNS), Sudan, Tanzania, Tunisia, Uganda, Zimbabwe, ASECNA, IFATSEA and Roberts FIR.

Other members: All AFI States and Air Navigation Service Providers (ANSPs) with implemented and planned AMHS systems.

Note: Members should nominate suitable experts involved in aeronautical telecommunications operations and systems engineering.

Working arrangements: TBD.

AGENDA ITEM 3.4 - Appendix 3.4C

PROPOSED AFI FMG TERMS OF REFERENCE, COMPOSITION AND FUTURE WORK PROGRAMME

Terms of Reference:

1) Ensure that the allocation and operation of aeronautical frequency meet ICAO Standards and Recommended Practices for the provision and operation of Aeronautical spectrum application as specified in Annex 10 Volume V[5], and the provision of the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation, Doc. 9718;

2) Promote and support with developed credible arguments, ICAO position for the World Radiocommunication Conference of the International Telecommunication Union;

3) Ensure timely availability and appropriate protection of adequate spectrum to create a sustainable environment for growth and technology development to support safety and operational effectiveness for current and future CNS systems and allow for the transition between present and next generation technologies;

4) Coordinates within and across the AFI region on spectrum management activities to present consistent and robust rationale and ensure that appropriate AFI regional protection criteria for aeronautical systems are defined and implemented;

5) On the basis of the above, develop and coordinate AFI strategy and plan for the provision, the operation and the protection of aeronautical spectrum within the AFI Region in the framework of ICAO Global Air Navigation Plan (GANP, Doc.9750) and in accordance with relevant additional ICAO provisions.

Considerations:

In addressing these terms of reference, the Group should consider, inter alia, the following aspects:

a) Efficient use of aeronautical spectrum allocated through efficient frequency management and use of best practices;

b) Continued access to protected spectrum for legacy systems;

c) Access to protected spectrum to expand legacy systems when required;

d) Access to protected spectrum for future systems in line with ASBU CNS roadmaps;

e) Special protection requirements of aeronautical safety services from interference;

f) Efficient spectrum management both for future and legacy CNS systems;

g) Strategy from legacy to future system including frequency demand during transition

h) The aeronautical frequency assignment criteria in the AFI Region could differ from those applicable in other ICAO Regions and accordingly provide recommendable Regional action with global goals;

i) Inter and intra-regional issues taking into consideration ICAO Aviation System Block Upgrades (ASBU) planning requirements;

j) Personnel training for safe spectrum operation;

k) Minimized impact of market mechanism on aviation spectrum allocation and operation.

WORK PROGRAMME

Task No.	ASBU Performance Improvement Area and Block() Modules	Subject	Target Date
1	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	Review of ICAO SARPs and Guidance Material Team Leader: Secretariat Team members: All AFI/FMG Core members References: • ICAO Annex 10 (Vol. 5) • ICAO Doc 9718	CNS/SG/5 Deliverable:
2	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	AFI Aviation Spectrum requirements: Monitor and report to APIRG the status of available capacity in the various aviation bands Team Leader: Secretariat Team members: All AFI/FMG Core members References: • ICAO Annex 10 (Vol. 5) • ICAO Doc 9718	CNS/SG/5 Deliverable:
3	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	Frequency planning and assignment: Ensure the effective coordination process for new frequency assignments Team Leader: Secretariat Team members: All AFI/FMG Core members References: • ICAO Annex 10 (Vol. 5) • ICAO Doc 9718 • AFI COM Lists 1,2&3	CNS/SG/5 Deliverable:
4	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	Development of regional strategies and coordination between States and stakeholders in preparation to ITU WRCs	CNS/SG/5 Deliverable:

Task No.	ASBU Performance Improvement Area and Block() Modules	Subject	Target Date
		1. Coordination with ITU Team Leader: Secretariat Support: AFI/FMG Rapporteur 2. Coordination with Regional Telecommunication Regulators Union (ATU) Team Leader: AFI/FMG Rapporteur Support: Secretariat 3. Coordination with Sub Regional Telecommunication Regulators associations: a) WATRA: http://www.watra.org Team Leader: Nigeria Support: ECOWAS/UEMOA AFI/FMG Members b) CATRA: http://www.artac.cm Team Leader: Cameroon Support: CEMAC AFI/FMG Members CRASA: http://www.crasa.org Team Leader: Botswana Support: SADC AFI/FMG Members 4. Coordination with stakeholders for the establishment of the AFI Users of Satellite Communication for Civil Aviation (AUSCA) Team Leader: AFI/FMG Rapporteur Team members: All AFI/FMG Core members	
5	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	Review and update AFI database COM Lists Team Leader: Secretariat Team members: All APIRG States members	CNS/SG/5 Deliverable:

Task No.	ASBU Performance Improvement Area and Block() Modules	Subject	Target Date
		References: • Template on the collection of Aeronautical Frequency • COM List 1, 2 &3 Data base	
6	PIA: 1-2-3-4 Bloc 0 Modules: All supported by AFS; AMS; ARNS; ASS	Training on Aeronautical frequency spectrum allocation, operation and management Organization of seminars/workshops on frequency spectrum allocation, operation and management Team Leader: Secretariat Support: ANSPs (ASECNA, ATNS, GCAA, NAMA) Regional /International Organization (ECOWAS/UEMOA, CEMAC, SADC, ITU, ATU, AFCAC) Industry (Intelsat, SITA, IATA...) References: • Report on AFI/FMG and APIRG meetings • ICAO Annex 10 (Vol. 5) • ICAO Manual on Radio frequency Spectrum for Civil Aviation , Doc. 9718 (Vol. & & 2) • ICAO Training Manual (Doc. 7192 Part E-2 - Air Traffic SafetyElectronic Personnel (ATSEP)	CNS/SG/5 Deliverable:

. COMPOSITION

ANGOLA; BOTSWANA; BURUNDI; CAMEROON; ETHIOPIA; GAMBIA; GHANA; KENYA; MADAGASCAR; MALI; MAURITANIA;NIGERIA; RWANDA; SENEGAL; SOUTH AFRICA; TANZANIA; UGANDA;ASECNA; ROBERTS FI

AGEND ITEM 3.4 - APPENDIX 3.4D

LIST OF DEFICIENCIES IN THE AIR NAVIGATION FIELDS

AFTN

State Name	*Requirements*	*Facilities or Services*	*Description of Deficiency*	*Date first reported*	*Comments on Deficiency*	*Description of Corrective action*	*Executing Body*	*Target date for implementation*	*Priority*
Djibouti									
	AFTN Plan, AFI Rec. 9/7	Djibouti AFTN centre	Circuit Djibouti/Addis Ababa	2002	Unserviceable	To repair and upgrade. Modem available in Djibouti as well as new automatic switching centre	Djibouti, Ethiopia		U
Eritrea									
	AFTN Plan, AFI Rec. 9/7	Asmara AFTN centre	Circuit Asmara/Addis Ababa	1998	The circuit has been disconnected	To be restored	Eritrea, Ethiopia		U
Ethiopia									
	AFTN Plan, AFI Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Djibouti	2002	Unserviceable	To repair and upgrade. Modem available in Djibouti as well as new automatic switching centre	Ethiopia, Djibouti		U
	AFTN Plan, AFI Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Asmara	1998	This circuit has been disconnected	To be restored	Ethiopia, Eritrea		U

LIST OF DEFICIENCIES IN THE AIR NAVIGATION FIELDS

ATS DIRECT SPEECH

State Name	*Requirements*	*Facilities or Services*	*Description of Deficiency*	*Date first reported*	*Comments on Deficiency*	*Description of Corrective action*	*Executing Body*	*Target date for implementation*	*Priority*
Algeria	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Algiers ACC-FIC	Circuit Algiers/Tripoli	1998		Implement LTF circuit	Algeria, Libya		U
Burundi	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bujumbura APP	Circuit/ Bujumbura/Kinshasa	1998	Not operational	VSAT implemented at Bujumbura and Kinshasa	Burundi, DR Congo		A
Dem. Rep. of Congo	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Bukavu TWR	Circuit Bukavu/Kigali	1996	Not implemented		DR Congo, Rwanda		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kinshasa	Circuit Brazzaville/Kinshasa		unserviceable	Interconnection between AFISNET and SADC/2	DRC ASECNA	End of year 2010	A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Gbadolite TWR	Circuit Gbadolite/Bangui	2002	Not implemented	Could be implemented by interconnection between Bangu AFISNET and G'Badolite RVA domestic VSATs.	DR Congo, ASECNA	End of year 2010	A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Goma APP	Circuit Goma/Bujumbura	1998	Not implemented		DR Congo, Burundi		A
	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Goma APP	Circuit Goma/Kigali	1998	Not implemented		DR Congo, Rwanda		A
Eritrea	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Asmara ACC	Circuit Asmara/ Addis Ababa	1998	The circuit has been disconnected	To be restored. NAFISAT	Eritrea, Ethiopia		U
Ethiopia	ATS Direct	Addis Ababa	Circuit Addis Ababa/	1998	The circuit has	To be restored. NAFISAT	Ethiopia,		U

State Name	*Requirements*	*Facilities or Services*	*Description of Deficiency*	*Date first reported*	*Comments on Deficiency*	*Description of Corrective action*	*Executing Body*	*Target date for implementation*	*Priority*
	Speech Circuits Plan, AFI/7 Rec. 9/9	ACC/FIC	Asmara		been disconnected		Eritrea		
Ghana	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Accra ACC	Circuit Accra/Kano	2009	Unserviceable	To be restored AFISNET	Ghana Nigeria		A
Congo	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Brazzaville ACC	Circuit Accra/Brazzaville		Unserviceable	To be restored AFISNET	GHANA ASECNA	End of year 2010	A
Rwanda	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Kigali ACC	Kigali/Kinshasa		Unserviceable	To be restored SADC//2	Rwanda, DR Congo		A
Somalia	ATS Direct Speech Circuits Plan, AFI/7 Rec. 9/9	Hargeisa APP	Circuit Hargeisa/Djibouti	1998	Not implemented	Implement LTF circuit	Somalia, Djibouti		A

AGEND ITEM 3.4 - APPENDIX 3.4E

TERMS OF REFERENCE, FUTURE WORK PROGRAMME AND COMPOSITION OF THE COMMUNICATIONS, NAVIGATION AND SURVEILLANCE SUB-GROUP (CNS/SG)

1. TERMS OF REFERENCE

a) Ensure the Continuous 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 Air Navigation System Implementation Action Plan in the light of new developments, in harmony with the ICAO Global Air Navigation Plan (Doc 9750) 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

Item	Task description	Priority	Target date
Communications			
1.	Follow up and monitor the implementation of VHF coverage in the AFI region in accordance with AFI/7 Rec. 5/12.	A	APIRG/20
2.	Update the AFI AFTN routing directory	A	APIRG/20
3.	In coordination with the ATM/AIM/SAR Sub-group, participate in the development of a communication infrastructure to support an AFI Central AIS Database (AFI CAD)	A	Continuous
4.	Monitor the development, and coordinate the implementation of guidance material for the implementation of the Aeronautical Telecommunication Network (ATN) and supported ground-ground and air-ground applications.	A	APIRG/20
5.	Review and update, if needed, the ICAO Register of AMHS managing domains and addressing information pertaining to AFI.	A	Continuous
Navigation			
6.	Follow up and monitor the implementation of the AFI GNSS Strategy.	A	Continuous
Surveillance			
7.	Analyse and review CNS aspects of the report of the Aeronautical Surveillance Implementation Task Force.	A	APIRG/20
Communications, Navigation and Surveillance – General matters			
8.	Analyse, review and monitor the implementation and operation of aeronautical communications, navigation and surveillance (CNS) systems, identify CNS deficiencies and propose measures for their elimination, as required.	A	Continuous

Item	Task description	Priority	Target date
9.	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	Continuous
10.	In co-ordination with the ATS/AIS/SAR Sub-group, continue the evolutionary and harmonized development of the AFI CNS/ATM Systems Implementation Plan (AFI/7 Concl. 13/1).	A	Continuous
11.	In co-ordination with the ATS/AIS/SAR Sub-group, develop, as necessary, comprehensive business cases for competing CNS/ATM elements implementation options for the identified routing areas.	B	Continuous
12.	Co-ordinate plans developed by States, international organizations, airlines and industry for the implementation of the regional CNS/ATM systems implementation plan; and monitor CNS/ATM systems research and development, trials and demonstrations within the AFI Region and information from other regions.	B	Continuous
13.	Coordinate the implementation of ICAO Global Air Navigation Plan, Aviation Systems Block Upgrades and Technology Roadmaps pertaining to CNS and develop associated regional performance objectives.	A	Continuous
Aeronautical Spectrum			
14.	Coordinate regional activities aimed at promoting ICAO position for ITU-WRC meetings, and improving aeronautical spectrum management and control in the Region.	A	Continuous
15	Review the report of the AFI Frequency Management Group	A	APIRG/20

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, Mali, Mauritius, Morocco, Niger, Nigeria, Senegal, South Africa, Spain, Sudan, Tanzania, Tunisia, Zambia, ACAC, ASECNA, IATA, and IFALPA.

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