

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



**REPORT OF THE FOURTH MEETING OF THE APIRG
AIS/MAP TASK FORCE (AIS/MAP/TF/4)**

(Dakar, 18 – 19 April 2007)

Prepared by the Secretary of the AIS/MAP/TF 4 Meeting

April 2007

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

PART I – HISTORY OF THE MEETING

1. Place/Duration

1.1 The Fourth meeting of the AIS/MAP Task Force was convened at the ICAO WACAF Office, Dakar from 18 – 19 April 2007.

2. Objective of the meeting

2.1 The main objective of the meeting was to review and update the ICAO provisions in the field of AIS/MAP and provide guidance to States in the fostering of their implementation in the most expeditious manner. The meeting also had an objective to review the report of the First AFI-CAD meeting in order to provide guidance for the establishment of a Centralized AFI Region AIS Data base similar to the European Aeronautical database, in accordance with the requirements of the AFI Air Navigation Plan, for the improvement of overall speed, accuracy, efficiency and cost-effectiveness for the development of an integrated automated AIS System concept in order to obtain a general standardization of procedures, products and services to users, and to avoid potential divergences, incompatibilities and duplication of efforts in the AFI Region.

3. Secretariat

3.1 The meeting was opened by Mr. Mam Sait Jallow, Deputy ICAO Regional Director who welcomed all participants to the ICAO Western and Central African Office, Dakar for attending Fourth AFI AISMAP Task Force Meeting being organized under the aegis of ICAO pursuant to various relevant APIRG Conclusions.

3.2 The Regional Director took the opportunity to call attention of the participants on the fact that the collection and distribution of aeronautical information for use by all types of aircraft operations is the responsibility of the AIS of each State, as specified in Annex 15 to the Convention on International Civil Aviation designed to promote uniformity in the collection and dissemination of aeronautical information, in the interest of safety, efficiency and economy of civil aviation.

3.3 He emphasized that Annex 15 - Aeronautical Information Services, defines the standards and recommends the practices regarding exchange to aeronautical information that is vital to the safety of air navigation. Currently, States exchange aeronautical information in a paper-based format using the aeronautical information publication (AIP). Each State is not only responsible for the creation but also updating of its own AIP. Such as creating and promulgating AIP Amendments, AIP Supplements and NOTAMs to notify other States and users of changes to its AIP.

3.4 He highlighted that in order to achieve the future ATM objective of making informed collaborative decisions for the most efficient operations and business practices, the necessary aeronautical information must be shared on a system-wide basis, and must be available for access by any ATM participant when and where required. To accomplish this, the ICAO Secretariat in Montreal has envisioned a computerized aeronautical information services (CAIS) system concept for use by the States. He also highlighted that to achieve the future ATM objective of making informed collaborative decisions for the most efficient operations and business practices, the necessary aeronautical information must be shared on a system-wide basis, and must be available for access by any ATM participant when and where required

3.5 He recalled Conclusion 15/43 of the APIRG/15th meeting which states inter-alia, *“that IATA, in cooperation with ICAO and Air Navigation Service Providers in the AFI Region, study the establishment of a centralized AFI AIS Data Base similar to the European Aeronautical database and forward it to the AFI AIS/MAP Task Force for its consideration,”*

3.6 Mr Sahbani Hassen, Head of AIS, Tunisia was unanimously elected the Chairman and Rapporteur of the meeting.

3.7 Mr. George Baldeh, Regional Officer, AIS/MAP was Secretary of the meeting. He was assisted by Mr. Apolo Kharuga, Regional Officer, Air Traffic Management and Search and Rescue (ATM/SAR) and Secretary of the ATS/AIS/SAR Sub-Group.

4. Attendance

4.1 The meeting was attended by **23** participants from **9** Contracting States and **4** International organizations (ASECNA, Eurocontrol, IATA and Roberts FIR). A list of participants is at **Appendix A** to this report.

5. Working Languages

5.1 The meeting was conducted in English only.

6. Agenda

6.1 The following Agenda was adopted:

Agenda Item 1 : Review of the Status of Implementation of the Conclusions of the Third Meeting of the AIS/MAP Task Force.

Agenda Item 2 : Status of implementation of the ICAO requirements in the AIS/MAP field in the AFI Region (deficiencies).

Agenda Item 3 : Status of implementation of the Integrated Aeronautical Information Package

Agenda Item 4 : Review of the Report of the First Meeting of the AFI Region Study Group on the Establishment of a Centralized AFI Region AIS Data base (AFI-CAD/Study Group/1)

Agenda Item 5 : Any other business

5.1 New memberships to the Task Force

5.2 Reverting the ATM/SG to ATS/AIS/SAR/SG

PART II – REPORT ON THE AGENDA ITEMS

Agenda Item 1: Review of the status of Implementation of the Conclusions of the Third Meeting of the AIS/MAP Task Force

1.1 Under this Agenda Item, the meeting reviewed the status of implementation of the conclusion of the Third meeting of the AIS/MAP Task Force held in Dakar from 4 – 5 August 2005.

1.2 The meeting reviewed the Status of implementation of the Conclusion of the Third Meeting of the AIS/MAP Task Force. It was noted that the ATS/AIS/SAR Sub-Group during its eighth meeting held in Dakar, Senegal from 10-12 August 2005, adopted 11 out of 14 Draft Conclusions of the Third Meeting of the AIS/MAP Task Force and added 2 more Draft Conclusions within the AIS/MAP field. It was also noted that the APIRG/15th Meeting adopted 12 Conclusion (*As per APIRG/15 Conc.15/33;15/34;15/35;15/36;15/37;15/38;15/39;15/40;15/41;15/42;15/43and 15/44*) out of the 13 Draft Conclusions presented by the ATS/AIS/SAR/SG-8 Meeting Report. The Conclusions were reflected in the report of the APIRG/15 Meeting held in Nairobi, Kenya from 26-30 September 2005. Consequently, the AIS/MAP Task Force and the ATS/AIS/SAR Sub-Group were accordingly charged to follow-up on the implementation process and inform APIRG accordingly.

1.3 With regard to APIRG Conclusion 15/33 – Dissemination of AIS data, the meeting agreed that, in order to facilitate its follow up, the Secretariat should prepare a list of existing AIS websites, including their universal resource locator (URL) for presentation at future meetings of the AIS/MAP Task Force.

1.4 The meeting also agreed that Draft Conclusions 3/3 and 3/4 of the Third meeting of the AIS/MAP Task Force held in Dakar from 4 – 5 August 2005 as listed below under Draft Conclusion 4/1 and 4/2 be retained for review and endorsement by the Ninth ATS/AIS/SAR Sub-Group meeting .

Draft Conclusion 4/1 : Quality and status of AIS Personnel

That States take necessary action to ensure that:

- a) AIS is accorded a status commensurate with the current technological developments requiring high calibre and skilled personnel;*
- b) Personnel recruited for AIS receive adequate professional training;*
- c) Such personnel are accorded same status as that of personnel of other air navigation services; and adequate facilities and funds needed for the efficient performance of AIS duties and priorities are provided.*

Draft Conclusion 4/2 Training Guidelines for AIS personnel

- a) *That ICAO expedite the publication of the revised Training Manual (Doc.7192), Part E-3 as recommended by the AIS/MAP Divisional Meeting in 1998 (Doc. 9733), so as to facilitate the introduction of the basic requirements for States to consider the licensing issue of their AIS personnel; and*
- b) *ICAO develop AIS training guidance material relating to the implementation of CNS/ATM system.*

Agenda Item 2: Status of Implementation of ICAO Requirements in the AIS/MAP Field in AFI Region (Deficiencies)

2. Pre-flight and post-flight information services

2.1 The meeting reviewed the status of Implementation of ICAO Requirements in the AIS/MAP Field in the AFI Region (Deficiencies). It is noted that, though there was an improvement since the AFI/7 RAN Meeting held in Abuja, pre-flight and post-flight services still remain at a low level implementation while international flights have continued to increase in the region. It is observed that the persistence in deficiencies is due to:

- a) Non-implementation of Aerodrome AIS units,
- b) lack of provision of adequate facilities, and
- c) Lack of qualified AIS personnel at the existing units.

2.2 The updated list of the status of implementation of the ICAO Requirements in the AIS/MAP field in the AFI Region at Appendix B be further circulated to States for updates. The meeting noted that APIRG/15 conclusion 15/35 (which states inter-alia “*That the following AFI FASID tables be circulated to States for update and which will subsequently form the amendment proposal to the AFI FASID:*

- a) *AFI FASID Table AIS-1, which sets out the requirements pertaining to the establishment of aerodrome AIS Units in the AFI Region;*
- b) *AFI FASID Table AIS-2, which sets out the requirements pertaining to the AIS required at aerodromes; and*
- c) *AFI FASID Table AIS-4, which sets out the requirements for the Integrated Aeronautical Information Package from foreign AIS to be available at aerodrome/heliport AIS Units in the AFI Region, for pre-flight briefing.”) has already addressed this Agenda .*

Agenda Item 3: Status of Implementation of Integrated Aeronautical Information package

3. Aeronautical Information Publication (AIP)

3.1 The meeting reviewed the status of implementation by States of the Aeronautical Information Publication (AIP) and noted that, although the majority of States in the Region have produced an AIP, the amendments have been sporadic or their presentation falls short of the provisions of Annex 15, or is not in conformity with the new format in the AIS Manual (Doc.8126). In addition AFI States should note that, the ability to view AIP components electronically is becoming increasingly available and States are encouraged to endeavour to make every effort to make their AIPs available electronically for briefing purposes at the established aerodromes.

3.2 The updated list of the status of implementation of the integrated aeronautical information package at Appendix C be further circulated to States for updates. The meeting noted that APIRG/15 conclusion 15/36 (which states inter-alia “*That the status of implementation of the integrated aeronautical information package, at F4.3B be circulated to States for update*”) has already addressed this Agenda .

Agenda Item -4 : Review of the Report of the First Meeting of the AFI Region Study Group on the Establishment of a Centralized AFI Region AIS Data base

4.1 The meeting recalled Conclusion 15/43 of the APIRG/15th meeting which states inter-alia , *“that IATA, in cooperation with ICAO and Air Navigation Service Providers in the AFI Region , study the establishment of a centralized AFI AIS Data Base similar to the European Aeronautical database and forward it to the AFI AIS/MAP Task Force for its consideration”*. The meeting noted that the AFI-CAD Study-Group is a Study-Group of the AFI Planning and Implementation Regional Group (APIRG), and its Reports are therefore submitted to APIRG for review and action.

4.2 The meeting reviewed the main objectives of the Study Group which are to provide guidance for the establishment of a Centralized AFI Region AIS Data base similar to the European Aeronautical database, in accordance with the requirements of the AFI Air Navigation Plan, for the improvement of overall speed, accuracy, efficiency and cost-effectiveness for the development of an integrated automated AIS System concept in order to obtain a general standardization of procedures, products and services to users, and to avoid potential divergences, incompatibilities and duplication of efforts in the AFI Region.

- **Purpose and Scope**

4.3 The meeting noted that the development of the Centralized AFI Region AIS Database Program will implement and initiate the operation of a reference database of quality assured aeronautical information from the AFI Region for the benefit of the whole aviation community. Implementing the Centralized AFI Region AIS Database will remove service duplication and remedy current deficiencies. It will provide a reliable and cost effective service and will obviate the need for a number of national AIS investments.

4.4 The meeting also noted that in addition to the processing of NOTAMs and of static data the Centralized AFI AIS Database will be used to produce Aeronautical Information Publication (AIP), AIP Amendment, Supplement , AIC and charts (CHART), according to the data/ information stored in the database. These documents are to be stored in a document management systems (PAMS) allowing retrieval, viewing and downloading of documents.

- **The Current Situation : (The existing modus operandi)**

4.5 The meeting noted that with the current situation in the AFI Region, there are 53 Contracting States of ICAO each of whom, in accordance with Article 28 of the Convention on International Civil Aviation (Chicago Convention) and Annex 15 to this Convention, has responsibility for providing an Aeronautical Information Service (AIS) to ensure the efficient flow of aeronautical information for international air navigation within the area of responsibility of the State.

4.6 The meeting noted that whether a State provides AIS itself, or jointly with one or more other States or by delegating the authority for the provision of the Service to a non-governmental agency, the State remains responsible and retains authority for the information/data published for and on behalf of the State itself. A State may however delegate the authority for publication and distribution of the information to a commercial agency.

4.7 The meeting noted that the current operational structure bears several deficiencies in the provision of AIS in the AFI Region as follows:

- no single African consolidated database of aeronautical information;
- lack of cross border aeronautical information coherence checking;
- inconsistent quality of data;
- duplicated, redundant and dispersed investments in the development and maintenance of systems by both Aeronautical Information services and the end users;
- high maintenance (costs) for each State and end users;
- lack of interoperability between systems;
- shortcomings in ensuring timely distribution of aeronautical information updates to all users, possibly compromising safety and/or efficiency of air navigation.

- **The Proposed Centralized AFI Region AIS Data Base Solution**

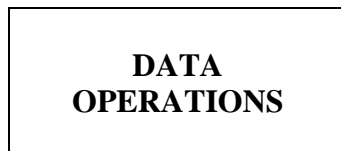
4.8 The meeting noted that on overall, the proposed Centralized AFI Region AIS Data Base solution can be defined as comprising of the AFI Region AIS Data Base System (the System) and the AFI Region AIS Data Operations and network provision.

4.9 The meeting noted that States in the AFI Region have to set-up or identify an Agency to operate the AFI CAD.

- **The Proposed Services**

4.10 The meeting noted and recommended that provision of the AFI CAD operations service should be designed to comprise the task and activities related to the following services domains :

-A



CORE SERVICES

- INO International Notam Operations
NOTAM /
- SDO Static data operations
- PAMS Published AIP management systems
LIBRARY
- DATA QUALITY ASSURANCE

PRODUCTS

PIB /

AIP / CHARTING

AIP

QUALITY LEVEL MEASUREMENT
OF: INO DB
SDO DB
PAMS DM

SUPPORT SERVICES

- HELPDESK

- DOCUMENT HANDLING

MANAGEMENT SERVICES

- QUALITY MANAGEMENT
- SAFETY & SECURITY MANAGEMENT
- CHANGE MANAGEMENT → EVOLUTION OF THE SYSTEM WITH USER REQUIREMENTS & TECHNOLOGIES
- INFRASTRUCTURE MANAGEMENT
- INTERNATIONAL REGULATION MANAGEMENT
- DOCUMENT CONFIGURATION MANAGEMENT

-B

IT SERVICE PROVISION

→

CORE – IT SERVICES

SUPPORT – NETWORK MANAGEMENT

- CLIENT MIGRATION

MANAGEMENT -

Infrastructure

Configuration

-C

NETWORK PROVISION

-D

TRAINING

-E

TESTING AND DEVELOPMENT

4.10 The Proposed Centres

4.10.1 The meeting adopted the following proposed Centres :

- Four Operating Centres: North; South; East; West (and Central if required)**
- Three Training Centres for English; French and Arabic**
- IT Server on Line Centre – (At least two centres)**
- Research and Test Centres where Technical Capabilities Exist**
- Network provision**

- **Assumptions**

4.12 The meeting noted that at the outset of the Service Creation, certain fundamental assumptions are made and need to be understood.

- **Basic Criteria**

That the following criteria should be taken into consideration :

- a) The Centralized AFI Region AIS Data Base
 - i. (System and Data Operations Services) shall enhance operational Safety by ensuring the quality of aeronautical information;
 - ii. (System and Data Operations Service) shall facilitate the timely and efficient flow and provision of (electronic) aeronautical information/data necessary for the Safety, regularity and efficiency of international air navigation.
 - iii. (System and Data Operations Service) shall be designed with the intention to meet the needs of the Air Transport Community;
 - iv. (Data Operations Service) shall not be delegated by a State, the Authority for the provisions or execution of that States AIS .

Draft Conclusion 4/3- Basic Criteria

The meeting then concluded that :

- a) *whether the service provision is subcontracted or not:*
 - i. *The service shall at all times be AFI States owned service. The service provider shall ensure the service is at all times perceived and recognized as being an AFI States provided service.*
 - ii. *The service provision shall be an activity of cost-recovery nature and shall not generate profit on its own behalf (bearing in mind that the AFI CAD facilitates the safety, regularity and efficiency of international air navigation);*
 - iii. *the service provision shall be subjected to a “ trial phase” of operation at the end of which the service may be reviewed if there has been insufficient take-up by clients and/or if the service levels have not been met;*
 - iv. *all clients’ service level agreements shall be between the client and the Agency entrusted by the AFI States.*
 - v. *The Agency shall not be allowed to sell, trade or commercialize the data and/or services of the AFI CAD on its own behalf and/or profit.*

The proposed Business model

4.13 The meeting agreed to task the Study Group to develop the appropriate business model.

Additional Issues

4.14 The meeting noted that the implementation of the AFI CAD will improve the flow and delivery mechanisms of aeronautical information.

4.15 The AIS of participating States will continue to be responsible for the production, maintenance and publication of aeronautical information which will be delivered and stored by them in the AFI CAD. The AFI CAD will then deliver and/or provide access to the aeronautical information.

4.16 The AFI CAD will thus act as a relay for aeronautical information, which will be delivered from the Data providers to and from the AFI CAD to the Data users.

Future meetings, work programme and membership of the AFI-CAD Study Group

4.17 The meeting noted with appreciation the work of the First meeting of the AFI Region Study Group on the Establishment of a Centralized AFI Region AIS Data Base (*AFI-CAD/STUDY GROUP/1*). The meeting then reaffirmed the validity of APIRG Conclusion 15/43 by which the Study Group was established.

4.18 However, the Meeting felt that the Study Group should continue to monitor the progress of the establishment of a centralized AFI Region AIS Data Base in its future work programme. The meeting also expressed the need for the Study Group to hold a second meeting of AFI-CAD in order to cater for the presence of States from the Northern part of the AFI Region whose absence were noted in the first meeting. The Task Force meeting was also convinced that the second Study Group meeting will provide an opportunity to develop a business plan model and the user requirements specifications as well as a financial model.

4.19 Taking cognizance of the above issues, the Secretariat proposed a second meeting of the AFI-CAD Study Group to be held in the Region in August or September 2007.

4.20 Following the review of the Report of the First meeting of the AFI Region Study Group on the establishment of a centralized AFI Region AIS Data Base (*AFI-CAD/STUDY GROUP/1*) the meeting reviewed the recommendations of the AFI CAD and adopted them as following draft Conclusions:

Draft Conclusion 4/4 : AFI CAD services

That AFI CAD should provide the following major services:

- a) the International NOTAM Operation (INO) providing facilities for world-wide NOTAM, SNOWTAM, ASHTAM and AFTN or equivalent message handling and for pre-flight Information Bulletins (PIB) generation.*

- b) *the Static Data Operation (SDO) providing facilities for AFI Static Aeronautical Data/information handling and reporting. moreover, a minimum set of data is also maintained to allow the correct functioning of the INO system.*

Draft Conclusion 4/5 : AFI CAD Client

That the recommended AFI CAD clients are the following:

- a) *The Data Providers which are AIS Organizations providing aeronautical information to the Centralized AFI Database;*
- b) *The Data Users which are Air Transport Community and beyond.*

Draft Conclusion 4/6 : Proposed AFI CAD System Design

That the proposed AFI CAD System should be designed to provide the following:

- a) *a single repository for aeronautical information and IAIP elements of participating States;*
- b) *data questioning enhancement through multilevel consistent data checking processes, including cross border data verification;*
- c) *a secure channel/vehicle for timely and efficient electronic distribution of aeronautical information and IAIP elements;*
- d) *harmonization and interoperability will be ensured by common and standardized:*
- *System interface and data exchange model (AIXM),*
 - *Static data model (AICM);*

Draft Conclusion 4/7 : AFI CAD System Data Operations Services

That the proposed System Data Operations Services will then provide the Centralized AFI Database clients with the following system services:

- a) *support to edit and provide (to the system) aeronautical information;*
- b) *electronic access to and delivery of aeronautical information;*
- c) *browsing and downloading of participating State's aeronautical information; and*
- d) *generation of reports;*

Draft Conclusion 4/8 : Access to AFI CAD

That the Data Operations System Services will be accessed by clients via direct electronic interface in one or more of the following three ways:

- a) *The Client Interface terminal (CIT). A terminal located at the client site, connected to the AFI CAD, and allowing download, modification (only by data providers) and reporting of aeronautical information as determined by the clients Service Level Agreement (SLA);*
- b) *The Client Interface (CI). A technical toolkit allowing clients' own systems to access and interact with the AFI CAD to upload, download, modify (only Data Providers can modify) and report aeronautical information as determined by the clients' SLA;*
- c) *INTERNET: Access to the Centralized AFI AIS Data Base will also be allowed via the Internet.*

Draft Conclusion 4/9 : Development of AFI CAD user requirements specifications

That States and/or Organizations in a position to do so, provide the required technical expertise to assist the Study Group to develop user requirements specifications (URS) for AFI CAD.

Draft Conclusion 4/10 : Scope of Services Provided

That :

- a) *Regarding the data operations service domains, the services provided shall ensure :*
 - i. *Co-ordination of the resolution of data conflicts detected by the system data checking processes ;*
 - ii. *for non-participating States (world wide) :*
 - *NOTAM processing (verification, validation, etc...)*
 - *entry of the statistic data required by the system NOTAM function.*
- b) *As currently defined, the service does not include the provision of AIS services on behalf of participating States, i.e. the service shall not comprise the following activities :*
 - i. *creation of NOTAMs*
 - ii. *origination and publication of AIP, AIP supplements, AIP amendments, AIC and charts.*
- c) *As part of the provision of the service, the service provider will deliver to the centralized AFI Region AIS Data Base client the following services :*
 - i. *24 hour operational and technical help desk*
 - ii. *Client training*
 - iii. *Management and monitoring of the delivery of aeronautical information and AIP elements.*

Draft Conclusion 4/11 : Institutional Arrangements

That AFI States shall:

- a) *Identify or set up an agency to develop, establish and operate the centralized AFI CAD;*
- b) *Determine the most effective and appropriate ways of funding, implementing and delivering the service.*
- c) *Commit to the timely provision of the required information to the AFI CAD;*
Note: This shall not preclude them from providing the same data to other agents and/or entities.
- d) *Continue to be responsible for providing an AIS singularly or jointly with one or more other States or by delegating the authority for the provision of the service to a non-governmental agency in accordance with Annex 15 of the Chicago Convention;*
- e) *Maintain the intellectual property rights for the data provided to the AFI CAD;*
- f) *Provide advice and other appropriate support to any administration outside the AFI Region to consider the introduction of an aeronautical information database system compatible with the AFI CAD;*
- g) *Promote the use of the AFI CAD by taking active steps to provide appropriate information to the public on the services available from the AFI CAD and encourage the use of the service;*
- h) *Define a legal and financial framework to be applied to States participating in the AFI CAD, and non members of the AFI Region States, covering contribution to the funding of the data operations service provision;*
- i) *Define a charging policy that:*
 - *complies with the principle of free exchange of aeronautical information amongst States AIS, in accordance with Annex 15 of the Chicago Convention;*
 - *Continues to allow recovery by States of the costs incurred for the provision of AIS services;*
 - *Avoids double charging of the Data Users.*

Draft Conclusion 4/12 : Suggestions for Financial Model

a) *Business Plan*

- i. *Setup Capital:* *The business plan to be adopted must define the total set-up costs and where this capital will be obtained (eg Loans, Donations/Aid, State Contributions). Each states responsibility in this regard must be defined and be enforceable in any AFI CAD membership agreement*

- ii. **Financial Sustainability:** *The business plan to be adopted must also define how financial sustainability will be ensured (eg by State Contributions, fees to be charged for access by users, en-route charges, etc). This must also show how continuous improvement and safety monitoring systems will be maintained and funded.*
 - iii. **Service Provider:** *The resources that the Service Provider will bring to the project must be defined and enforced in the Service Providers contract. It should not be the sole responsibility of the member states or the Agency to fund this project as it should be based on the User/ Beneficiary Pays principle.*
- b) **Financial Plans:** *The financial model for AFI CAD as discussed above also needs to address the following operational considerations:*
- i. **Continuous Operational Cost Recovery:** *Continuous Operational Cost Recovery must be ensured as a minimum requirement. If this does not occur AFI CAD will not be a viable concern.*
 - ii. **Cost Benefit Analysis:** *A Cost Benefit Analysis reflecting the advantages and disadvantages of all business models discussed above needs to be performed before a particular model can be recommended and accepted by AFI CAD member states.*
 - iii. **Future Cost Benefits:** *To AFI CAD (eg via provision of services additional to what is presently being provided) will need to be assessed to ensure organizational structuring to take advantage of these future benefits.*

Draft Conclusion 4/13 : Development of AFI CAD Business Model and Financial Model

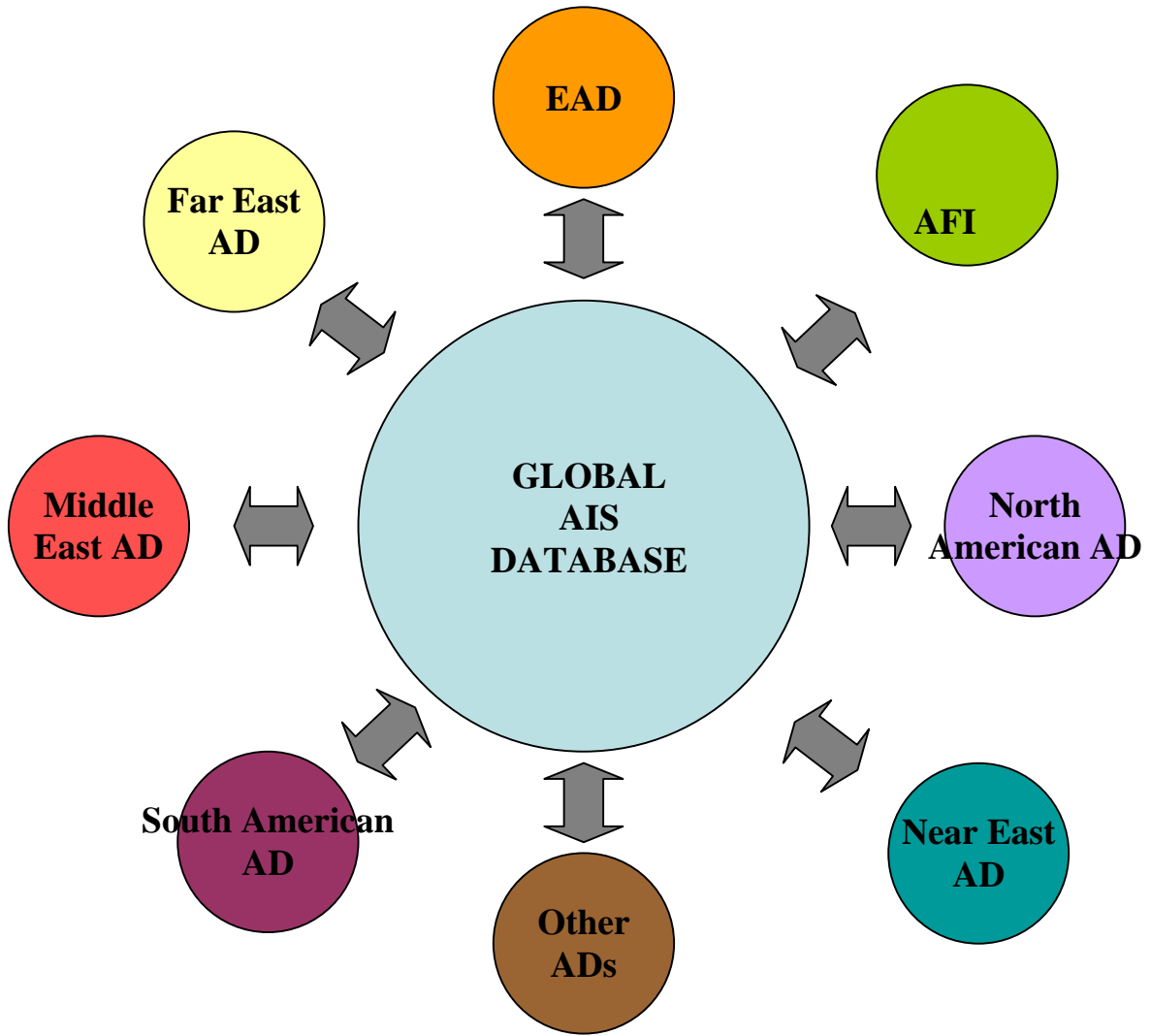
That the Study Group develop a business model and financial model for the AFI CAD.

4.21 The meeting then reviewed and endorsed the framework proposal for a centralized AFI Region Database AFI-CAD as listed below:

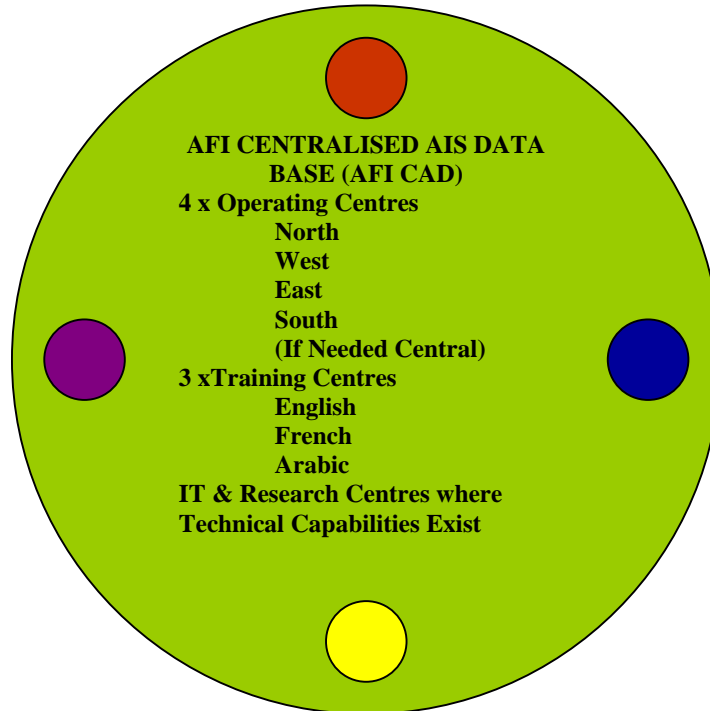
FRAMEWORK FOR AFI REGION CENTRALISED AIS DATA BASE (AFI CAD)

1. **Current Status of AIS**
 - a. Infrastructure
 - b. Products
 - c. Human Resources
 - i. Skills, Competencies & Qualifications
 - d. Present ATM Community Requirements
2. **Global Concept (Macro Overview)**

a. Global AIS Database



b. AFI AIS Database



c. Operating Centres

- i. All Mirror Images of Each Other
- ii. All contain the full AFI Centralized AIS Database (AFI CAD)
- iii. Each Operating Centre can replace each other if needed.
- iv. The Operating Centres are in constant communication with each other updating the databases at each Operating Centre as it is changed by the Operating Centres (possibly using a form of best suitable available communications)
- v. Countries within a region provide their data to and access the AFI CAD via their Regional Operating Centre (local communication networks to be utilised)
- vi. Each Region Responsible for the Maintenance of their regions Data in the AFI CAD.
- vii. Why Four Regional Operating Centres?
 1. Geographical Distances
 2. Communication Networks
 3. Common Infrastructure

4. Existing Working Agreements
5. Common Interests
6. Ability to provide assistance on a regional basis
7. Redundancy/Service Integrity

Note: A study needs to be performed to decide if the need exists for a Fifth Operating Centre for Central.

3. Management Issues

a. Legal Requirements

- i. Formal State Agreements (Institutional): Legal Counsel needs to be consulted. If not then Formal Agreements between the designated Agency and individual states and possibly consortiums of states will then need to be instituted.
- ii. Service Level Agreements: Service Level Agreements will have to be instituted between states and consortiums of states.
- iii. Interstate Consortium Agreements: These will need to be instituted to ensure attainment of target levels of service provision within consortiums of states.
- iv. Service Provider Contract: The study group assumes the designated agency has legal authority to act as co-ordinating authority for AFI CAD, and utilises a Service Provider Contract determining the extent of and target levels of performance needs to be instituted.

b. State Responsibilities

- i. Enforceable: The agreements instituted for the participation in AFI CAD need to be enforceable to ensure target levels of source data integrity and service support are provided.
- ii. States which cannot conform: A mechanism needs to be instituted whereby states that cannot conform to the required standards are encouraged to partake in AFI CAD and are assisted to reach and maintain the required standards. This can either be on a regional basis or via interstate agreements.
- iii. Non-conforming States: Procedures to deal with states which have entered into this agreement to join AFI CAD and then refuse to comply with the standards will need to be established.

- iv. Financial: The financial contributions for the establishment, maintenance and advancement of AFI CAD need to be defined in all agreements to join AFI CAD. This commitment will need to be actively policed to ensure compliance by member states to ensure the future sustainability of AFI CAD.
 - v. Human Resource: Target levels of service provision and its associated Human Resource requirements (Skills, Competencies and Qualifications) must be defined and be enforceable under these agreements.
 - vi. Infrastructure: Target levels of infrastructure service provision and its associated support by states (eg guarantees of security provision) must be defined and be enforceable under these agreements.
- c. Service Provider: The manner in which a Service Provider is utilised in the provision of the AFI CAD service will need to be studied and various business models will need to be assessed to determine the safest, most cost-effective, reliable and sustainable model to be adopted. These models must be assessed and the most appropriate one recommended for adoption. This must include at least the following models:
- i. The Agency establishing a subsidiary to perform this service.
 - ii. Establishment of a Consortium owned by AFI States possibly in co-operation with an external stakeholder (eg EAD)
 - iii. External Company as Service Provider (eg Group EAD)
- d. Data Provider Requirements
- i. Data Standards: Data standards, which are to be utilised in AFI CAD, need to be defined and accepted by all member states. These standards may be defined (as the Eurocontrol Standards for example) and must be enforceable under these agreements between the Agency and member states or between AFI CAD Service Provider and States.
 - ii. State Data Requirements: The minimum data requirement for AFI CAD (eg IAIP) will need to be defined in agreements. Any additional state requirements (eg Obstacle, Terrain, etc) will also need to be accommodated possibly in phased implementation.
 - iii. Required Data not available: If the required data is not available or not available in the required standard in a particular State, procedures will need to be established as to who will be responsible for the acquisition and maintenance of this data, how this will be conducted and who will then own this data.

e. Data Users

- i. Internal (State/Consortium) User Requirements: Access to the data in AFI CAD must be free to contracting States and consortiums of States.
- ii. External Clients: The requirements of external clients must be addressed to encourage them to utilise and pay for the services provided by AFI CAD. These will include but not be limited to the aviation community:

f. Technical Functionality

- i. Hardware and Facilities: The manner of provision of hardware and facilities either by states or Service Provider must be defined and contained in AFI CAD membership agreements. This will include but may not be limited to the following:

1. Location
2. Technical Support
3. System/Network Interoperability
4. Growth Plans/Capacity Expansion Plans
5. Back-up facilities and hardware

- ii. Software: The software utilised by AFI CAD must be agreed upon by AFI CAD members and the Service Provider to ensure compatibility and commonality. This will include but not be limited to the following:

1. Software System to be utilised (eg a UNIX system with Oracle or SQL database software along the lines of the EAD system)
2. Exchange Models to be utilised (eg AIXM)

Note: For custom State Software Interfaces, converters will be required and concerned States will be responsible for their provision and funding.

- iii. Human Resources: The Human Resources which each AFI CAD member state and the Service Provider will contribute must be defined in membership agreements to ensure attainability of target levels of data standards. This will include but not be limited to the following:

1. Qualifications & Training
2. Standards of Qualification and Training

3. Availability of Skills
 4. Demonstrated Competencies
 5. Required Skills, Competencies and Qualifications for Posts
- iv. Infrastructure: The provision of infrastructure to ensure operational effectiveness of AFI CAD by member states and the Service Provider regarding but not limited to the following:
1. Communications
 2. Uninterrupted Power Supply
 3. Operational Technical Skills
 4. Technical Training Centres
 5. Security Guarantees (physical and financial)
 6. Technical Support

g. AIS Operational Functionality:

- i. Implementation: Detailed planning as to how operationally the AFI CAD will be implemented including time scales, responsibilities and accountabilities must be defined in agreements between AFI CAD members and the Service Provider. These plans must take the following into account.
1. Phased Implementation: Pilot States/Operational Centres will be used initially. Other member States/Operational Centres to be added continuously until all AFI states are members
 2. Transition Plans: Plans must be defined on how state data will be incorporated into AFI CAD.
 - i. State Data Standards/ Quality Assurance: The data standards and methodology to ensure Quality Assurance of state provided data must be defined and accepted and implemented by states before incorporation into the AFI CAD member states.
 - ii. Data Harmonisation/Conflict Resolution: Procedures on how data harmonisation and conflict resolution are to be performed needs to be defined, agreed upon and implemented by states and the Service Provider before states are admitted to AFI CAD.

- iii. Target Levels of Service Provision: Target levels of service provision by states and the Service Provider must be agreed upon and implemented before admittance to AFI CAD is obtained.
- iv. Business Contingency Management: Business Contingency Management plans need to be designed and state and service provider responsibilities in these plans agreed to.
- v. Operational Control, Responsibility & Accountability: Operational Control, Responsibility and Accountability for AFI CAD and the data contained therein must be defined in all agreements between the Agency, States and the Service Provider
- vi. Safety Management System: A SMS must be implemented by all data providing states and the Service Provider to ensure the continuing integrity of data provided by AFI CAD.

h. AIS Services Provided By State: The AIS services provided by each AFI CAD member State utilising the data used in AFI CAD must be defined and agreed to by both the state and the Service Provider/Agency. This can include the following services:

- i. IAIP
- ii. Obstacles
- iii. Terrain
- iv. Airport Services
- v. Other

i. State AIS Human Resources: State AIS Human Resource provision to ensure the attainment of target levels of service by AFI CAD member states must be incorporated into AFI CAD membership agreements. This will include but not be limited to the following:

- i. AIS staff establishment and staffing levels
- ii. AIS Staff Skills, Competency & Qualifications
- iii. AIS Staff Training Development Plans
- iv. Target Levels of AIS Service Provision

j. Future Development: Future Development of AFI CAD must be continuously researched and conducted to ensure compatibility with the following stakeholder drivers:

i. Research & Development

- 1 Comply with future ICAO requirements
- 2 Database Development
- 3 Database Interoperability Requirements
- 4 Future Technologies
- 5 Future User Requirements

ii. Implementation

1. Future Development Implementation & Transition Plans
2. Future Cost Benefits

4.22 The meeting then drafted the following Conclusion.

Draft Conclusion 4/14 : Proposed Framework of AFI-CAD

That the proposed framework for the development a centralized AFI Region AIS Database at para 4.21 above be adopted by the ATS/AIS/SAR SG/9 Meeting.

Agenda Item 5 : Any other business

5.1 Under this Agenda Item, the meeting discussed the application by Roberts FIR and Senegal to become members of the AIS/MAP Task Force and endorsed the following Conclusion .

Draft Conclusion 4/15: Membership of Roberts FIR and Senegal to the AFI AIS/MAP Task Force.

That the Roberts FIR and Senegal be admitted as members of the AFI AIS/MAP Task Force.

5.2 The meeting further discussed the appellation of the current ATM Sub-Group to be reverted to the ATS/AIS/SAR Sub-Group in order to have a comprehensive coverage of the subject matters related to this Group.

5.3 The meeting then framed the following Conclusion .

Draft Conclusion 4/16: Appellation of the current ATM Sub-Group to be reverted to the ATS/AIS/SAR Sub-Group :

That the appellation of the current ATM Sub-Group be reverted to the ATS/AIS/SAR Sub-Group.

6. Draft Conclusions/Decisions

6.1 The Task Force recorded its action in the form of conclusions/decisions

Number	Title
Draft Conclusion 4/1 :	<p>Quality and status of AIS Personnel</p> <p>That States take necessary action to ensure that:</p> <ul style="list-style-type: none"> a) AIS is accorded a status commensurate with the current technological developments requiring high calibre and skilled personnel; b) Personnel recruited for AIS receive adequate professional training; c) Such personnel are accorded same status as that of personnel of other air navigation services; and adequate facilities and funds needed for the efficient performance of AIS duties and priorities are provided.
Draft Conclusion 4/2 :	<p>Training Guidelines for AIS personnel</p> <ul style="list-style-type: none"> a) That ICAO expedite the publication of the revised Training Manual (Doc.7192), Part E-3 as recommended by the AIS/MAP Divisional Meeting in 1998 (Doc. 9733), so as to facilitate the introduction of the basic requirements for States to consider the licensing issue of their AIS personnel; and b) ICAO develop AIS training guidance material relating to the implementation of CNS/ATM system.
Draft Conclusion 4/3 :	<p>Basic Criteria</p> <p>The meeting then concluded that :</p> <ul style="list-style-type: none"> a) whether the service provision is subcontracted or not: <ul style="list-style-type: none"> i. The service shall at all times be AFI States owned service. The service provider shall ensure the service is at all times perceived and recognized as being an AFI States provided service. ii. The service provision shall be an activity of cost-recovery nature and shall not generate profit on its own behalf (bearing in mind that the AFI CAD facilitates the safety, regularity and efficiency of international air navigation). iii. the service provision shall be subjected to a “ trial phase” of operation at the end of which the service may be reviewed if there has been insufficient take-up by clients and/or if the service levels have not been met. iv. all clients’ service level agreements shall be between the client and the Agency entrusted by the AFI States.

	<p>v. The Agency shall not be allowed to sell, trade or commercialize the data and/or services of the AFI CAD on its own behalf and/or profit.</p>
Draft Conclusion 4/4 :	<p>AFI CAD services That AFI CAD should provide the following major services:</p> <p>a) the International NOTAM Operation (INO) providing facilities for world-wide NOTAM, SNOWTAM, ASHTAM and AFTN or equivalent message handling and for pre-flight Information Bulletins (PIB) generation.</p> <p>b) the Static Data Operation (SDO) providing facilities for AFI Static Aeronautical Data/information handling and reporting. moreover, a minimum set of data is also maintained to allow the correct functioning of the INO system.</p>
Draft Conclusion 4/5 :	<p>AFI CAD Clients</p> <p>a) That the recommended AFI CAD clients are the following:</p> <p>b) The Data Providers which are AIS Organizations providing aeronautical information to the Centralized AFI Database;</p> <p>c) The Data Users which are Air Transport Community and beyond.</p>
Draft Conclusion 4/6 :	<p>Proposed AFI CAD System Design That the proposed AFI CAD System should be designed to provide the following:</p> <p>a) a single repository for aeronautical information and IAIP elements of participating States;</p> <p>b) data questioning enhancement through multilevel consistent data checking processes, including cross border data verification;</p> <p>c) a secure channel/vehicle for timely and efficient electronic distribution of aeronautical information and IAIP elements;</p> <p>d) harmonization and interoperability will be ensured by common and standardized:</p> <ul style="list-style-type: none"> - System interface and data exchange model (AIXM), - Static data model (AICM);
Draft Conclusion 4/7 :	<p>AFI CAD System Data Operations Services That the proposed System Data Operations Services will then</p>

	<p>provide the Centralized AFI Database clients with the following system services:</p> <ul style="list-style-type: none"> a) support to edit and provide (to the system) aeronautical information; b) electronic access to and delivery of aeronautical information; c) browsing and downloading of participating State's aeronautical information; and d) generation of reports.
<p>Draft Conclusion 4/8 :</p>	<p>Access to AFI CAD</p> <p>That the Data Operations System Services will be accessed by clients via direct electronic interface in one or more of the following three ways:</p> <ul style="list-style-type: none"> i. The Client Interface terminal (CIT). A terminal located at the client site, connected to the AFI CAD, and allowing download, modification (only by data providers) and reporting of aeronautical information as determined by the clients Service Level Agreement (SLA); ii. The Client Interface (CI). A technical toolkit allowing clients' own systems to access and interact with the AFI CAD to upload, download, modify (only Data Providers can modify) and report aeronautical information as determined by the clients' SLA; iii. INTERNET: Access to the Centralized AFI AIS Data Base will also be allowed via the Internet.
<p>Draft Conclusion 4/9 :</p>	<p>Development of AFI CAD user requirements specifications</p> <p>That States and/or Organizations in a position to do so, provide the required technical expertise to assist the Study Group to develop user requirements specifications (URS) for AFI CAD.</p>
<p>Draft Conclusion 4/10 :</p>	<p>Scope of Services Provided</p> <p>That :</p> <ul style="list-style-type: none"> a) Regarding the data operations service domains, the services provided shall ensure : <ul style="list-style-type: none"> i. Co-ordination of the resolution of data conflicts detected by the system data checking processes ; ii. for non-participating States (world wide) : <ul style="list-style-type: none"> - NOTAM processing (verification, validation, etc...) - entry of the statistic data required by the system NOTAM function.

	<p>b) As currently defined, the service does <u>not</u> include the provision of AIS services on behalf of participating States, i.e. the service <u>shall not comprise</u> the following activities :</p> <ol style="list-style-type: none"> i. creation of NOTAMs ii. origination and publication of AIP, AIP supplements, AIP amendments, AIC and charts. <p>c) As part of the provision of the service, the service provider will deliver to the centralized AFI Region AIS Data Base client the following services :</p> <ol style="list-style-type: none"> i. 24 hour operational and technical help desk ii. Client training iii. Management and monitoring of the delivery of aeronautical information and AIP elements.
<p>Draft Conclusion 4/11 :</p>	<p>Institutional Arrangements</p> <p>That AFI States shall:</p> <ol style="list-style-type: none"> a) Identify or set up an agency to develop, establish and operate the centralized AFI CAD; b) Determine the most effective and appropriate ways of funding, implementing and delivering the service. c) Commit to the timely provision of the required information to the AFI CAD; <i><u>Note: This shall not preclude them from providing the same data to other agents and/or entities.</u></i> d) Continue to be responsible for providing an AIS singularly or jointly with one or more other States or by delegating the authority for the provision of the service to a non-governmental agency in accordance with Annex 15 of the Chicago Convention; e) Maintain the intellectual property rights for the data provided to the AFI CAD; f) Provide advice and other appropriate support to any administration outside the AFI Region to consider the introduction of an aeronautical information database system compatible with the AFI CAD; g) Promote the use of the AFI CAD by taking active steps to provide appropriate information to the public on the services available from the AFI CAD and encourage the use of the service;

	<p>h) Define a legal and financial framework to be applied to States participating in the AFI CAD, and non members of the AFI Region States, covering contribution to the funding of the data operations service provision:</p> <ul style="list-style-type: none"> - Define a charging policy that: - complies with the principle of free exchange of aeronautical information amongst States AIS, in accordance with Annex 15 of the Chicago Convention; - Continues to allow recovery by States of the costs incurred for the provision of AIS services; - Avoids double charging of the Data Users.
<p>Draft Conclusion 4/12 :</p>	<p>Suggestions for Financial Model</p> <p>a) Business Plan</p> <ol style="list-style-type: none"> i. <u>Setup Capital</u>: The business plan to be adopted must define the total set-up costs and where this capital will be obtained (eg Loans, Donations/Aid, State Contributions). Each states responsibility in this regard must be defined and be enforceable in any AFI CAD membership agreement ii. <u>Financial Sustainability</u>: The business plan to be adopted must also define how financial sustainability will be ensured (eg by State Contributions, fees to be charged for access by users, en-route charges, etc). This must also show how continuous improvement and safety monitoring systems will be maintained and funded. iii. <u>Service Provider</u>: The resources that the Service Provider will bring to the project must be defined and enforced in the Service Providers contract. It should not be the sole responsibility of the member states or the Agency to fund this project as it should based on the User/ Beneficiary Pays principle. <p>b) <u>Financial Plans</u>: The financial model for AFI CAD as discussed above also needs to address the following operational considerations:</p> <ol style="list-style-type: none"> i. <u>Continuous Operational Cost Recovery</u>: Continuous Operational Cost Recovery must be ensured as a minimum requirement. If this does not occur AFI CAD will not be a viable concern.

	<p>ii. Cost Benefit Analysis reflecting the advantages and disadvantages of all business models discussed above needs to be performed before a particular model can be recommended and accepted by AFI CAD member states.</p> <p>iii. <u>Future Cost Benefits</u>: To AFI CAD (eg via provision of services additional to what is presently being provided) will need to be assessed to ensure organization structuring to take advantage of these future benefits.</p>
Draft Conclusion 4/13 :	<p>Development of AFI CAD Business Model and Financial Model</p> <p>That the Study Group develop a business model and financial model for the AFI CAD.</p>
Draft Conclusion 4/14 :	<p>Proposed Framework of AFI-CAD</p> <p>That the proposed framework for the development a centralized AFI Region AIS Database at para 4.21 above be adopted by the ATS/AIS/SAR SG/9 Meeting.</p>
Draft Conclusion 4/15 :	<p>Membership of Roberts FIR and Senegal to the AFI AIS/MAP Task Force.</p> <p>That the Roberts FIR and Senegal be admitted as members of the AFI AIS/MAP Task Force.</p>
Draft Conclusion 4/16 :	<p>Appellation of the current ATM Sub-Group to be reverted to the ATS/AIS/SAR Sub-Group :</p> <p>That the appellation of the current ATM Sub-Group be reverted to the ATS/AIS/SAR Sub-Group.</p>

**APPENDIX A****AIS/MAP/TF/4**

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

FOURTH MEETING OF THE AIS/MAP AUTOMATION TASK FORCE

(Dakar, 18 – 19 April 2007)

List of Participants

Country/Etat	Name/Nom	Designation/Fonction	Address/Adresse	E-mail, Telephone, Fax
GAMBIA	Mr. COLE B. JAMES	AIS Manager	Gambia Civil Aviation Authority P.O Box 285 – Banjul	☎ : + 220-4472730 /89024 96 Fax : + 220-4472190 E.mail :aismgr.gcaa@qanet.gm
KENYA	Ms. NYAGA JUSTINA M.	Manager, Aeronautical Information Services	Kenya CAA, P.O. Box 30163, 00100 Nairobi	☎ : + 254 20 827470/1/2/3/4/5 Fax : + 254 020 822 300 E.mail: ais@kcaa.or.ke jnyaga@kcaa.or.ke
SENEGAL	Mr. GUEYE SIDY	Représentation ASECNA - NOF Dakar Chief	BP 8155, Dakar, Yoff, Sénégal	☎ : + 221 869 2332 Fax : + 221 820 0656 E.mail : senegalbni@asecna.org
	Mr. SARR ALI	Représentation ASECNA - Chef BIA/BDP	BP 8552 – Dakar, Yoff, Sénégal	☎ : + 221-869 22 40/ 6870885 Fax : + 221-8200656 E.mail : alisarr2000@yahoo.fr
NIGERIA	Mr. Capt. Sonny ODIDISON	Director (AIS)	NAMA - Murtala M. Airport Ikeja – Lagos	☎ : + 234-805 505 7000 Fax : + 234-1-4931330 E.mail : captsonny2004@yahoo.com
	Mr. GARBA M. GWON	Senior AERO Informatique Officer (Cartographer)	NAMA - Murtala M. Airport Ikeja – Lagos	☎ : + 234-8025280915 Fax : + E.mail : garbagwon@yahoo.com
SIERRA LEONE	Mr. SESAY JOHN S.	Sierra Leone Airports Authority – Senior Air Traffic Control Officer	c/o Control Tower-Freetow Airport-Lungi	☎ : +232-76-636807/ 232-30204949/ 232-33 433771 Fax : + 233-22 223188 /226543 E.mail :jssesay01@yahoo.com
	DURAMANY SHERIFF	Aeronautical Information Officer (AISO)	Sierra Leone Airports Authority – Freetown – Lungi	☎ : + 232-33411745 /338361 Fax : + 232-22 223 88 / 22 65 43 E.mail : dura-shero@yahoo.com
SOUTH AFRICA	Mr. LEVERS MABASO	Director: C.A. Compliance & Monitoring	Private Bag x193 – Pretoria 0001	☎ : + 27-12 3093285 Fax : + 27-12 3093468 E.mail : mabasol@dot.gov.za
	Mr. MATSHOBA J.M.	Manager AIS	Private Gab x 15 Kempton Park 1620	☎ : + 27-11 961 0208 Fax : + 27-11 392 3869 E.mail : jeffm@atns.co.za
	Ms PHIRWA BARADI	Head of Operation AIS	Private Bag x 73 Halfway House 1685	☎ : + 27-11 545 1341 Fax : + 27-11545 1459 E.mail : phirwab@caa.co.za
TANZANIA	Mr. KIBAKAYA JIMMY T.	Principal Aeronautical Information Officer	Tanzania CAA, P.O.Box 2819, Dar Es Salaam	☎ : + 255 22-2115079/80 Fax : + 255 22-2124914 E.mail : tcaa@tcaa.go.tz jkibakaya@tcaa.go.tz
TUNISIA	Mr. SAHBANI HASSEN	AIS Manager	Office de l'Aviation civile et des Aéroports BP 137, Aéroport de Tunis-Carthage – 1080. Tunis	☎ : + 216 71 755000 poste 32140 Fax : + 216 71 783 621 E.mail : tunisia-ais@oaca.nat.tn
	Mr. THABET SAMI	AIS Quality Manager	Office de l'Aviation civile et des Aéroports, BP 137, Aéroport de Tunis-Carthage – 1080. Tunis	☎ : + 216 71 755000 poste 33251 Fax : + 216 71 751 463 E.mail : sami.thabet@oaca.nat.tn
ZIMBABWE	Mr. RONDOZAI BONIFACE	Principal AIS OFFICER	Civil Aviation Authority of Zimbabwe, 3 rd floor, Harare International Airport,	☎ : + 263-4 585 018 (Dct) 585 073/88 Fax : + 263-4 585 100

Country/Etat	Name/Nom	Designation/Fonction	Address/Adresse	E-mail, Telephone, Fax
			Harare	E.mail : ais@caaz.co.zw
INTERNATIONAL ORGANIZATIONS/ORGANISATIONS INTERNATIONALES				
ASECNA	Mr. YOGUELM KADJIBAYE	DG/DEE	Direction Générale, BP 3144, Dakar	☎ : + 221 869 5700 Fax : + 221 820 7495 E.mail : yoguelimkad@asecna.org
	Mr. MAIGA. ISSA SALEY	Chef Bureau Coordination N.A	75, Rue la Boetie 75008, Paris	☎ : + 331 44950738 Fax : + 331 42257311 E.mail : maigaiss@asecna.fr
	Mr. AHOUANGAN ATHANASE	DG/DEE	Direction Générale, BP 3144, Dakar	☎ : + 221-8695716/ 6322008 Fax : + 221- 820 7495 E.mail : ah_athanase@yahoo.fr
EUROCONTROL	Mr. GALAIS JEAN-MICHEL	Expert Aeronautical Information Management Division	Rue de la Fusée 96-B-1130 Bruxelles	☎ : + 32-2 729 4768 Fax : + 32-2 729 90 08 E.mail : jean-michel.galais@eurocontrol.int
IATA	Mr. SENE AMADOU	Consultant	BP 8443 – Dakar Yoff - Dakar	☎ : + 221-820 50 44 Fax : + E.mail : amsene@yahoo.com
ICAO	Mr. KARUGHA APPOLO	Regional Officer/ATM, ICAO	ICAO, ESAF Office, Nairobi	☎ : + 254-020 622 395/396 Fax : + 254 020 623028/621092 E.mail : icao@icao.unon.org apolo.kharuga@icao.unon.org
	Mr. AUYO IBRAHIM U.	Regional Officer/ATM, ICAO Dakar	P.O. Box 2356, Dakar, Sénégal	☎ : + 221 839.93.93 Fax : + 221 823.69.26 E.mail : icaodkr@icao.sn iauyo@icao.sn
	Mr. BALDEH GEORGE	Regional Officer/AIS/MAP, ICAO, Dakar	P.O. Box 2356, Dakar, Sénégal	☎ : + 221 839.93.93 Fax : + 221 823.69.26 E.mail : icaodkr@icao.sn gbaldeh@icao.sn
ROBERTS FIR	Mr. BARRY MAMADOU K.	ATCO//Head of Roberts RCC	BP 5294 – Conakry	☎ : + 224-60227458 Fax : + E.mail : kanabarry@yahoo.fr
	Mr. CONTEH Almamy D.	Senior Air Traffic Control Officer ROBERTS FIR (SATCO)	BP 5294 - Conakry	☎ : + 224-63404391 Fax : + E.mail : almamydixon@yahoo.co.uk alimamydixon@yahoo.co.uk
	KOLAKO JONATHAN M.	Aeronautical Information Officer (AISO)	BP 5294 - Conakry	☎ : + 224-404 391 Fax : + E.mail : centralaisoffice@yahoo.co.uk jonkolako2000@yahoo.com