



Agenda Item 3: Review of AIM Planning and Transition issues

3.1 DEVELOPMENT FOR A CAR/SAM TRANSITION PLAN TO AIM

(Presented by the Secretariat)

SUMMARY

This Working Paper provides a strategic framework for the evolution and development of Aeronautical Information Management within CAR/SAM States in a harmonized and integrated manner, during the period from 2008 to 2015. It contributes to the achievement of the future ATM/CNS operational target objectives, discusses the requirements for the transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM) and proposes a work programme to enable that transition.

References:

- *Annex 4
- *Annex 15
- *Doc 8126, *Aeronautical Information Services Manual*
- *Doc 8697, *Aeronautical Chart Manual*
- *Doc 9674, *World Geodetic System – 1984 (WGS-84) Manual*
- *Doc 9828, *Report of the Eleventh Air Navigation Conference (2003)*
- * Doc 9881 – *Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information.*
- * AIS QM/TF/3 Meeting Report

This working paper relates to ICAO Strategic objectives **A – Safety** and **D – Efficiency**

1. Introduction

1.1 The 11th Air Navigation Conference (AN-Conf/11) held in Montreal in 2003 endorsed the ATM Operational Concept and recognized that in the global ATM system environment envisioned by the operational concept, aeronautical information service (AIS) would become one of the most valuable and important enabling services. As the global ATM system foreseen in the operational concept was based on a collaborative decision-making (CDM) environment, the timely availability from authorized sources of high quality electronic aeronautical information, meteorological, airspace and flow management information would be necessary. The extensive sharing of information encourages collaborative decision-making, thereby allowing air traffic management to optimize efficiency in the conduct of its operations. AN-Conf/11 stressed that aeronautical information services (AIS) and meteorological services (MET) are subsets of the ATM information requirements and therefore, would need to be fully addressed when developing ATM requirements.

2. Discussion

2.1 Evolution of requirements for the transition of AIS to AIM

2.1.1 To achieve the future ATM objective of making informed collaborative decisions for the most efficient operations and business practices, AN-Conf/11 was of the view that aeronautical information must be managed efficiently and shared on a system-wide basis by making it available for access by any participant in the ATM environment when and where required. It was therefore agreed that quality-assured aeronautical information should ultimately be available in real-time, through a seamless interchange between parties in an interoperable, flexible, adaptable and scalable manner. To ensure the cohesion and linkages between different components of the operational concept and to accomplish the role of AIS, AN-Conf/11 recognized the need for the interchange and management of aeronautical information to be used by different services and users, while taking into account interoperability of existing and future systems.

2.1.2 In addition in June 2006, a Global AIS Congress was held in Madrid, Spain. The event was facilitated by European Organization for Safety of Air Navigation (EUROCONTROL) in partnership with ICAO and served as a platform to bring together originators, processors, publishers, regulators, system designers, service providers and end-users of aeronautical information. The Congress considered the essential role of AIS in the evolving world of ATM. It identified the key drivers for change, looked at the many complex issues associated with that evolution and explored what must be done. The Congress supported Recommendation 1/8 of the AN-Conf/11 and began to define a future high-level view as to the shape, nature and content of a strategy for the evolution of AIS to AIM.

2.1.3 The Congress agreed that, in order to prevent diverging developments in the future and realizing the safety critical nature of aeronautical information, it was considered essential that ICAO take the lead at the global level with regard to the transition from AIS to AIM. Accordingly, the Congress developed ten recommendations calling for ICAO action or support from States and international organizations. The recommendations of the Congress are at **Appendix A**.

2.1.4 In September 2007, Portugal presented WP/51 to the 36th Session of the Assembly on behalf of forty-three Contracting States, comprising the European Community and its member States, members of the European Civil Aviation Conference and EUROCONTROL. The Paper discussed the need for a strategic evolution towards AIM. It outlined the general support expressed at the Global AIS Congress, the progress achieved, and recommendations directed at achieving a uniform and efficient AIM structure to support all phases of flight. The Assembly supported WP/51 and recognized the need for the Secretariat to support the recommendations of the Global AIS Congress together with the need for further coordination and transparency.

2.2 Work programme to enable the transition of AIS to AIM

2.2.1 It will be necessary to first develop a global strategy/road map document to plan, manage and facilitate the global transition from AIS to AIM. The road map should recognize that not all States or Regions can make the transition immediately to AIM, and that implementation will be evolutionary, based on regional needs. The transition should be supported by the Global Air Navigation Plan, regional plans and State implementation plans, which would also describe the progressive intermediate steps. The plans of all States and regions need to be aligned to ensure, to the greatest extent possible, that solutions are internationally harmonized and integrated and do not unnecessarily impose multiple equipment carriage requirements in the air components of the ATM system, or multiple systems on the ground.

2.2.2 Annex 4 and Annex 15 provisions, and associated guidance material, will need to provide for standard aeronautical information conceptual and exchange models to enable the global exchange of data in digital format. In accordance with Recommendation 1 of the Global AIS Congress, it is intended that these models be largely based upon the established and widely used standard aeronautical information conceptual model/standard aeronautical information exchange model (AICM/AIXM) developed by EUROCONTROL and the United States. However, the Secretariat considers it necessary to review the documentation on the models to ensure their suitability for global use. A review of the airport mapping exchange model (AMXM) should also be undertaken to determine how it may be integrated. Additionally, global mechanisms to allow the further evolution of these models in a managed and supportable manner will need to be defined.

2.2.3 Annex 4, Annex 15 and associated guidance material will also require amendment to support new digital requirements and an appropriate presentation of aeronautical information to the end user. This should include electronic AIPs (eAIP) and electronic charts. The development of these requirements should take into account that though the transition from a product-centric (current AIS) to a data centric (AIM) service is essential, it is foreseen that AIM will still have to cater for the provision of traditional AIS products during the transition phase. Nevertheless, the quality, consistency, availability and timeliness of data must meet stringent new digital requirements, substantially exceeding those currently considered acceptable.

2.2.4 Recommendation 7 of the Global AIS Congress, stated that, as a pre-requisite for the transition to AIM, States that have not yet done so should give high priority to the implementation of existing SARPs in Annex 15 and in particular those related to WGS-84, the quality management system and automation. In this regard, there is a need to further update the Aeronautical Information Services Manual (Doc 8126) and the World Geodetic System — 1984 (WGS-84) Manual (Doc. 9674), and provide a new manual on the quality management system for aeronautical information.

2.2.5 It will be necessary to define the human resource activities necessary to realize the future AIM. This will involve identification of the basic future personnel skills required, mechanisms for validating competency, and the development of supporting guidance and training material.

2.2.6 A number of legal and institutional issues may restrict the evolution of AIM. In this regard, the ICAO World Wide Symposium on Enabling the Net Centric Information Environment will be held in Montreal from 2 to 4 June 2008. It is expected that this Symposium will address, inter-alia, the legal and institutional issues related to the transition from AIS to AIM. It is intended that a work programme to address identified key issues should be developed from experience gained at this Symposium.

2.2.7 Today, the temporality, accuracy and integrity of Aeronautical Information do not meet future Navigation system requirements. Moreover, the current ATM system is based upon isolated information islands: civil and military AIS, MET, ATFM... This implies a series of transaction points at which aeronautical information integrity is potentially reduced: the same information is manually re-entered a number of times in discrete systems. AIM will ensure uniqueness of aeronautical information throughout the ATM/CNS system.

2.3 Conclusion

2.3.1 In view of the complexity of the issues involved in the transition from AIS to AIM, the scope of the ICAO Head Quarters is considered that establishment of a several tasks that could provide to States guidelines and specific activities in order to assist States for transition, those guidelines and activities will be prepared by an international group (AIS-AIMSG) conformed by experts in our field. The main expected outputs are contained in **Appendix B**.

2.3.2 As all we know, AIM is not a physical System is a “system of systems”, based upon the networking of various database components, through a middleware concept architecture. The migration from AIS to AIM will require the addressing of a set of interrelated aspects: Information Architecture (data dictionaries, interface definition, R&D...), Safety, Business & Human Resource Cases, Implementation Programmes, new SARPS and Regulation etc...These aspects will be further analyzed and structured in the second volume of the AIM Strategy that will provide the “Roadmap to AIM”.

2.3.3 It is suggested to review the “Strategic Project for the Transition to the AIM”, prepared by AIM QM TF contained in Attachment 2 of WP/05. In line with the work programme that will be discussed in Item 5.1, it is proposed that the AIM SG be tasked with assisting the Secretariat with the development of a strategy/roadmap for the transition from AIS to AIM, to prepare an updated guidance material for next AIM/SG/12, and present it to the next GREPECAS Meeting, taking into account the expected outputs that are provided in Appendix B. It is also envisaged that MET items will be discussed on Agenda Item 6.1 must be included in the future work of the subgroup as part of the transition from AIS to AIM matures.

2.3.4 Suggested Action

2.3.4.1 The Meeting is invited to agree that:

- a) CAR/SAM States adopt the first version of the “Strategic Project for the Transition to the AIM”, prepared by AIM QM TF contained in **Appendix C** to this WP;
 - 1) that provide to CAR/SAM States with initial guidelines for a **strategy/roadmap for the transition from AIS to AIM;**
- b) States be invited to ensure the implementation of the appropriate actions for the transition AIS to AIM, included in Appendix C.

APPENDIX A

GLOBAL AIS CONGRESS Madrid, Spain, 27–29 June 2006

RECOMMENDATIONS

Recommendation 1: ICAO adopt the AICM/AIXM as the standard aeronautical information conceptual model and the standard aeronautical information exchange model, and

- develop appropriate means of compliance, and
- global mechanisms to manage and develop the AICM/AIXM.

Recommendation 2: ICAO should evolve the AIM Concept and associated performance requirements and develop a road map to plan, manage and facilitate on a world-wide basis the transition from AIS to AIM.

Recommendation 3: ICAO instigate an urgent review of Annex 4 and Annex 15 in accordance with the recommendation of the 11th Air Navigation Conference.

Recommendation 4: ICAO should incorporate transition activities into the Global Air Navigation Plan in order to ensure broad-based development of AIS/AIM capabilities across all ICAO Regions

Recommendation 5: ICAO should, as a matter of urgency address legal and institutional issues including those associated with an expansion of service from AIS to AIM that could constrain the adoption and implementation of AIM.

Recommendation 6: States working in close coordination with international organizations should support ICAO in any activity to accommodate the transition from AIS to AIM.

Recommendation 7: Recognising the critical nature of aeronautical information in the present and future ATM systems, States should give high priority to the implementation of existing Standards such as WGS-84 and Quality Management Systems and should, if necessary, request assistance from ICAO or if appropriate international organisations to do so.

Recommendation 8: Recognising the social dimension associated with change, ICAO working with States and international organisations determine the required Staff Profile(s) for AIM and determine appropriate skills and competencies and amend existing guidance material and develop new guidance and training material, under the TRAINAIR programme perhaps, to assist States and other AIS organisations in the transition process.

Recommendation 9: ICAO should promote open access to information.

Recommendation 10: That ICAO consider as a matter of priority how a Global Forum could be established.

APPENDIX B

EXPECTED OUTPUTS OF THE AIS-AIMSG ON ICAO HEAD QUARTERS

— Aeronautical Information Management

<i>ID</i>	<i>Expected output</i>	<i>Source</i>	<i>Final results</i>	<i>Completed</i>
1.	Global strategy/roadmap for the transition from AIS to AIM	Global AIS Congress 2006, Rec 2 ; A36-WP/51; ANC	State letter/Guidance material	2008
2.	SARPs and guidance material related to the provision of a standard aeronautical information conceptual model and standard aeronautical information exchange model to enable the global exchange of data in digital format. Definition of a means to allow the further evolution of these models in a managed and supportable manner.	Global AIS Congress 2006, Rec 1; A36-WP/51; ANC	Amendments 36/37 to Annex 15 Amendments 56/57 to Annex 4 New manual and amendment Defined means to allow the further evolution of the models	2010/13 2010/13 2010/13 2010
3.	SARPs and guidance material related to an appropriate presentation of digital aeronautical information to the end user, including the electronic AIP (eAIP) and electronic charts.	Global AIS Congress 2006, Rec 3; A36-WP/51; ANC	Amendments 36/37 to Annex 15 Amendments 56/57 to Annex 4 Amendments to Doc 8126 Amendments to Doc 8697	2010/13 2010/13 2010/13 2010/13
4.	Guidance material and further development of SARPs related to the quality system to support AIM	Global AIS Congress 2006, Rec 7; A36-WP/51; ANC	New AIM quality system manual Amendment 36 to Annex 15	2010 2010
5.	Review of SARPs and guidance material related to electronic terrain and obstacle data to determine if refinement of SARPS or additional guidance material is necessary.	EANPG C49/39	Amendment 36 to Annex 15 Amendment to Doc 9881	2010 2010
6.	Guidance and training material related to staffing and training for the transition from AIS to AIM	Global AIS Congress 2006, Rec. 8; A36-WP/51; ANC	New AIM training manual Amendment to Doc 8697	2010 2010
7.	Development of a proposed work plan to address key legal and institutional issues raised during the Worldwide Symposium on Enabling the Net-Centric Information Environment (Montreal, 2 to 4 June 2008)	Global AIS Congress 2006, Rec. 5; A36-WP/51; ANC	AN-WP	2009