International Civil Aviation Organization

WORKING PAPER

ASSEMBLY — 36TH SESSION

TECHNICAL COMMISSION

Agenda Item 31: Continued evolution of a performance-based global air traffic management (ATM) system

FROM AIS TO AIM - THE STRATEGIC EVOLUTION OF AERONAUTICAL INFORMATION MANAGEMENT (AIM)

(Presented by Portugal, on behalf of the European Community and its Member States[1], by the other States Members of the European Civil Aviation Conference[2], and by EUROCONTROL)

EXECUTIVE SUMMARY
This paper outlines the need for a strategic evolution towards Aeronautical Information Management (AIM), building on the AIM Concept. It explains the progress achieved so far, the general support expressed at the June 2006 AIS Global Congress and presents the recommendations required to achieve a uniform and efficient aeronautical information management structure to support all phases of flight.
Action: The Assembly is invited to:
a)   Take note of the contents of this paper and the progress being made in the field of AIM;
b)   Support the global adoption and implementation of the AIM strategy and concept; and
c)   Urge the Council to take action on the recommendations by the Global AIS Congress contained in paragraph 3.

Strategic Objectives:	This working paper relates to Strategic Objective D *(Efficiency – Enhance the Efficiency of aviation operations)*
Financial implications:	Not applicable
References:	

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[1] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. All these 27 States are also Members of the ECAC.

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Croatia, Georgia, Iceland, Moldova, Monaco, Norway, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

1.	**INTRODUCTION**

1.1	Air transport has evolved to become a key enabling component of the world economy. As the global economies expand, the demand for air transportation grows apace. Airspace and airport capacity must be increased to absorb this demand. Since traditional methods of increasing capacity are near exhaustion, new and improved methods and concepts are needed to maximise the exploitation of existing capacity and to add capacity wherever possible. In order to release the latent capacity in the Air Traffic Management (ATM) system and to create new capacity, ATM is required to evolve, and implement the available means to provide the necessary capacity in a safe, sustainable, timely, efficient and economic way.

1.2	ATM is dependant on the provision of timely, relevant, accurate, and quality assured information that allows the ATM community to make informed decisions. These decisions need to be taken on the basis of Collaborative Decision Making (CDM) rather than in isolation. When shared on a system-wide basis and using advances in the corresponding technologies, this kind of information will allow the ATM community members to conduct their business and operations in an efficient and cost effective way. The ICAO Global ATM Operational Concept was endorsed by the Eleventh Air Navigation Conference (2003) and provides the framework and direction that should be followed.

1.3	The traditional product-centred provision of Aeronautical Information has to be replaced by a data-centred and systems-oriented solution, in which timely and reliable data are made available permanently and dynamically, for use in applications that perform the required tasks (flight planning, flight management, navigation, separation assurance, CDM or any other strategic or tactical ATM activity).

1.4	One key enabler of the ATM system is interoperability. It is essential that the new definition of aeronautical data is provided in a common format (or set of formats) which is system and platform independent, within a virtual information management system. The objective is to ensure consistency, authenticity and appropriate coverage of the data, and to provide accessibility to the data by all users of the ATM network, both on the ground and in the air. The enlarged scope of Aeronautical Information Management (AIM) includes all categories of information required to support the new ATM system.

1.5	Traditional Aeronautical Information Services (AIS) must make the transition to AIM, which would be the first and major step in the evolution of a network-centred information environment for ATM, which should be characterised by the increasing application of the "all embracing" System Wide Information Management (SWIM) principles.

2.	**AIM CONCEPT**

2.1	Recognising the need to provide complete aeronautical information of the right quality and timeliness in accordance with the Eurocontrol ATM Strategy for the years 2000+, the Agency developed the AIM Concept in the late 1990's in close collaboration with all stakeholder groups. It was adopted as European policy in 2000. It is designed to create a community of people, devices, information and services interconnected by a communications network to achieve optimal benefit of resources and better synchronisation of events and their consequences. The objective is to establish an environment in

which all actors have the same situational awareness, by sharing a common ground and airspace picture. AIM, also referred to as the "net(work)-centred" or "information-centred" environment, will be the ATM realisation of SWIM. Initiatives such as the Mandate originated by the European Commission on Aeronautical Data Quality are fully aligned with the AIM Concept and moreover, are powerful enablers for its successful implementation.

2.2   The basis of AIM is the ICAO Global ATM Concept mentioned above and other ICAO Regional activities reflecting the worldwide dimension which characterises aeronautical information. The AIM Concept embraces concept, system and service layers. It is built on the recognition of the need for current AIS to evolve to AIM and become an integral component of the new aeronautical information management environment.

2.3   The most important changes from traditional AIS, as instantiated by ICAO Annex 15, reflected in the AIM Concept are the transition from a product-centred service to the provision and management of data in an interoperable form sufficient for end use, and the broadening of scope in terms of information coverage beyond the narrow confines of Annex 15. In order to be effective and ensure overall consistency and interoperability, AIM must consider that all data used in aeronautical operations are of concern to AIM and should thus be progressively incorporated in its open scope.

2.4   The overall strategic objective of Aeronautical Information Management is the achievement of a uniform and efficient aeronautical information management structure, based on system-wide information management, in order to support all phases of flight.

3.   **TOWARDS GLOBAL ACCEPTANCE**

3.1   On behalf of its Member States, Eurocontrol submitted a paper to the 11th Air Navigation Conference in the autumn of 2003 outlining the concept of AIM. In a parallel paper, the United States announced the adoption of AIM as a core element of its policy. Recognising the need for change in the aeronautical information paradigm and the benefits to be obtained from AIM, the Conference recommended its adoption as a global concept.

3.2   At the European level a revision of the AIM concept and strategy was endorsed, in March 2006, by AIS stakeholders from Eurocontrol Members States assembled in a large consultation group (AIS Team meeting) and a global version entitled "*From AIS to AIM – a Global Strategy*" has been published.

3.3   **The 2006 Global AIS Congress**

3.3.1   Recognising the resource limitations of ICAO, an informal Global Consortium comprising Australia, Canada, China, Japan, the United States and Eurocontrol, working on behalf of and in conjunction with ICAO, has worked to promote the understanding and enhance the acceptance of the AIM concept. The Consortium organised a very successful Global AIS Congress, held in Madrid in June 2006. The Congress, the largest global AIS meeting held to date, attracted more than 500 participants drawn from across the AIS/AIM stakeholder community and representing 85 countries. The objectives of the Congress were to bring together originators, processors, publishers, regulators, system designers, service providers and end-users, which collectively constitute the global AIS community.

3.3.2   The Congress outlined a vision on the shape, nature and content of a strategy for the evolution from AIS to AIM in particular, and the provision and management of aeronautical information in general. It was agreed that the Congress document "*From AIS to AIM – a Global Strategy*" constituted a firm basis for further debate.

3.4   **Recommendations from the Congress**

3.4.1   The Global AIS Congress made the following ten recommendations for change, which on that occasion the ICAO Secretariat agreed to study:

Recommendation 1
ICAO should adopt the AICM/AIXM[3] 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 worldwide basis, the transition from AIS to AIM.

Recommendation 3
ICAO should initiate 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 the 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 organisations, 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 from appropriate international organisations to do so.

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[3] AICM/AIXM – Aeronautical Information Conceptual Model/Aeronautical Information Exchange Model

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

Recommendation 9
ICAO should promote open access to information.

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

3.5   **Post Congress Developments**

3.5.1   In December 2006, Eurocontrol sponsored a facilitated, interactive workshop to further
develop the concept of AIM. This workshop examined six of the nine strategic objectives outlined in the
AIM Concept. In order to ensure active and effective debate, the workshop was limited to ninety
participants, fifteen per working group. Once again, there was healthy global participation, the interactive
approach via working groups worked well, and considerable progress was made.

3.5.2   To maintain the momentum for change, the Global AIS Consortium agreed to organise
annual "mini-Congresses" possibly ahead of a second main Congress in 2010. The mini-Congresses have
as their main themes Global AIM (2007), Quality AIM (2008) and Implementing AIM (2009).

3.5.3   In addition, ICAO's Air Navigation Bureau and Eurocontrol have developed a proposed
work plan for the evolution of AIM with the aim of meeting the near and medium term objectives and
recommendations from the Congress. The work plan has already been subject to some stakeholder
scrutiny, and further consultation is planned. The ICAO Secretariat has also committed to take a leading
role and to participate fully in the work of the consortium and other AIS for a in order to ensure that the
continuing work on transition to AIM is harmonised globally and the requisite Standards and
Recommended Practices (SARPs) and other ICAO provisions are developed and made available in a
timely fashion to support AIM.

3.5.4   In short, progress is being made towards the evolution and implementation of sufficient,
capable and adequate aeronautical information, suitable to meet the needs of the present and future ATM
systems.

4.   **CONCLUSIONS**

4.1   A start had been made in the evolution of AIS to AIM, but much more is required.
Further evolution must be derived from continued global interaction and discussion.

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