INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
EIGHTEENTH MEETING (APIRG/18)
Kampala, Uganda (27 – 30 March 2012)

Agenda Item 4.1: Review and update of the list of deficiencies in the Air Navigation Fields – Implementation of the AFI Regional Database and transition to a Central Database.

CENTRALISED AERONAUTICAL DATABASE

(Presented by South Africa)

SUMMARY
This information Paper presents the progress made by South Africa, with the implementation of a Centralized Aeronautical Database (CAD) solution and the benefit this solution could have for the African Continent.

REFRENCE(S):

- APIRG/17 Meeting
- ICAO AIS to AIM Roadmap
- TWELFTH APIRG ATM/AIM/SAR/SG/12 MEETING

Related ICAO Strategic Objective(s):

1. INTRODUCTION

1.1 One of the requirements of the ICAO AIS to AIM Roadmap, is the creation of a centralised repository of Aeronautical Information in support of future ATM requirements as defined in the *Global Air Navigation Plan* (Doc 9750) and the *Global Air Traffic Management Operational Concept* (Doc 9854).

1.2 Conclusion 15/43 of the AFI Planning Implementation Regional Group (APIRG) 15 Report stated that IATA, in cooperation with ICAO and air navigation service providers in the AFI Region, study the establishment of a centralised AFI AIS data base similar to the European aeronautical database and forward it to the AIS/MAP Task Force for its consideration.

1.3 South Africa's major Air Navigation Service Provider, ATNS has therefore acquired a solution identical to the European AIS Database (EAD) currently used by Eurocontrol and the European ATM Community, to ensure that ATNS and South Africa align itself with global initiatives and technologies.

2. DISCUSSION

2.1 The ATNS CAD system is identical to the European AIS Database (EAD), this allows for the synchronisation and information sharing between the CAD and EAD and any other compatible databases.

2.2 The ATNS CAD will enhance current AIS service functionalities in support of the air traffic management system envisioned in the *Global Air Traffic Management Operational Concept* (Doc 9854).

2.3 The traditional product centric provision of Aeronautical Information has to be replaced by a data centric and systems oriented solution, one in which timely and quality assured data is made available permanently and dynamically for use in applications that perform the required tasks, be it flight planning, flight management, navigation, separation assurance, Collaborative Decision Making (CDM) or any other strategic or tactical ATM activity.

2.4 To achieve this, Aeronautical Information Services (AIS) has to transition from a general "paper based" information sharing environment to a "digital" information sharing platform.

2.5 This "digital" information sharing platform will be achieved within the CAD system through the functionalities of the following various subsystems:

- CAD BASIC - Web-presence for Airline Operators, Pilots and the General Aviation Public to access IAIP information seamlessly and effortlessly;
- SDO – Static Data Operation (application utilised to manage the input and output processes of static and dynamic aeronautical information contained within CAD);
- GT - Graphical Tools (GIS visualisation of static and dynamic aeronautical information, airspace design etc.);
- eAIP – Aeronautical Information Publication (authorising of aeronautical documents as per Annex 15 requirements);
- PAMS – Published AIP Management System (document management system for aeronautical documents and charts);
- eCharting – Aeronautical Chart Production (application utilised to generate quality, information rich aeronautical charts); and
- AST – Accountable Sources Toolkit (application utilised by data originators to provide aeronautical information in a controlled digital environment).

2.6 Aeronautical data not previously accessible in digital format (topographical and obstacle data, etc.) will thus be entered into the CAD system and be available to the entire aviation community, either through direct connection or through an internet based interface.

2.7 One of the key benefits of the CAD system is that it would allow for the definition of a data "Provider" or "User". A Data Provider (Usually Data Originators, Air Navigation Service Providers or State Civil Aviation Authorities) will be responsible for the following main functions in SDO:

- **SDO Slot Management** - The Slot Management provides a set of functionalities to co- ordinate and checks static data changes and makes it effective at a future date (Effective date);
- **SDO Static Data Maintenance** - The Static Data Maintenance provides a set of functionalities to insert and maintain static data changes based on the SDO data model entities; and
- **Upload & Download Management** - The Upload & Download Management provides a set of functionalities to upload and download aeronautical data in the ARINC 424 or AIXM (XML syntax) exchange format.

2.8 The information contained within the SDO would then be used in creating the required publications (AIP, Supplement or AIC). The publications will then be available in the Published AIP Management System (PAMS) application on the CAD system.

2.9 Data Users (Usually Aircraft Operators, Airport Operators/Developers, Military and General Aviation) are able to perform the following functions using the CAD internet based applications:

- **Generate Reports** - Execute pre-defined and saved user-defined reports;
- **Manage User-defined Reports** - Define new reports by using the whole range of the supplied SDO database views;
- **Search Published AIP Management System (PAMS)** – View aeronautical documents and charts; and
- **SDO Graphical Reporting** – Visualisation of Aeronautical Information.

2.10 As the ATNS CAD is based on the Aeronautical Information Conceptual Model (AICM), it would allow for the exchange of the information with any other aviation subsystem utilising the Aeronautical Information Exchange Model (AIXM) principles.

2.11 Other exchange models developed and defined through combined international collaboration of Eurocontrol, FAA, etc. for the exchange of information include:

- Aeronautical Information Exchange Model (AIXM);
- Airport Mapping Exchange Model (AMXM);
- Weather Information Exchange Model (WXXM); and
- Environmental Information Exchange Model (ENXM).

2.12 The benefit this holds for the African continent is the exchange and information sharing between the CAD and any other compatible databases, based on System to System Interfaces which allows data providers and users to integrate into the CAD system via a standardized interface with existing or new systems.

CONCLUSION

2.13 The ATNS CAD is a vital asset and is essential for the role of AIS in the evolving world of ATM. Computer-based navigation systems, area navigation (RNAV), required navigation performance (RNP) and other ATM requirements necessitates the need for AIS to be able to provide and manage digital, quality assured information in a timely manner.

2.14 Through collaboration and information sharing, a global interoperable ATM system network can be created that enables ATNS to safely handle more traffic in the same amount of space during the same amount of time. The CAD system would effectively link the full range of services from airspace design to flight planning, airport operations planning and flight separation assurance by ensuring the integrity and quality of the aeronautical data contained throughout the CAD system for the South African aviation community and African States.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Review the information in this paper regarding the implementation and future use of the Centralised Aeronautical Database

b) It is recommended that the Secretariat support this initiative and consider recommending that the AFI States migrate to the South African Regional AIS Database as an alternative as proposed by the First AFI Region AIM Implementation Task Force held in Dakar, Senegal (20^{th} – 22^{nd} July 2011).

c) Note that this initiative will enhance the AIM implementation process within the AFI Region

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