



International Civil Aviation Organization

MIDANPIRG MIDAD Task Force

First Meeting (MIDAD TF/1)

(Cairo, Egypt, 16 - 18 June 2014)

Agenda Item 3: MIDAD Project Phase 2 - Detailed Study

DEVELOPMENTS IN THE WORLD AND MIDAD REQUIREMENTS

(Presented by Avitech GmbH)

SUMMARY

This working paper tries to emphasis on developments in ICAO which might effect the requirements definition phase of MIDAD. The implementation horizon of MIDAD is at least until 2018. Parallel new planning and changes in ICAO shall be taken into account in order to save the investment in MIDAD. It also reiterates essential user requirements which need to be fulfilled by AIS.

Action by the meeting is at paragraph 0.

REFERENCES

- ANCONF/12 RECOMMENDATIONS 3/2 TO 3/9
- Air Navigation Report 2014 (April 2014)
- DGCA-MID/2 CONCLUSION 2/7
- ICAO GLOBAL AIR NAVIGATION PLAN (DOC 9750), 4TH ED.
- ICAO Strategic objective "Safety (A2)" and "Environment ..." (C31)"
- ICAO Aviation Systems Block Upgrades B0-30 and B1-31
- MIDANPIRG/13 CONCLUSION 13/19

1. INTRODUCTION

1.1 The role and importance of aeronautical data has changed significantly with the implementation of Area Navigation (RNAV), Required Navigation Performance (RNP), and airborne computer- based navigation systems, including Global Navigation Satellite Systems (GNSS). These systems are all data-dependent, and in that respect aeronautical data have become the necessary critical components of the system. Consequently corrupt or erroneous aeronautical data can potentially affect the safety of air navigation.

1.2 The advent of RNP Authorisation Required (RNP AR) for terminal operations will enhance the requirements again. Therefore ICAO has established standards and recommended practices which require all contracting states to introduce a properly organised quality system. This quality system must provide users with the assurance and confidence that distributed aeronautical data satisfy defined operational requirements for data quality (accuracy, resolution and integrity) and timeliness.

1.3 Implementation of Performance-Based Navigation (PBN) is ICAOs most important priority in the Global Air Navigation Plan (Doc 9750), 4th Ed. This must be supported by MIDAD.

1.4 Based on the Recommendation 3/1, 3/2, 3/3 and 3/9 of the 12th Air Navigation Conference (ANConf/12), Montreal, Canada, 19 – 30 November 2012, ICAO is introducing an Information Management Panel (IMP) which addresses globally interoperable system-wide information management (SWIM), and global transition from AIS to AIM. This will cause an adaptation of the Roadmap from AIS to AIM as outlined in the ICAO Air Navigation Report dated April 2014.

1.5 Based on DGCA-MID/2 Conclusion 2/7, this Working Paper contains thoughts and consideration to harmonize the planning and schedule for MIDAD with the ICAO Global Air Navigation Capacity & Efficiency Plan (Doc 9750) and the Aviation System Block Upgrades 0 and 1 (Block 0 - 2013 to 2018, and Block 1 – 2018 to 2023) in conjunction with the Recommendations from ANConf/12, the Roadmap from AIS to AIM, and the outcome of the work of the AIS to AIM Study Group (AIS-AIMSG).

1.6 It shall also be noted that the work of the AIS to AIM Study Group will be continued within the Information Management Panel after 2016. It is assumed that the AIM requirements are guided by the Global ATM Operational Concept (Doc 9854).

2. DISCUSSION

ANConf/12, Doc 9750, and Information Management Panel

2.1 ANConf/12 and Doc 9750 focusing inter-alia on development of a global system-wide information management (SWIM) based on ICAO provisions and supported by states and industry to assist the services and distribution of improved aeronautical information by aeronautical information management. This is summarised in ANConf/12 Agenda Item 3 Recommendations 3/2 to 3/9 and in Block Module B0-30 (2013-2018) and B1-31 (2018-2023).

2.2 The subsequently ICAO introduces a new Information Management Panel (IMP)¹. This must be watched and analysed careful to ensure that the MIDAD Planning is in line and harmonise with the latest development.

2.3 The IMP will so be responsible for AIM evolution after the AIS to AIM Study Group has finalised its work (2016).

Ais-Aim Study Group

2.4 The work of the AIS-AIM Study Group, which has planned to finalise its work until end of 2016, is especially important for MIDAD. The Amendment 40 to Annex 15 will **change the AIS from a product driven services to a data centric management system**. The new SARPs will mainly described in:

¹ State Letter SP 68/1-IND/14/7 of 9 June 2014 to be answered until 9 July 2014

Chapter 4 - Data and information scope
Chapter 5 - Information services
Chapter 6 - Temporality and distribution

2.5 The Study Group considered the need for a minimum data set or scope to support digital data exchange requirements such as in the use of the Aeronautical Information Exchange Model (AIXM). Additionally, in consideration of extensive textual information in the current Aeronautical Information Publications (AIP) such as for regulatory, procedural and restriction information the group determined the need to also define an information scope.

2.6 It was noted that the current Chapter 4 of Annex 15 would be revised to provide the required performance requirements for the AIM data and information scope and that a more detailed description would be provided in the PANS-AIM document by means of a data catalogue.

2.7 The full move into the data centric environment with a data centric management system (AIM), as Amendment 40 to Annex 15 and PANS-AIM is planning to do will require the definition of the data and information scope for all data as follows:

- a) terrain data (terrain feature types);
- b) cultural data (cultural feature types);
- c) aeronautical data (aeronautical feature types); and
- d) obstacle data (obstacle feature types).

to make them available in form of (electronic or digital) structured data sets (features, attributes, domain values).

2.8 Data sets shall become the primary mean of data publication in order to allow verification of correctness of received data sets at the next intended user and to support further electronic processing without any future human intervention.

2.9 That verification of correctness of received data sets at the next intended user shall also be possible at AIS Offices to minimise the necessity of human intervention at AIS Offices. This is also necessary as the number of features and the level of detail of those data will increase. This requires provisions in Annex 15, Chapter 4, for data handling throughout the aeronautical data chain. Current provisions for Originators and Users are covered by various Annexes.

2.10 Those Annexes have been identified and the relation between the contents of the changed Chapter 4 of Annex 15 will be updated as well. Figure 1 shows the current approach of the AIS to AIM Study Group in showing Annexes which are valid for Originators and how the new general process could look like when introducing electronic data sets as main mean of publication.

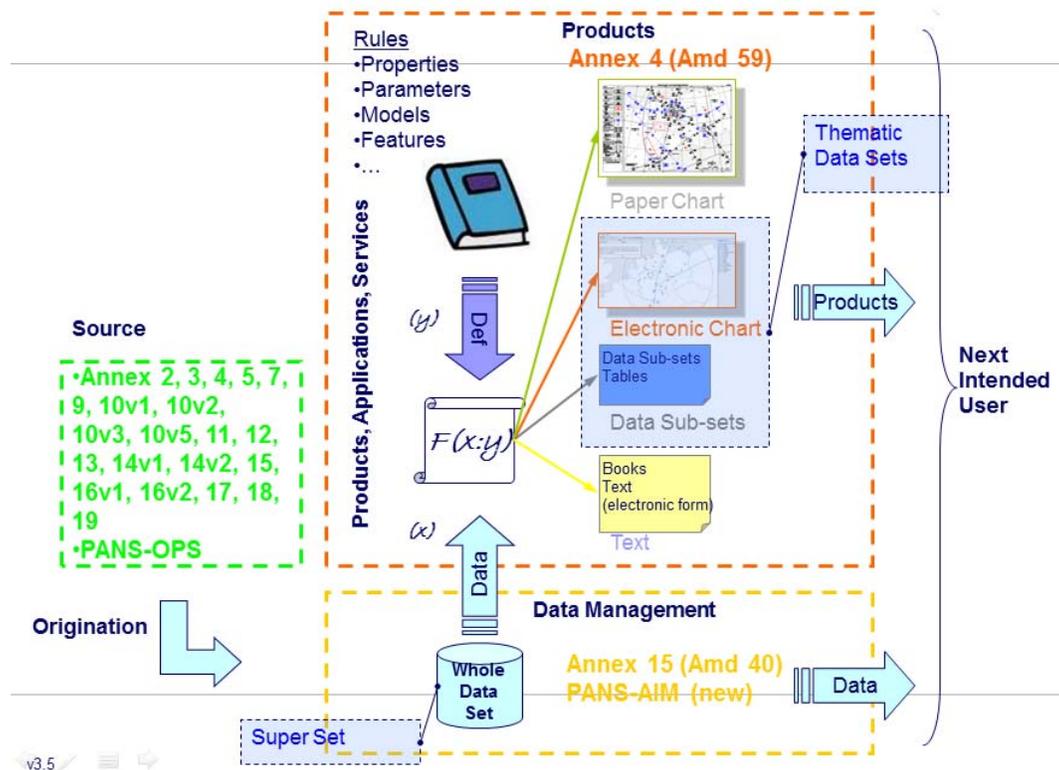


Figure 1: Data Centric Approach and Data Originator (Sources)

2.11 The introduction of a State AIS Office as AIS Organisation includes also the clearer introduction of “Data Originators” and “Next Intended Users”. Figure 2 shows this process by introducing:

- a) “Collect” for the part of the process which refers from the Data Originators to the AIS Organisation; and
- b) “Provide” for the part of the process which refers from the AIS Organisation to the Next Intended Users.

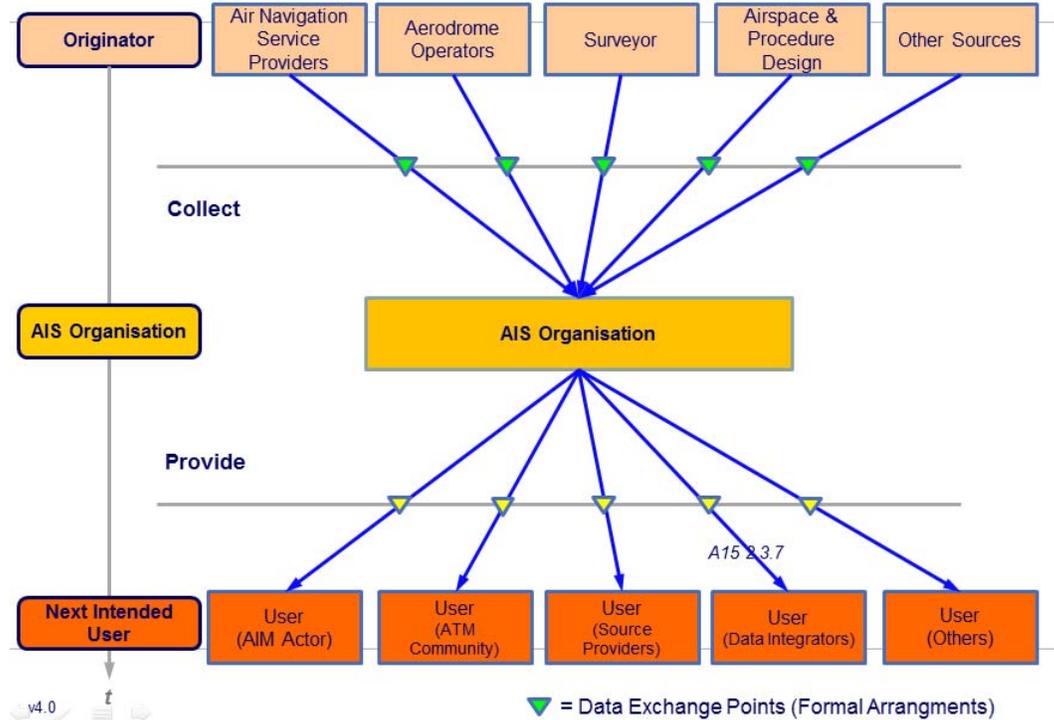


Figure 2: AIM Process

2.12 To raise the importance of Data Origination at Sources the different groups of Originators will be mentioned in Annex 15, Chapter 4, by referencing into the Annexes which are applicable to Originators already. A good example is Annex 14, which contains basically all SARPs for Aerodromes which includes SARPs for aeronautical data publication. Important here is to show clearly the relation between “Originator Annexes” and Annex 15. The Originator Annex shall define the provision for an Originator and Annex 15, on high level, and PANS-AIM, on detailed level, describes the contents.

2.13 The Data Originators are called as follows in Figure 2:

- a) Air Navigation Services Providers (ANSPs);
- b) Aerodrome Operators;
- c) Surveyor (Terrain, Obstacle);
- d) Airspace and Procedure Design; and
- e) other sources.

2.14 MIDAD must find its identified and agreed place in this aeronautical data chain. It might be a AIS Organisation on Regional Level. This must be discussed.

User Requirements

2.15 The Airline Industry Requirements:

- a) to Save Fuel;
- b) to Save Flight Time; and
- c) move to GNSS/RNP Procedures:

- 1) less Maintenance;
- 2) more Safety; and
- 3) more Payload Capacity.

2.16 Therefor, the need for a) Better Terrain Data; b) Better Obstruction Data; and c) Better Aerodrome Maps will be addressed by MIDAD. This is important for airline by-in into MIDAD.

2.17 Operating limitations of Annex 6, Part I, Chapter 5 (IIIA/B, OBST single-ENG, night, IMC), and Part III, Section II, Chapter 3 (FLT OPS), the need to develop contingency procedures to be used in emergency during missed approach or take-off, and for aircraft operating limitations analysis are still existing requirements for airlines and can also be addressed in sense of providing aeronautical data to support these cases.

Summary

2.18 The above considerations influencing the requirements definition for MIDAD and shall therefore be taken into consideration.

2.19 The required levels of data integrity need to be reached throughout the *whole* Aeronautical Data Chain (ADC). The improvement of:

- a) Data Quality (accuracy, resolution, integrity);
- b) Timeliness of publication; and
- c) Data consistency.

2.20 Is only achievable with an Uninterrupted Electronic ADC – no Media breaks!

2.21 All actors in the chain need to contribute to that improvement. The liaison of all partners is needed as shown in Figure 3.

Conclusion - Liaison of all partners

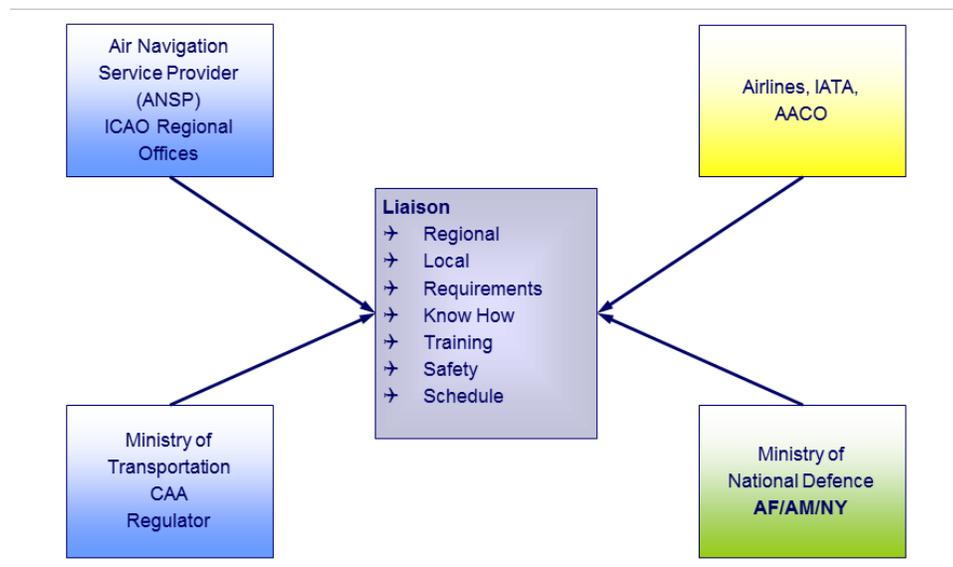


Figure 3: Liaison of all partners

2.22 The main tentative planning dates:

- a) Inauguration of the IMP in 2014;
- b) May 2015 ICAO Block Upgrades Demonstration Showcase and Symposium (BUDSS), to be confirmed;
- c) November 2016 date of applicability for Amendment 40 of Annex 15 and introduction of PANS AIM;
- d) 2016 IM Symposium; and
- e) 2017 IM Divisional Meeting.

2.23 MIDAD planning shall be harmonised accordingly.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the contents of this paper and should take the development in the world into account when defining the MIDAD Requirements; and

-END-