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**

DRAFT SPECIFICATIONS OF TENDER DOCUMENTATION
OF THE MIDAD PROJECT PHASE 2 – DETAILED STUDY

(Presented by Bahrain and ITV)

SUMMARY
The aim of this paper is to review the Draft Specifications for Tender Documentation of the MIDAD Project Phase 2 – Detailed Study.
Action by the meeting is at paragraph 3.
REFERENCES
- MIDAD SG*/1-Report

1. INTRODUCTION

1.1   The meeting may wish to recall that the documentation which could form the Call for Tender (CfT) was firstly discussed in MIDAD SG*/1 meeting and documented in para 9.5 of the Report of MIDAD SG*/1 and are shown in the table below:

No	Doc Group	Doc Title	Audience	Priority
1.1	Planning and Control	Program Manual	Internal	-
1.2		Program Plan	Internal	High
2.1		Program Proposal	Internal	High
2.2		Legal Framework of the operation of the MIDAD	Internal	High
2.3	Requirements and Analyses	Operational Concept	External	High
2.4		Requirements Specification Overall Project	External	High
2.5		Requirements Evaluation	External	-
2.6		Service Provision Requirements	External	High
3.1		RFP Concept	Internal	High
3.2	Acquisition and Contracting *(in case of procurement)*	Criteria Catalogue for Assessment of Offers	Internal	-
3.3		Request for Proposal	External	-
3.4		Offer Assessment	Internal	-
3.5		Contract	External	-
3.6		Contract Addendum	External	-
3.7		Statement of Acceptance	External	-

No	Doc Group	Doc Title	Audience	Priority
4.1	Configuration and Change Management	Problem Report - Change Request	External	-
4.2		Change Status List	Internal	-
4.3		Problem Change Evaluation	Internal	-
4.4		Change Decision	External	-

Table 1: Management and Tender Documents

Note: the documents marked in the Audience Column as "Internal" are important for setting up the internal process of the study and later implementation. The documents marked "External" need to be sent to the potential bidders or implementation body during the tender process (if any) or to be used during program execution process, as appropriate. The documents marked in the Priority Column as "High" shall be developed in parallel to the Requirements Specification. The documents with no priority shall be developed when the process for the set-up of the MIDAD is more settled.

1.2   One set of documents needs to be prepared for the **external** use of the CfT towards the tendering industry. Those documents are marked brown in

1.3   Table 1. However, an **internal** set of documents is needed for the management of the CfT by the organization which will issue the CfT. Those documents are not part of the Detailed Study to be prepared by the consultant(s) company for which this Specification Documentation shall apply.

1.4   In line with DGCA-MID/2 Conclusion 2/7 and MIDANPIRG/14 Report, item 4.4.23, Bahrain CAA is the organization responsible to manage the MIDAD Call for Tenders. BCAA will develop the internal documentation by themselves or will contract an outside party with this work.

2.   DISCUSSION

2.1   In previous meetings it was agreed that in Phase 2, a more detailed study would be necessary to cover all technical, financial, human, legal and institutional issues. The so called "Detailed Study" should consist of:

- A Concept of Operations – CONOPS.
- Functional and non-functional requirements documentation.
- Commercial and legal call for tender documentation.

2.2   As a matter of fact what is really meant with the term "Detailed Study" is not a study but the tender documentation for procurement of the MIDAD System. Therefore the more appropriate term Tender Documentation is used now for what was called Detailed Study in previous MIDAD documents.

2.3   The methodology to be followed shall be guided by the IT-System procurement V-Model of the German Government[1].

Concept of Operations (CONOPS)

2.4   The Concept of Operations (CONOPS) is the first deliverable of the Detailed Study.

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[1] Cf. MIDAD SG*/1 Report Chapter 9.1 and MIDAD SG*/1-WP/8, Chapter 3 for details.

2.5   A CONOPS is defined as a: *"... a user-oriented document that describes system characteristics for a proposed system from the users' viewpoint. The CONOPS document is used to communicate the overall quantitative and qualitative system characteristics to the user, buyer, developer and other organizational elements (e.g. training, facilities, staffing and maintenance). It is used to describe the user organization(s), mission(s) and organizational objectives from an integrated systems point of view."[2]*

2.6   The MIDAD CONOPS shall be a description on a conceptual level of the actors, roles and responsibilities, the user functions and requirements, the data items and data flow of the system and shall cover the following subjects:

- MIDAD purpose and scope;
- Stakeholders (provider and user of data and information)
- Services and Data flows
- System architecture
- Internal and external interfaces
- Communication infrastructure
- Governance (Access rights, liability, licensing, security)
- Timeline and Data migration and conversion concepts and plans

2.7   The CONOPS shall be elaborated to a level of details that allows:

- For the Contractor to derive of the functional requirements of the system
- For the Industry to prepare a tender for the system and services

Stakeholders

2.8   MIDAD will provide services to at least the following stakeholders:

- Civil Aviation Authorities
- Military Aviation Authorities
- Air Navigation Service Providers
- All military and civil airspace users (Airline operators, Pilots etc.)
- Aerodromes
- Data integrators
- Airspace and Network Planning and Coordination Organizations

2.9   A stakeholder can have the role of a data provider, data user or both.

2.10   The CONOPS shall describe the roles of each stakeholder, their required services and document their interaction with MIDAD.

Data Scope

2.11   The minimum MIDAD data scope shall be according to ICAO Annex 15 and the future PANS AIM document released with the next major Amendment to Annex 15 and shall include data and descriptions of services, procedures and facilities from the following domains:

- Aerodromes
- Airspace

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[2] 1362-1998 - IEEE Guide for Information Technology - System Definition - Concept of Operations (ConOps) Document and wikipedia

- Instrument Procedures
- NAV AIDs and Navigation Systems
- ATS Routes and fixes
- Weather (as far as the data is published in the AIP)
- Regulatory / Government
- Obstacles (outside AD)
- Geography (Terrain, Hydrography, Culture)

2.12   MIDAD shall be able to handle permanent data, temporal changes and status information of the ATM infrastructure and services.

Services and Data Flows

2.13   The CONOPS shall have a description of all applications and services provided by MIDAD.

2.14   The data flows between MIDAD and all stakeholders shall be documented. The responsibilities and exchange points shall be clearly identified.

2.15   The target aeronautical data chain defines the responsibility of each actor related to the data in the data chain and is the basis for traceability. The management of the target aeronautical data chain should consider to reach conformance to the RTCA/EUROCAE DO-201A/ED77 "Industry Requirements for Aeronautical Information" and DO-200A/ED76A "Processing of Aeronautical Data".

System Architecture

2.16   The targeted MIDAD architecture should be discussed in the Detailed Study.

2.17   In the CONOPS the proposed architecture has to be validated against the user requirements and its feasibility has to be investigated. If considered necessary alternative scenarios have to be investigated.

Interfaces

2.18   The internal and external interfaces of the MIDAD are critical areas as for each interface of each IT system because two different worlds interfacing each other. AIXM has more or less the data contents and data structure described but only limited rules, no error handling and no physical implementation.

2.19   The matter of interfaces shall be addressed in the frame of the System Wide Information Management (SWIM) Network Layer and also under consideration of the discussion in the ICAO Aeronautical Communication Panel (ACP).

2.20   The ICAO SWIM Concept[3] and any output of the ICAO IM Panel[4]– if available within the time frame of the elaboration of the Tender Documentation – shall be considered in CONOPS and requirement specifications.

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[3] Through the ICAO ATMRPP (Air Traffic Management Requirements and Performance Panel) the ICAO SWIM Concept document is being agreed which establishes guidelines for information management enabling ATM service providers (ASPs) to ensure global interoperability. While standards will permit interoperability, this ICAO SWIM Concept does not prescribe, or expect, a single global implementation of SWIM.

The ICAO ATMRPP meeting which recently took place between 10 and 14 March reviewed the comments provided by all relevant ICAO groups and panels. A final version is now in preparation and hand-over to ICAO for further publication is foreseen in the coming months.

2.21   Therefore the internal and external interfaces of MIDAD shall be identified, the data contents and structure shall be agreed and physical implementation and error handling shall be explored.

Communication Infrastructure

2.22   Communication capabilities are the pre-requisite for any interoperability between national AIS/AIM systems, MIDAD and other Regional AIS databases in other ICAO Regions (EAD, etc.). It was highlighted in similar projects that the AFTN Network cannot be used for the purpose of MIDAD, except for NOTAM reception and distribution.

2.23   Therefore, other means of communications (VSAT, public internet, AMHS, ICAO IPS1 conform networks, etc.) shall be explored. This shall be done in close coordination with the CNS Sub- Group and the ATN/IPS Working Group.

Governance

2.24   In the CONOPS governance, access rights, liability, licensing, security issues have to be covered.

Migration and implementation plan

2.25   The migration from the existing environment to the use of MIDAD shall also be studied and an outline concept needs to be part of the CONOPS.

2.26   At least the following should be investigated:

- Data conversion concepts;
- Data conversion plan and schedule;
- Data migration concepts;
- Data migration plan and schedule; and
- Data migration in cases of version changes of the AIXM (backward compatibility).

2.27   A phased implementation plan based on an agreed schedule with the users can reduce the complexity and risk of implementation and gives some time for the finalization of the standardization for those data which are not included in common models at the moment.

Requirement Specification

2.28   The second deliverable of the Tender Documentation is the functional and non-functional requirement specification.

2.29   The functional and non-functional requirements are not only intended as development specifications, but also as basis for the tracing of requirements and the change management. The requirements should be prepared in such a way that traceability and a suitable change management are possible for the entire system life cycle.

2.30   The Contractor of the Detailed Study shall derive the functional requirements primarily from the CONOPS.

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[4] An ICAO Information Management Panel is being setup with the objective to develop a global and harmonised interoperable approach and elaborate on necessary concepts in order to ensure effective management of Information on a system-wide basis within the Air Navigation System.

2.31 The MIDAD Requirements shall also take into account that the ICAO ATM Operational Concept views seven ATM concept components in paragraph 2.1.6, Figure 2-1:

1. Airspace organisation and management (AOM);
2. Demand/capacity balancing (DCB);
3. Aerodrome operation (AO);
4. Traffic synchronisation (TS);
5. Conflict management (CM);
6. Airspace user operations (AUO); and
7. ATM service delivery management (ATM SDM).

2.32 MIDAD will contribute to all of those new components which show that the aeronautical information in form of aeronautical data, aeronautical obstacle data, terrain data and others (e.g. NOTAM) is a key enabler for the new ATM concept. It shall be carefully analyzed that the new requirements stemming from this concept are reflected in the Requirements Document.

2.33 The regulatory requirements constitute a substantial part of the non-functional requirements. As MIDAD is a long term program it will not be sufficient to only take into account today's regulation and standards but it will be necessary to also consider the trends in the industry and the upcoming regulation, standards and technology of the next 10-15 years.

2.34 Taking into account the significance of the system-wide availability of information ICAO in the fourth edition of the Global Air Navigation Plan (GANP) included the introduction of system wide information management (SWIM) as a Block 1 ASBU module with an initial deployment target of 2018.

2.35 MIDAD shall significantly support the implementation of system-wide information management (SWIM) services (applications and infrastructure) creating an aviation intranet based on standard data models and internet-based protocols to maximize interoperability.

2.36 The requirements specifications for MIDAD shall therefore consider the performance improvement area "Globally Interoperable Systems and Data" and information management domain in the roadmap of the GANP and specially the ASBU modules:

- B0-DTAM (formerly B0-30)
- B1-DTAM (B1-30)
- B1-SWIM (B1-31)

2.37 The following documents have to be considered when establishing the MIDAD Requirements:

1. ICAO Annexes to the Convention on International Civil Aviation		
a)	ICAO Annex 4	Aeronautical Charts
b)	ICAO Annex 10	Aeronautical Telecommunication
c)	ICAO Annex 14	Aerodromes
d)	ICAO Annex 15 including next major AMDT drafted by the ICAO AIS-AIM SG	Aeronautical Information Services

2.		**ICAO Procedures for Air Navigation Services (PANS)**	
	a)	ICAO Doc 4444	Air Traffic Management (PANS-ATM)
	b)	ICAO Doc 8168	Aircraft Operations Volume 2 – Construction of Visual and Instrument Flight Procedures (PANS-OPS)¨
	c)	ICAO Doc 8400	ICAO Abbreviations and Codes (PANS-ABC)
	d)	Currently drafted by the ICAO AIS-AIM SG	Aeronautical Information Management (PANS-AIM)
3.		**Industry Standards**	
	a)	RTCA DO-200A / EUROCAE ED-76	Standards for Processing Aeronautical Data
	b)	RTCA DO-201A / EUROCAE ED-77	Industry Requirements for Aeronautical Information
	c)	RTCA DO-272B / EUROCAE ED-99B	User Requirements for Aerodrome Mapping Information
	d)	EUROCAE ED-153	Guidelines for ANS Software Safety Assurance
4.		**Supporting documentation and Guidelines**	
	a)	ICAO Doc 7030	Regional Supplementary Procedures, MID Region;
	b)	ICAO Doc 7383	Aeronautical Information Services Provided by States;
	c)	ICAO Doc 7910	Location Indicators
	d)	ICAO Doc 8126	Aeronautical Information Services Manual
	e)	ICAO Doc 8585	Aircraft operators, air traffic authorities and directory services
	f)	ICAO Doc 8697	Aeronautical Charts Manual;
	g)	ICAO Doc 9377	Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services;
	h)	ICAO Doc 9674	World Geodetic System – 1984 (WGS-84) Manual
	i)	ICAO Doc 9750 4th Edition	2013 – 2018 Global Air Navigation Plan
	j)	ICAO Doc 9854	ATM Operational Concept
	k)	ICAO Doc 9855	Guidelines on the Use of the Public Internet for Aeronautical Applications
	l)	ICAO Doc 9881	Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information
	m)	ICAO Doc 9906 (Volume I)	Flight Procedure Design Quality Assurance System.

3. **ACTION BY THE MEETING**

3.1   The meeting is invited to discuss the information contained in this working paper and take action, as appropriate.

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