INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE

FIRST MEETING OF THE AFI REGION AIM IMPLEMENTATION TASK FORCE

(Dakar, Senegal, 20 – 22nd July 2011)

DP-8

Agenda Item 8 : Review of the Report of QMS for AIS/MAP Service Implementation Workshop held in Dakar, Senegal from 17-19 May 2011.

(Presented by the Secretariat)

Summary

This Paper presents the report of the Quality Management System (QMS) Implementation Workshop for AIS/MAP Services conducted for the benefit of States in the AFI Region, at the ICAO Regional Office in Dakar, Senegal, from 17-19 May 2011.

Action by the Task -Force is at paragraph 3.

References :
APIRG/17 – Report
AFI QMS SIP Seminar Report

1. Introduction

1.1 In an effort to measure the level of awareness and commitment of AIS/MAP Service providers in the AFI Region, regarding the need for application of Standards and Recommended Practices (SARPs) and to foster the implementation of AIS/AIM QMS, the ICAO Regional Offices of Dakar and Nairobi agreed to assist States to implement this ICAO requirement by organizing from 17 to 19 May 2011, the above-mentioned workshop in collaboration with Eurocontrol and Jeppesen for the AIS/AIM Services of States in the AFI Region, pursuant to Conclusion 15/41 of the APIRG/15 meeting held in Nairobi, Kenya from 26 -30 September 2005 stated inter-alia:

"That:

a) in accordance with Annex 15 – Aeronautical Information Services provision, AFI States which have not done so are required to take the necessary measures to implement a Quality Management System within their AIS, in conformity with the ISO 9000 Series of Standards".

2. Discussion

2.1 The AFI SIP Seminar/Workshop on Quality Management Systems Implementation for AIM Services, organized under the aegis of ICAO was convened in the ASECNA Conference room, ASECNA Headquarters, 32-38 Avenue Jean Jaures, Dakar, Senegal.

2.2 The main objectives of the Seminar/workshop were to :

a) increase the level of awareness of AIS/AIM Services providers regarding the need for, and application of the SARPs contained in Annexes 4 and 15;
b) accelerate the implementation of quality management systems supporting AIS/AIM services across the AFI Region.
c) provide briefing relating to international requirements and advances being made in the AIS/AIM fields pertaining to QMS implementation.
d) provide a forum for open discussions relating to AIS/AIM matters of mutual interest between Service providers and users.
e) provide a forum for AIS/AIM users to articulate their specific needs and requirements; and
f) provide a forum where technological advancement and enhancements in the field of AIS/AIM can be displayed and demonstrated.

2.3 The Seminar was attended by **42 participants** from 14 Contracting States and Interrnational Aviation Agencies: **ASECNA**, **Eurocontrol**, and **Jeppesen .**

2.4 The Seminar/Workshop adopted at its opening session the following agenda.

Agenda Item 1. Status of Implementation of ICAO provisions in QMS

Agenda Item 2. Measures to Implement QMS within AIS/MAP Services

Agenda Item 3. Quality Management System for AIS/MAP Services

Agenda Item 4. User requirements for Quality Aeronautical Information

Agenda Item 5. QMS Implementation and Planning

Agenda Item 6. AIS role within the Global ATM

Agenda Item 7. Recommendations and Closing Session

2.5 This Discussion Paper recommends the inclusion of the Findings of the above Seminar/Workshop in Appendix-A for consideration in proposing new Conclusions for QMS implementation as per ICAO Annex 15.

3. ACTION BY THE MEETING

3.1 The meeting invited to:

a) Note the contents of this paper, notably the findings in Appendix- A

b) Support the inclusion of the adopted findings in drafting Conclusions for QMS implementation as per Annex 15 requirements

c) Forward the outcomes of the Seminar to be adopted by the APIRG/18 Meeting;

Findings

1. The Seminar/Workshop encourages all AFI States to implement Conclusion 15/41 of the APIRG/15 meeting held in Nairobi, Kenya from 26 -30 September 2005 stated inter-alia:

   "That:

   a) in accordance with Annex 15 – Aeronautical Information Services provision, AFI States which have not done so are required to take the necessary measures to implement a Quality Management System within their AIS, in conformity with the ISO 9000 Series of Standards".

2. Additionally, Standard 3.2.1 of Annex 15 stipulates that *"Quality Management System shall be implemented and maintained encompassing all functions of an Aeronautical Information Services as outlined in Standard 3.1.7. The execution of such quality management systems shall be made demonstrable for each function stage, when required."*.

3. The Seminar/Workshop noted Recommendation 3.2.3.— The quality system established in accordance with 3.2.1 should be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and certified by an approved organization.

   - The execution of such quality management systems shall be made demonstrable for each function stage, when required.

   - ISO9001 certification – is a recommendation

4. The Seminar/Workshop noted the following Annex 15 Standards stipulated for QMS implementation :

   - 3.2.4 that within the context of a quality system, the skills and knowledge required for each function shall be identified and personnel assigned to perform those functions shall be appropriately trained. States shall ensure that personnel possess the skills and competencies required to perform specific assigned functions, and appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required skills and competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

   - 3.2.5 Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data is traceable throughout the aeronautical information data chain so as to allow any data anomalies or errors, detected in use to be identified by root cause, corrected and communicated to affected users.

   - 3.2.6 The established quality system shall provide users with the necessary assurance and confidence that distributed aeronautical information/data satisfy stated requirements for data quality (accuracy, resolution, integrity) and for data traceability by the use of appropriate procedures in every stage of data production or data modification process. The system shall also provide assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.

5. The Seminar/Workshop noted that the ISO 9000:2000 series consists of 3 Primary standards :

   ISO 9000: QMS concepts and vocabulary
   ISO 9001: QMS requirements
   ISO 9004: QMS guidelines

5.1 ISO 9001: QMS requirements:

"ISO 9001 specifies the requirements for a quality management system that may be used for internal application by organisations, certification, or contractual purposes."

5.1.1 ISO 9001:2008

ISO 9001:2008 is divided into 8 sections; the first 3 are introductory

The requirements begin at section 4 and have the following headings:

- Quality management system
- Management responsibility
- Resource management
- Product realisation
- Measurement, analysis and improvement

- Specifies QMS requirements for all organizations, products and services
- Only standard in ISO 9000:2000 family that can be used for certification of system
- AIS provider can only seek QMS certification after validating that every ISO 9001:2008 requirement is met
- ISO 9001:2008 only defines fundamental requirements and framework for certification
- Each AIS provider needs to formulate its own QMS based on its own needs, processes & circumstances
- Most AIS providers will already have system in place to address ISO requirements
- Will be able to address ISO 9001:2008 in a simple & cost-effective manner
- Process approach must be follow as per ISO 9001:2008
- To develop and maintain effective QMS
- AIS provider needs to identify and manage numerous linked processes, such as:
- Process for review of requirements related to products
- Process for provision of such products
- Process for monitoring quality of products

5.2 ISO 9004: QMS guidelines

"ISO 9004 gives guidance on a wider range of objectives of a quality management system to improve the organisation's overall performance.

It is not a guideline for implementing ISO 9001 and is not intended for certification or contractual use."

- This is supported by an additional standard: **ISO** 19011: QMS auditing guidelines

6. Aeronautical Information Service dependencies.

- AIS has become a crucial and critical enabler for the implementation of future ATM Systems. The global requirement for precise navigation capability will require high quality (accuracy) resolution and integrity) aeronautical database.

- For the safe performance of operations, the conducted data has to be published in WGS-84. For future developments, it is essential that electronic storage, provision, update and interrogation of aeronautical databases and charts (including terrain and obstacle information) are implemented.

- The role and importance of AIS has changed with the implementation of FMS, RNAV, RNP and airborne computer based navigation systems with the following factors:

a) Existing and evolving navigation system required are dependent upon the quality of aeronautical information
b) AIS is one of the foundation blocks for the successful transition to a global ATM System.
c) The timeliness and integrity of quality aeronautical information is a significant enabling activity for the globalization of ATM.
d) Corrupt/erroneous aeronautical information can potentially affect safety.

7. The current status of AIS in the AFI Region has been listed as follows:

a) integrity of aeronautical information is considerably below ICAO requirements;
b) dissemination of aeronautical information is often not timely (this varies significantly from State to State);
c) data accuracy does not always fulfill the requirements for performance based navigation;
d) the same is true for data resolution;
e) works in many AIS Offices is still base on manual processes;
f) quality management systems have not yet been implemented in many States.

8. Integrity of Navigation data base is an important requirement for RNAV operations in accordance with the following factors:

a) need for regulatory requirements for data suppliers to implement quality procedures for data integrity are tremendously high;
b) high data integrity needs to be achieved everywhere in the data base.

9. That RNAV operations depends on WG5-84 coordinates for consistent navigation and if a State is not WG5-84 compliant, it is not consistent with the rest of the world. It should also be noted that GNSS operation is completely based on WGS-84 implementation.

10. Two types of coordinate problems should be noted:

a) coordinate errors place the aircraft in wrong position;
b) in different coordinate system, the aircraft will also miss-align with fixes.

11. The mismatch of coordinate datum's have been noted as follows:

a) in the same coordinate system, everything lines up.
b) in different coordinate systems, the approach doesn't aim at runway threshold

12. Today virtually all worldwide procedures are available in the FMS. Charts are no longer the only tool for navigation. Pilots rely on their on-board navigation databases as follows :

- Aviation is changing to Performance Based Navigation (PBN) which requires data in much higher quality.

- Relative accuracy is no longer sufficient.

- Cockpit technology over the past 40 years changed from self-contained instruments to software and data-driven, integrated, graphical situational awareness.

13. The role and importance of aeronautical information changed significantly with the implementation of RNAV, RNP and more precise airborne computer systems as follows :

- Aircraft are becoming database driven and their operation requires access to aeronautical

information of a significantly higher quality than is currently available.
- Efforts of all States must be aimed at significantly improving their AIM systems to assure that aeronautical information will be available in the right quality, the right form, at the right time, for the right user and it must be available without restriction.
- Improvements are needed without further delays because the future has already started.

14. The quality management system established in accordance with 3.2.1 should follow the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and be certified by an approved organization. An ISO 9000 certificate, issued by an accredited certification body would be considered an acceptable means of compliance.

15. In the end-to-end environment between the data originators and AIS, data is originated at its sources, assembled, processed and formatted to meet the requirements of its end applications.

16. A Quality Management Process is that which provides the framework upon which the procedures for doing the job are developed, managed, controlled, assessed, and changed as follows :

    - This leads to the necessity to implement techniques and procedures throughout the entire process to ensure the aeronautical data meets quality requirements

17. That all Aeronautical data shall have the agreed data quality, characterized by:

a. the accuracy of the data;
b. the resolution of the data;
c. the confidence that the data is not corrupted while manipulated, stored or in transit (data integrity assurance level);
d. the ability to determine the origin of the data (traceability and meta-data);
e. the level of confidence that the data is applicable to the period of intended use and the assurance that it is provided to the users according to the AIRAC requirements (timeliness);
f. the assurance that all of the data needed to support the function is provided (completeness);
g. the format of the data meets the user requirements.

18. **When ISO 9001 is implemented in an organization it is noted that:**

a. Well defined and documented procedures improve the consistency of output
b. Quality is constantly measured
c. Procedures ensure corrective action is taken whenever defects occur
d. Defect rates decrease
e. Defects are caught earlier and are corrected at a lower cost
f. Definition of procedures identifies current practices that are obsolete or inefficient
g. Documented procedures are easier for new employees to follow
h. Operational efficiency is increased
i. Customer satisfaction rises

19. **If the ISO 9001:2008 implementation project is to be successful, then there <u>MUST</u> be support and commitment from Top Management.**

20. Annex 15 specifies quality requirements for aeronautical data :

- Requires States to introduce quality system to implement QM at each stage of AI:
  - Originating
  - Collating
  - Editing
  - Formatting

- Storing
- Publishing
- Distributing

- Recommends quality requirements be met by quality system compliant with ISO 9001

21. When auditing a process, auditors will look for:
    - Inputs and outputs of subject process
    - Process activities
    - Process ownership
    - Quality objectives
    - Continual improvement of process
    - Interrelation and interaction with other processes
    - Risks to process

22. Senior management support for implementation of QMS for AIM should be obtained

- Initial steps for senior management planning to implement QMS:
    - Learn about ISO
    - Formulate quality policy and establish quality objectives of AIM
    - Convey quality policy and quality objectives to entire AIM organization
    - Define roles and responsibilities of quality manager
    - Appoint quality manager
    - Arrange ISO training for quality manager
    - Arrange ISO training for staff
    -

23. <u>QMS Implementation Project will consist of the following phases:</u>

- Phase 1 – Planning
    - Review existing quality system and assess where is need to develop and extend existing features of system to meet ISO 9001

- Phase 2 – Design
    - Provide all components of QMS capable of producing quality in reliable and repeatable manner and ensure capability can be proven by audit

- Phase 3 – Deployment & testing
    - Implementation of QMS / activation of PDCA cycle

- Phase 4 – Certification
    - Certify QMS by approved organization in accordance with ISO 9001:2008, as recommended in Annex 15

24. That the best data in respect of accuracy resolution and integrity does not help if it comes too late.

25. That to cope with the future needs, the entire data chain must be supported by automated processes and rigid quality management systems.

26. For efficient operation of the AIRAC system, AIS services should maintain an effort to liaise with decision planners etc.

    a) the immediate changes are the NOTAM-System etc.
    b) AIRAC System should be scheduled to the NOTAM System and the rest.

27. That AIS information providers should note that “how and when” the information provided to the

users is very important to be noted.

28. The Seminar/Workshop noted, the AIRAC publication system is the best system currently available to the aeronautical community and encourages AIS personnel to work with this system.

29. That States maintain a regulatory quality System management for the timely provision of required information/data to the aeronautical information services by each of the States Services associated with aircraft operations.

30. It was suggested that States more advanced in the implementation of QMS systems share their experience and offer assistance with neighboring states in their efforts to implement QMS.

31. That it is required for Service Level Agreements be established and signed between data originators and AIS Providers.
