

INTERNATIONAL CIVIL AVIATION ORGANIZATION

WESTERN AND CENTRAL AFRICAN OFFICE



REPORT ON

AFI SIP Seminar/Workshop on Quality Management Systems Implementation for AIM Services

(17-19 May 2011, Dakar, Senegal)

(This report has no official status and is not subject to any formal action by ICAO)

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TABLE OF CONTENTS

Table Of Contents	PAGE
History of the Seminar	
Report on Agenda Item 1:.....	1-1
Report on Agenda Item 2:.....	2-1
Report on Agenda Item 3:.....	3-1
Report on Agenda Item 4:.....	4-1
Report on Agenda Item 5:.....	5-1
Report on Agenda Item 6:.....	6-1
Report on Agenda Item 7:.....	7-1
Appendix A: List of Participants.....	
Appendix B: Tunisie experience in QMS Implementation	

History of the Seminar

i-1. Introduction

i-1.1 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.

i-1.2 The Seminar/Workshop was officially opened by Mr. M.S. Jallow, ICAO Regional Director, WACAF Office.

i-1.3 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.

i-2 Attendance

i-2.1 The Seminar was attended by **42 participants** from 14 Contracting States and International Aviation Agencies: **ASECNA, Eurocontrol, and Jeppesen** .

i-2.2 The list of participants is at Appendix A.

i-3 Officers, Organization and conduct of the Seminar/Workshop

i-3.1 To encourage free discussions and an open exchange of opinions, the seminar/ workshop was conducted informally and without an appointed chairman.

i-3.2 Mr. G. Baldeh, Regional Officer, AIS/MAP of the ICAO Regional Office, Dakar, served as Secretary of the Seminar/Workshop. The Seminar/Workshop was moderated by Mr. M. Hohm, Technical Officer AIM, ICAO HQ, Montreal and was assisted by Mr. Werner Kurz, Jeppesen Director of International Aviation Affairs in Germany.

i-3.3 In his welcoming address at the opening of the Seminar/Workshop, Mr. Jallow expressed his satisfaction with the participation in the Seminar/Workshop (and referred to the objectives of the aeronautical information service which is to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation). He stated that in spite of the economic hardships affecting most States in the region, such participation highlighted the importance attached by Contracting

States on the subject to be discussed and urged the participants to ensure that appropriate follow-up action is taken by their respective authorities to implement the findings of the Seminar/Workshop. Mr. Jallow highlighted that the role and importance of aeronautical information/data changed significantly with the implementation of area navigation (RNAV), required navigation performance (RNP) and airborne computer-based navigation systems.

i-3.4 The main reference documents for the Seminar/Workshop were:

Annex 15 – (noting Amendments 30, 31, 32, 33 and 36 to Annex 15 – Aeronautical Information Services included new provisions in the areas of quality management of AIS and automated aeronautical information systems and require that Contracting States take all the necessary measures to introduce one properly organized quality system).

Annex 4 - (noting the new provisions in amendments 50, 51, 52, 53, and 54 to Annex 4 (Aeronautical charts) with emphasis on aeronautical data quality requirements related to the charting resolution and integrity).

Aeronautical information Service manual (Doc. 8126)
AFI ANP (Doc. 7474 – Volume 1)
AFI FASID (Doc.7474 – Volume 2)

i.3.5 Series of Discussion papers and Information papers were presented in the form of a video projection.

i-3.6 **Working languages**

i-3.6.1 English and French were the working languages of the Seminar/Workshop. Translation and simultaneous interpretation services were provided by two freelance interpreters.

i-4 **History of the Seminar/Workshop**

i-4.1 **Agenda**

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

Report on Agenda Item 1

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

1.1 The first working session of the Seminar/Workshop started on Tuesday 17 May 2011 following the opening statement by Mr. Mam Sait Jallow, the ICAO Regional Director for the Western and Central African office who emphasized on the objectives of the aeronautical information services which is to ensure the flow of information necessary for the safety regularity and efficiency of international air navigation.

1.2 Under Agenda Item 1 a), the RO AIS/MAP, Secretary and Coordinator of the Seminar/Workshop, presented a paper on the status of implementation of ICAO Provisions in the AIS/MAP field and with emphases to Annex 15 Standard 3.2.1 which states that *“Each Contracting State shall take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage as outlined in 3.1.7 above. The execution of such quality management shall be made demonstrable for each function stage, when required”*. He also emphasized that 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.

1.3 The Seminar/Workshop noted that the ability to view AIP components electronically is becoming increasingly available, especially as the use of the Internet increases. This avoids the necessity to maintain and distribute paper copies. It also allows the user to perform electronic searches for the information of particular interest.

1.4 The Seminar/Workshop noted the current provisions of Standard 3.2.5 of Annex 15 (thirteenth edition) which stipulates that *“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”.

1.5 The Seminar/Workshop reviewed the status of implementation of ICAO provisions concerning the integrated Aeronautical Information package, Aeronautical Information Regulation and Control (AIRAC), Pre-flight and Post-flight information, Aeronautical Charts, Notification of differences from ICAO, Annexes 4 and 15, SARPS and the AFI FASID AIS Tables as presented by Eurocontrol under DP/12.

Report on Agenda Item 2

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

2.1 Under this agenda item, the Seminar/Workshop was briefed by the delegated of Tanzania on measures undertaken by the State of Tanzania to implement QMS within their AIS/MAP Services presented under DP/4.

2.2 The Seminar/Workshop noted that the purpose of this presentation was to enable participants to appreciate the efforts that Tanzania has taken in implementing Quality Management System as migrating to AIM as listed below:

2.2.1 Organization of AIS in Tanzania

- Requirements of QMS
- Efforts taken by Tanzania towards implementation
- Challenges in implementation of QMS
- The way forward

2.2.2 AIS fall under the Division of Air Navigation Services in Tanzania Civil Aviation Authority.

- AIS is divided in working Units as follows:
 - i. AIS OPS/MAP-HQs
 - ii. International NOTAM Office at Julius Nyerere International Airport (JNIA).
 - iii. Automatic Message Switching Centre.
 - iv. AIS Aerodrome Units at five major Airports

2.2.3 AIS Products and Services provided include the following:

- AIP, AIP amendments
- Supplement to the AIP.
- AIC
- Production of Aeronautical Charts.

- As per Annex 15 (Recommendation)
- Quality management system should be applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.

2.2.4 The AIS quality policy states that “AIS Tanzania” is aiming to provide Quality Aeronautical Information and data by ensuring the information flow necessary for the safety, regularity and efficiency of air navigation, so as to meet the demand and requirement of internal and external customers and committed to ISO 9001:2008 Standard and continual improvement

2.2.5 Tanzania Civil Aviation Authority is responsible for provision of Aeronautical Information Services and committed for implementation of Quality Management System, not only in AIS but eventually in the whole organization.

2.2.6 The Process of QMS Implementation

PHASE I

- October 2008 a dedicated Quality Assurance Manager for the Authority was recruited.
- The Authority decided that the officer to work with AIS first before embarking on the whole Authority toward ISO certification
- December 2008 all the AIS Staff underwent through sensitization seminar/workshop in house.

PHASE II (*QMS manual was develop, including MANS OPS and SSI.*)

- During this phase everyone operated according to procedure and collected records that were demonstrated.

PHASE III (*Registrar was found who assessed the effectiveness of Tanzania’s QMS.*)

- On January 2010 the Authority awarded ISO 9001:2008 Certificate.



Certificate of Registration

This is to certify that the
Quality Management System
of

Tanzania Civil Aviation Authority,
P.O Box 2819,
Dar es Salaam,
Tanzania.

Has been independently assessed and is
compliant with the requirements of:

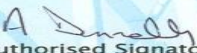
ISO 9001:2008

For the following scope of activities:

Provision of Air Navigation Services within Dar es Salaam Flight
Information Region (FIR) which includes Air Traffic Management (ATM),
Communication Navigation Surveillance (CNS) & Aeronautical
Information services (AIS).

Certificate Number: 091759A

Date of initial registration	22 nd January 2010
Date of this certificate	22 nd January 2010
Certificate expiry (subject to the company maintaining its system to the required standard)	21 st January 2013


A. Smally
Authorised Signatory



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2.2.7 CHALLENGES DURING IMPLEMENTATION

- AIS Budget constraints
- AFTN System not reliable.
- Changing staff from one place to another hinders the implementation.

2.2.8 QMS – CHALLENGES AFTER IMPLEMENTATION

- Too much paper work
- Traceability and,
- Data storage
- Maintenance of Standard and Continual improvement.

2.2.9 WAY FORWARD

- To develop electronic system which will assist in traceability, data storage and reducing, if not eliminating paper works.

2.3 The Seminar/Workshop was briefed by Euro control's presentation through video-web conference jointly carried out from the ICAO Paris Office, Euro control's HQ, in Brussels and the Seminar location in Dakar. The Seminar was apprised on Euro control's initiatives in the Transition from AIS To AIM through the Roadmap Phase I- (Consolidation –consisting of the following elements:

- AIRAC Adherence
- SARPs
- WGs-84
- QMS on AIS/MAP Services

2.4 The Seminar/Workshop noted that in accordance with Eurocontrol's experience, the accomplishment of QMS in AIS/MAP Services would involve the following issues to be raised and understood by CAA Administrations

- High level mandates are a must ;
- Misconception : ISO 9000 = Paper;
- Management System (not a quality control system);
- Do it yourself
- Cost (rules of thumb)
 - 10% of Working Force
 - External fees on consulting/training +Auditor
 - 18 months duration period
- Note that all would do it again.

2.5 In summary of AIRAC, QMS , WGS-84 and Annex 4, 15 inventory concerning the pre-requisites for transition from AIS to AIM, the Seminar/Workshop was apprised on the following elements:

- AIRAC Adherence: an essential element ensuring that each person involved makes decisions based on the same information.
 - (*Monitoring tool-pTracker, AIS AGORA, Awareness*)
- SAPRS compliance: users should know if anything is different.
 - (*Annex 4, 15 inventory – publication of differences*)
- WGS-84 : No PBN without WGS-84
- QMS : customer can have confidence in a product in terms of its performance and safety
 - (*Documented processes, key performance indicators*)

2.6 Under review of DP/13 concerning the AIS to AIM Roadmap Phase2 concerning Data Quality Monitoring, the Seminar was briefed that Data Quality is a degree or level of confidence that the data provider meets the requirements of the data user in terms of accuracy, resolution and regularity (*ICAO Annex 15*) with the following highlights :

- Accuracy : a degree of conformance between the estimated or measured value and the true value;
 - *(How close to reality)*
- Resolution : a number of units or digits to which a measured or calculated value is expressed and used;
 - *(How many digits after comma)*
- Integrity : a degree of assurance that aeronautical data and its value has not been lost or altered since the data origination or authorized amendment
 - *(How good is the data)*

2.7 The Seminar/Workshop was further briefed that in terms of Annex 15 required integrity levels, a degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment are defined as follows:

- Critical
 - Runway threshold, runway holding positions etc *(Require as integrity value of 10^{-8} 1 error in 100m)*
- Essential
 - Coordinates of en-route nav aids , aerodrome elevation , etc; *(Require an integrity value of 10^{-5} 1 error in 100k)*
- Routine
 - FIR points, Aircraft stands , Airway segments etc *(Require an integrity value of 10^{-3} 1 error in 1000)*

2.8 The Seminar/Workshop was also briefed that on the monitoring aspects, despite automatic and semi-automatic procedures and QMS, the main causes of an inconsistency are :

- Non compliance data supplied by the originator
- AIS errors
- Ambiguities in ICAO SARPs

2.9 In summary the Seminar/Workshop was briefed on the following :

- Aeronautical data quality – key foundation for the present are future AIM data-dependent systems
- Quality of information provided by AIS falls short of the required values
- There is a need for monitoring data quality-to bring up to ICAO SARPs to be maintained in order to support AIM target levels of safety.

2.10 Under DP/14 Concerning the Transition from AIS- AIM Phase 3, the Seminar /Workshop was briefed on navigation technology from 1933 to 1987 and the impact of Aeronautical information and role of data in ATM in the past and present. The

Seminar/Workshop noted that relative accuracy is no longer sufficient as Satellite based RNAV Procedures will gradually replace conventional procedures .

2.11 The Seminar /Workshop was briefed on Eurocontrol’s Chain Program as follow:

- Objective of Chain
 - Support States to establish System wide traceable, auditable processes for;
 - Improve accuracy and quality of aeronautical data until data integrity is increased
 - Enhance data management by establishing common procedures/processes to enable interoperability;
 - Enhance the transfer of AI between origination and publication

- Slope of Chain
 - Critical and essential navigation data;
 - Point of origination to point of publication
 - Upstream data operation

- Out of scope :
 - Nav. Domain work for origination and procedure design
 - Tool creation

2.12 The Seminar/Workshop was further briefed that a SLA “Service Level Agreement” is a contact between a service provider and its customers and that SLA defines the following :

- Services to be provided
- Associated indicators
- Acceptable and unacceptable service levels
- liabilities and responsibilities of the parties
- Action to be taken in specific circumstances

2.13 Furthermore the results of an SLA would be the following :

- Clarify of Service and Product
- Business Plan
- Better Communication
- Mutually agreed standard
- A process for gauging service effectiveness
- A guard against “expectation creep”

2.14 In Summary, Seminar/Workshop was apprised on ICAO requirement for arrangements between the AIS and Data originators as follows:

- Bilateral and Trilateral types of SLA for AIS
- SLA Structure : Document and processes
- SLA's area crucial tool for driving business performance

Note 1 : Without an SLA with an internal or external provider, how can you effectively judge the suppliers performance.

Report on Agenda Item 3

Agenda Items 3 Quality Management System for AIS/MAP Services

3.1 The Seminar/Workshop reviewed DP/6 and DP/10 concerning the importance of QMS, training aspects for AIS/MAP Services and understanding and implementing ISO 9000 Series.

3.1.1 Quality management system in AIS/MAP Services were initiated by the following :

- Introduced into Annex 15 by Amendment 29 in 1997
- Applicability date of the Quality system was 1 January 1998
- Annex 15 specifications updated by the AIS/MAP/98

3.1.2 The Seminar/Workshop was the apprised on the aspects of QMS in AIS/MAP Services :

- Quality system established should be in conformity with the ISO 9000 series of quality assurance standards and certified by an approved organization (*Amendment 30 to Annex 15*)
- The system must provide users with assurances and confidence that aeronautical data satisfy stated requirements for quality
- Quality management must be demonstrable for each functional stage of aeronautical data handling
- Aeronautical data record must be traceable to its origin

3.1.3 With regard to compliance of QMS within AIS/MAP Services, the following were noted :

- Demonstration of compliance of the quality system applied by audit
 - Non-conformity, remedial action
 - Audit observations and remedial actions documented
- Necessary to implement quality management at each AIS function stage

3.1.4 On matters concerning Quality System and AIS Personnel, the following were noted:

- Skills and knowledge required for each function shall be identified and AIS personnel assigned to perform those functions shall be appropriately trained
- States shall ensure that AIS personnel possess the skills and competencies required to perform specific assigned functions
- Appropriate records shall be maintained so that the qualifications of AIS personnel can be confirmed
- Initial and periodic assessments shall be established in order to allow the AIS personnel to demonstrate the required skills and competencies
- Analysis of periodic assessments of AIS personnel shall be used as a mean to detect and correct shortfalls

3.1.5 In the context of the Quality System, the objectives concerning skills and competency management must include:

- identification of the functions to be performed
- establishment of the knowledge and skills required for each step of the processes
- assurance that the personnel assigned to those functions have the required knowledge and skills
- and, that they are competent to perform those functions
- States must place emphasis on the human component in their quality management program for AIM
- development of an ICAO training program by establishing uniform standards for the qualifications and scope of knowledge which must be met by AIM technical officers worldwide

3.2 Under review of DP/10, the Seminar/Workshop noted the following importance of QMS for AIS/MAP Services

3.2.1 Need for quality is greater than ever in current environment:

- Higher accuracy of data required to support RNAV, RNP & data-dependent airborne computer-based nav systems

3.2.2 Quality requirements evolved to include:

- Integrity
- Accuracy
- Order of publication & charting resolution
- Protection of electronic data

3.2.3 Annex 15 specifies quality requirements for aeronautical data and requires States to introduce quality system to implement QM at each stage of AI:

- Originating
- Collating
- Editing
- Formatting
- Storing

- Publishing
- Distributing

3.2.4 Annex 15 also recommends that quality requirements be met by quality system compliant with ISO 9001

3.2.4.1 ISO 9000 & Customer Focus

- ISO 9000 emphasizes customer satisfaction
- Customer will determine acceptability of product/service delivered
- In AIM context, customer is user of AI/data:
 - Pilots
 - Aircraft operators
 - ATC
 - Flight planning organizations
 - General aviation
 - Data vendors
 - Etc.

3.2.4.2 A Process Approach

- *Process*: set of activity that transform inputs to outputs;
 - Requires resources
- *Process approach*: application of system of processes, together with identification and interaction of these processes, and their management;
- Process approach is at core of ISO 9001;
- Process may be linked to previous to succeeding process;
- ISO QMS requirements focus on systematically identifying, organizing, documenting, managing and improving processes, and interactions between processes;
- All activities and resources related to AIM have to be managed as a process;
 - including operational and administrative

3.2.4.3 Data Quality Process

- Extends from original data sources through AIS & publication to end-users
- QMS required for all organizations operating within total aeronautical data chain
- Data supply chain management based on QMS
 - and supported by Service Level Agreements (SLAs)

3.2.4.4 Annex 15, QMS & ISO 9000

- Annex 15 recommends ISO 9000 be used when developing QMS for AIM
- New ICAO Manual under development
- Guidance to meet Annex 15 requirements for States to introduce QMS for AIS
 - Addresses key requirements of QMS
 - *Development of quality manual*
 - Methodology & concepts derived from
- ISO 9001:2008 – *QMS Requirements*
- ISO 9000:2005 – *QMS Fundamentals & Vocabulary*

3.2.4.5 ISO 9001:2008 QMS

- 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

3.2.4.6 ISO 9001:2008 & Process Approach

- 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

3.2.4.7 ISO 9001:2008 Structure

- Clause 1 – Scope
- Clause 2 – Normative reference
- Clause 3 – Terms and definitions
- Clause 4 – QMS
- Clause 5 – Management responsibility
- Clause 6 – Resource management
- Clause 7 – Product realization
- Clause 8 – Measurement, analysis and improvement

3.2.4.8 ISO 9001:2008 Structure (Cont'd)

- First 3 clauses set the stage for requirements
- The *Shall* clauses (requirements) are stipulated in last 5 clauses
- QMS described in clause 4 encompasses 4 major groups of processes, within process-based QMS
- They are described in clauses 5 to 8:
 - Management responsibility
 - Resource management
 - Product realization
 - Measurement, analysis and improvement

3.2.5 General Requirements for QMS Implementation

- Identify processes needed for QMS
- Determine sequence and interaction of processes
- Determine criteria and methods required to ensure effective operation and control of these processes
- Ensure availability of information necessary to support operating and monitoring of processes

- Measure, monitor and analyse processes, and implement action necessary to achieve planned results and continual improvement

3.2.6 Management Responsibility

- AIM managers have responsibilities within quality system, related to:
 - Quality policy
 - Commitment to quality
 - Customer focus
 - Planning
 - Management representation
 - Management review

3.2.7 QMS Documentation

- ISO 9000 requires QMS be properly documented
- Different documentation levels exist (4)
- QMS documentation includes:
 - Quality & objectives
 - Quality manual
 - Documented procedures
 - Work instructions/operational procedures
 - External docs which can include specifications, statutory and regulatory requirements, standards, codes, etc.
 - Forms and records
 - Quality plans, usually used in complex projects, products, processes or contracts

3.2.8 Documentation Requirements

- Documentation for QMS must include:
 - Documented procedures
 - Documents required by organization to ensure effective operation and control of its processes
- Extent of QMS depends on following and may be in any form or type of medium:
 - Size and type of organization
 - Complexity and interaction of processes
 - Competence of personnel

3.2.9 Auditing Process

- ISO requires audit criteria – set of policies, procedures or requirements used as reference
- Those materials are contained in QMS documentation
- During audit, certification body/registrars will try to:
 - Verify if AIS provider is doing what it says it will do (QMS doc)
 - Confirm if QMS is effectively implemented
- Real importance of audit is to confirm that QMS is effectively implemented and maintained
 - So that benefits of establishing the system are realized

3.2.10 Process Auditing Approach

- Since ISO 9000:2000 promotes “process approach”, audit emphasizes practice of process auditing
 - Identifies inputs/outputs of subject process and determines if process is capable of delivering desired output consistently

3.2.11 Process Auditing Approach

- 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

3.2.12 Initiating a QMS

- 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

3.2.13 QMS Implementation Project

- 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

3.2.14 Data Quality Process

- In order to ensure end-to-end integrity of aeronautical data, data process must be fully identified, mapped and understood
- Establishment of process is critical as it identifies key participants, processes, inputs and outputs that must be addressed un any regularized process

3.2.15 AI Data Process

- End-to end data quality made up of 3 key elements of a process:
 - Inputs
 - Actions
 - Outputs
- Data originators initiate inputs to process
 - E.g. Surveyors, ATS personnel, service organizations, etc.
- Activities then performed to turn inputs into outputs
 - These form actions associated processes
- Outputs of process are products that meet needs of users of data
 - Human or system-based users (e.g. pilot using info from AIP or FMS using integrated geospatial data)

3.2.16 Generic Process for AI/Data

- Data/info is provided by defined/approved/certified ISO 9001:2008, ISO accredited companies in accordance with legal and regulatory requirements
- Data/info is held in electronic media (standard worksheets that are used throughout process)
- In order to ensure data/info is received at next activity without change, CRC value needs to be calculated (CRC wrapping)
- Data/info transferred electronically is encrypted to provide further protection to integrity
- Data/info is checked/verified by responsible organization if provided by subcontractor
- Data/info transferred electronically to AIS
- AIS verifies completeness & integrity
- AIS processes data to publication using electronic media

3.2.17 Relevant Provisions in Annexes & Documents

- Annex 15 – SARPs related to QMS in Chapter 3, Section 3.2:
 - States ensure QMS implemented & maintained for AIS
 - QMS should cover whole data chain
 - QMS should follow ISO 9000 and be certified by approved organization
 - Assigned personnel
 - Skills/knowledge for each function in QMS defined
 - Personnel properly trained & records maintained
 - Assessments conducted to verify personnel skills/competencies
 - QMS ensures traceability of data to detect anomalies/errors
 - Identify root cause, correct and communicate to affected users
- Annex 15 – SARPs related to QMS in Chapter 3, Section 3.2 (cont'd):
 - QMS provides users with assurance and confidence that distributed data is adequate for use

- States shall monitor compliance with QMS
- Order of accuracy of data (95% confidence level) based upon Annex 11, Chapter 2 & Annex 14, Vol. I & II
- 3 types of positional data shall be identified:
 - Surveyed points (Rwy thresholds, nav aids, positions, etc.)
 - Calculated points (mathematical calculations from surveyed points of points in space/fixes)
 - Declared points (e.g. flight information region boundary points)
- Annex 4 – Section 2.17 “Aeronautical Data” and Appendix 6 “Aeronautical Data Quality Management”:
 - Contain similar provisions
 - Annex 4 refers to data quality requirements in Annex 15
- Doc 8126 “AIS Manual” – Chapter 1:
 - Refers to need for quality system
- Required accuracy, resolution and integrity of data are outlines in chapter 2 of Doc 9674, “WGS-84 Manual”
- QA of data required for quality of instrument flight procedure is set out in Doc 9906 “QA Manual for Flight Procedure Design”

Report on Agenda Item-4

Agenda Item 4: User requirements for Quality Aeronautical Information

4.1 Under this agenda item, the Seminar/Workshop reviewed the user requirements for aeronautical information as presented by charts/documents/navigation databases producing agencies represented by Jeppesen.

4.2 The Seminar/Workshop was informed that the objectives of AIS was stipulated in Annex 15, Chapter 1 which states : “Introduction : Ensure the flow of Aeronautical Information necessary for the safety, regularity and efficiency of international civil aviation” ; and Annex 15 standard 3.1.1.2 which states: “Each Contracting State shall take all necessary measures to ensure that Aeronautical information it provides is adequate, of required quality and timely.

4.3 The Seminar/Workshop was further informed that over many decades, navigation technology and operational requirements did not change much from 1933 – 1962 – 1982. For decades, operational requirements and the provision of Aeronautical Information by State AIS offices was going hand in hand and did not create problems due to the following reasons:

- Navigation was based on conventional navigaids on the ground ;
- Relative accuracy was sufficient for pilots;
- The primary medium for aeronautical information in the cockpit was charts.
- Aeronautical Information published by AIS offices meet the charting requirements ;
- The amount of Aeronautical Information and the number of changes was large but still manageable with manual processes ;
- impact of late information was less significant;
- Data quality and integrity could be achieved with manual processes along the entire data chain ;
- Data resolution was of lesser importance.

4.4 However, the Seminar/Workshop noted that the aviation world has changed with the first Flight Management System (FMS) on-board of aircraft and for FMS operations, navigation databases became very important. It was noted that presently, almost all worldwide procedures are available in databases and charts are no longer the only tool for navigation. Since pilots rely on-board navigation databases, information has been expanding rapidly and the impact of late information is very high if aircraft operation depends on FMS and on-board navigation databases.

4.5 The Seminar/Workshop was briefed that satellite based RNAV procedures will gradually replace conventional procedures and that relative accuracy would no longer be sufficient due to the

following requirement for performance based operation :

- Future aircraft operation and navigation will be based on defining performance requirements in the form of RNP values;
- ICAO has endorsed the concept of Required Navigation Performance (RNP) which is a statement of the aircraft navigation performance defined in terms of accuracy, integrity, availability and continuity of service necessary for operation within a defined airspace ;
- Efforts of all States must be aimed at providing positioning and navigation data at the required performance level to support the various applications in the ATM requirement.

4.6 The Seminar/Workshop noted the goal of seamless information for AIS from gate to gate for all operational needs. It was also noted that the future has already started with a cockpit technology which is beginning to change from self-contained instruments to software and data-driven integrated graphical situational awareness. The Seminar/Workshop noted the following :

- That paper charts are being replaced by Electronic Flight Bags ;
- That Electronic Flight Bags (EFB) are database driven and is much more than an electronic chart viewer;
- That Aeronautical Databases are already used for terrain, obstacles and Airport Mapping ;
- That new applications define new data requirements.

4.7 The Seminar/Workshop noted that at present, virtually all worldwide procedures are available in the FMS. Charts are no longer the only tool for navigation and Pilots rely on their on-board navigation databases.

- New technologies enter the cockpit, and Aviation is changing to Performance Based Navigation (PBN) which requires data in much higher quality, making relative accuracy to be no longer sufficient.
- Cockpit technology over the past 40 years changed from self-contained instruments to software and data-driven, integrated, graphical situational awareness
- Paper charts are being replaced by EFB
- EFB is database driven and it is much more than just an electronic Chart Viewer
- Aeronautical Databases are used for Terrain, Obstacles, and Airport Mapping

4.8 The Seminar noted that these revolutionary changes in our aviation world mean the following for aeronautical information and for AIS/AIM:

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

4.9 The aeronautical data chain

- The entire data chain must be supported by rigid Quality Management Systems

4.10 Data Quality – The Seminar was apprised on the following Data Quality within PBN;

- Most actors in the data supply chain achieve data integrity no better than 10^{-3} (routine)
- Most data for PBN operations requires integrity levels of 10^{-5} (essential) or 10^{-8} (critical).
- PBN is extremely data-dependent requiring timely Aeronautical Information of considerably higher quality than is generally available today.
 - In principle, aeronautical data of poor or insufficient quality may compromise the safety of air traffic operations which can lead to an airspace user hazard resulting in an incident or accident.
 - Providers of aeronautical information are facing new challenges in having to serve computer-based navigation applications and decision support tools, all of which are data reliant. This requires that more attention must be given to the importance of the aeronautical data quality to mitigate a substantial portion of identified risks.

4.11 The Seminar was briefed that ICAO Annex 15 defines International Standards and Recommended Practices for Aeronautical Information Services. Amendment 36 to Annex 15, issued 18 November 2010, contained new and revised provisions for the implementation and execution of Quality Management Systems which is defined as follows:

- Quality Management Systems shall be implemented and maintained encompassing all functions of an aeronautical information service as outlined in 3.1.7. The execution of such quality management systems shall be made demonstrable for each function stage, when required.
- 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.

4.12 ISO 9001 QMS for AIS/AIM identifies the following :

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

4.13 The processes defined by a Quality Management System in AIS/AIM must assure that the following data quality characteristics will be met.

- The data shall have the agreed data quality, characterized by:
 - the accuracy of the data;
 - the resolution of the data;
 - the confidence that the data is not corrupted while manipulated, stored or in transit (data integrity assurance level);
 - the ability to determine the origin of the data (traceability and meta-data);
 - 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);
 - the assurance that all of the data needed to support the function is provided (completeness);
 - the format of the data meets the user requirements.

4.14 Seminar/Workshop was apprised on the following when ISO 9001 is implemented in an organization:

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

4.15 The Seminar noted the following Quality standards in the Industry

- New cross reference note in Amendment 36 to ICAO Annex 15:
 - Note - Supporting material in respect to the processing of aeronautical data is contained in RTCA Document DO-200A and EUROCAE Document ED-76A — Standards for Processing Aeronautical Data. These standards support the development and application of aeronautical databases.

Report on Agenda Item 5

Agenda Item 5 – QMS Implementation and Planning

5.1 The Seminar/Workshop discussed the issue of understanding and implementing ISO 9001:2008 as presented in DP/8 and noted the following :

- How to implement a QMS?
 - Planning & Designing
 - Describing
 - Implementing the QMS
 - Improving the QMS

5.2 Top Management

- Get in first by.....
 - Learning about ISO
 - Planning the project and assigning responsibilities
- Make your commitment visible by.....
 - Providing resources

- Rewarding participation in the ISO project

5.3 In ISO 9001:2000 there is significant emphasis on the role of Top Management as follows :

- “provide evidence of commitment”
- “establish the quality policy”
- “ensure quality objectives are established”
- “conduct management reviews”
- “ensure availability of resources”

5.4 Gaining Management Support through:

- Education, training
 - ensure management understand the need for a quality management system and the potential benefits
- Investments/Dividends
 - management will understand the concepts of investing in order to achieve returns
 - stress the long term cost advantages and potential improvements in efficiency

5.5 Cost of Implementation

- This will depend upon a number of factors, for example:
 - The size of the organization
 - The number of distinct processes and activities that need to be managed
 - How well the organization is managed
 - The amount of required documentation, e.g. records, that already exist

5.6 Planning for ISO 9001 Implementation

- Planning & Designing Phase:
 - Getting a clear picture of how you already comply
 - Developing an Action Plan

5.6.1 INITIAL SURVEY

- Start by reviewing the current situation
 - ❖ What elements of a QMS are already in place?
 - Organisation charts
 - Process documents
 - Forms and records

5.6.5 Describing ISO 9001 Implementation

- Describing Phase:
 - Description of What Exists
 - Interfaces
 - Process mapping

5.6.6 QMS FRAMEWORK

- The framework of the Quality Management System starts with Top Management
 - they set the business objectives
 - they must then establish an organization to put those policies into action
 - they must ensure that key processes are controlled

- they must identify responsibilities and interfaces
- they must ensure that resources are provided

5.6.7 ISO 9001 FRAMEWORK

- ISO 9001 states :
 - All requirements are intended to be generic
 - Applicable to all organizations
 - Where a requirement cannot be applied it can be considered for exclusion
 - Exclusions are limited to clause 7
 - Must not affect ability to provide product that meets customer and regulatory requirements

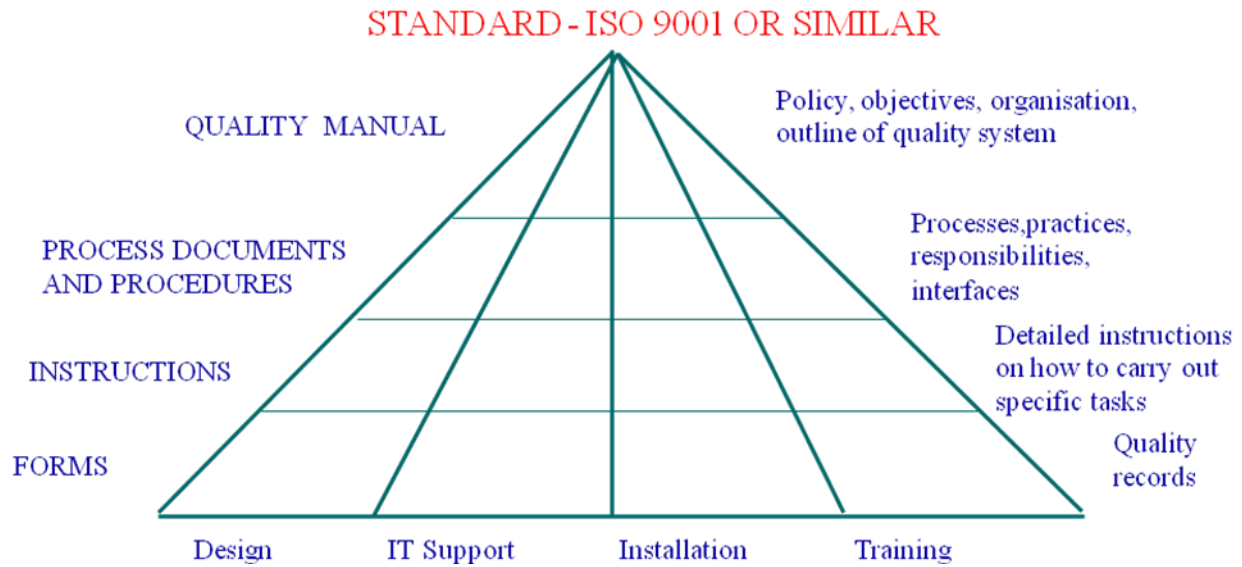
5.6.8 SUGGESTED APPROACH

- Examine requirements of clause 7
- Determine whether any may be considered for exclusion
- Be sure that this can be justified against the ISO 9001 stated criteria
- Document the exclusion and justification in the Quality Manual

5.6.9 SYSTEM DOCUMENTATION

- The framework of the system documentation will depend upon the business structure, e.g.
- The size and complexity of the organization
- Is there a department or team-based structure?
- A typical documentation structure is shown on the next slide.

5.6.10 TYPICAL QMS STRUCTURE



5.6.11 DOCUMENT FORMAT

- ISO 9001 States: “*The documentation may be in any form or type of medium*”
- Therefore it could be in text form or in the form of process maps/flowcharts
- It could be a paper-based system or could be on computer, e.g. accessed via an intranet browser

5.6.12 CHOOSING a FORMAT

- Each organization can choose its own format
- The majority at present have paper-based text documents
- Increasingly organizations are using flowcharts and “computerised” systems
 - a computer based solution often has advantages when it comes to document and change control

5.6.13 Implementing ISO 9001

- Making the QMS Work involves putting planning into action

5.6.14 PRODUCING the QMS Documentation (*THE QUALITY MANUAL*)

- Description of the organisation
- Quality Policy, key objectives
- Structure of the organisation
 - Interfaces, responsibilities

- Overview of the Quality System
 - show approach to Standard requirements
 - detail and justify any exclusions

5.6.15 PROCESS Documents

- Do we need process documents?
- The ISO 9001 standard calls for few mandatory procedures
- The question is do we need documents in order to effectively control our business processes?

- Benefits of process documents :
 - Provide consistency/repeatability
 - Define responsibility/authority
 - Continuity when staff change
 - Assist in staff training
 - Help identify cause of errors
 - Benchmark for improvement

➤ PROCESS

- Definition:
 - Set of inter-related or interacting activities which transforms inputs into outputs

➤ PROCEDURE

- Definition:
 - Specified way to carry out an activity or process

i.e. describes how a process is performed

5.6.16 GOOD PROCEDURE

- Process based - not ISO 9001 clause based
 - *Should not be excessive*
 - Simple, clear, concise style
 - Aimed at education/experience
 - of personnel using procedure
 - Realistic - do not specify the impossible

5.6.17 PROCEDURE DEVELOPMENT

- Establish current practice
- Document current practice
- Review current practice
- Prepare procedure
- Review and approve

- Issue procedure

5.6.18 PRODUCING PROCEDURES

- Establish standard format/template
- Indicate approval/revision status
- Consider using flow charts or process maps
- Train the procedure writers

5.6.19 FLOWCHARTS

- Using a flowchart is a very effective way to describe a process
 - “a picture is worth a thousand words”

5.6.20 Internal Quality Systems Audits

- AUDIT OBJECTIVES
 - To ensure that procedures are being followed
i.e. We are doing what we say we do
 - To determine the effectiveness of the systems and procedures in meeting the quality objectives
 - To afford an opportunity to improve the quality system

5.6.21 INTERNAL AUDIT

- Verify compliance, effectiveness
- Planned audit programme
- Independent auditors
- Documented procedure
- Timely corrective action
- Follow-up activities

5.6.22 AUDIT PROGRAMME

- Audits planned in advance
- Audits are not random spot checks
- Scheduled usually by department, function, or process
- Consider the status and importance of

process, and previous results

5.6.23 AUDIT REPORT

- Summary of results, including :
 - Scope, dates, auditors
 - Satisfactory areas
 - Nonconformities (refer to NCR's)
 - Observations, recommendations

5.6.24 FOLLOW-UP

- Auditee responsible for corrective preventive actions
- Auditor follows-up action to ensure it is taken and effective
- Audit actions are closed - *records*

5.6.25 SUMMARY OF AUDIT PROCESS

- PLANNING
Schedule, Preparation, Checklist
- AUDITING
Opening Meeting, Audit, Closing Meeting
- COMPLETION
Report, Corrective action, Follow-up

5.6.26 BENEFITS OF AUDITING

- Verifies that procedures are followed
- Reviews effectiveness of system
- Helps to identify problem areas
- Assists transfer of best practice
- Effective mechanism for continuous improvement

5.6.27 Preparing for Certification

- ISO 9001- Steps in Implementation
 - Management decision/commitment
 - Decide scope of system
 - Review current situation - report gaps
 - Formulate action plan
 - Document & implement processes
 - Review and internal audit
 - Formal assessment

5.6.28 KEY QUESTIONS

- Before inviting an external assessment
check the following:
 - Are the mandatory documents in place - quality manual and procedures?
 - Are key processes identified and controlled?
 - Have internal audits and management reviews been conducted?
- Are results from these satisfactory


5.6.29 FINAL PREPARATION

- Consider a pre-assessment
 - internal
 - independent consultant
 - your assessment body
- Inform all of your staff
 - explain the process
 - clarify their responsibilities
 - seek their feedback regarding any concerns

5.6.30 THE CERTIFICATION PROCESS

- STAGE 1: Documentation Review
 - STAGE 2: Initial assessment of the
Quality System in action
 - STAGE 3: Continuing assessment by
periodic surveillance
- STAGE 1
- Company agrees contract with one Certification Body
 - Company submits QMS documentation to the Certification Body
 - Certification Body reviews the documents against Standard and reports results
 - When satisfactory, Certification Body produces plan/schedule for assessment
- STAGE 2
- Certification Body carry out assessment
 - Examine all major processes
 - Interview a cross-section of personnel
 - The audit is a sampling process
 - Result is reported at closing meeting
 - If necessary a follow-up visit is arranged
 - When successful, an Approval Certificate is i

TYPICAL ISO 9001 CERTIFICATE


Lloyd's Register
Quality Assurance

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

RAFI (GB) Limited
Redhill, Surrey, U.K.

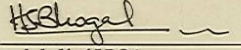
has been approved by Lloyd's Register Quality Assurance Limited to the following Quality Management System Standards:

BS EN ISO 9001:1994

The Quality Management System is applicable to:

Design, development and supply of customised data entry systems, including computer keyboards and keypads. After sales support, repair and servicing of data entry systems. Stockholding and supply of RAFI standard keyboards.

Approval Certificate No: 361603	Original Approval: 20th April 1989
	Current Certificate: 1st May 1995
	Certificate Expiry: 30th April 1998


on behalf of LRQA

The approval is subject to the company maintaining its system to the required standards, which will be monitored by LRQA.

FORM L019A (R90) The use of the Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001.

➤ STAGE 3

- Throughout approval period the Certification Body conducts regular surveillance visits
- Typically every 6/12 months
 - target specific parts of the system
 - cover certain core elements every time
- Many Certification Bodies operate a 3-year approval cycle

5.6.31 QUALITY MANAGEMENT PRINCIPLES

- Customer focused organization
- Leadership
- Involvement of people
- Process approach

- System approach to management
- Factual approach to decision making
- Mutually beneficial supplier relationships
- Continual improvement

5.6.32 Key Principles of ISO 9000

- GET ORGANISED
 - define roles, responsibilities, interfaces
- PROVIDE RESOURCES
 - human resources, training, facilities
- DOCUMENT MANAGEMENT SYSTEMS
 - establish procedures, control documents
- CONTROL PROCESSES
 - plan processes, control operations
- KEEP RECORDS OF ACTIVITIES
 - evidence of effective operation
- CARRY OUT REGULAR CHECKS
 - inspections, tests, surveys, audits
- IMPROVE THE SYSTEMS
 - pro-active continual improvement process

5.6.33 MAIN ASUMPTION !!!

- If the ISO 9001:2008 implementation project is to be successful, then there MUST be support and commitment from Top Management.

Report on Agenda Item 6

Agenda Item 6 – AIS role within the Global ATM

6.1 Under this Agenda Item, the Seminar/Workshop noted the AIS role within the Global ATM operational concept through the AIS to AIM transitions and the AFI challenges as follows :

- The global evolution from AIS to AIM capability is considered an essential and over-arching objective guiding global and Regional developments related to ICAO's Efficiency and Safety Strategic Objectives.
- The Roadmap for the transition from AIS to AIM proposed as Guidance material to assist States in planning the scope and prioritizing projects and actions for the transition to AIM.

6.1.1 OVERVIEW

- The 2003 11th ICAO Air Navigation Conference (AN-Conf/11) established that aeronautical information would be required to be managed efficiently and shared on a system-wide basis, making it available to any participant in the ATM environment whenever and wherever it was required.
- AN-Conf/11 called upon ICAO to define requirements for safe and efficient global Aeronautical Information Management (AIM), adopt a common Aeronautical Information Exchange (AIXM) model, and develop new specifications for ICAO Annex 4—*Aeronautical Charts* and Annex 15—*Aeronautical Information Services* (AIS) that would govern the future availability of aeronautical information and charts.

6.1.2 AFI transition from AIS to AIM

- ICAO recognized that not all States or Regions could make the transition immediately to AIM, and that implementation would be evolutionary based on Regional needs and capabilities. The Organization accounted for transition requirements in its Global Air Navigation Plan, and worked to ensure that the plans of all States and Regions would be coordinated to ensure, to the greatest extent possible, that solutions will be internationally harmonized and integrated.
- ICAO Annex 4, Annex 15 and associated guidance material will also require further amendment to support new digital requirements and the standardized presentation of aeronautical information to the end-user. This will include provisions for electronic Aeronautical Information Publications (eAIPs) and charts. The development of these requirements will need to take into account that, though the transition from a product-centric (current AIS) to a data-centric (AIM) service is essential. The provision of traditional AIS products during the transition phase will also be required.
- Notwithstanding this caveat, the quality, consistency, and timeliness of data within the AIM framework must meet stringent new digital requirements, substantially exceeding those currently considered acceptable.

6.1.3 AFI-CAD database initiative

- Noting the adoption of the framework and guidance material for development of an AFI

Centralized AIS Database (AFI-CAD) by the APIRG/16 meeting in 2007, the ICAO Regional Offices in Dakar and Nairobi, in collaboration with ICAO HQ, organized the third AFI-CAD Study Group meeting in Dakar, Senegal in October 2008.

- The main objective of the 2008 AFI-CAD event was to initiate and steer the process of developing the AFI-CAD business/financial model and associated User Requirements (URS).
- AFI-CAD will eventually comprise the AFI Region AIS Data Base System and the AFI Region AIS Data Operations and network provision. It will function as a single repository for aeronautical information and IAIP elements of participating States; provide data questioning enhancement through multilevel consistent data checking processes (including cross border data verification); act as a secure channel/vehicle for timely and efficient electronic distribution of aeronautical information and IAIP elements; and finally ensure harmonization and interoperability through a standardized system interface and data exchange model (AIXM) as well as a static data model (AICM).
- Eventual clients of the AFI-CAD system will enjoy support to edit and provide (to the system) aeronautical information, electronic access to and delivery of aeronautical information, browsing and downloading of participating States' aeronautical information; and finally a report generating function. Access will be provided via dedicated Client Interface Terminals (CITs) and a web-based interface as determined by a given client's Service level Agreement (SLA).

6.1.4 ICAO Global Operational ATM

- The “glue” that binds ATM components together is the management, utilisation, and transmission of data and information : “**information management**”.
- A function called “information services” is also defined to include:
 - Information management;
 - Aeronautical information;
 - Meteorological information;
 - Other essential services (MIL, S&R, accident investigation, ...).

6.1.5 Change from AIS to AIM

- Glue of the future ATM Network
- The AIS-AIM Transition Roadmap document is a plan, to manage and facilitate the global transition from AIS to AIM.
- Evolution, no revolution
- Step 1 consolidation,
- Step 2 databases,
- Step 3 information management.

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 MUST 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. QMS Implementation Project will consist of the following phases:**
- 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.
-

QMS FOR AIS/MAP SERVICE IMPLEMENTATION WORKSHOP
(Dakar, Senegal, 17 – 19 May 2011)
List of Participants

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Last Update 13 July 2011



ديوان الطيران المدني والمطارات
OFFICE DE L'AVIATION CIVILE ET DES AEROPORTS

Direction Centrale du Trafic Aérien

OACA

Missions du SIA

Le SIA est chargé d'assurer la publication de toute information nécessaire à la sécurité, la régularité et l'efficacité de la navigation aérienne.

Le SIA a pour mission principale de rassembler, traiter, vérifier et éditer toutes les informations aéronautiques reçues des informateurs locaux et d'échanger ces informations sur le plan international sous les formats suivants:

- ▣ Information permanente : AIP, AMDT AIP et AMDT AIP AIRAC
- ▣ Information temporaire : SUP AIP, SUP AIP AIRAC, NOTAM, liste des NOTAM valides et PIB
- ▣ Information administrative et réglementaire : AIC.

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4

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4

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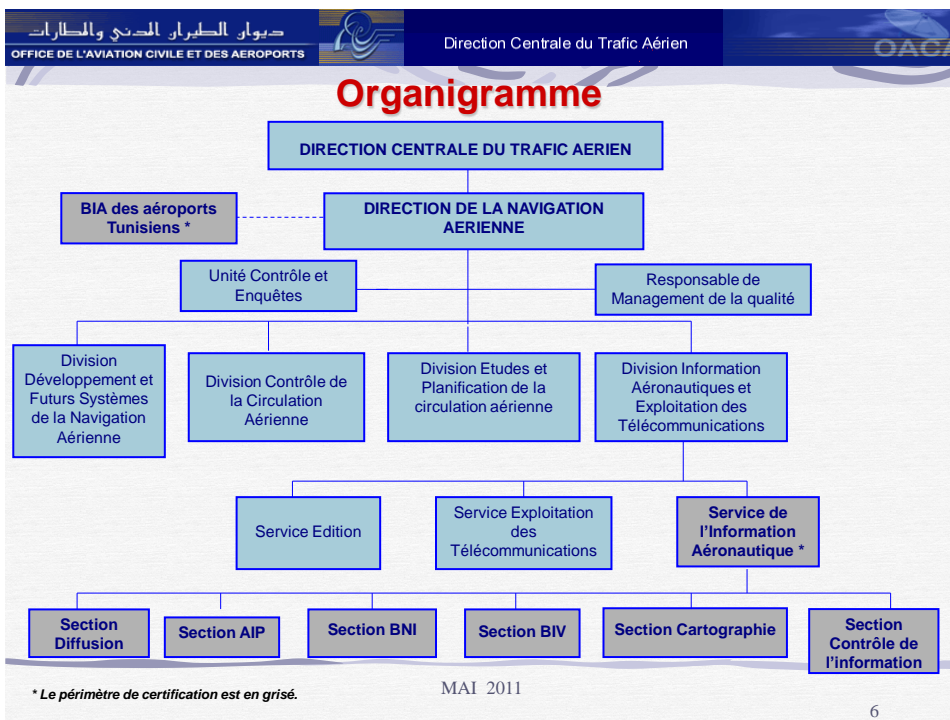
Missions des BIA

Les BIA ont pour missions de:

- ▣ Rassembler et exploiter toutes les informations aéronautiques intéressant sa zone de couverture et les mettre à la disposition des exploitants d'aéronefs sous forme de document ou de PIB selon le caractère de l'information.
- ▣ Assurer l'affichage mural au personnel navigant.
- ▣ Informer le Service d'Information Aéronautique de l'état de fonctionnement des installations, procédures et services de la navigation aérienne de l'aérodrome (Informateur local du SIA).

MAI 2011

1



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Responsabilités et autorités (5.5.1 de la norme ISO 9001-2008)

- Un organigramme, accompagné de fiches de fonctions, décrit les responsabilités et l'autorité au sein du SIA et des BIA.
- Les fiches de fonctions sont communiquées à tous les intéressés.
- Les fiches de fonctions définissent la mission, les responsabilités et les tâches de chaque fonction ayant une incidence sur la qualité du produit.
- L'intérimaire est désigné à chaque fois par note interne ou mentionné sur la demande de congé.

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7

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Engagement et politique qualité de la direction

S'inscrivant dans les orientations qualité de l'Office de l'Aviation Civile et des Aéroports, et répondant aux exigences de l'Organisation de l'Aviation Civile Internationale, la Direction Générale de l'OACA s'engage au développement et à l'entretien d'un Système de Management de la Qualité au sein

MAI 2011

8

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Direction Centrale du Trafic Aérien

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Engagement et politique qualité de la direction Engagement du SIA et des BIA

Conformément à l'engagement et politique qualité de la Direction Générale de l'OACA (Note NR 0038150 en date du 21/09/2004), le Service d'Information Aéronautique (SIA) ainsi que les Bureaux d'Information Aéronautiques (BIA) des Aéroports Tunisiens (Tunis, Monastir, Sfax, Djerba, Tozeur, Tabarka et Borj El Amri) s'engagent dans une mise en conformité de leur fonctionnement avec la norme internationale ISO 9001 version 2000.

La politique qualité spécifique du SIA et des BIA s'articule autour de:

- La conformité à la réglementation nationale et internationale en matière de navigation aérienne.
- La satisfaction des clients du SIA et des BIA, tant internes qu'externes.
- L'amélioration des compétences du personnel du SIA et des BIA.
- L'adhésion des partenaires et fournisseurs du SIA (internes à l'OACA), par l'établissement de contrats de services avec le SIA.

Cette politique vise l'établissement, l'entretien et la recherche d'amélioration permanente d'un système de Management de la Qualité garantissant que les informations aéronautiques diffusées répondent aux spécifications (de précision, de rapidité et de traçabilité) dictées tant par les exigences des clients que par celles réglementaires et légales.

Un Responsable du Système de Management de la Qualité a été désigné à cet effet. Un manuel Qualité a été élaboré avec la participation de chacun. Il décrit les dispositions prises par le SIA et les BIA en matière de qualité pour maintenir les processus et leurs interactions. Chacun est tenu de suivre les règles qui y sont décrites.

Nous nous engageons à assurer que les objectifs qualité soient identifiés et suivis aux niveaux appropriés et à mener à bien des revues de direction.

Chacun, à tous les niveaux, est invité à participer activement à la réussite de cette démarche. Son engagement personnel est indispensable à l'application de notre Système de Management de la Qualité.

En date du 01-10-2004

Le Chef de Service de l'Information Aéronautique MAI 2011 Le Directeur de la Navigation Aérienne
Hassen SAHBANI Mohamed Ali BEN ALAYA 9

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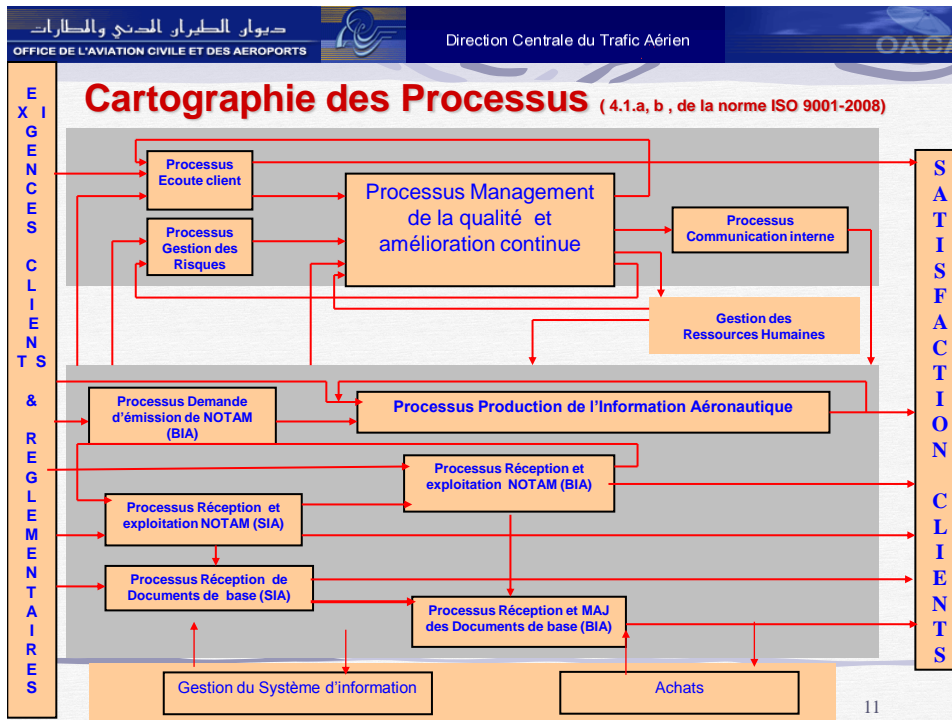
Exclusions du SMQ (1.2 de la norme ISO 9001-2008)

Quatre exclusions ont été identifiées et justifiées pour le Système de Management de la Qualité :

- ▣ **Première exclusion:** « conception et développement des produits » (clause 7.3), les produits concernés par le SIA et BIA sont des produits qui répondent aux exigences réglementaires de l'OACI. La responsabilité de leur conception ou développement incombe à l'OACI.
- ▣ **Deuxième exclusion:** « la Validation des processus de production et de la préparation de service » (Clause 7.5.2), cette exigence a été exclue du SMQ, vu la non existence de processus spéciaux et vu que les données de sortie de tous les processus peuvent être contrôlées.
- ▣ **Troisième exclusion:** « la propriété des clients » (Clause 7.5.4), le SIA et les BIA ne reçoivent pas de produits appartenant aux clients. Dans le cas où le client envoie sa propriété, les dispositions nécessaires seront prises pour en assurer la maîtrise.
- ▣ **Quatrième exclusion:** « Maîtrise des dispositifs de surveillance et de mesure » (Clause 7.6), car les produits du SIA et BIA ne sont pas mesurables par ces dispositifs.

MAI 2011

10



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Typologie des Processus

Type de processus	Intitulé du processus
Processus de management (SIA & BIA)	<ul style="list-style-type: none"> ✘ Processus de management de la qualité et amélioration continue. ✘ Processus d'écoute client. ✘ Processus de gestion des risques. ✘ Processus de communication interne.
Processus de réalisation (SIA)	<ul style="list-style-type: none"> ✘ Processus de production de l'information aéronautique. ✘ Processus de réception et d'exploitation NOTAM SIA. ✘ Processus de réception et de mise à jour des documents de base SIA.
Processus de réalisation (BIA)	<ul style="list-style-type: none"> ✘ Processus de demande d'émission de NOTAM BIA. ✘ Processus de réception et d'exploitation de NOTAM BIA. ✘ Processus de réception et de mise à jour des documents de base BIA.
Processus de support (SIA & BIA)	<ul style="list-style-type: none"> ✘ Processus de gestion des ressources humaines. ✘ Processus d'achat. ✘ Processus de gestion du système d'information.

MAI 2011

12

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Surveillance et Maîtrise des Processus

Les processus SIA & BIA sont surveillés pour assurer leur efficacité et leur maîtrise par:

- L'identification des processus et de leur interaction.
- L'identification et la maîtrise des indicateurs de performance des processus (mesure trimestrielle des indicateurs de performance des processus).
- L'analyse des risques et des dysfonctionnements des processus par le biais des revues des processus (revue semestrielle des processus).
- Le suivi de la politique et des objectifs qualité.
- les audits qualité interne.

MAI 2011 13

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OFFICE DE L'AVIATION CIVILE ET DES AEROPORTS

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Maîtrise des Processus externalisés (4.1, 2ème & de la norme ISO 9001-2008)

Les processus d'achat et de gestion du système d'information sont des activités de support nécessaires à une bonne réalisation du produit et se font dans d'autres départements de l'OACA. Ces deux processus constituent des processus externalisés dont la maîtrise est décrite dans le tableau suivant :

Processus	Finalité du processus	Sous-traitant	Données d'entrée	Activités du processus	Données de sortie	Vis-à-vis SIA	Comment la maîtrise du processus est assurée ?
Achat	Assurer la satisfaction du besoin d'approvisionnement du SIA par les différents produits achetés afin de satisfaire l'exigence en matière de qualité de l'information Aéronautique.	DAGS	<input type="checkbox"/> Besoin d'achat <input type="checkbox"/> Données d'achat du produit	<input type="checkbox"/> Formulation du besoin par le SIA, <input type="checkbox"/> Achat des produits par la DAGS. <input type="checkbox"/> Réception du produit par le SIA.	<input type="checkbox"/> Produits réceptionnés, <input type="checkbox"/> Bon de sortie validé, <input type="checkbox"/> Produits non conformes refusés.	Chef SIA	<input type="checkbox"/> Respect des termes du Contrat de service liant le SIA à la DAGS. <input type="checkbox"/> Evaluation annuelle de la DAGS par le SIA. <input type="checkbox"/> Traitement des incidents selon «fiche d'amélioration».
Gestion du système d'information	Garantir que toutes les données informatiques soient disponibles et récupérables à n'importe quel moment sans risque de perte ou de modification accidentelle.	DENA / DISI / DDFSNA	Nouveau Software ou Hardware ou changement d'affectation d'un utilisateur	<input type="checkbox"/> Identification et enregistrement du moyen du système d'information <input type="checkbox"/> Définition des utilisateurs et affectation des mots de passe. <input type="checkbox"/> Configuration du matériel au profil de l'utilisateur <input type="checkbox"/> Identifier les accès <input type="checkbox"/> Sécurisés des utilisateurs. <input type="checkbox"/> Gestion de la sécurité des données.	Moyen du système d'information disponible et fonctionnel	Chef SIA / chef BIA	<input type="checkbox"/> Respect des termes du Contrat de service liant le SIA à la DISI, à la DENA et à la DDFSNA. <input type="checkbox"/> Evaluation annuelle des contrats de service par le SIA. <input type="checkbox"/> Traitement des incidents selon «fiche d'amélioration».

MAI 2011 14

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Processus client

- L'activité du SIA/BIA est fortement réglementée.
- Les produits et services générés par cette activité sont standardisés et sont régis par la réglementation nationale et internationale en vigueur.
- Les clients du SIA/BIA n'ont pas d'exigences pouvant toucher les caractéristiques réglementées des produits et services du SIA/BIA.
- L'écoute client n'a donc pas pour finalité de déterminer les exigences des clients mais la conversion des exigences réglementaires en satisfaction des clients.
- Les principaux clients du SIA et des BIA sont :
 - Les Compagnies aériennes ;
 - Les SIA étrangers ;
 - Les abonnés aux publications des informations aéronautiques ;
 - Le Ministère du Transport.
- Des dispositifs d'écoute et de mesure de la satisfaction des clients sont mis en place:
 - Les enquêtes de satisfaction.
 - Le traitement des réclamations clients.

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15

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Processus gestion des ressources humaines

- Ce processus inclut les activités de recrutement, d'évaluation des compétences et de formation.
- Le SIA et chacun des BIA disposent d'une cellule d'instruction locale.
- Les actions de formation sont planifiées, réalisées et évaluées conformément au manuel de formation.
- les compétences sont régulièrement évaluées par des tests.
- La qualification des nouvelles recrues est assurée dans le cadre d'un programme d'intégration.

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16

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Processus de management de la qualité et de l'amélioration continue

Ce processus assure le pilotage, la mise en œuvre et l'amélioration continue du SMQ .

La maîtrise de ce processus est assuré par les dispositifs suivants :

- le bilan des revues des processus.
- le bilan de l'écoute et de la satisfaction clients.
- le bilan des actions correctives et préventives.
- le bilan des revues de direction.
- les audits internes.
- le bilan sur l'atteinte des objectifs et la réalisation des indicateurs de performance des processus.

MAI 2011 17

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Structure Documentaire

La documentation du système de management de la qualité se présente comme suit :

ENREGISTREMENTS

- Le manuel de management de la qualité qui cite les objectifs qualité du SIA et des BIA, la politique qualité, le domaine d'application et son organisation. Il précise les procédures documentées, justifie les exclusions et donne la description des interactions entre les processus du SMQ.
- Les procédures et instructions de travail qui décrivent des activités liées aux processus.
- Les documents de référence OACI qui donnent un cadre réglementaire aux activités du SIA et BIA.
- Les supports d'enregistrements prévus pour assurer la traçabilité et la preuve tangible de la réalisation des activités.

MAI 2011 18

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Contrats de service

Pour la formalisation du cadre d'échanges entre le SIA et ses fournisseurs, des contrats de service ont été établis pour arrêter les responsabilités, définir les engagements de chaque partie contractante et offrir un cadre pour le traitement des difficultés rencontrées.

Ces contrats de service offrent également un dispositif pour l'évaluation des fournisseurs du SIA.

Ainsi des contrats de service ont été établis avec les fournisseurs suivants:

- CCR.
- SECRETARIAT DNA.
- SECA
- IMPRIMERIE.
- SFD & BIBLIOTHEQUE DNA.
- DDFSNA.
- DEA & AEROPORTS.
- DENA.
- DISI.
- DMD.
- DAGS.
- INM

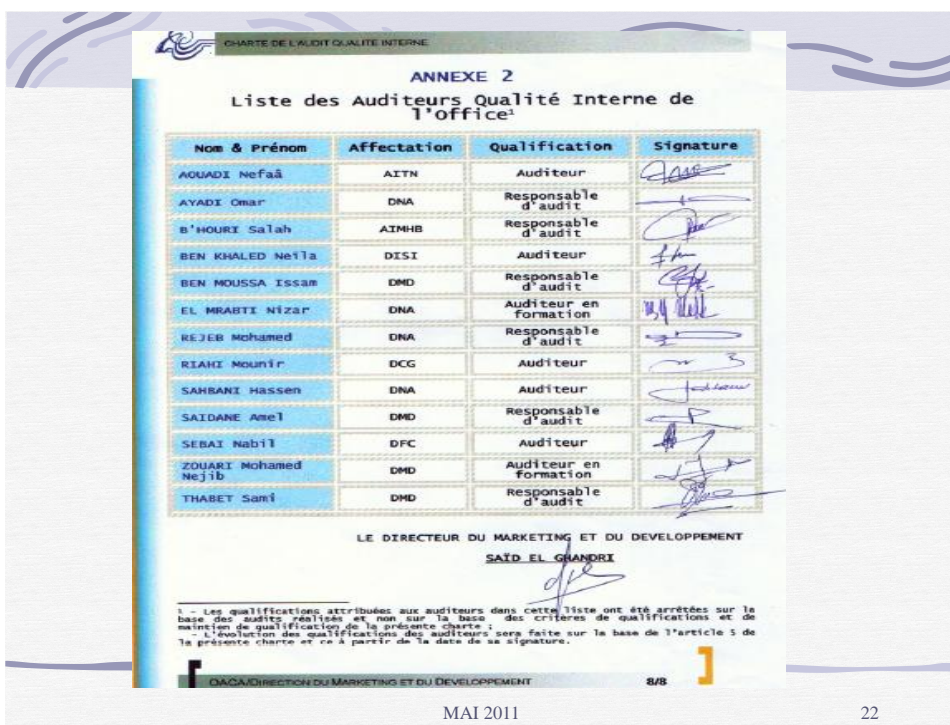
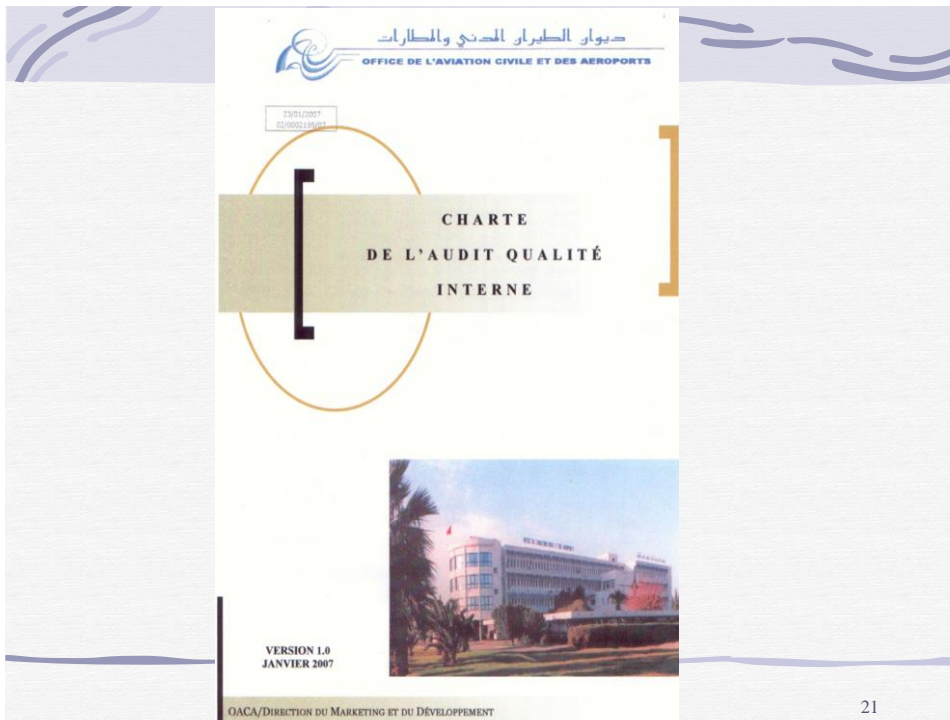
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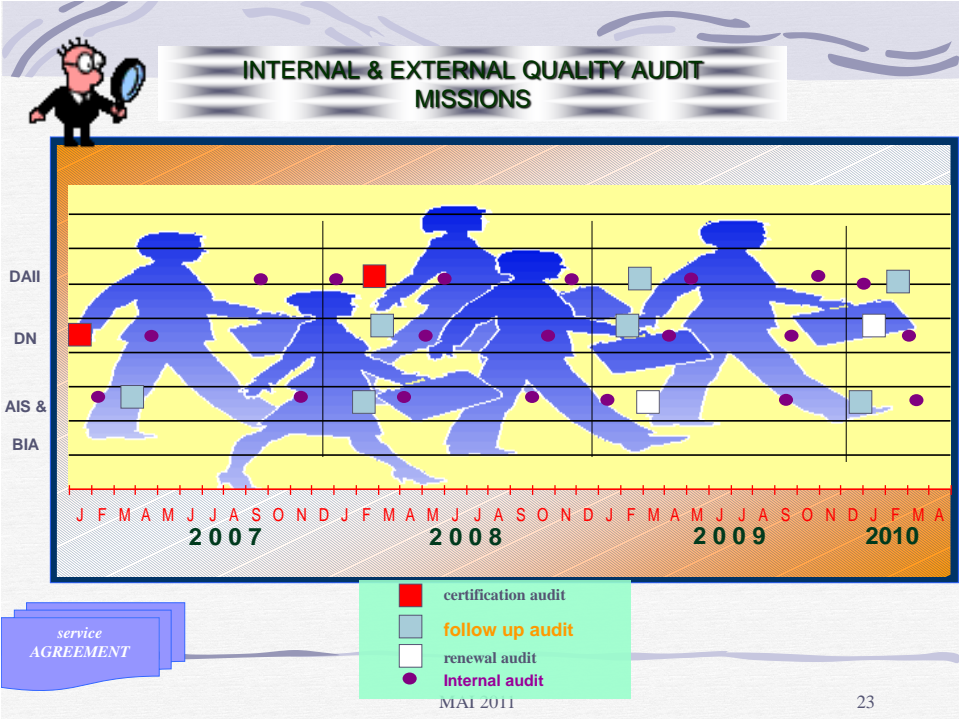
19

MERCI POUR VOTRE ATTENTION

OCTOBRE_2005

20









MAI 2011

27

TABLEAU DE BORD GENERAL DE SUIVI DES OBJECTIFS QUALITE

Axe de la politique	Processus	Objectifs	Zone d'alerte	Valeur réalisée de la période	Suivi
la conformité à la réglementation nationale et internationale en matière de navigation aérienne	Production de l'information aéronautique (SIA)	Nombre de projet d'élément SIA non conforme (plan de contrôle et/ou par rapport à la demande) détecté par la section contrôle ≤= 15	10		
		Nombre d'erreur détectée après publication des éléments SIA ≤= 3	2		
la satisfaction des clients du SIA et des BIA, tant internes qu'externes	Demande d'émission de NOTAM (BIA)	Nombre de fois où le délai entre la validation par le BIA de la demande émanant du service technique et sa transmission au SIA dépasse 45 minutes ≤= 3	2		
		Nombre de message de correction ≤= 4	3		
	Réception et mise à jour des documents de base (BIA)	Taux des documents de base mis à jour par AIRAC avant 15 :00 de la journée AIRAC ≥= 90%	NA		
		Nombre de NOTAM PERM n'ayant pas fait l'objet de corrections manuscrites sur les cartes affichées = 0	NA		
	Réception et exploitation NOTAM (BIA)	Nombre séries exploitées après 5 jours ≤= 7 (BIA AITC, AIMHB, AIDZ)	5		
		Nombre séries exploitées après 3 jours ≤= 5 (BIA AIST, AITN, AIGK, A17NT)	3		
		Nombre de PIB en zone produits par le BNI ≤= 10 (pour les BIA AITC, AIMHB, AIDZ)	7		
		Taux des PIB produits entre 3h et 1h :30 avant EOBT départ ≥= 90% (pour les BIA AITN, AIST, A17NT, AIGK)	95%		
	Production de l'information aéronautique (SIA)	Nombre de NOTAM périmés affichés = 0 NOTAM (pour le BIA ABEA)	NA		
		Délai de diffusion des publications tunisiennes et étrangères ≤= 2 jours ouvrables	NA		
Nombre de réponse aux enquêtes = 170		NA			
Taux minimum de satisfaction par critère = 75%		NA			
Client	Taux minimum de satisfaction par client = 75%	NA			

28

Axe de la politique	Processus	Objectifs	Zone d'alerte	Valeur réalisée de la période	Suivi
la satisfaction des clients du SIA et des BIA, tant internes qu'externes	Réception et exploitation NOTAM SIA	Délais d'élaboration des PIB demandés par les BIA <=3h	NA		
	Réception et mise à jour des documents de base SIA	Nombre de NOTAM non affichés mais nécessaires à la protection aéronautique = 0	NA		
l'amélioration des compétences du personnel du SIA et des BIA	Gestion des ressources humaines	Nombre de non conformités détectées lors du contrôle de l'AIP = 0	NA		
		Taux des actions de formation planifiées reportées <=20%	NA		
		Moyenne minimale de qualification par activité du processus >=3.2	NA		
l'adhésion des partenaires et fournisseurs du SIA (internes à l'OACA), par l'établissement de contrats de services avec le SIA	processus de management de la qualité et amélioration continue (SIA/BIA)	Moyenne minimale de qualification par personne >=3.2	NA		
		Valeur minimale des notes d'évaluation des fournisseurs >=3	NA		
Amélioration continue du SMQ	processus de management de la qualité et amélioration continue (SIA/BIA)	Réalisation des objectifs qualité >=85%	NA		
		Nombre de fiches d'action traitée par le RMQ >=36	9 par trimestre		
		Nombre d'actions correctives ou préventives >= 8	ou AP par trimestre		
	Gestion des risques	Nombre de risques maîtrisés >=4	NA		
	Communication interne	Délais entre la date de réception d'un document qualité et la fin des actions de sensibilisation <=10 jours	NA	29	