International Civil Aviation Organization SAM/AIM/15-WP/07
South American Regional Office 23/11/2022
Fifteenth Multilateral AIM Workshop/Meeting of the SAM Region for the transition of AIS to AIM (SAM/AIM/15)
Lima, Peru, 28 November to 2 December 2022

Agenda Item 3: Follow-up to the implementation of the quality management system in AIM units (AIM/QMS)

THE QUALITY MANAGEMENT SYSTEM APPLIED TO AIM IN BRAZIL

(Presented by Brazil)

SUMMARY

This paper aims to share the Quality Management System (QMS) requirements applied to AIM (Aeronautical Information Management) in Brazil. States must ensure the implementation of a QMS in each functional phase of the AIM process. This is achieved by establishing an appropriate policy for the implementation of a QMS applicable to the production and processing of aeronautical data and publication/availability of aeronautical information.

Action required:	**The suggested action is shown in Section 9.**
Strategic objectives:	A - Air navigation capacity and efficiency B - Safety
References:	• Annex 15 – Aeronautical information services; • Doc 8126 – Manual on aeronautical information services; • Doc 10066 - PANS-AIM; and • ISO 9001:2015.

1 INTRODUCTION

1.1 High-quality aeronautical information is a prerequisite for new technologies and equipment that will use it to provide additional and better services to aircraft and air traffic management (ATM) systems. Therefore, the QMS (quality management system) applied to air navigation service providers shall ensure the reliability, availability and veracity of information, and enhance air navigation safety and the level of service.

1.2 The Department of Airspace Control (DECEA), through the Aeronautical Mapping Institute (ICA), is responsible for the management of aeronautical information in Brazil, with a focus on data rather than products.

1.3 In this context, ICA has implemented the "Aeronautical Publications" process, certified since 2006 under ISO (International Standardization Organization) 9001 (at the time, version 2000). In 2010, ISO 9001 was implemented according to version 2008, and currently the implemented version of ISO 9001 is 2015, which modified the name of the process to "Aeronautical Information Management", due to the transition from AIS to AIM.

2 PROCESS-BASED MANAGEMENT

2.1 According to ISO 9001:2015, the QMS is based on process-based management. Therefore, an overriding requirement is that all processes related to the dissemination of aeronautical information are to be mapped.

2.2 ICA has a Doctrine Section (SDO) that standardises processes and, together with the technical team, defines their flow in order to ensure data quality and integrity. The flows are recorded in work instructions that are available to the technical team on the institutional website. The flow chart is designed in a software called Bizagi.

2.3 The following list shows all the mapped processes for the dissemination of aeronautical information:

- Aeronautical information management;
- Topographic surveys;
- Visual charts;
- Visual corridor charts;
- Registration of objects projected in the airspace;
- Electronic terrain and obstacle data;
- Capability building; and
- Analysis of the protection zone plan.

3 LEADERSHIP

3.1 In relation to leadership, the 2015 version of ISO 9001 no longer requires the formal designation of a Management Representative (MR), but ICA has chosen to maintain a QMS responsible party and has even created a sector devoted to carrying out quality-related activities.

3.2 Another important aspect is the sharing of responsibility for quality with process and technical managers. This sharing of responsibilities can be formalised in the work instructions and disseminated through meetings and training sessions.

3.3 Since the QMS is based on the integration of processes, the involvement of the staff is very important, as well as the understanding of the benefits to be derived with the QMS, such as:

- Process-based management;
- Definition of objectives;
- Monitoring of processes and objectives;
- Failure prevention rather than failure correction;
- Avoidance of rework;
- Traceability of information;
- Visibility of results; and
- Increased customer satisfaction.

3.4 The following figure illustrates ICA's organisational chart, showing that the Quality Management System (QMS) Section is directly under Management, exercising leadership over the other sectors.

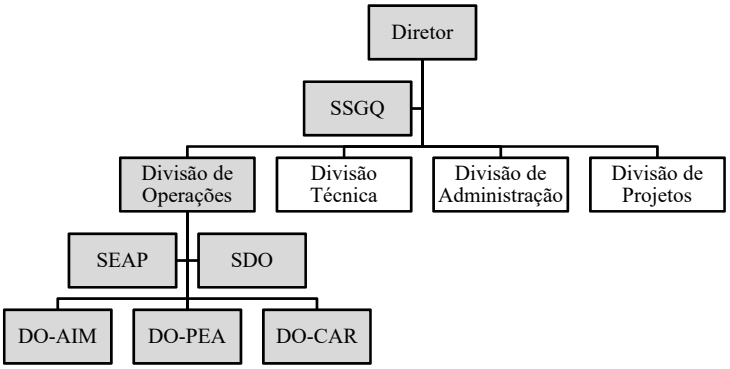

Figure 1- Organisational chart of the Aeronautical Mapping Institute (ICA)

DO-AIM - Aeronautical Information Management Branch;
DO-PEA - Airspace Procedures Branch;
DO-CAR - Mapping Branch;
SEAP - Study, Analysis and Planning Section; and
SDO - Doctrine Section.

4 RISK MANAGEMENT

4.1 The 2015 version of ISO 9001 introduced the risk mentality into the process management, to replace the preventive action procedure. The standard does not prescribe how to apply risk management, allowing organisations to define the most appropriate method for their organisational context.

4.2 ICA has developed a formal risk management procedure to identify the factors that may cause processes and the QMS to deviate from expected results, and to use preventive controls that minimise the possibility of errors that may affect the quality of aeronautical information.

4.3 In determining the causes of risk, consideration is given to all actual or potential situations that may lead to risk, including, but not limited to, tool error, missing information in the database, insertion of incorrect information, operator failure, or typing error, in addition to risks inherent in changes.

4.4 Consideration will also be given to the possible impact of the error on customers, such as the use of inconsistent aeronautical information, aeronautical accidents, among others.

4.5 Once the risk, its causes and consequences are defined, it is classified as follows:

- **High risk**: the consequences compromise the quality of available products and services and affect safety;
- **Medium risk**: the consequences compromise the quality of available products and services, but do not affect people or safety; and
- **Low risk**: the risk exists, but does not compromise the quality of available products and services.

4.6 Depending on the risk classification, the following measures must be taken:

- **High risk**: eliminate the cause of the risk;
- **Medium risk**: eliminate the cause of the risk or reduce its consequences; and
- **Low risk**: accept the risk, with no action needed.

5 QUALITY OBJECTIVE

5.1 One of the objectives established in the QMS implemented at ICA is to deliver quality products, including the AIP (aeronautical information publication), the AIP Supplement and the NOTAM (notice to airmen), as well as the other AIS products. To assess the achievement of this objective, a 95% compliance "indicator" per product is used.

5.2 For NOTAMs, two performance indicators are generated, one for domestic NOTAMs and one for international NOTAMs. Their analysis must be performed on a monthly basis and the percentage of NOTAM compliance must be measured in at least 95%.

5.3 The AIP and AIP Supplement performance indicators are obtained in each Amendment from the analysis of the quality of these products during the "Aeronautical Information Management" process, which aims to control the level of compliance of AIC products and services, *i.e.* the ratio between the total number of errors found and the total number of products processed.

5.4 Three performance indicators are generated for the charts, according to the purpose (ground; procedure; and routes or area), and the indicators are calculated by counting the fields outside the standard established for each chart. If a chart has more than one error in the same field, only one non-compliance will be computed.

5.5 For each indicator that does not reach the target established by top management, the Quality Management System (QMS) Section completes an Indicator Analysis (IA) form, as established in the indicator management procedure, so that the process managers can design corrective actions to eliminate the causes of non-conformities.

6 RESULTS OF THE SATISFACTION SURVEYS

6.1 ISO 9001 cites customer guidance as one of the principles of quality management. It is also mandatory for the organisation to monitor customer perception and evaluate whether expectations have been met.

6.2 Brazil analyses the level of user satisfaction through a satisfaction survey, conducted annually, where the following information requirements are assessed: reliability, availability, accuracy and security.

6.3 The level of client satisfaction is assessed using a rating scale from 1 to 10, according to the following classification:

1 - 2	Very Dissatisfied
3 - 4	Dissatisfied
5 - 6	Reasonable

7 - 8	Satisfied
9 - 10	Very Satisfied

6.4 When the customer rates any element of the survey with a score from 1 to 6, both inclusive, the comments option is available for the customer to report the reason for dissatisfaction. With this, it is possible to assess whether or not it is necessary to implement any improvement process in the aeronautical information service.

6.5 The following is the result of the satisfaction survey conducted in 2021, to which 351 customers responded voluntarily:

Reliability	**8.33**
Availability	**8,85**
Accuracy	**8,62**
Security	**8,77**
Attention	**8,67**

6.6 The results of the satisfaction survey show that customers are satisfied with the aeronautical publications produced by Brazil, as the average scores are above 8.

6.7 In March 2022, Brazil started to adopt an additional methodology to obtain the customer satisfaction result, which consists of sending the satisfaction survey to customers who contact ICA, through the Citizen Service System (SAC). This data is assessed on a quarterly basis and the first result of this survey is still being consolidated.

6.8 This new methodology seeks a more dynamic follow-up of customer perceptions.

7 QMS EVOLUTION

7.1 Quality management is a means to achieve success and meet a set of predefined requirements. A QMS makes it possible to formalise an organization's processes and thus ensure compliance with its requirements.

7.2 To evolve, the QMS must be applicable to the entire data supply chain, from origin to distribution, taking into account the intended use of the data and ensuring data integrity and air navigation safety. This implies the integration of the QMS in all the organisations that are part of that chain.

7.3 DECEA has developed a specific plan to structure regional organisations. This plan aims to transform them into links responsible for providing aeronautical data and information to effectively meet the requirements of the global ATM community. At the end of the implementation process, these organisations will be able to perform the actions related to the dynamic and integrated management system for the dissemination of aeronautical information products and services inside and outside the Brazilian territory.

7.4 The adopted plan consists of an implementation based on five phases, one for each of the regional organisations, namely:

- Physical structuring of the facilities;
- Adequacy of human resources
- Training of human resources;
- Updating or creating processes, service standards, standard operating rules and updating internal regulations;
- Assessing the capacity to carry out the work through the aeronautical data and information monitoring chain.

7.5 The plan began on 20 September 2021 and is scheduled to end in December 2025.

8 CONCLUSION

8.1 Achieving effective results increasingly requires organisations to work together. By working together, they can continuously improve and maintain a collaborative approach to achieving their quality goals, objectives and targets, as demanded by the national and global air transport industry. Therefore, joint action is necessary and indispensable to succeed in our activities.

8.2 For the QMS to be effective, and for it to evolve, it is necessary to advocate, create and maintain a culture that seeks the fulfilment of quality objectives. States must be proactive in raising awareness among all stakeholders to promote the quality management culture necessary for the evolution of AIM by applying the QMS to the entire data chain.

9 SUGGESTED ACTION

9.1 The Meeting is invited to:

a) recognise the importance of QMS;
b) recognise that QMS is fundamental to AIM; and
c) understand that QMS must be applied to the entire data chain.

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