



International Civil Aviation Organization

MIDANPIRG/20 and RASG-MID/10 Meetings

(Muscat, Oman, 14-17 May 2023)

Agenda Item 5.2: Outcome of the SEIG

**Safety and Quality Different Sides to the Same Coin
(SMS-QMS Integration)**

(Presented by Saudi Arabia)

SUMMARY

This Paper an overview about the Integrated Management System (Safety Management System and Quality Management System). This study looks at the evolvement of both management systems (quality and safety), similarities, differences and overlapping of both. The purpose is an attempt to reach an answer to the question of how to integrate both under effective management system to improve the level of safety, and to address the main challenges that encounter States and Organizations/Operators for establishing the IMS. Through this paper, Saudi Arabia seeks to share the best practice in IMS (SMS-QMS) with the objective of enhancing the Safety, efficiency and sustainability in the aviation industry.

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1. INTRODUCTION

- 1.1. The overall management system of an organization is usually split into some individual management systems being defined within the organization for the purpose of satisfying certain regulatory standards and help the organization (as a service/product provider) to satisfy customer requirements. Accordingly, both legal requirements and economic reasons form the shape of the organization in terms of its management system. Of primary importance to an aviation organization are the safety management system and the quality management system both of which are essentially linked and primarily exist for compliance with legal (regulatory) standards and economic values.
- 1.2. Quality management has transitioned from its previous status of being mere technical inspection to a holistic management realm. It has been incorporated in various aspects of management in various sectors to address quality control and assurance which monitor the organization's performance, the level of compliance with the national and/or international standards and requirements (e.g. ICAO Standards and

Recommended Practices (SARPs)) toward achieving the set objectives and goals. These applications have resulted in universal principles that are applicable as the basis for those seeking continuous sustainable improvement and achievement.

- 1.3. Safety management has also become essential and an aspect of concern especially because it is intricately related to the integrity of the resources of an organization, such as equipment and human resources, alongside the prevention of adverse organizational and societal implications.
- 1.4. Both quality and safety management fundamentals have pervaded even in the aviation industry with their common philosophies that are based on standards and individual guidance for organizational sustenance.
- 1.5. The need for Safety management System is essential for safe operations in aviation industry, especially with the noticeable fast growing up and increasing in the complexity of the global air transportation (ICAO , 2013). The Safety Management System continue to develop over the years, and they have consequently been subjected to enhanced regulations owing to the central role that these systems continue to play in the aviation industry as well as to promote safety culture.
- 1.6. There exists a relationship among the Quality Management System and Safety Management System, which has caught the attention of multiple researchers and practitioners in the aviation industry in the recent past. The need for harmonization and integration of the two vital systems is becoming indispensable in operating successfully and safely, and in providing quality services in the aviation industry.
- 1.7. Even though, but the main challenge was existing on how to establish and implement the SMS-QMS integration properly to meet ICAO SARPs, to avoid any shape of conflict of interest and achieve the objectives of the said integration. Accordingly, the question was addressed, is the integration means to merge the two systems under single management, or to create an integrated system in collaboration and cooperation which is managed by different independent management or under Corporate Safety and Quality.
- 1.8. The question could also, philosophically, be taken further is Quality and Safety: are they different sides to the same coin? What is the methodology and what are the benefits?
- 1.9. The current paper will explore and shed more light on the main aspects of the SMS-QMS integration, SMS-QMS similarities, differences, challenges and differences, and the common practices of implementations. And also to

2. DISCUSSION

- a) According to ICAO Document 9859, Safety management system is a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures through continuous hazard identifications and risk management to be at or above the acceptable level of safety (ALoSP).
- b) Quality Management System (QMS) is a set of policies, processes and procedures that are needed for planning and carrying out the core business activities to meet the expectations of the consumer. In the aviation industry, QMS encompasses the set of policies and processes required in planning and executing of safe air operations. To be more precise, the QMS in aviation is a monitoring system to assure continuously that the organization's systems, process, procedures and performance are in compliance

with the set Standards and requirements (e.g ICAO SARPs, Regulatory requirements, etc.)

- c) SMS and QMS are complementary and support each other in many areas especially in their assurance programmes, considering that each system has requirements, risk analysis and documentation through planned, scheduled and unscheduled auditing and inspections to assure that certain performance criteria and standards are met.
- d) While the QMS assurance programme focuses on the organization's compliance with regulatory requirements, safety assurance specifically monitors the effectiveness of safety risk controls. (ICAO, 2013).

2.1 Similarities and differences between the SMS and QMS

There are notable similarities and differences between the SMS and QMS (See Figure 1 below). This paper will highlight on the main issues as follows:

2.1.1 For similarities, both SMS and QMS:

- a) need proper planning and management;
- b) Key Performance Indicators used to monitor their performance
- c) involve all organizational functions related to the delivery of aviation products and services;
- d) identify ineffective processes and procedures;
- e) holistic and dependent on both internal and external processes
- f) strive for continuous improvement; and
- g) have the same goal of providing safe and reliable products and services to customers.

2.1.2 The differences between SMS and QMS

2.1.2.1 The SMS focuses on:

- a) identification of safety-related hazards facing the organization;
- b) assessment of the associated safety risk;
- c) implementation of effective safety risk controls to mitigate safety risks;
- d) measuring safety performance; and
- e) maintaining an appropriate resource allocation to meet safety performance requirements. (ICAO, 2018)

2.1.2.2 The QMS focuses on:

- a) compliance with regulations and requirements;
- b) consistency in the delivery of products and services;
- c) meeting the specified performance standards; and
- d) delivery of products and services that are "fit for purpose" and free of defects or errors. (ICAO, 2018).

QMS	SMS
Quality	Safety
Quality Assurance	*Safety Assurance
Quality Control	Hazard Identification & Risk Control
Quality Culture	Safety Culture
Compliance with Requirements	Acceptance level of Safety Performance
Prescriptive	Performance-based
Standards & Specifications	Organisational and Human Factors
Reactive > Proactive	Proactive > Predictive

Figure 1: Comparison between QMS and SMS [Sources: ICAO (2013)]

2.2 Why integrate SMS and QMS

2.2.1 When an organization decides to integrate its management systems, the SMS and QMS integration normally will take the priority because both systems are complementary.

2.2.2 According to ICAO Doc. 9859, the complementary aspects of SMS and QMS play the main role in establishing the synergistic relationship between both systems which can be summarized as follows:

- QMS supports SMS by its auditing, inspection, process design, statistical analysis, and preventive measures, etc.;
- QMS may predict safety issues even the organization in compliance with the predetermined standards and specifications;
- Quality principles, policies and practices are linked to safety management objectives;
- The systems utilize similar risk management processes and assurance procedures; and
- The systems utilize similar tools." (ICAO, 2013).
- reducing duplication and overlapping of processes and resources;
- considering the wider impacts of risks and opportunities across all activities;
- allowing effective monitoring and management of performance across all activities.

2.2.3 Furthermore, SMS and QMS focus on the same goals of providing safe operations and compliance with the prescriptive states regulations and requirements as well as providing respectable products and services to the aviation customers.

2.2.4 As a part of the similarities and complimentary, quality and safety team are trained on various analysis methods including root-cause analysis, statistical trending analysis, auditing techniques, etc. (ICAO , 2013).

2.3 Principles of Integrated SMS and QMS

2.3.1 The implementation of SMS/QMS integration principles, processes and procedures can greatly reduce the potential problems and risks in operations, especially when both systems function properly and evolve in an effective manner in all organization systems and operations. Lack of proper implementation and improvement of the said integration will cause a significant increase in hazard potential and risk control.

2.3.2 The SMS/QMS integration is achieved through organization's policies, structure, safety and quality assurance programs and other elements of SMS into the counterparts of QMS. The tendency for the integration stems from the increasing awareness and understanding that both SMS and QMS have common values and drives.

2.3.3 Both systems have to be managed and planned as well as they must be provided with the required resources. Furthermore, SMS and QMS depend on the analysis and monitoring of organizational processes and procedures, and also they aim at continually improving processes performance by involving every functional element in the organization (ICAO, 2010). Figure (2 and 3) below show the proposed SMS and QMS integration under different management and single management system (Corporate Safety and Quality).

2.3.4 Some practices went to merge the SMS-QMS under one manager and same team, assuming that this model is the best practice to achieve the objectives of the Integrated Management system but actually the embedded reason for that is to save salaries and cutting cost. Actually this model lead to the conflict of interest because one of the QMS responsibilities and functions to monitor the performance and compliance of the organization's systems including the SMS. Furthermore, any monitoring system must be independent to assure the integrity and free of any doubt of conflict of interest. So that the Integrated Management System must have a proper system to avoid any shape of the conflict and to achieve the objectives. Figure (4) shows sample of this model, which is not recommended, and is not accepted by some States regulations.

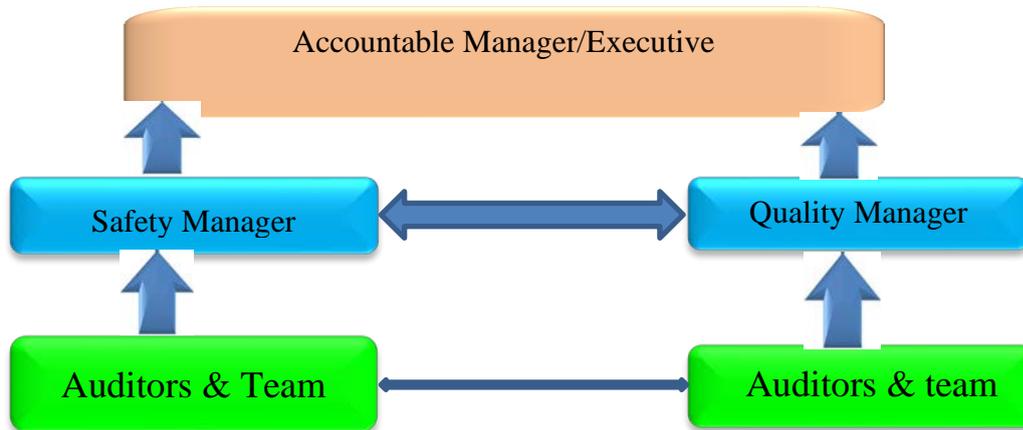


Figure 2: Model of the Proposed Integrated Management of SMS and QMS. Self-generated (SMS-QMS Integration through collaboration and cooperation)



Figure 3: Model of the Proposed Integrated Management of SMS and QMS. Self-generated (SMS-QMS Integration through creating corporate Safety and Quality)



Figure 4: Model of the Proposed Integrated Management of SMS and QMS. Self-generated
(SMS-QMS Merging under same Manager and team)

2.4 Challenges of SMS-QMS Integration (IMS)

2.4.1 Despite the complementary relationship and similarities between the SMS and QMS, there are still challenges in establishing and implementing the IMS. These challenges as follows:

- a. IMS does not clearly identify the accountabilities and responsibilities for both management and personnel could lead to overlapping in their accountabilities, responsibilities and conflict.
- b. The organization does not document how the integrated management systems are functionally linked and also does not identify how the said systems interface and interact with each other organization's management systems.
- c. The organization does not avail and dedicate the necessary priorities and resources for the IMS.
- d. The organization does not have an effective continuous monitoring system to assess and evaluate the effectiveness of the IMS.
- e. The organization does not provide the required documented processes, procedures, guidance materials, facility, tools, etc. for the IMS management and personnel to carry out their tasks and duties properly.
- f. Establishing the IMS properly and suitable to the organization's culture and complexity.
- g. Establishing the IMS with existing systems may have different functional managers and other personnel who resist the integration specially those who will be impacted by the integration that needs more cooperation, and this could result in conflict.
- h. Different cultures may have impact on the overall safety culture within the organization which could lead to conflicts;
- i. State's regulations may not accept the IMS or the different regulators may have diverging expectations on how the IMS must be done to meet their standards and requirements.
- j. Integrating different management systems (such as QMS and SMS) may create additional workload to assure that all each system requirements are met.

3. CONCLUSION

- 3.1. SMS and QMS have an objective of improving safety, quality and performance. SMS seeks to improve safety performance and culture while QMS aims to enhance the quality and the level of compliance through its monitoring system and assessing the compliance of the organization's systems with the applicable national and/or international rules and regulations.
- 3.2. The relationship between SMS and QMS leads to the complementary contributions of each system to the achievement of the organization's safety and quality objectives and goals. It can be claimed that SMS and QMS integration is the future of the aviation industry. There are more advantages of integrating the two systems to the reduction of costs within the context of the aviation sector. This aviation sector is susceptible to safety issues. In aviation industry, the quality of services and products are equated to safety.
- 3.3. Culture, complexity of origination and operations are essential factors that must be considered by States and organizations when establishing the IMS (e.g Safety and Quality Integration, etc.)

4. ACTION BY THE MEETING

- 4.1 The meeting is invited to note the information of this Paper.

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