An approach to the Integration of Quality and Safety Management Systems in Aviation

Ashmi G V[1]

[1] Engineering, Airindia Engineering Services Limited, Trivandrum, India

E-mail: ashmi.gv@airindia.in

Abstract

To establish a management system as well as safety system in any aviation organization with stated lines of necessary organizational structures, accountabilities, policies and procedures and processes. The safety can be achieved through safety management and specified outputs are accomplished through quality management. The Quality Management System (QMS) and Safety Management System (SMS) has formed into a smart relationship in the aeronautics sector, to accomplis the general safety goals. The amicable incorporation of both system became a decisive element in any successful flight operation as SMS continues to be more regulated and takes on a presiding role in an organisations overall strategy.

Keywords: Quality Management System, Safety Management System, aviation

1. INTRODUCTION

Aviation organizations varies in terms of overall size and complexity has some type of management system which has multiple processes and subsystems "integrated" through some form of governance structure and organizational goals. Aviation safety regulations requires a quality system, in the form of requirements for quality control, quality assurance, quality management, or a compliance monitoring function, as a means to ensure conformance to standards and monitor compliance with the applicable requirements.

There has been a critical ascent in light of a legitimate concern for lessening information the executives unpredictability and expanding collaborations by coordinating quality management systems (QMS) and safety management systems (SMS) in the avionics business. At one-point, persistent improvement of security activities just as quality-control tasks is required and it occurs in settling on certain choices about: rebuilding the aviation SMS; changing QMS activities to more readily oblige the SMS prerequisites; or coordinating QMS and SMS. QMS programs are centered around making an association effective, and amplifying its respectability in wording or offering quality types of assistance/items to clients at the most minimal expense. It centers with the point of consistent improvement of operational procedures to convey the item or administration that characterizes the association's crucial. An SMS framework in aviation alludes to a lot of procedures and apparatuses to officially deal with an organized processes and programs. In aviation industry, safety management systems usage are based on ICAO measures.

By merging quality management systems and safety management systems to shape "Quality and Safety Management System" (QSMS), and this structure in aviation requires the aeronautics industry to give exceptional exercises and procedures. The goal of quality management systems is "Customer Satisfaction" and safety management systems goal is "Aviation Safety". Quality is basically taking a gander at compliance, while wellbeing is taking a gander in risk.

2. INTEGRATED QUALITY AND SAFETY MANAGEMENT SYSTEM

"Quality and Safety Management System" (QSMS), is an exorbitant technological explicitation intended to advance the efficiency of organisations, incorporates, pilots, crew and staff. Besides, the

system relies on the foremost practices of the aviation industry, and is highly applicable and recommended.

Quality and Safety Management System is a system focuses on human and organizational factor. For the purpose of identification of any risk or hazard, its reduction, specifically, with regards to practices including human components, guarantee that the current or suggested safeguard frameworks consider human and authoritative variables.
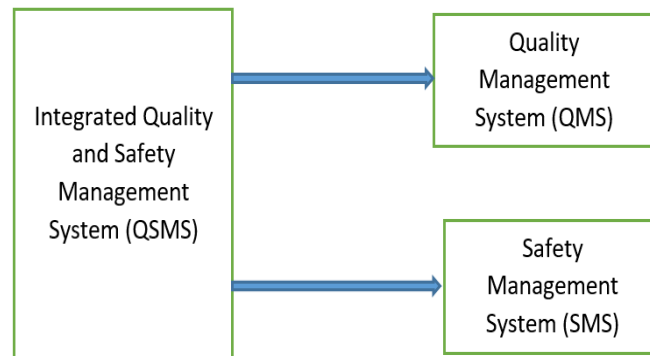

Fig.1: The components of QSMS

The fig.1 shows the components of Quality and Safety Management System. One of strategies for integrating QMS and SMS is to to include relative procedures of safety concerning risk and hazard management in the current QMS processes. Therefore, this will prompt "assure safety" and accomplish the goals of SMS.

2.1. The scope of QSMS

The scope of QSMS in Aviation imparts resources to detect quality and safety issues, minimization of safety risk activities, secures safety performance tracking and constant safety improvements.

It is vital to be noted that national and international norms, customs, and cultures often influence safety performance acceptability. In spite of the fact that, we have to guarantee risks in safety under the proper degree of control. This framework, as open and dynamic in organisation can experience the reasonable harmony among creation and assurance.

2.2. The elements of QSMS

Fig. 2: The elements of QSMS

The fig. 2 shows the different elements of Quality and Safety Management System (QSMS) in aviation

2.3. Integration of QMS and SMS in Aviation Systems.

Commonly, integration of QMS and SMS can be termed as:
a. 'Quality-safety management systems' (QSMS);
b. 'Safety-quality management systems' (SQMS); or
c. 'Integrated management systems'

The different ways to integrate aviation SMS and QMS into a "quality-safety management system" (QSMS) are

i. Secure the Support of Top Level Management

ii. Redesign Policies and Procedures to Incorporate QMS and SMS

iii. Create Objectives That Are QMS and SMS in Nature

iv. Incorporate SMS and QMS Resources into System Resource Management

v. Quality Performance Monitoring is

vi. Half Safety Performance Monitoring

2.4. Quality Management System

A Quality Management System (QMS) is the mechanism through which an organization directs and controls, all the business activities (which have an impact on the quality). The QMS is normally built – up on an already existing management structure.

The QMS helps an organization to build their capability to meet customer's requirements (stated, unstated, legal) in a consistent manner. A quality management system standard defines the method for managing quality in an organization to ensure that products conform to the quality level it has set for itself. It is not a standard for any particular product. Hence, a quality management system standard helps the organization to plan and consistently achieve the desired level of product quality.

Quality Management System is based on 'process approach' and it is a strategy of management itself. The organisations should use 'process approach' to deal with their tasks, so as to improve performance and make continued progress. When the senior level management uses this methodology, it implies that they oversee and control their procedures, the cooperations between these procedures, and the data sources and yields that integrate these procedures. Additionally, it implies that they deal with these connections as a system or framework. At the point when this methodology is applied to quality management, it implies that they deal with their procedures as a rational quality management system.
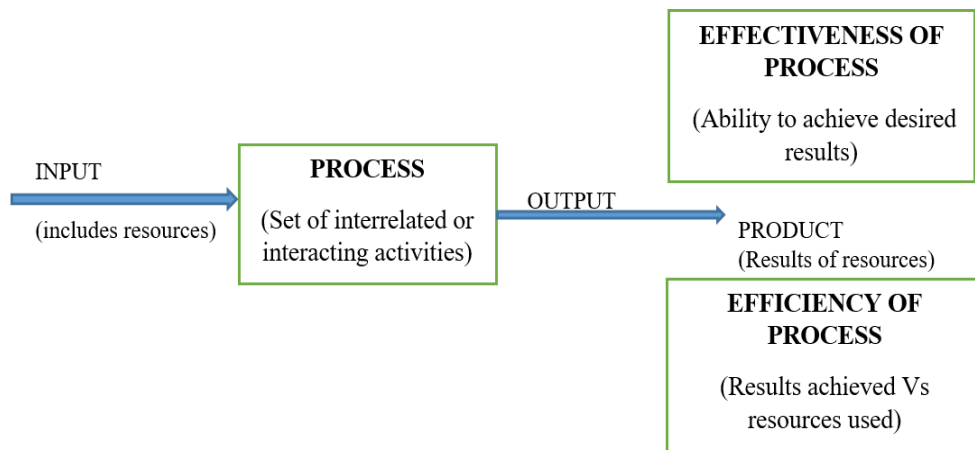

Fig. 3: The Process Approach

The fig. 3 shows the Process Approach used in Quality Management System (QMS).

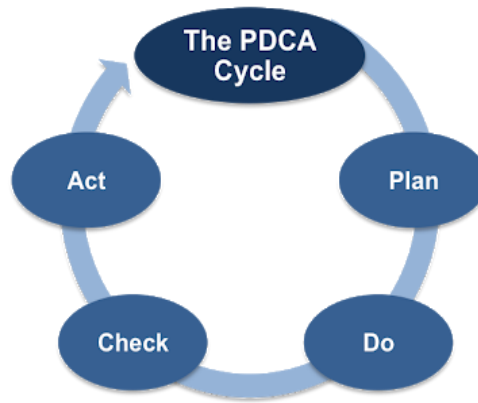*2.4.1. The Process Approach And The PDCA Cycle*

Fig. 4: The PDCA Cycle

The fig. 4 shows the Plan Do Check Act cycle. Plan means the improvement, Do means implement the improvement, Check means monitor and measure the results against policies, objectives and requirements and Act means take actions to continually improve the performance.

QMS is centered essentially around clients and business targets. For a QMS to arrive at its goals, it normally needs to clarify, an association's structure, strategies and methodology, arranging, dispersion of assets and quality administration. QMS programs are centered for the most part around making an association effective, and boosting its trustworthiness in wording or offering quality types of assistance and items to clients.

There are two sections, which can be defined in a quality management system: 'quality control' and 'quality affirmation or assurance'. The quality control is reactive — that "part of quality management focused on fulfilling requirements." The quality assurance is proactive — the "part of quality management focused on providing confidence that quality requirements will be fulfilled".

Similarly as the extent of QMS works out positively past observing consistence with wellbeing necessities, its incorporation in SMSs expands the extent of security the executives past guaranteeing the conformance of working practices with security prerequisites toward completely distinguishing dangers, some of which are association explicit.

2.5. Safety Management System

Safety management system is defined as "a system of safety management activities such as policies, processes and procedures are created to systematically approach which includes hazard identification, risk monitoring, and prevention of accidents and serious incidents".

In aviation, safety management system (SMS) is making a sorted out structure to depend on, rather than an individual to depend on. The primary aim is to keep individual safe and free from hazards or risks. According to safety manager's point of view, the objective of the SMS is to forestall "The Accident."

As per the ICAO Doc. 9859, "safety risk management is the identification, analysis and elimination (and/or mitigation) to an acceptable or tolerable level) of the hazards, as well as the subsequent risks, that threaten the viability of an organisation"[6].

From the FAA's perspective, "the objective of the SMS is to proactively manage safety, identify potential hazards, determine risk, and implement control measures to mitigate the risk".

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3. CORRELATION BETWEEN QUALITY AND SAFETY IN AVIATION

A Quality Management System (QMS) is an approach for guaranteeing that an organization is able to meet its prerequisites and consistently enhancing its procedures. In avionics framework, QMS is centered around safety aspects and have set up an approach for quality, targets and processes archives and measures that attention on safety.

The aviation system Quality Management System is mainly meant for the establishment for the aviation system Safety Management System. The QMS set up a large number of the procedures that the SMS requires, for example, the executives survey, investigation of information, remedial action, and internal audit. The QMS developed certain procedures and is required by SMS namely, as management review, data analysis, corrective action, and internal audit. A few enhancements to QMS forms are expected to completely meet SMS necessities. Models incorporate building up procedures to all the more likely distinguish new perils and setting up procedures to quantify the viability of safety risk mitigation. These upgrades will be created during the SMS execution.

Safety Management System is defined as 'securing the safety of individuals by ensuring all safety risks have been recognised and controlled by means of identifying hazards, analysing and applying necessary control measures to mitigate it'. Also, SMS focuses on the safety, human and organizational aspects of an organization'. QMS intends to 'guarantee an organization capacities proficiently, and conveys its business objectives including meeting client prerequisites of an organisation and predominately considers the fulfillment of the client or end client'.

.SMS intends to 'secure the wellbeing of staff, clients or the general population by guaranteeing all dangers have been recognized evaluated and acceptably alleviated, likewise centers around the security, human and hierarchical parts of an association'.

'Safety management and quality management systems' are extraordinarily correlative and work eagerly together to achieve the safety objectives of aviation system.

4. GOALS OF QSMS IN AVIATION

The reason for utilizing this framework in aviation suggests, diminishing a wide range of human and organizational error by improving the general flying security and quality. Mainly, it should begin from the work environment security and quality culture, consistence with the guidelines, principles, and regulations. Work environment safety covers countless individuals associated with flying activities, including the pilots, the team, the activity control officials, flight dispatchers, ground activity officials and pros, flight facilitators, dispatch directors, group dispatchers, and – we should not overlook – the travelers themselves.

Additionally, it infers the security of everybody engaged with this procedure, just as the individuals who can straight forwardly or by implication be influenced by potential dangers, in addition to, the quality of service provided for them

The objectives of QSMS can be listed as:

- Identifying the occurrence of hazards/risks

- Quality performance indicators.

- Monitoring the threats.

- Prevention and mitigation of hazards/risks, accidents, and incidents.

- Enhancement of quality management system.

- Enhancement of safety policies and guidelines.

- Customer fulfillment.

QSMS is based on the principle of combining the key SMS and QMS goals. Combining them means that QSMS is the comprehensive version of the quality management system and the safety management system. In other words, QSMS focuses both on customer satisfaction and safety in aviation.

QSMS depends on the standard of consolidating the key SMS and QMS objectives. Integrating them implies that QSMS is the complete variant of the 'quality management system and the safety management system'. Inaddition to that, QSMS centers both around consumer loyalty and aviation safety.

5. REQUIREMENTS OF QSMS?

The entities required to establish, implement and use the QSMS in aviation include;

- civil aviation authorities,

- aircraft operators,

- approved educational organizations,

- organizations responsible for design and/or aircraft production,

- ground handling companies

- different airports.

- Design and/or aircraft production companies,

- Providers of the air navigation services

6. CONCLUSION

SMS guarantees that operational processes and procedures are designed and implemented to detect safety hazards and monitor and/or mitigate safety risks in aviation operations. QMS offers a systematic framework to ensuring that these procedures and methodology are working as expected, addressing any non-compliances, if not, and continually enhancing their effectiveness. While SMS gives the components to the association to do its operational capacities inside a system of 'safety risk-based decision making' and QMS guarantees that this system is working in an organized, repeatable design and can meet its planned destinations and when not, gives the way to improve.

As SMS becomes more regulated, it will take on a dominant role in an organization's overall strategy. In an integrated management system with unified goals and decision-making, considering the wider impacts across all activities, SMS and QMS processes will be highly complementary and will support the achievement of the overall organizational goals without compromising on safety. Although, QSMS is of the extraordinary significance for work environment wellbeing, and quality improvement of the procedures in the aviation sector, thus, accomplishing consumer loyalty. The implementation of the Quality and Safety Management System (QSMS) is important in aviation.

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