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Convergence between the IATA Operational Safety Audit (IOSA) and the International standard ISO 9001:2015: A Comparative Analysis of Safety and Quality Management Systems.

The Case of Air Algérie

Prepared by

BOUMEDIENE Sara

Supervised by

Dr. BELIMANE Wissam

Dr. BEDAIDA Imad Eddine

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ABSTRACT

In a highly regulated and safety-oriented aeronautical context, airlines must ensure compliance with multiple management standards and regulatory requirements, creating a major challenge: how to effectively coordinate compliance with IOSA and ISO 9001:2015 within an integrated management system? This study analyzes the interaction between the IOSA (IATA Operational Safety Audit) standard and ISO 9001:2015 within Air Algérie to address this question.

A qualitative approach was adopted through a case study combining documentary analysis, semi-structured interviews with eight managers occupying key managerial positions within the Quality, Safety, Audit, and Documentation departments of Air Algérie, observations, and a comparative assessment grid. The results reveal a moderate level of alignment (1.87/3) between IOSA and ISO 9001, with strong convergence in the areas of documentation, audit, and continuous improvement, as well as notable gaps in risk management and governance.

The study concludes that IOSA and ISO 9001 are not interchangeable but complementary. Their effective coordination through a coordinated integrated management approach constitutes an essential lever for improving organizational performance and ensuring regulatory compliance in the aviation sector.

Keywords: IOSA, ISO 9001:2015, integrated management system, aviation, quality management, safety management.

RESUME

Dans un contexte aéronautique fortement réglementé et axé sur la sécurité, les compagnies aériennes doivent assurer leur conformité à plusieurs référentiels de management et exigences réglementaires, créant ainsi un défi majeur : comment coordonner efficacement la conformité à l'IOSA et à l'ISO 9001:2015 au sein d'un système de management intégré ? Cette étude analyse l'interaction entre le référentiel IOSA (IATA Operational Safety Audit) et la norme ISO 9001:2015 au sein d'Air Algérie pour répondre à cette question.

Une approche qualitative a été adoptée à travers une étude de cas combinant une analyse documentaire, des entretiens semi-directifs menés auprès de huit responsables occupant des fonctions managériales clés au sein des directions Qualité, Sécurité, Audit et Documentation d'Air Algérie, des observations, ainsi qu'une grille d'évaluation comparative. Les résultats mettent en évidence un niveau d'alignement modéré (1,87/3) entre IOSA et ISO 9001, avec une forte convergence en matière de documentation, d'audit et d'amélioration continue, ainsi que des écarts notables dans la gestion des risques et la gouvernance.

L'étude conclut que IOSA et ISO 9001 ne sont pas interchangeables mais complémentaires. Leur coordination efficace selon une approche de management intégré coordonné constitue un levier essentiel pour améliorer la performance organisationnelle et assurer la conformité réglementaire dans le secteur aérien.

Mots-clés : IOSA, ISO 9001:2015, système de management intégré, aviation, management de la qualité, gestion de la sécurité

ملخص

في سياق جوي يخضع لتنظيم صارم ويركز على السلامة، يتعين على شركات الطيران ضمان الامتثال لعدة معايير إدارية ومتطلبات تنظيمية، مما يطرح تحدياً رئيسياً: كيف يمكن التنسيق الفعال بين الامتثال لمعيار ضمن نظام إداري متكامل؟ تهدف هذه الدراسة إلى تحليل التفاعل بين معيار ISO 9001:2015 ومعيار IOSA داخل ISO 9001:2015 ومعيار (IATA) تدقيق السلامة التشغيلية لشركات الطيران الصادر عن IOSA للإجابة عن هذا السؤال (Air Algérie) شركة الخطوط الجوية الجزائرية.

تم اعتماد منهج نوعي من خلال دراسة حالة تجمع بين التحليل الوثائقي، ومقابلات شبه موجهة مع ثمانية Air Algérie مسؤولين يشغلون مناصب إدارية رئيسية في إدارات الجودة والسلامة والتدقيق والوثائق بشركة إلى جانب الملاحظة الميدانية وشبكة تقييم مقارنة. أظهرت النتائج وجود مستوى توافق متوسط (3/1.87) بين مع تقارب قوي في مجالات الوثائق والتدقيق والتحسين المستمر، إلى جانب ISO 9001 و IOSA معياري فجوات ملحوظة في مجالي إدارة المخاطر والحوكمة.

ليس قابلين للتبادل بل متكاملين. ويُعد التنسيق الفعال ISO 9001 و IOSA تخلص الدراسة إلى أن معياري بينهما عبر نظام إداري متكامل ومنسق رافعة أساسية لتحسين الأداء المؤسسي وضمان الامتثال التنظيمي في قطاع الطيران.

الكلمات المفتاحية : ISO 9001:2015، IOSA : نظام الإدارة المتكامل، الطيران، إدارة الجودة

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LIST OF ABBREVIATIONS AND ACRONYMS

AESA : European Union Aviation Safety Agency

ANAC : National Civil Aviation Agency

CAB : Cabin Operations

CGO : Cargo Operations

CMD : Compliance Monitoring Directorate

FLT : Flight Operations

FDA : Flight Data Analysis

GRH : Ground Handling

HLS : High Level Structure

IATA : International Air Transport Association

ICAO : International Civil Aviation Organization

IOSA : IATA Operational Safety Audit

ISO : International Organization for Standardization

KAP : Integrated Airport Quality Indicator

MNT : Maintenance

ORG : Organization and Management System

QMPs : Quality Management Principles

SARPs : Standards and Recommended Practices

SAS : Aviation Safety System

SEC : Operational Security

SMS : Safety Management System

SMES : Security Management System

SMQ : Quality Management System

SSP : State Safety Programme

TQM : Total Quality Management

USOAP : Universal Safety Oversight Audit Program

INTRODUCTION

The aviation industry is a highly complex and strictly regulated sector, characterized by the coexistence of multiple national and international regulatory frameworks that airlines must comply with and continuously monitor. Within this environment, operational certifications have progressively become essential requirements, often perceived as implicit obligations by states and regulatory authorities.

In this context, three major frameworks play a central role in airline management systems: safety management systems, security systems, and quality management systems. The governance of these systems aims to ensure compliance with regulatory requirements, protect passengers from both intentional and unintentional risks, and enhance overall operational performance.

Beyond these frameworks, the IATA Operational Safety Audit (IOSA) has emerged as a key reference in the aviation industry. IOSA is an internationally recognized audit program that plays a strategic role in airline safety oversight and operational credibility. Compliance with IOSA has become closely associated with airline reputation and international acceptance.

IOSA is structured into multiple sections covering all operational domains of an airline, including organizational management, security, flight operations, ground operations, maintenance, and cargo activities. It is not merely a set of requirements; rather, it represents a comprehensive audit system that integrates standards issued by the International Civil Aviation Organization (ICAO) as well as national regulatory authorities into a unified compliance framework. IOSA therefore reflects the level of maturity of an airline's safety, security, and compliance systems. (kazem, 2022, pp. 60-66)

In parallel, ISO 9001:2015 is an international standard focused on quality management systems and customer satisfaction. Although it is not a mandatory requirement for airlines, it is widely adopted within the aviation sector. Many organizations seek to integrate ISO 9001 with safety and security systems in order to improve efficiency and overall organizational performance. (Gasymov, 2021, pp. 13-26)

Objectives of the Study:

The main objective of this study is to analyze safety, security, and quality management systems in aviation, with a particular focus on IOSA requirements and ISO 9001:2015, in order to explore their interaction within airline quality management systems in the Algerian context.

Sub-objectives:

- To study the IOSA framework and its role in airline safety and compliance.
- To analyze the ISO 9001:2015 standard in the aviation context.
- To explore the interaction between IOSA and ISO 9001:2015.
- To identify overlaps and complementarities between the two systems.
- To propose ways to integrate safety, security, and quality systems into a unified management system.

Problem Statement:

This raises the following research question:

How can an airline certified under IOSA coordinate compliance with ISO 9001:2015 and IOSA requirements within an integrated management system, while ensuring alignment with applicable regulatory frameworks?

From this research problem, several sub-questions arise.

- To what extent can IOSA be considered a management framework comparable to ISO 9001?
- How does ISO 9001 support or complement IOSA requirements within an integrated system?

Methodology:

To address these research questions, a qualitative approach based on a case study design has been adopted. This methodology relies on the combination of multiple data collection techniques, including documentary analysis, field observations, and semi-structured interviews conducted with stakeholders involved in the studied system.

This approach enables the triangulation of empirical data with the theoretical framework, ensuring a comprehensive understanding of the phenomenon under

investigation. It also allows the development of a rigorous diagnosis, as well as the formulation of relevant and context-appropriate improvement recommendations.

Significance of the Study:

This study contributes to existing literature on quality management systems, safety management, and integrated management systems. It also provides academic insight into the interaction between a sector-specific audit framework (IOSA) and a general quality management standard (ISO 9001:2015). And from a practical perspective, this study may help airlines:

- ✓ Better understand the relationship between IOSA and ISO 9001.
- ✓ Identify overlaps between the two systems.
- ✓ Improve integration and efficiency of management systems.
- ✓ Enhance overall organizational performance.

Dissertation Structure:

This dissertation is structured into three main chapters, each addressing a specific aspect of the research problem.

The first chapter presents the theoretical and conceptual framework of the study. It reviews the existing literature on quality management systems, safety and security management systems in aviation, and introduces the main concepts related to ISO 9001:2015 and the IOSA program. It also provides an overview of the regulatory environment governing the aviation sector at international and national levels.

The second chapter focuses on the practical context and the methodological framework of the study. It introduces the case of Air Algérie, describes the organizational environment, and details the research methodology adopted, including data collection methods and analysis tools used to examine the relationship between IOSA and ISO 9001.

The third chapter is dedicated to the presentation and discussion of the results. It provides a comparative analysis of IOSA and ISO 9001 requirements, identifies areas of convergence and divergence, and proposes recommendations for improving the

integration of safety, security, and quality management systems within an integrated management framework.

CHAPTER 01: STATE OF ART

Section 01: Literature Review

The literature review represents a crucial step in the construction of the theoretical framework. It enables an in-depth exploration of key concepts and prior academic work related to the research theme. Through this review, existing findings, methodologies, and theoretical approaches are examined, providing a solid foundation for the present study.

This literature review is structured into four main parts. First, it addresses Quality Management System (QMS) and Its impact across airline companies. Secondly, it explores the Safety and Security System designed by ICAO to ensure safe and secure air transport operations then how they were both integrated with the QMS. Finally, we shed light on IATA Operational Safety Audit system and its impact on airline companies. The objective is to try to understand the relationship between the Quality management system and IATA operational safety Audit program in order to combined them into a coherent framework.

1. Quality Management System in Airline Industry Context:

The airline industry represents a distinct context characterized by high operational complexity, strict regulatory oversight, and elevated customer/passenger expectations. Consequently, the implementation of quality management principles in aviation requires specific consideration.

Within the airline industry, several studies have examined the impact of Total Quality Management (TQM) on operational performance and competitiveness. (HAMARE, 2024, pp. 1- 41), in a mixed method study of the Nigerian airline sector, found that the implementation of TQM principles positively influenced key performance indicators, particularly passenger satisfaction and organizational competitiveness. The study emphasizes that successful TQM adoption requires strong commitment and involvement at all organizational levels. Consistent with these findings, (Abdulla, 2019, pp. 29-33), through a quantitative analysis of Bahrain Airport Services, demonstrated that TQM practices significantly improve organizational performance, explaining a substantial proportion of performance variation. The study highlights the importance of training, strategic quality planning, and continuous improvement in enhancing

operational and employee outcomes. Similarly, (SADIK, 2018, pp. 22-25) in a case study of Emirates Airlines, confirms that TQM contributes to passenger satisfaction, operational efficiency and corporate image. The findings underscore the role of customer focus, leadership, employee participation, and systematic process management in sustaining competitive advantage. Likewise, (Gasimov & V. Ye. Miltsov, 2019, pp. 109-120) analyze the role of ISO 9001:2015 in the development of cargo aviation companies and argue that it functions as a central framework for structuring the airline management systems. Their qualitative analysis demonstrates that ISO 9001 enhances operational efficiency, risk management, regulatory compliance, and interdepartmental coordination, while reducing duplication in audits and documentation. The authors conclude that ISO 9001 aligns effectively with international aviation requirements established by ICAO, EASA, FAA, and IATA.

Taken together, these studies suggest that TQM functions as a strategic management approach within the airline industry, supporting service enhancement, operational efficiency, and long-term competitiveness.

The relationship between quality management and safety performance has been explored in the review of literature by (Stolzer & Carl Halford, 2004, pp. 27-32) who examined how quality management principles contribute to airline safety, highlighting the industry's transition from reactive safety practices to proactive. Despite technological advances in safety data systems, the study notes that many safety managers lack adequate training in quality and statistical tools. The authors therefore argue that formal Quality Management Systems and structured quality tools are essential for strengthening airline safety performance and fostering continuous improvement. Similarly, (Gupta & Belokar, 2014, pp. 1077-1081) investigate the implementation of TQM in the Indian airline industry and confirm its positive impact on customer satisfaction, employee satisfaction, and operational effectiveness. However, their findings also reveal significant barriers to successful TQM implementation, including financial constraints, weak brand positioning, and political influences. These results suggest that while TQM can enhance competitiveness and performance, contextual and organizational challenges may limit its effectiveness.

Overall, the literature suggests that Total Quality Management (TQM) and ISO 9001 can enhance airline performance, customer satisfaction, operational efficiency, and safety. However, the effectiveness of these systems depends heavily on proper implementation, leadership commitment, employee engagement, and adequate training. Despite clear benefits, contextual and organizational barriers such as financial constraints, regulatory complexity, and weak brand positioning can limit their full impact, indicating that certification or adoption alone does not guarantee improved performance or safety outcomes.

2. Safety and Security Systems in Airline Industry Context:

According to (Konert, Kasprzyk, & Łaciński, 2016, pp. 20-40) the primary legal framework governing international air transport is the Convention on International Civil Aviation, signed in 1944. This agreement led to the creation of the International Civil Aviation Organization (ICAO), which oversees its implementation. Under this framework, member states are expected to make ongoing efforts to enhance both operational efficiency and aviation safety and security.

According (KAŁUŻNA, 2024, pp. 33-41) in a qualitative research. The last Annex of ICAO: Annex 19 deals with safety management at the national level where each country must set up its own National Safety Program for civil aviation, designed to fit how aviation works in that country. The goal is to make sure the state has the right conditions in place to manage safety and reach an acceptable level of protection. The program is made up of four parts: state safety policies and goals, management of safety risks, safety assurance, and promotion of safety.

Similarly in a qualitative research carried out by (Jr., John S. Strong, & C. Kurt Zorn, 2013, pp. 148-164)) where they reviewed global aviation safety performance between 1990 and 2011 and demonstrate that although accident rates have declined, pilot error remains the leading cause of accidents, followed by equipment failure and weather related factors. The authors emphasize that future improvements depend on proactive risk management approaches, particularly the implementation of Safety Management Systems (SMS) promoted by the International Civil Aviation Organization (ICAO).

Although safety and security are often addressed together in aviation governance, they represent distinct but interconnected domains. (Wipf, 2020, pp. 20-50) explains that

safety concerns unintentional operational risks, whereas security addresses intentional harmful acts, such as interference or attacks. Similarly, (Sweet, 2008, pp. 40-120) highlights how the events of September 11 transformed aviation security into a central national and global concern, demonstrating the economic and strategic vulnerability of air transport systems. In addition, earlier regulatory analyses by (Mirmina, 1998, pp. 150-400) highlight the growing complexity of aviation safety and security governance in the United States during the 1990s, particularly in response to terrorism concerns, counterfeit aircraft parts, and passenger misconduct. These developments laid the legal foundation for modern safety oversight systems. These perspectives underscore that modern aviation management must address both accidental and intentional threats within an integrated framework.

Within this evolving regulatory environment, the concept of Safety Management Systems (SMS) emerged as a proactive framework for managing operational risks. (Stroeve, Job Smeltink, , & Barry Kirwan, 2022, pp. 1-26) in a qualitative study, they introduced the SMART tool to assess SMS maturity, arguing that although SMS follows ICAO's four components (safety policy, risk management, safety assurance, and safety promotion), it is sometimes too focused on paperwork and procedures rather than real operational safety. The authors stress that effective safety management requires leadership involvement, organizational learning, and safety culture rather than mere regulatory compliance. On the other hand, (RAT, 2019, pp. 1051-1058) in a mix method study, she analyzed the implementation of SMS in passenger air transport and compares airlines with and without SMS implementation using International Air Transport Association (IATA) data from 2012–2019. The findings indicate that airlines complying with IOSA and SMS requirements demonstrate lower accident rates. In line with strengthening safety assurance mechanisms, (Krstic, Slobodan Gvozdenovic, & Petar Mirosavljevic, 2022, pp. 57-80) in a quantitative research emphasize the importance of integrating compliance monitoring within SMS. Their study primarily aligns with the safety assurance component of ICAO, as aircraft performance monitoring and compliance activities are used to verify the effectiveness of safety controls. The findings indicate that systematic performance monitoring strengthens safety assurance, while proactive compliance monitoring enables early detection of operational deviations and improves risk control. Overall, the study concludes that

integrating compliance monitoring within SMS enhances decision making and contributes to maintaining an acceptable level of safety.

Safety and Security management Systems are not only for regulatory requirement but also an effective management tool that enhances performance, reduces incidents and accidents and supports a proactive approach to aviation.

2.1 The integration of QMS with Safety and Security Systems:

From a strategic perspective, integrating two to three systems supports competitiveness and market performance. It improves profitability, reputation, and passenger traffic by combining safety processes, environmental considerations, and continuous improvement mechanisms. (Simkova Tetiana & Panchoshna Tetiana, 2021, pp. 72-77) On the other hand, the relationship between Quality Management Systems (QMS) and Safety and Security Systems have been widely examined in aviation literature. (Karanikas, 2014, pp. 51-60) in a qualitative study, he analyzes the interrelationship between safety and quality management, demonstrating that both systems share common foundations such as leadership commitment, continuous improvement (PDCA cycle), performance measurement, and employee involvement. While QMS focuses primarily on customer satisfaction and service quality, Safety system concentrates on hazard identification and risk management. The author argues that the two systems are complementary rather than identical, and suggests that safety management should incorporate quality principles as a structural foundation. Similarly, (Gasimov A. , 2021, pp. 88-92) in a qualitative study, he emphasizes the growing importance of integrating QMS and Safety and Security systems within civil aviation governance, particularly in light of ICAO Annex 19 and annex 17. He argues that managing the two systems separately leads to duplication and weak coordination, whereas integration within a unified governance framework enhances compliance management and operational control. Reinforcing this view, (Gasymov, 2021, pp. 13-26) in a qualitative research concludes that combining Safety and Security systems and QMS into a single Integrated System (IMS) strengthens safety and security oversight, improves efficiency, and enhances overall organizational performance. Furthermore, the author emphasized that ICAO guidance supports this integrated approach.

While these studies establish the conceptual compatibility between these three systems, subsequent research moves beyond theoretical alignment to examine how such integration can be implemented in practice. According to the study conducted by (Adekitan, 2020, pp. 13-20) That adopts a qualitative and conceptual approach by analyzing the deployment of integrated Safety Management system (SMS) and QMS along the aviation fuel supply chain. The findings concludes that SMS or QMS alone is not enough, A integrated safety and quality management system is best. It improves risk control, compliance, audit performance and overall competition.

Similarly, (Nam, Yushin Hwang, HaeYoon Byeon, & Woon-Kyung Song, 2022, pp. 14-23) in a qualitative study, they analyzed aviation safety oversight in Korea airlines and examine how ISO 9001 principles can enhance regulatory effectiveness. Their comparative study shows that international bodies such as ICAO and the FAA apply ISO based quality principles within safety oversight programs, whereas the Korean authority applies them more narrowly. The findings suggest that broader integration of quality management principles can improve the effectiveness, consistency, and transparency of aviation safety oversight systems. Likewise, (Alla Valko, Olena Soloviova, Ganna Volkovska, & Iryna Herasymenko, 2021, pp. 13-26) in a quantitative study argue that aviation safety should be embedded within the Quality Management System rather than treated as a separate structure. The authors classify airport service quality into three levels: infrastructure (Level I), operational processes (Level II), and personnel performance (Level III), positioning aviation safety within operational processes. They propose integrating the Aviation Safety System (SAS) as a subsystem of the QMS, where safety is measured, controlled, and continuously improved like any other quality indicator. Furthermore, the study introduces an integrated Airport Quality Indicator (KAP) that combines aviation safety, personnel and equipment quality, transport accessibility, passenger comfort, and non-aviation services into a unified performance index. A model and cost-based framework linking safety expenditures to different threat levels (green, orange, red) are also developed. The findings demonstrate that aviation safety significantly influences service quality, competitiveness, and financial planning, and that embedding safety within the QMS enhances strategic decision making and overall operational efficiency.

3. IATA Operational Safety Audit Program:

Complementing SMS implementation, the IATA Operational Safety Audit (IOSA) was developed to standardize airline safety assessments and reduce audit duplication. In a qualitative study (HSU, Jyh-shyan CHOU, & Chao-Che HSU, 2007, pp. 378-385) explain that IOSA covers all main operational areas, including management, flight operations, maintenance, cabin operations, ground handling, cargo, and security. IOSA combines safety management principles with quality management ideas similar to ISO 9000, focusing on clear documentation, defined responsibilities, risk control, and continuous monitoring. Similarly, (Fakleš & Tomislav Gradišar, 2004, pp. 2-10) in a qualitative research argue that IOSA eliminates redundant inter airline audits, enhances transparency, and establishes globally recognized safety standards, although limitations remain regarding cost and flexibility for smaller carriers. Together, these studies position IOSA as a critical mechanism supporting standardized safety oversight and continuous improvement within global aviation

In addition to SMS and QMS integration, researchers have examined how ISO 9001 aligns with sector specific oversight systems, particularly IOSA. (Kugusheva, 2019, pp. 3-9) in qualitative, based on case examples, standards review, and audit evaluation. examines the integration of ISO 9001:2015 with IOSA standards. The study demonstrates that although ISO 9001 emphasizes process management and customer satisfaction while IOSA focuses on operational safety compliance, both share principles such as documentation control, internal audits, and continuous improvement. The author concludes that integrating IOSA within an ISO based QMS enables airlines to build a comprehensive management system that enhances both safety performance and service quality.

This article by (Deb, 2007, pp. 42-44) conducts a conceptual comparison between IATA Operational Safety Audit (IOSA) and ISO 9001 to show how quality management principles are applied in airline safety standards. The author explains that the IATA Operational Safety Audit (IOSA) standard incorporates the eight quality management principles derived from ISO 9001, adapting them to the specific context of airline safety management. While ISO 9001 focuses on improving the quality of

organizational processes and products, IOSA applies these principles to operational safety in airlines. According to the author, IOSA often applies these principles more rigorously than ISO 9001, particularly in areas such as leadership involvement, employee training, supplier oversight, and documentation requirements. For example, whereas ISO 9001 requires organizations to document processes, IOSA requires both the documentation and the actual implementation of those processes in airline operations. The author concludes that by integrating ISO 9001 quality management principles into a safety oriented framework, IOSA provides a stronger quality assurance approach for ensuring operational safety in the aviation industry.

Synthesis of Findings:

This literature-review first examined the impact of Quality Management Systems (QMS) in airline companies, showing their contribution to operational performance, customer satisfaction, and safety. It then explored ICAO's Safety and Security Systems, which provide regulatory frameworks for Civil Aviation Authorities. While studies have highlighted the conceptual compatibility and potential integration of QMS and safety and security systems, there is limited research specifically on the practical alignment of ISO 9001 quality principles with the IATA Operational Safety Audit (IOSA). Although IOSA incorporates quality management concepts, it is primarily an audit program rather than a full management system, and few studies have examined how QMS and IOSA requirements can be jointly applied to strengthen safety, security, and quality. This study aims to address this gap by exploring how the requirements of ISO 9001 and IOSA can be combined into a coherent framework for airline operations.

Section 02: Conceptual Framework

This conceptual framework aims to clarify the essential notions of quality, its history and delve into the quality management system. It explores the international and national regulatory organizations, as well as the annexes related to safety and security. Furthermore, It explores the relevant tools and standards, such as the International Air Transport Association Operational Safety Audit (IOSA) program and the ISO 9001 standard. These frameworks support airlines in implementing structured quality

management systems, ensuring compliance with international requirements, continuous improvement, and the delivery of safe, efficient, and reliable air transport services.

1.General Overview of Quality and Quality Management System:

This section introduces the fundamental concepts of quality and quality management systems, emphasizing their role in ensuring efficiency, consistency, and continuous improvement within organizations.

1.1 Definition of Quality:

Quality is generally defined as “*The ability of a product or service to satisfy stated or implied needs.*” According to the international standard International Organization for Standardization (ISO, 2026) quality is “*The degree to which a set of inherent characteristics fulfils requirements.*” This definition emphasizes compliance with requirements and customer expectations. However, the concept of quality has evolved over time. For pioneers such as (Deming, 1986, pp. 156-183) quality is closely linked to continuous improvement and the reduction of variation. And to (LÉRAT-PYTLAK, 2002, pp. 33-44) adds that the ISO 9000 perspective shifts the focus: quality is less about merely meeting needs and more about how an organization interprets those needs and its ability to satisfy them. In essence, quality is seen as the alignment between the organization’s interpretation of stakeholder expectations and its capacity to fulfill them.

1.2 History of Quality:

The concept of quality dates back to the earliest stages of human activity. At first, it was reflected in everyday practices and craftsmanship, before gradually becoming structured and specialized across various fields, demonstrating its cross functional nature.

Firstly, during the late nineteenth century, the rise of industrialization and Taylor’s scientific management marked the beginning of formal quality practices within organizations. The focus was primarily on individual inspection and control to support mass production. After wards, in the twentieth century, quality management evolved toward a more scientific approach with the introduction of statistical quality control by

Walter A. Shewhart in 1924. Later, in the 1950s, W. Edwards Deming further advanced these ideas by integrating statistical methods into manufacturing processes, significantly influencing Japanese industry, particularly the automotive sector.

Japan subsequently emerged as a leader in the development of modern quality management concepts, including Quality Assurance and Total Quality Management (TQM). The economic success often referred to as the “Japanese miracle” contributed to the widespread adoption of these principles in the United States, largely inspired by Deming’s philosophy (Lahlou, 2015, p. 2)

By the 1990s, quality had become a strategic priority in Europe, reinforced by the expansion of international standards such as ISO 9000. Today, quality management is generally understood through two complementary perspectives: a cultural dimension, which views quality as a mindset emphasizing discipline and continuous improvement, and a more operational dimension embodied in Quality Assurance systems that ensure compliance with defined standards and procedures (Bedaida, 2023, pp. 31-38)

1.3 Quality Management System (QMS):

A Quality Management System (QMS) refers to a structured framework through which an organization directs and controls its activities in order to consistently meet customer and regulatory requirements while enhancing overall performance. According to ISO 9001, quality management is founded on a set of core principles that guide organizations toward sustained success by improving processes, strengthening leadership, and fostering a culture of continuous improvement.

The ISO 9000 standard identifies seven Quality Management Principles (QMPs) that form the conceptual foundation of modern quality management systems. These principles are designed to help organizations improve performance, enhance customer satisfaction, and ensure long term sustainability. (CANARD, 9001, pp. 16-41)

ISO 9001 bases quality management on a set of guiding principles that support long-term success through effective processes, strong leadership, and continuous improvement.

Rather than treating them as detailed rules, the ISO 9000 standard groups quality management into seven key principles that collectively guide how organizations operate. In essence, these principles emphasize understanding and delivering value to customers, ensuring strong leadership and clear direction, and actively involving employees at all levels. They also promote managing work as interconnected processes, continually improving operations, and making decisions based on reliable data. In addition, they highlight the importance of maintaining effective relationships with stakeholders such as suppliers and partners.

Together, these principles provide a broad framework for improving efficiency, enhancing customer satisfaction, and achieving sustainable organizational performance (Standardization, 2015, pp. 2-14)

1.4 ISO 9001 Certification:

ISO 9001 is the most widely recognized international standard for quality management systems. It provides organizations with a structured framework to organize their activities, improve internal efficiency, control operations, monitor market signals, reduce costs, and strengthen competitiveness. The standard primarily focuses on ensuring product and service quality while enhancing customer satisfaction. With more than one million certified organizations worldwide, ISO 9001 has become a global reference in quality management. The certification process supports strategic alignment by encouraging organizations to systematically analyze their internal and external environment, including market trends, regulatory requirements, customer expectations, and stakeholder needs. This structured analysis improves organizational coherence and contributes to performance enhancement and innovation. From a commercial perspective, ISO 9001 certification is often a prerequisite in public and private tenders. It serves as a credibility signal to the market and contributes to strengthening corporate reputation (Certification, 2026)

1.5 High Level Structure for management system standards:

The High-Level Structure (HLS) was introduced in 2012 by the International Organization for Standardization (ISO) to provide a uniform framework for management system standards. Its goal was to standardize core requirements, terms, and definitions, making ISO standards easier to compare and integrate. Since its

introduction, HLS has guided revisions and the development of new ISO standards. In May 2021, it was updated and renamed the Harmonized Structure (HS) an improved version with minor adjustments to terminology and content. (Droege, 2026)

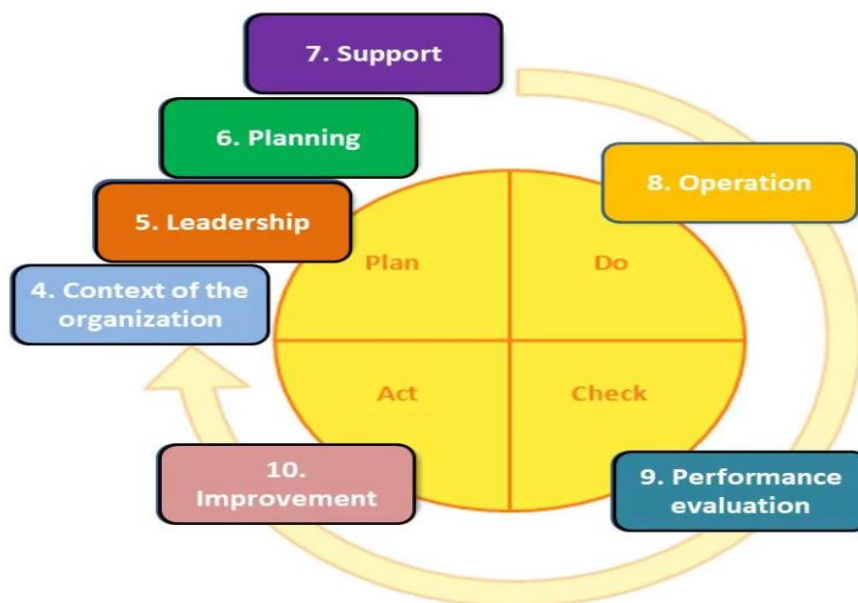
The HLS is organized into ten main clauses, each addressing a critical aspect of a management system:

- **Context of the organization** – Emphasizes understanding the internal and external environment, including stakeholder needs, organizational objectives, vision, values, and the scope of the management system. This ensures that all strategic decisions are aligned with the organizational context.
- **Leadership** – Focuses on commitment from top management to establish purpose, direction, and engagement throughout the organization. Leadership ensures alignment of strategy, policy, processes, and resources to achieve organizational objectives.
- **Planning** – Involves identifying risks and opportunities, defining objectives, and establishing actions to manage change effectively. It ensures proper allocation of responsibilities, resources, and processes to maintain system integrity and performance.
- **Support** – Covers the provision and management of resources, competence, awareness, communication, and documented information necessary for implementing and maintaining the management system. It ensures that personnel understand their role in achieving organizational objectives.
- **Operation** – Addresses planning, implementing, and controlling the processes required to deliver the organization's products or services. This includes infrastructure, technology, operational environment, and the management of activities to achieve intended results.
- **Performance evaluation** – Focuses on monitoring, measurement, analysis, and evaluation of the management system's effectiveness. It includes assessing customer satisfaction, compliance with legal and regulatory requirements, operational performance, and risk management.

- **Improvement** – Ensures that the organization continually enhances its management system, addressing nonconformities, optimizing processes, and implementing opportunities for better performance and resilience.

In essence, the HLS provides a systematic, risk-aware, and process-based approach to management, promoting organizational coherence, continual improvement, and integration of multiple standards. By following this structure, organizations can achieve sustainable performance while maintaining alignment with internal goals and external expectations. (Virmaux, Christian, 2019, pp. 17-23) (Shandu, Lungelo M.M, 2023, pp. 1-2)

Figure 1: High Level Structure for management system standards



Source: Adapted from Guillaume Promé

2. Aviation Regulatory Governance Structure:

This section examines the structure of governance in the aviation sector, focusing on how regulations are developed, implemented, and supervised at different levels. Aviation is a highly regulated industry due to safety, security, and the need for

international coordination. As a result, multiple institutions operate at global, regional, and national levels to ensure consistency and compliance.

At the global level, aviation governance is primarily ensured through international organizations that establish common standards and facilitate cooperation between countries. These institutions play a key role in harmonizing regulations, enhancing safety, and promoting efficient air transport systems worldwide.

At the national level, aviation governance is implemented through regulatory authorities that adapt international standards to local requirements. These institutions are responsible for overseeing aviation activities, ensuring compliance, and maintaining safety within the national context.

2.1 The International Civil Aviation Organization (ICAO):

The International Civil Aviation Organization, which is often referred to as ICAO, is an agency that is specialized and is part of the United Nations. It was created in the year 1944 after the Chicago Convention on International Civil Aviation was signed. This Convention set up the legal and institutional framework that is necessary for regulating and coordinating international civil aviation.

The Convention continues to serve as the main legal structure that governs international air transport and also formalizes the cooperation that exists among different States in this area. In order to make sure that global standards are harmonized, the International Civil Aviation Organization is responsible for developing *Standards and Recommended Practices*, which are often abbreviated to SARPs. These SARPs are issued as Annexes to the Chicago Convention. At the present time, there are a total of 19 Annexes that address various aspects related to civil aviation (Konert, Kasprzyk, & Łaciński, 2016, pp. 114-164)

Figure 2: ICAO's Annexes

Source: Adapted from Yandex

2.2 Annex 19-Safety Management:

As safety management gained more importance in aviation organizations, ICAO made the decision to gather related requirements into one single document. This resulted in the adoption of Annex 19, which is titled Safety Management in the year 2013, and is entirely focused on safety management. The creation of this separate annex that specifically addresses safety management shows the increasing focus on systematic and proactive safety oversight in civil aviation. Annex 19 sets out the essential regulatory requirements for Safety Management Systems, which are referred to as SMS. Additional guidance is offered in ICAO Doc 9859, which is known as the Safety Management Manual. This manual provides practical explanations and best practices to assist in effective implementation. According to Annex 19, Member States have the obligation to create and sustain a State Safety Program, abbreviated as SSP, which includes laws, regulations, and activities that are aimed at managing and enhancing aviation safety at the national level (Konert, Kasprzyk, & Łaciński, 2016, pp. 31-111)

At the organizational level, the International Civil Aviation Organization (ICAO) defines a Safety Management System (SMS) as a structured framework built around four interrelated components: Safety Policy and Objectives, Safety Risk Management, Safety Assurance, and Safety Promotion (ORGANIZATION, Doc 9859-Safety Management Manual 4th Edition, 2018, pp. 15-68)

Rather than functioning independently, these components operate as an integrated system that supports a proactive approach to managing safety. Safety Policy and Objectives establish the foundation by defining the organization's commitment to safety, clarifying responsibilities, and setting overall safety goals. This creates the strategic direction and embeds safety within the organizational culture.

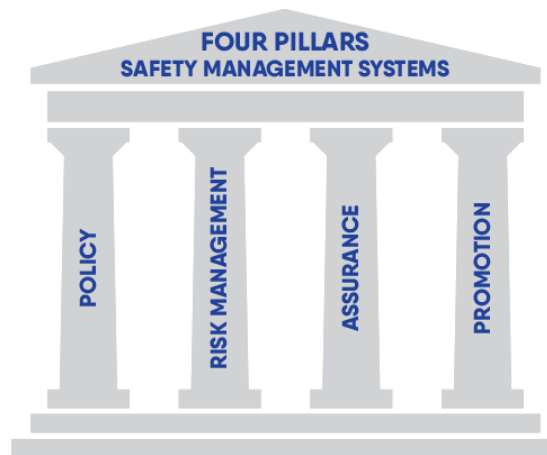
Safety Risk Management focuses on systematically identifying hazards and assessing associated risks. It relies on a combination of reactive, proactive, and predictive methods, ensuring that risks are evaluated and controlled before they lead to incidents. This shifts safety management from a purely reactive approach to a more anticipatory one.

Safety Assurance complements this by monitoring performance and verifying that safety measures are effective. Through continuous evaluation, performance measurement, and management of operational changes, it ensures that the system remains relevant and capable of addressing emerging risks.

Finally, Safety Promotion supports the entire framework by strengthening safety culture through training and communication. It ensures that personnel are competent, informed, and engaged, enabling the consistent application of safety practices across the organization.

Together, these four elements form a continuous cycle of planning, implementation, monitoring, and improvement, aligning organizational practices with international aviation safety standards and fostering sustained safety performance. ((DACM), May 2010, pp. 10-64)

Figure 3: The four Pillars of safety management system



Source: Adapted from aviationsafetyblog

2.3 Annex 17-Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference:

Aviation security refers to the measures and procedures implemented to protect civil aviation against acts of unlawful interference, including terrorism, sabotage, and other criminal activities. According to International Civil Aviation Organization. (ORGANIZATION, Doc 9859-Safety Management Manual 4th Edition, 2018, pp. 55-70) (ICAO), 2026)

Aviation security encompasses safeguards intended to protect civil aviation against acts of unlawful interference through a combination of measures, human and material resources. The objectives of aviation security include:

1. Protection of passengers, crew, and airport personnel
2. Protection of aircraft and airport infrastructure
3. Prevention of acts of unlawful interference
4. Support of national security and counter-terrorism policies
5. Maintenance of public confidence in air transport (Shybanov, 2023)

To summarize security seeks to safeguard civil aviation from intentional malicious acts, which may stem from a variety of motivations, including terrorism, criminal activity, political activism, or individual mental instability. (Schwach, 2015)

3. Algerian civil aviation agency:

The National Civil Aviation Agency, known as ANAC, is a public institution that is designated as an Establishment with Legal Personality and Financial Autonomy, abbreviated as EPCS. This agency was created by Law No. 19-04 on July 17, 2019, that sets forth the general regulations that govern civil aviation. Some of ANAC's missions are to regulate, monitor, and supervise activities related to civil aviation. They ensure Airlines apply the State's civil aviation policies. while proposing legislative and regulatory texts related to civil aviation to the Minister in charge. ((ANAC), 2026)

The State Safety Programme (SSP) explains how a State takes the international safety requirements established by ICAO Annex 19 and applies them within its own aviation system. At a basic level, this means that the State translates ICAO Standards and Recommended Practices (SARPs) into national legislation, regulations, and procedures, ensuring that all aviation activities comply with these requirements. However, SSP goes beyond simple compliance. It represents a modern approach where the State not only enforces rules but also actively manages safety.

Through the SSP, the State adopts a proactive and data-driven approach to safety. This includes identifying hazards, assessing risks, and implementing measures to prevent accidents before they occur. The State also monitors the overall safety performance of its aviation system using indicators and continuously improves its safety strategies. In addition, the SSP ensures coordination between different aviation authorities and promotes collaboration with service providers, such as airlines and airports, which are required to implement their own Safety Management Systems (SMS). (ORGANIZATION, 2018)

3.1 ICAO Safety Oversight Evaluation – USOAP:

The Universal Safety Oversight Audit Program known as USOAP is a tool that was created by the International Civil Aviation Organization which is abbreviated as ICAO for the purpose of assessing how effective member States are in overseeing aviation safety. This program has the aim of verifying that countries implement ICAO's Standards and Recommended Practices which are referred to as SARPs in an appropriate manner and that they maintain a robust aviation safety oversight system.

Through the USOAP program, ICAO carries out audits of national civil aviation authorities in order to evaluate their capacity to regulate and supervise aviation activities. The evaluation places emphasis on the effectiveness of the safety oversight system of the nation which includes aspects such as the regulatory framework, the organizational structure, and the technical capabilities that are essential for ensuring aviation safety. The audit looks at eight critical elements that form the basis of a State's safety oversight system. These elements include aviation legislation, the organization of the civil aviation authority, personnel licensing, aircraft airworthiness, oversight of flight operations, oversight of air navigation services, investigation of aircraft accidents, and oversight of aerodromes.

In order to perform the evaluation, ICAO uses standardized protocol questions that are designed to assess the level of implementation of these elements. The results from this process reveal how effectively a State adheres to ICAO safety standards and also identify areas where there may be potential for improvement in the aviation regulatory and oversight system of that State. (Silitonga, Sumadinata, Sudirman, & Hidayat, 2022, pp. 10188-10210)

4. Industry Operational Oversight Layer:

This section focuses on the operational oversight layer of the aviation industry, where international organizations and industry bodies play a key role in supporting safe and efficient airline operations. Unlike regulatory authorities, these entities provide guidance, standards, and evaluation mechanisms that complement government oversight and promote best practices across the industry.

4.1 The International Air Transport Association (IATA):

The International Air Transport Association IATA is the global trade association for the airline industry and it represents more than 360 airlines that together make up around 85 percent of global air traffic. This organization has an important role in supporting different parts of aviation operations and in shaping policies related to significant issues in aviation. IATA has a vision for working together to guide the future development of the air transport industry that puts emphasis on safety, security, and

environmental sustainability while still connecting people and having a positive effect on global society. Its mission is to represent, lead, and serve the airline sector by advocating for the interests of airlines and addressing their needs related to operations.

In its support of the airline industry, IATA helps airlines to operate in a way that is safe, secure, efficient, and economical while following well-defined regulations. It provides professional support, specialized products, and expert services to airlines and other stakeholders in aviation. (IATA), 2026)

4.2 IATA Operational Safety Audit (IOSA) Program:

The IATA Operational Safety Audit (IOSA) program is an internationally recognized initiative designed to assess and improve airline operational safety. It establishes a standardized evaluation framework based on industry best practices and contributes to strengthening safety performance across the aviation sector.

4.2.1 Presentation of IOSA:

The IATA Operational Safety Audit (IOSA) is an internationally recognized audit program created by the International Air Transport Association (IATA). It is designed to evaluate how well an airline manages and controls its operational safety systems. The program is built on international standards and industry best practices, and it is applied in a consistent way worldwide.

The main goal of IOSA is to improve global aviation safety and reduce the number of repetitive audits conducted on airlines (Hounsell, 2010, pp. 3-20)

4.2.2 IOSA Audit:

IOSA includes around 900 operational standards and recommended practices focused on safety management, operational control, and oversight. These standards are used only for audit purposes; they are not regulations. ((IATA), About IATA, 2026)

The audit covers several operational areas, including:

- 1) Organization and Management System (ORG)
- 2) Flight Operations (FLT)
- 3) Maintenance (MNT)
- 4) Cabin Operations (CAB)

- 5) Ground Handling (GRH)
- 6) Cargo Operations (CGO)
- 7) Operational Security (SEC)

It is important to note that IOSA does not replace government oversight. Instead, it complements it. The program is recognized by regulators and by the International Civil Aviation Organization. Many states use IOSA audit reports to strengthen their own oversight activities, especially for foreign operators or code-share agreements. (Hounsell, 2010, pp. 3-20)

In analyzing the relationship between IOSA and ISO 9001, it is important to note that the IATA Operational Safety Audit (IOSA) is operated under the quality management framework of the International Air Transport Association, which is guided by the principles of ISO 9001. Although IOSA itself is not an ISO 9001 certification standard, it is delivered within a structured quality management system that integrates performance monitoring, documentation control, risk analysis, corrective actions, and continuous improvement. Therefore, IOSA can be considered as a sector specific operational safety audit program that is institutionally aligned with ISO 9001 concepts, demonstrating a complementary rather than identical relationship between the two frameworks. ((IATA), Quality Management, 2026)

Conclusion:

In conclusion, this chapter has established the theoretical and conceptual foundations necessary for understanding quality management systems within the aviation sector. It has explored the key concepts of quality, the evolution of quality management, and the structure and principles of Quality Management Systems, particularly through ISO 9001 standards.

Furthermore, the chapter examined the regulatory and operational framework governing aviation, highlighting the role of international and national institutions such as ICAO and ANAC, as well as industry organizations like IATA. The analysis of key instruments, including Annex 19, Annex 17, and the IOSA program, provided insight into how safety and security are managed in practice.

The knowledge and tools developed in this chapter will serve as a foundation for the following chapters, enabling a deeper analysis of the implementation and effectiveness of quality and safety management systems in the aviation industry.

**CHAPTER 02: PRACTICAL
CONTEXTE AND
METHODOLOGICAL FRAMEWORK**

The effectiveness of this study depends on a structured methodological approach and a thorough understanding of the organizational environment. Following the presentation of the organizational context, with particular focus on the case of Air Algérie, it becomes necessary to outline the different stages of the research process. This chapter therefore presents the methodology adopted, including the project framework and the approach used, in order to support the analysis conducted in this study.

Section 01: Organizational Context

This section presents Air Algérie, the national airline that constitutes the framework of this study. It provides an overview of the company, including its history, organizational structure, main activities, as well as the services it offers. By gaining a better understanding of Air Algérie, this section helps to contextualize the study and allows for a more in-depth analysis of its impact on quality and safety management practices.

1. Organizational Context:

This study was conducted within Air Algérie, the national airline of Algeria and a major actor in both domestic and international air transport. The company operates in a highly regulated environment where compliance with international aviation standards is mandatory to ensure safety, operational efficiency, and service quality. Furthermore, the company's primary mission is to transport passengers and cargo under optimal conditions that ensure safety, comfort, and reliability.

Air Algérie is subject to national oversight by the *Autorité Nationale de l'Aviation Civile (ANAC)* and must comply with international frameworks established by organizations such as the International Civil Aviation Organization, the International Air Transport Association, and European regulatory bodies. In this context, the airline is certified under the IOSA (IATA Operational Safety Audit) program and implements a quality management system aligned with ISO 9001.

Maintaining compliance with these frameworks requires a structured organizational approach capable of integrating multiple management systems, including quality

(SMQ), safety (SMS), and security (SeMS), while ensuring continuous improvement and operational coherence.

2. Compliance Monitoring Directorate:

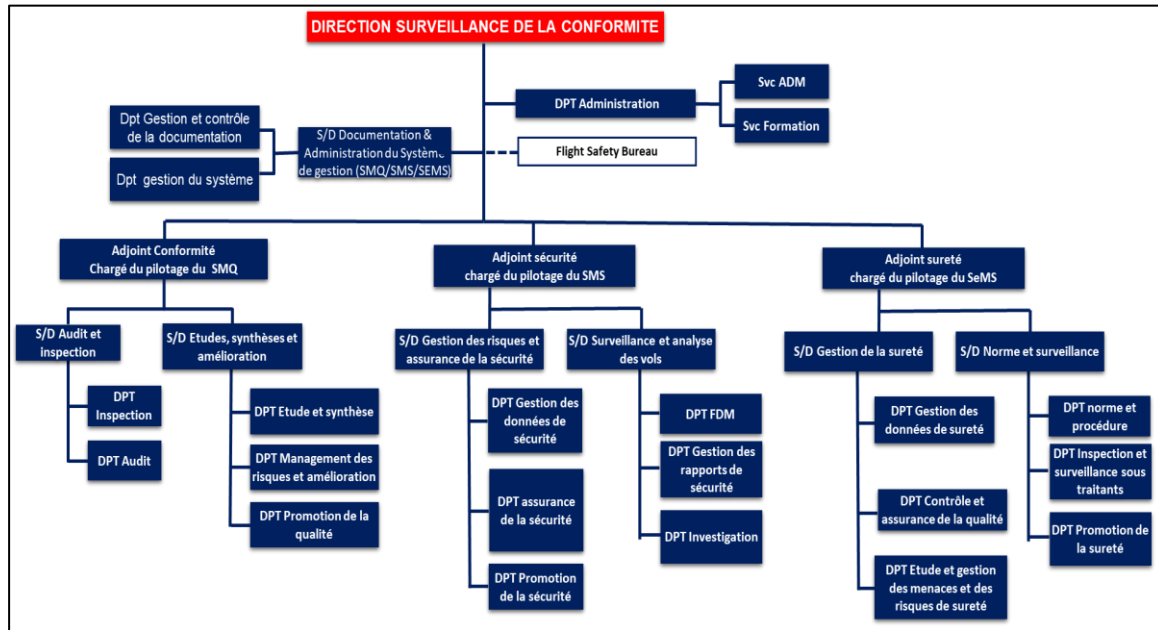
The Compliance Monitoring Directorate is the central entity responsible for ensuring compliance with regulatory and normative requirements related to quality, safety, and security within Air Algérie. It operates under the direct authority of the Chief Executive Officer and plays a strategic role in the implementation and continuous improvement of the company's management systems.

The Compliance Monitoring Directorate is composed of several sub-directorates and departments, each contributing to the effectiveness of the management systems:

- **Safety Division (SMS):** Responsible for risk management, hazard identification, safety performance monitoring, and incident investigation. It includes functions such as flight data monitoring (FDM), safety reporting systems, and safety assurance processes.
- **Security Division (SeMS):** Ensures compliance with aviation security regulations, manages threats, oversees subcontractor surveillance, and maintains security documentation and procedures.
- **Quality Division (SMQ):** Focuses on process standardization, performance monitoring, continuous improvement, and alignment with ISO 9001 requirements.

In addition, transversal functions such as:

- Audit and Inspection
 - Documentation Management
 - Risk Management and Analysis
- support the integration and effectiveness of these systems.

Figure 4: Air Algerie Organization Chart

Source: From the Organization Manual of the Compliance Oversight Department

3. Quality Management System:

Air Algérie was first IOSA-certified in 2006 and subsequently obtained ISO 9001:2008 certification in 2008. Since then, the airline has continuously improved and enhanced its management systems up to the present day.

3.1 Quality Policy:

Air Algérie is committed to delivering safe, reliable, and high-quality air transport services for passengers and cargo, in line with its strategic objectives and customer expectations. The company places customer satisfaction at the heart of its priorities and is dedicated to continuous improvement across all its activities. In this context, Air Algérie focuses on the following quality objectives:

- ❖ Improving flight punctuality, by ensuring timely departures and arrivals to strengthen operational reliability and customer trust.
- ❖ Enhancing communication with customers and stakeholders, through clear, timely, and transparent information before, during, and after travel.

- ❖ Improving onboard comfort, by maintaining aircraft in optimal condition and ensuring a pleasant travel experience.
- ❖ Strengthening staff professionalism, by promoting courteous, efficient, and high-quality service in terms of reception, guidance, and assistance.

Air Algérie is also committed to complying with applicable regulatory requirements and international standards, particularly ISO 9001:2015, and to continually improving the effectiveness of its Quality Management System. Through this policy, the company aims to build long-term customer loyalty and reinforce its position as a trusted air transport provider. (See Appendix A)

3.2 Process Mapping of the Company:

The company's process map is structured into three main categories: management processes, support processes, and core (operational) processes. This structure ensures effective governance, efficient resource support, and optimal service delivery.

Management Process: The management process defines the overall governance of the organization and ensures the proper functioning and continuous improvement of the management system.

- Management System Process: Establishes policies, objectives, and strategic direction, while ensuring performance monitoring and continuous improvement.

Support Processes: Support processes provide the necessary resources and infrastructure to ensure the smooth execution of operational activities.

- Competency Management Process: Ensures that personnel have the required skills and qualifications.
- Airworthiness Maintenance Process: Maintains aircraft in a safe and airworthy condition.
- Aircraft Servicing and Cleaning Process: Ensures aircraft readiness, cleanliness, and proper servicing.

- Logistics Support Process: Manages materials, equipment, and supply chain needs.
- Operations Control Process: Oversees and coordinates daily operations.
- Marketing Process: Promotes services and manages market presence.
- Information Systems Process: Supports operations through IT systems and digital infrastructure.

Core (Operational) Processes: Core processes represent the company's main activities that directly create value for customers.

- Service Offering Process: Defines and develops the company's services.
- Customer Relationship Process: Manages interactions and ensures customer satisfaction.
- Ground Operations Process: Handles all airport ground activities.
- Flight Operations Process: Ensures safe and efficient execution of flights.

4-Safety and Security Management Systems:

At Air Algérie, both the Safety Management System (SMS) and the Security Management System (SeMS) are implemented as integrated and structured frameworks aimed at ensuring the protection, reliability, and continuous improvement of operational activities.

The SMS is designed to manage safety risks and prevent accidents through a proactive and data-driven approach. It is centrally overseen by the Deputy Director of Safety and structured around two main functions: flight monitoring and analysis, and risk management and safety assurance. In practice, the system relies on multiple sources of information, including flight data monitoring (FDM), safety reports, audits, and incident or accident investigations. These inputs are analyzed to identify hazards, which are then assessed and recorded in the Safety Risk Register. Appropriate mitigation measures are implemented and continuously monitored through Safety Performance Indicators and periodic reviews such as Safety Meetings and Safety Review Boards.

The SMS also integrates a strong safety promotion dimension, ensuring staff awareness and engagement through training, communication, and feedback mechanisms. In

addition, it guarantees compliance with applicable regulations through ongoing coordination with national and international aviation authorities and the integration of audit outcomes into a continuous improvement process.

Complementing the SMS, the SeMS focuses on protecting the organization against acts of unlawful interference while maintaining compliance with aviation security regulations. Managed by the Deputy Director of Security, it is structured around two main functions: norms and surveillance, and security management and risk control. The system operates through a continuous cycle of threat identification, risk assessment, and implementation of preventive and corrective measures to maintain an acceptable level of security.

Security-related information, including incident reports, inspections, audits, and other inputs, is collected and analyzed to detect potential threats. The norms and surveillance function ensures that all documentation and procedures remain compliant and up to date, while also overseeing subcontractors and operational activities across all stations. In parallel, the security management function focuses on analyzing risks, monitoring mitigation measures, and conducting tests and exercises to assess system effectiveness and preparedness.

Finally, the SeMS promotes a strong security culture through awareness, training, and communication initiatives, ensuring the active involvement of all personnel in maintaining security standards. (See Appendix B and Appendix C)

Section 02: Methodological Approach

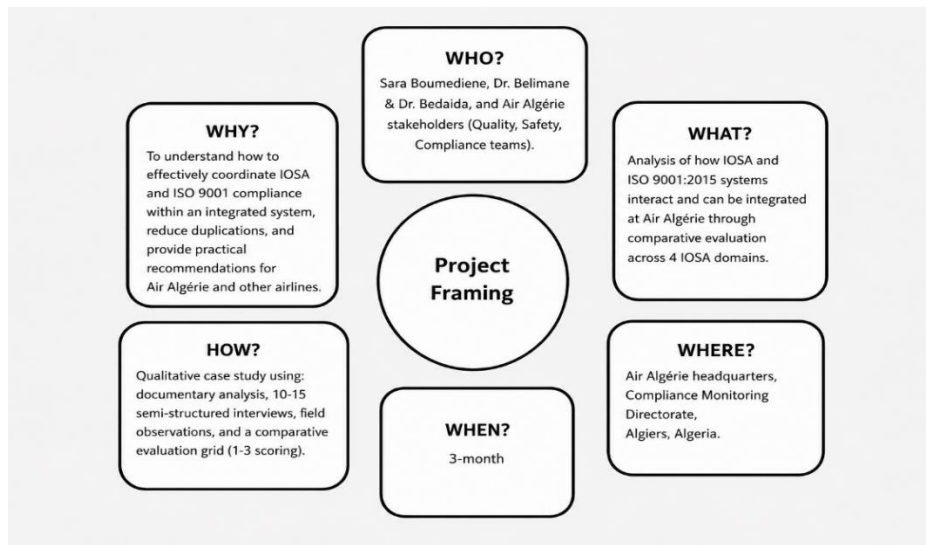
This chapter presents the research methodology adopted in this study, together with the rationale underlying the methodological choices made, in order to ensure the reliability, validity, and comprehensiveness of the analysis conducted. The methodological framework outlined herein constitutes the foundation upon which the subsequent interpretation of results and the formulation of recommendations are based.

Project Scoping:

We used the QOOQCP tool in order to define the scope of the research and establish our objective. This method adopts a constructive critical analysis approach based on a systematic line of questioning structured around six key questions: Who, What, Where, When, How, and Why.

The implementation of the QOOQCP method consists of answering the following questions:

- **What:** Phase, operation, activity, etc.
- **Who:** Actors, stakeholders, participants, etc.
- **Where:** Distances, location, setting, etc.
- **When:** Timing, duration, schedule, etc.
- **How:** Processes, procedures, tools, methods, techniques, etc.
- **Why:** Objective, purpose, rationale, etc.

Figure 5: Project Scoping

Source: Developed by the Authors

1. Research Methodology:

Research methodology originates from a specific problem or the need for deeper understanding. A researcher in Economics and Management selects a quantitative, qualitative, or mixed approach. The differentiation among these approaches pertains to the extent to which interpretation and subjective perception influence research techniques. Qualitative research employs a naturalistic model, while quantitative research adheres to a deductive process centered on hypothesis testing (El Morhit, Jan 2015, pp. 2-15).

The synthesis of these two approaches leads to mixed methods or triangulation, which seeks to leverage their respective strengths (Abousaid, 2023, pp. 547-567)

In the context of this study, the qualitative approach is viewed as particularly important. This approach is often seen as subjective and flexible, with a focus on internal validity as noted by (Abousaid, 2023, pp. 547-564). It is generally exploratory in nature which is useful when there is limited knowledge about a subject. It is commonly used to understand experiences and viewpoints, using a subjective perspective. (Dehbi & Angade, 2019, pp. 1-16)

Further Mothe literature reviewed demonstrates that studies examining quality management, safety systems, and operational oversight in the aviation sector often rely

on qualitative approaches to better understand organizational practices, management processes, and stakeholder perspectives within airline companies.

1.1 Action Research:

Action research is a research methodology that combines practical problem-solving with the generation of academic knowledge. Unlike traditional research approaches, where researchers mainly observe and analyze situations from a distance, action research involves direct collaboration between researchers and practitioners in order to create change while simultaneously studying the process. (Amaya & Jose A, 2020, pp. 1-11)

The choice of methodology aligns with the studies found in the literature review. In fact, most research that looks into similar topics, especially the implementation of management systems and the examination of organizational actors' perceptions, tends to prefer a qualitative approach. Moreover, action research is particularly relevant for understanding how changes happen within organizations and for capturing the experiences and viewpoints of stakeholders who are directly involved. This choice also makes it possible to use established conceptual frameworks and analytical tools that are relevant in similar situations while adjusting the approach to fit the specific details of the study area.

2. Sampling Strategy:

The sample for this study was selected using an intentional sampling strategy also commonly referred to as purposive sampling.

2.1 Intentional Sampling:

Intentional sampling is a non-probability sampling method in which the researcher deliberately selects participants based on specific characteristics, knowledge, or positions that are directly relevant to the research question. Unlike probability sampling (e.g., random sampling), which aims for statistical representativeness of a larger population, intentional sampling is strategically oriented toward depth, relevance, and information-rich cases. (Ricarda , Wojciech , & Florian , pp. 580-615)

In the context of qualitative research, this approach is widely recognized as appropriate when the researcher seeks to understand a phenomenon from the perspective of those who are most knowledgeable about it. According to (Md Asadul & Faraj Mazyed , 2022, pp. 1-11) purposive sampling enables researchers to deliberately select participants who are specially qualified or experienced in relation to the research topic, allowing them to collect rich and relevant data. The authors further explain that qualitative research focuses on exploring and understanding situations, experiences, and behaviors in depth rather than achieving statistical generalization, which makes purposive sampling suitable for qualitative studies.

2.2 Sample Size Justification

This composition of eight participants was deliberately constructed to ensure comprehensive coverage of the organizational functions most directly involved in the implementation and oversight of ISO 9001:2015 and IOSA-related processes. As shown in Table X, the sample spans documentation, safety, quality, audit, and compliance directorates, collectively representing the full chain of governance relevant to dual-standard compliance. This composition, rather than a larger but more diffuse sample, was considered methodologically appropriate given the aim of achieving depth, cross-functional triangulation, and information richness, consistent with the principles of purposive sampling in qualitative research.

Table 1: Composition of the Research Sample

Position/Role	Directorate	System(s) Covered	Relevance to the Study
Head of Documentation Department for SMS, QMS, and SeMS Documentation	Documentation	SMS / QMS / SeMS	Document control and integration across management systems
Head of Safety Promotion Department	Safety	SMS	Communication strategies and employee engagement within the SMS
Deputy Director, Risk Management and Safety Assurance	Safety	SMS	Risk identification, performance monitoring, and mitigation effectiveness
Deputy Director, Study, Analysis, and Improvement	Quality / Safety	QMS / SMS	Data analysis, incident investigation, and continuous improvement activities

Deputy Director, Audit and Inspection	Audit	QMS / SMS / SeMS	Audit execution, compliance verification, and corrective-action follow-up
Quality Promotion Department Representative	Quality	QMS	Quality culture promotion and performance monitoring
Deputy Director of Safety (SMS Oversight)	Safety	SMS	SMS implementation, oversight, and incident management
Deputy Director of Compliance (QMS Oversight)	Compliance	QMS / IOSA Requirements	ISO 9001 compliance, audit coordination, and regulatory conformity

Source: Developed by the Authors

2.3 Application to the Present Study:

For this research on understanding the relationship between ISO 9001:2015 and IOSA standards, an intentional sampling strategy was adopted for the following reasons:

- **Positional Relevance:** All participants were selected because they occupy specific managerial roles directly involved in quality management, safety oversight, audit, documentation, training, or continuous improvement. These roles (e.g., Deputy Compliance Director, Deputy Director of Audit and Inspection, Deputy Safety Director) carry formal responsibility for the very systems under investigation.
- **Functional Expertise:** Each participant was chosen because their daily activities relate directly to the implementation of ISO 9001:2015, IOSA, or both.
- **Information Richness:** Intentional sampling prioritizes “information-rich” cases those from which the researcher can learn the most about issues of central importance. The selected managers collectively represent the full chain of quality and safety governance within Air Algérie, from documentation and training to risk management and compliance oversight.
- **Cross-Functional Comparison:** By intentionally selecting participants from different but interconnected directorates (Compliance, Audit, Improvement, Promotion, Safety, Documentation), the study was able to capture multiple perspectives on the same organizational processes, enabling triangulation and a more holistic understanding.

Thus, the intentional sample was not designed to be statistically representative of all Air Algérie employees. Rather, it was deliberately constructed to provide deep, expert insight into how two distinct but overlapping quality and safety management systems are understood, implemented, and managed by those who hold formal responsibility for them. This strategic selection directly supported the study's aim of understanding the practical realities of dual-standard compliance in a complex aviation organization.

3.Data Collection Methods:

3.1 Documentary Review:

The documentary review is seen as an important part of the scientific research process, especially in qualitative studies in management sciences (Cruz, 2016, pp. 26-28) defines that relevant documents were gathered, chosen, examined, and combined to create a strong theoretical and contextual base for the study. In this situation, a collection of institutional and normative documents along with standards were looked a. This includes ISO 9001:2015 and IOSA Standards Manual (ISM) 18th Edition. In addition, scientific articles that lead or had similar objectives to those of our study were reviewed.

Moreover, several internal documents that were relevant to our study were provided by the host organization which is Air Algérie, although access to these materials was limited and they were subject to confidentiality. These documents included draft organizational charts, internal project documents, and various materials that were related to work planning.

All these sources contributed to the building of a solid database that enriched the understanding of the research topic and supported the rigorous implementation of our research approach.

Table 2: Document Review

Type of Document	Title / Description
Manual	Quality Manual – outlines the organization’s quality management system, objectives, and procedures in line with ISO 9001.
Manual	Organizational Manual of the Compliance Monitoring Directorate – defines the structure, roles, and responsibilities of the compliance function.
Manual	Safety Management System Manual – describes the framework and processes for managing operational safety within the organization.
Policy	Quality Policy – states the organization’s commitments and objectives regarding quality management.
Policy	Safety Policy – defines principles and commitments related to operational safety.
Standard External Reference	/ IOSA (IATA Operational Safety Audit) Edition 18 – international aviation safety audit standard used to assess operational management and control systems.
Standard External Reference	/ ISO 9001:2015 Standard – international standard specifying requirements for a quality management system.

Source: Created by the Authors

2.2 Interviews:

Interviews are a conversational research method that enables researchers to collect detailed information about how individuals perceive, experience, and interpret phenomena by directly questioning carefully selected participants. (Cruz, 2016, pp. 58-69) They are an important way to collect qualitative data. They consist of formal discussions that look at discourse and show the thoughts of individuals, whether they are aware of them or not. The purpose is to allow participants to share their thoughts honestly while dealing with any defense mechanisms that might come up because of being observed by others. (Gavard-Perret, Gotteland, D, Haon, & Jolibert, 2012, pp.

87-132) point out that there are three categories of interviews which are structured, semi-structured, and unstructured, and these categories differ in how much guidance and interaction are given during the interview process.

Table 3: Typology of Interviews According to the Degree of Directiveness

Type of Interview	Main Characteristics
Structured interview	A standardized interview method featuring predetermined question sequences and predetermined response options. The interviewer maintains consistency by adhering strictly to the established format, limiting spontaneity or deviation.
Semi- Structured interview	This hybrid approach combines flexibility with structure. It encourages participants to express themselves with relative freedom on topics the researcher has predetermined, while the interviewer maintains enough guidance to ensure the discussion addresses targeted themes. The researcher prepares an interview outline or checklist (Interview Guide) that identifies themes to explore without rigidly prescribing how they must be discussed.
Unstructured interview	A flexible questioning approach where the researcher asks an open question and permits respondents to develop their answers at their own pace, with the interviewer providing only minimal prompts or affirmation without steering the response.

Source: Developed by the Authors based on (Cruz, 2016)

For our study, we opted for Semi- Structured interview. An interview program was conducted to organize the interviews date and time for each head of department.

Table 4: Interviews Program

Position / Name	Theme (Current Situation & Identification of Issues)	Date	Duration
H. Head of Documentation Department for SMS, QMS and SMES	Document control, integration, and compliance of SMS, QMS, and SMES documentation systems.	05/04	45min
M. Head of Safety Promotion Department	development, communication strategies, and employee engagement in SMS.	05/04	34min
Ha. Deputy Directorate of Risk Management and Safety Assurance	Risk identification, safety performance monitoring, and effectiveness of mitigation measures.	06/04	50min
T. Deputy Directorate of Study, Analysis, and Improvement	Data analysis, incident investigation, and continuous improvement processes.	09/04	45min
Ham. Deputy Directorate of Audit and Inspection	Audit execution, compliance verification, and corrective action follow-up.	09/04	30min
Li. Quality Promotion Department	Quality culture promotion, performance monitoring, and continuous improvement initiatives.	12/04	45min
A. Deputy Director of Safety, Responsible for SMS Oversight	SMS implementation, safety performance monitoring, and incident management.	13/04	40min
S. Deputy Director of Compliance, Responsible for QMS Oversight	ISO 9001 compliance, audit coordination, and regulatory conformity management.	15/04	50min

Source : Created by the Authors

2.3 Observations:

Observation is a method for collecting data that is important in social sciences because it lets researchers look closely at behaviors, interactions, and situations in their natural settings without interfering with the subjects being observed, as noted by (Claude., 2026) and (Gavard-Perret, Gotteland, D, Haon, & Jolibert, 2012, pp. 132-154). This

method makes it possible to gather factual information about actual practices that might not always be clearly expressed.

For our study, we chose direct, structured, and participant observation. This choice allowed us to fully engage with the organizational context and examine the airline's operations and management processes. As participant observers, we saw real operational situations and talked to staff to ask questions for clarification. This structured participant observation was useful because it let us document specific practices that might not have come up in interviews and helped us gain a better understanding of the airline's culture, social dynamics, and individual behaviors.

4.Data Collection Tools:

4.1 Interview Guide:

The development of the interview guide represented a critical stage in this research process. A single, structured interview guide was designed and applied consistently with all managerial staff at Air Algérie (See Appendix D). This approach ensured coherence in data collection while enabling meaningful cross-comparison of responses across different roles and departments.

The guide was organized into three main phases:

Phase One: Introduction and Ethical Framework

This initial phase was dedicated to introducing the interview and clearly presenting its objectives. Particular attention was given to creating a climate of trust and openness, encouraging participants to share their perspectives freely and honestly. Ethical considerations including confidentiality, anonymity, and the academic purpose of the research were also clarified at this stage.

Phase Two: Understanding the Respondent's Profile

The second phase focused on understanding the profile of each interviewee. Participants were invited to describe their hierarchical position within Air Algérie, their specific roles and responsibilities, as well as their professional background and experience within the organization. This information helped contextualize subsequent

responses and provided insight into each participant's level of involvement in operational and quality management processes.

Phase Three: Core Themes – ISO 9001 and IOSA Compliance

The final phase was structured around two key dimensions central to the study: the implementation of ISO 9001: 2015 and compliance with IOSA (IATA Operational Safety Audit) standard. Questions in this section explored organizational practices related to quality assurance, safety management, operational procedures, and regulatory compliance. This phase aimed to capture both strategic perspectives and the practical challenges encountered when aligning with international aviation standards.

The design of the interview guide was informed by established qualitative interviewing principles. As noted in the literature on qualitative interview strategies, the guide should function as a prompt rather than a rigid survey instrument: *“The point of a qualitative interview is to let the respondent tell their own story on their own terms”* (Harvard University, 2015) Accordingly, the guide was used flexibly, allowing for probing, follow-up questions, and the exploration of emergent themes while maintaining overall thematic focus. Questions were formulated to be open-ended, simple, and free of jargon, in line with recommendations that the best questions are those which elicit the longest answers from the respondent. Each interview concluded with a final opportunity for participants to add any further observations, providing closure and reinforcing a sense of empowerment and collaboration.

4.2 Observation Grid:

To assess the alignment between ISO 9001:2015 and IOSA, data collection relied on an integrated approach rather than a standalone observation grid. Specifically, each interview session was designed to serve two complementary functions. First, it gathered in-depth qualitative responses regarding participants' roles, responsibilities, and perceptions of ISO 9001 and IOSA compliance. Second, it provided an opportunity for real-time, contextual observation. During the interview, the researcher systematically noted the availability, accessibility, and apparent use of key organizational elements such as policies, process maps, performance indicators, corrective action logs, and training records either by direct visual inspection of the workspace or through documents that participants referenced or produced during the conversation. (Appendix E)

Figure 6: Observation Grid

Observation Grid

Objective: The objective of observing these elements in the context of integrating IOSA (IATA Operational Safety Audit) and ISO 9001:2015 is to assess the alignment, effectiveness, and maturity of your organization's management systems. These elements serve as observable indicators to evaluate how well the two standards are integrated and implemented in practice.

Observable Element:

Observable Element	Observable Element	Availability	Comments
Quality Management System Documentation	Quality policy document visible and accessible		
	Process maps posted or referenced		
	Organizational roles/responsibilities clearly defined		
Process Control	Evidence of process monitoring (logs, records)		
	Corrective action records visible/accessible		

Source: Developed by the Authors

4.3 Evaluation Grid:

To evaluate the similarity between IOSA and ISO 9001: 2015 as standards and also within the company, a comparative framework was developed based on Integrated Management Systems (IMS) literature (Bernardo, Maria Gianni, Katerina Gotzamani, & Alexandra Simon, 2017, pp. 121-133) and (Ching-Fu, , & Shu-Chuan, 2012, pp. 177-181).

IOSA the IATA Operational Safety Audit was selected as the primary framework of reference for this study for several reasons. First, it constitutes the internationally recognized baseline for operational safety and quality management in the airline industry, making it the natural anchor for any comparative analysis involving an airline operator. Second, IOSA's audit standards are structured around clearly defined operational chapters, each governed by specific Standards and Recommended Practices (SARPs), which lend themselves well to a clause-by-clause comparison with ISO 9001. Third, by positioning IOSA as the framework of reference, the study reflects the operational reality of the company under study, where IOSA compliance already represents an established organizational commitment.

(ISO, 2015) is therefore examined through the lens of IOSA assessing the extent to which its generic quality management principles can complement, reinforce, or be integrated into the existing IOSA-compliant structure.

Given the scope of this research and the operational focus of the company, the analysis is limited to Section 1 (Organization and Management System)

of the IOSA Standards Manual (ISM). This section governs the foundational management system requirements of an airline, including organizational structure, accountabilities, management commitment, documentation systems, and internal audit processes.

The specific sub-sections of ISM Section 1 – ORG ((IATA), International Air Transport Association, 2026) that will be used in this research are as follows:

Section 1 — Organization and Management System

Management and Control:

- Management System Overview
- Management Commitment
- Roles and Responsibilities
- Safety Performance
- Resource Management
- Outsourcing Management
- Emergency Response

Assurance, Monitoring and Documentation Control:

- Quality Assurance
- External Monitoring
- Product Control
- Data Management
- Documentation System
- Records System

Risk Management:

- Hazard Identification

- Risk Assessment and Mitigation
- Flight Data Analysis (FDA)
- Specific Risk Assessments
- Occurrence Handling
- Cybersecurity Risk Management

Improvement, Promotion and Training:

- Management Review
- Safety Communication
- Training

To quantitatively assess the degree of alignment between IOSA and ISO 9001 across the identified categories, an Integration Alignment Index was developed. This provides a standardized measure of alignment for each category, as well as an overall alignment score for the entire framework.

The assessment is based on the assignment of a score (from 1 to 3) to each IOSA requirement, reflecting its level of alignment with ISO 9001. When multiple ISO clauses correspond to a single IOSA requirement, they are considered collectively to determine a single overall alignment score.

Below is the evaluation scale:

Table 5: Evaluation Scale of IOSA and ISO 9001:2015 Requirements

Description	Coefficient
Not aligned	1
Partially aligned	2
Strong alignment	3

Source: Elaborated by the Authors based on the principles set out by (Bernardo, Maria Gianni, Katerina Gotzamani, & Alexandra Simon, 2017) and (Ching-Fu, , & Shu-Chuan, 2012)

The alignment score is calculated as the average of the scores assigned to its corresponding IOSA clauses, as follows:

$$\text{Category Alignment Score} = \frac{\sum \text{Clause Scores}}{\text{Number of Clauses}}$$


Finally, the overall alignment index is calculated as the average of the alignment scores across all categories, assuming equal weighting:


$$\text{Overall Alignment Index} = \frac{\sum \text{Category Scores}}{n}$$

where n represents the number of analytical categories.

This approach ensures a balanced evaluation by avoiding distortions caused by differences in the number of clauses within each category, while preserving the qualitative interpretation of alignment levels. (See Appendix F)

Figure 7 : Evaluation Frame-work based on IOSA and ISO 9001 v 2015 Requirements





Evaluation framework based on IOSA and ISO 9001:2015 requirements

Organization: Air Algerie

Evaluators: Sara Boumediene

Evaluation date: 08/ 04/2026

Category	Clause of the evaluation standard		Evaluation	Alignment	Total Score
	IOSA	ISO 9001v2015			
Management and Control					
ORG 1.1.1	The operator must establish a comprehensive and integrated management system that governs all organizational activities and ensures effective control of operations as well as safety and security outcomes. This system must be fully documented, clearly defining the structure, roles, responsibilities, and interactions across the organization, while ensuring regulatory compliance. It should function as a single, unified system (not siloed) and support	4.4.1 The organization shall establish, implement, maintain and continually improve a quality management system, including the processes needed and their interactions, in accordance with the requirements of this International Standard. The organization shall determine the processes needed for the quality management system and their application throughout the organization, and shall: a)determine the inputs required and the outputs expected from these processes; b)determine the sequence and interaction of these processes; c)determine and apply the criteria and methods (including monitoring, measurements and related performance indicators) needed to ensure the effective operation and control of these processes; d)determine the resources needed for these processes and ensure their availability;	2		

Source: Elaborated by the Authors

Conclusion:

In this Section, we presented the methodological approach adopted to conduct our study. We detailed the different techniques and qualitative data collection tools used,

and in the second section of this chapter, we explained how the data were triangulated, analyzed, and processed to strengthen the credibility of the obtained results. This rigorous methodological approach allows us now to address the final chapter, dedicated to the practical application of our study in the field.

CHAPTER 03: RESULTS AND DISCUSSION

This chapter aims to present and analyze the results derived from this study, conducted within the framework of examining the relationship of ISO 9001v 2015 and IOSA requirements within an airline's management system. It is structured into two complementary sections.

The first section is dedicated to the presentation of the results obtained through the comparative analysis of the two frameworks. It highlights the main areas of convergence and divergence between ISO 9001 v 2015 and IOSA. This analysis is followed by the development of a structured evaluation grid, enabling the identification of gaps and areas for improvement with a view to establishing an integrated management system.

The second section focuses on the discussion of the results. It aims to interpret the key findings, draw relevant insights, and formulate practical recommendations to support the effective integration of quality management and operational safety and security requirements. It also examines the potential impact of such integration on the organization's overall performance, particularly in terms of safety, security and customer satisfaction.

In this context, it is important to recall that the main objective of this study is to contribute to the implementation of an integrated management system capable of ensuring simultaneous compliance with both ISO 9001 and IOSA requirements, while enhancing the overall performance of the airline.

To achieve this objective, the study is guided by the following central research problem:

How can an airline certified under IOSA coordinate compliance with ISO 9001:2015 and IOSA requirements within an integrated management system, while ensuring alignment with applicable regulatory frameworks?

From this research problem, several sub-questions arise.

- To what extent can IOSA be considered a management framework comparable to ISO 9001?
- How does ISO 9001 support or complement IOSA requirements within an integrated system?

Section 01 : Presentation of Results

In this section, the results derived from the collected data are presented and analyzed in order to assess the level of alignment between ISO 9001:2015 and IOSA requirements. The analysis is based on a comparative approach supported by a structured evaluation grid, which enables the identification of similarities, differences, and gaps between the two frameworks. This section highlights the key areas of convergence and divergence and provides a clear diagnosis of the organization's current level of alignment with both standards. The findings also serve as a basis for identifying opportunities for integration and improvement within the existing management system.

1-The Regulatory Cascade of Civil Aviation Oversight: From ICAO Standards to Operational Implementation:

Figure 8: Institutional Framework of Civil Aviation Oversight



Source: Developed by the Authors

The diagram depicts the hierarchical and cascading nature of aviation regulatory governance, illustrating how normative requirements are progressively transposed across three distinct institutional levels: global, state, and operator. At the global level, the International Civil Aviation Organization (ICAO) establishes Standards and

Recommended Practices (SARPs) through its Annexes, with Annex 17 governing the Safety Management System (SMS) framework and Annex 19 governing the Security Management System (SeMS) framework, both aimed at ensuring the safe, orderly, and efficient development of international civil aviation. These international standards are subsequently incorporated into the national regulatory framework through ANAC (the National Civil Aviation Agency of Algeria), which functions as the state-level authority responsible for regulating, monitoring, and supervising civil aviation activities in accordance with both international obligations and domestic legislation; in this capacity, ANAC operationalizes the ICAO annexes into national programmes, namely the State Safety Programme (SSP) and the National Civil Aviation Security Programme (PNSAC). At the operator level, air carriers such as Air Algérie implement these national requirements through their own internal management systems, namely an SMS and a SeMS, thereby demonstrating the progressive transposition of international standards into operational practice. This multi-level governance structure, which underpins the alignment between international norms and organizational implementation, is illustrated in the diagram below.

2. Assessment of Alignment between ISO 9001:2015 and IOSA Requirements:

To analyze the data collected through the various techniques and instruments presented in the previous chapter, a triangulation approach was adopted. This triangulation is summarized in a table structured around four main analytical domains:

- **The first domain** focuses on the analysis of the management system in terms of governance and control, in order to evaluate its level of alignment with ISO 9001:2015 and IOSA requirements. It also provides an organizational perspective on how the management system operates, particularly regarding the structuring of responsibilities, process documentation, and operational control.
- **The second domain** examines the approach to risk and safety management, with the objective of assessing how the requirements of both standards are integrated into the identification, prevention, and control of operational risks.

- **The third domain** relates to the evaluation of quality assurance and performance monitoring systems, in order to determine the level of convergence between ISO 9001:2015 and IOSA in terms of control mechanisms, auditing practices, and continuous improvement processes.
- **The fourth domain** focuses on competencies, training, and internal communication, with the aim of evaluating how both frameworks address personnel development, knowledge management, and the dissemination of information within the organization.

3. Results of the Comparative Analysis:

After completing the evaluation of the selected IOSA ORG requirements, the level of alignment between ISO 9001:2015 and IOSA was calculated for each of the four analytical domains:

- ✓ Management and Control (ORG1),
- ✓ Assurance, Monitoring and Documentation (ORG2),
- ✓ Risk Management (ORG3),
- ✓ Improvement, Promotion and Training (ORG4).

To facilitate the interpretation of the results, alignment levels were expressed using a standardized score ranging from 1 to 3, where 1 indicates no alignment, 2 indicates partial alignment, and 3 indicates strong alignment.

For each domain, the alignment score was calculated as the average of the scores assigned to its corresponding IOSA clauses. This approach ensures that differences in the number of clauses per domain do not bias the results.

In order to obtain an overall alignment level, the average of the alignment scores across the four analytical domains was calculated. This approach assumes equal weight for each domain and provides a synthetic measure of the level of alignment between ISO 9001:2015 and IOSA requirements.

This calculation is based on the following formula:

$$\text{Overall Alignment Index} = \frac{\sum \text{Domain Scores}}{n}$$

The results of the comparative Analysis are summarized as follows:

Table 6: Summary of the Comparative Analysis

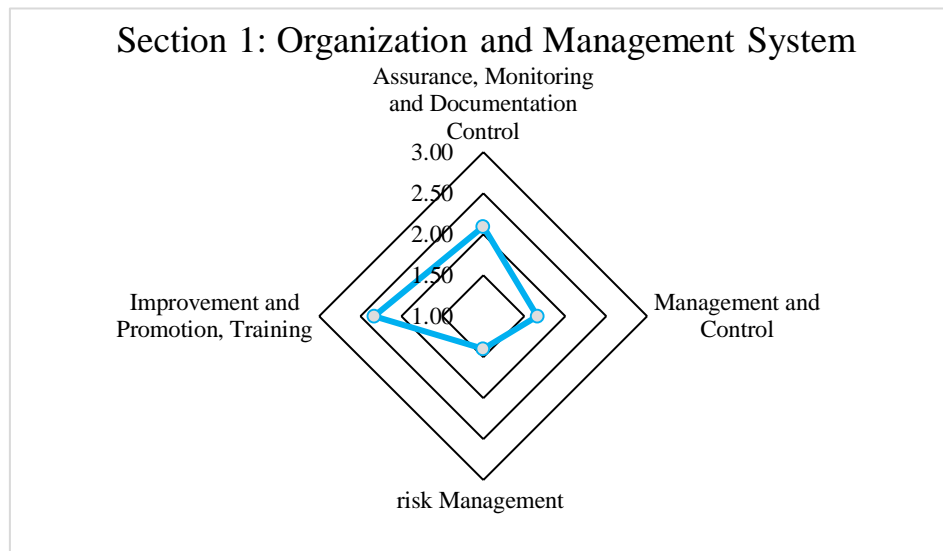
Clause	Domain	Description	Alignment Score (/3)
1	ORG1	Management and Control	1.66
2	ORG2	Assurance, Monitoring and Documentation Control	2.09
3	ORG3	Risk Management	1.4
4	ORG4	Improvement, Promotion and Training	2.33
		Overall Alignment Index	1.87

Source: Authors's elaboration based on the comparative analysis of IOSA and ISO 9001:2015 requirements

To improve the clarity and interpretation of the alignment results, they were presented using radar charts and analyzed accordingly.

3.1 Overall Alignment:

Figure 9: Radar Chart of Alignment Levels for Organization and Management system (Section1)



Source: Authors' elaboration based on the comparative analysis of IOSA and ISO 9001:2015 requirements

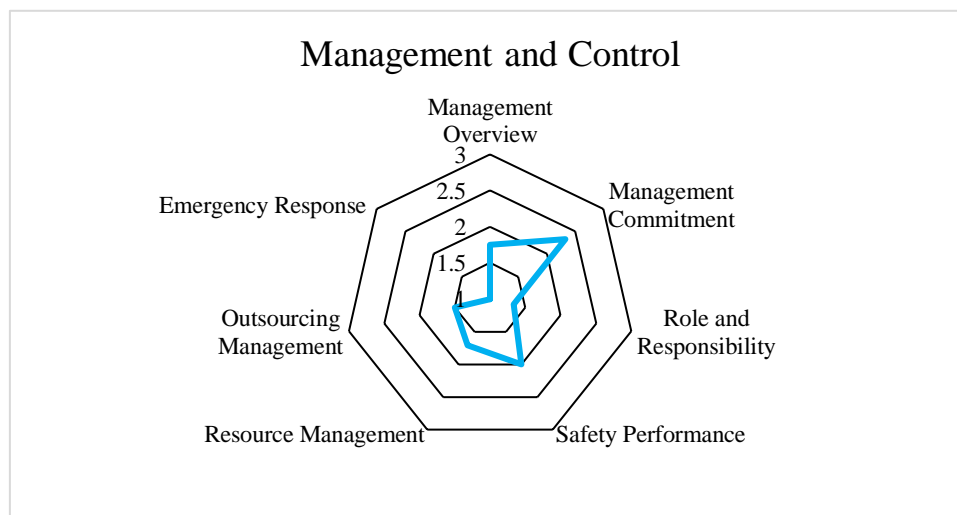
The radar chart illustrates the overall alignment profile between IOSA and ISO 9001:2015 across the four analytical domains. The results indicate an uneven distribution of alignment levels. The highest alignment is observed in Improvement, Promotion and Training (ORG4), with a score of 2.33, reflecting the strong convergence between the two frameworks in areas related to continuous improvement, management review, and competence development. Similarly, Assurance, Monitoring and Documentation (ORG2) shows relatively high alignment (2.09), due to the presence of structured audit, monitoring, and documentation requirements in both standards.

In contrast, Management and Control (ORG1) demonstrates a moderate level of alignment (1.66), highlighting differences in the structure and operational depth of management systems, particularly regarding safety-related responsibilities and organizational roles. The lowest alignment is observed in Risk Management (ORG3), with a score of 1.40, indicating a significant gap between the two frameworks. This is primarily due to the absence of a formal Safety Management System (SMS) and advanced risk management processes in ISO 9001, which are central to IOSA.

Overall, the alignment index of 1.87 out of 3 indicates a moderate level of compatibility between ISO 9001 and IOSA. While ISO 9001 provides a solid foundation for quality management and continuous improvement, it lacks several critical safety-oriented components required in the aviation context, particularly in risk management and operational safety control.

3.2 ORG 1-Management and Control:

Figure 10: Radar Chart of Alignment Levels For Management and Control (ORG1)



Source: Developed by the Authors based on the evaluation grid

The analysis of ORG 1 (Management and Control) reveals a heterogeneous level of alignment between IOSA and ISO 9001:2015, with significant variations across its subsections. While partial alignment is observed in management system structure and commitment, substantial gaps remain in safety-specific and operational requirements. In the area of management overview (ORG 1.1), both frameworks require the establishment of a structured and documented management system; however, IOSA goes further by explicitly integrating safety and security within a unified system, whereas ISO 9001 focuses primarily on quality management processes. Regarding management commitment (ORG 1.2), strong alignment is observed in policy definition and leadership involvement, but IOSA introduces additional requirements such as safety reporting systems and Just Culture principles, which are not addressed in ISO

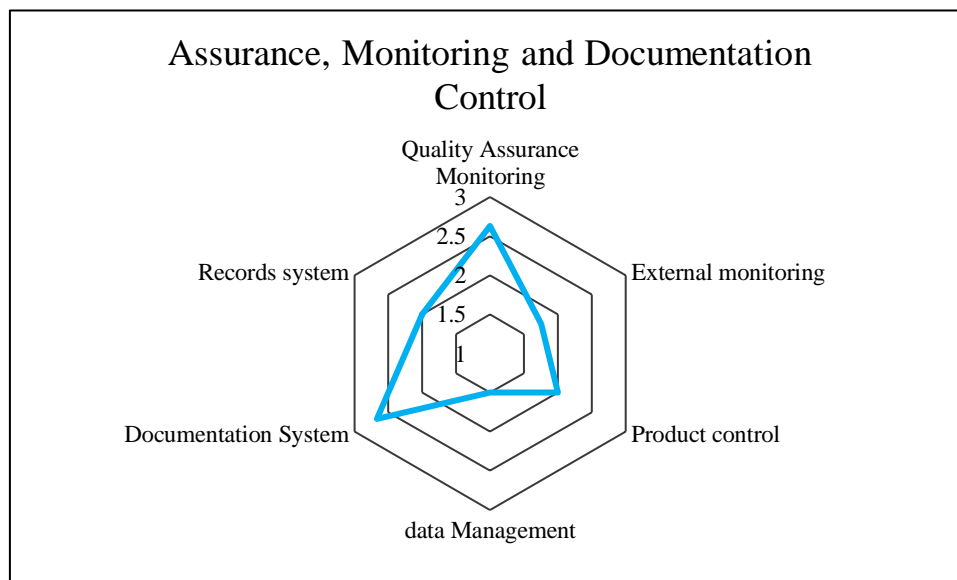
9001. In terms of roles and responsibilities (ORG 1.3), ISO 9001 requires the definition of responsibilities and authorities, but IOSA provides a more detailed and operationally focused framework, including the designation of an Accountable Executive and specific post holders responsible for safety-critical functions, as well as continuity and delegation mechanisms, which have no direct equivalent in ISO 9001.

The gap becomes more evident in safety performance (ORG 1.4), where partial alignment exists in the definition of objectives and performance monitoring; however, IOSA introduces structured safety performance indicators and targets directly linked to risk control, while ISO 9001 limits itself to general quality performance measurement. Similarly, in resource management (ORG 1.5), ISO 9001 addresses infrastructure, competence, and resources, but IOSA extends these requirements to include operational safety aspects such as fitness for duty, substance abuse policies, and safety-critical personnel selection, which are absent from ISO 9001. In outsourcing management (ORG 1.6), both frameworks require control over external providers, but IOSA imposes stricter and more explicit safety-related contractual and performance monitoring requirements, reflecting the operational risks of aviation activities. Finally, the most significant gap is observed in emergency response (ORG 1.7), where IOSA requires a comprehensive and structured emergency response plan, including coordination with external stakeholders, training, testing, and crisis management resources, while ISO 9001 does not address emergency response within its scope.

Overall, IOSA demonstrates a higher level of specificity and operational depth, particularly in safety management and risk-related processes. These elements represent a significant added value compared to ISO 9001, which remains focused on quality management principles without incorporating a formal Safety Management System (SMS). This explains the moderate overall alignment observed in ORG 1, as ISO 9001 lacks several critical components required for managing safety in an aviation context.

3.3 ORG 2-Assurance, Monitoring and Documentation Control :

Figure 11: Radar Chart of Alignment Levels for Assurance, Monitoring and Documentation Control (ORG2)



Source : Developed by the Authors based on the evaluation grid

The analysis of ORG 2 (Assurance, Monitoring and Documentation Control) reveals a relatively high level of alignment between IOSA and ISO 9001:2015, particularly in structured quality assurance and documentation processes, while notable gaps remain in safety-specific monitoring and data management practices. In the area of quality assurance and monitoring (ORG 2.1), strong alignment is observed, as both frameworks require the establishment of internal audit programs, defined audit criteria, corrective action processes, and auditor independence. However, IOSA introduces additional requirements related to aviation-specific oversight, such as the qualification and continuous evaluation of auditors, as well as the integration of safety considerations into audit activities, which are not explicitly addressed in ISO 9001.

In external monitoring (ORG 2.2), partial alignment exists, as ISO 9001 requires the control and evaluation of external providers; however, IOSA extends these requirements by incorporating continuous safety and security monitoring of partner operators, including audit processes for third-party airlines and compliance with ICAO standards. These safety-oriented monitoring mechanisms represent a significant addition beyond ISO 9001's quality-focused supplier control approach.

For product control (ORG 2.3), alignment remains moderate, as both standards require verification of externally provided products and services. Nevertheless, IOSA emphasizes safety-critical validation before operational use, reflecting a higher level of operational risk awareness.

In data management (ORG 2.4), alignment is limited, as ISO 9001 primarily requires the retention of documented information related to audits, while IOSA introduces advanced data-driven safety management practices, including hazard databases, incident reporting systems, and participation in industry-wide data sharing programs such as IATA's Incident Data Exchange (IDX). These elements demonstrate IOSA's focus on proactive safety analysis and benchmarking, which are absent from ISO 9001.

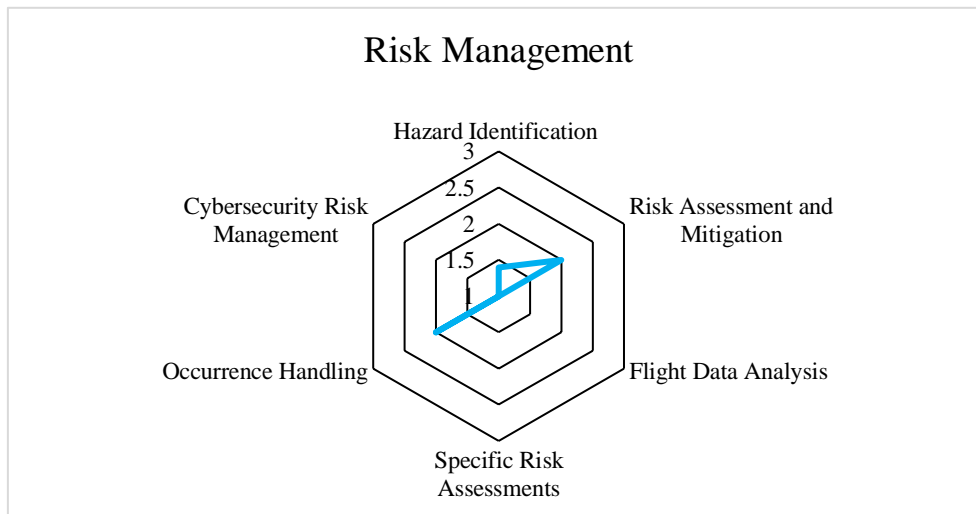
Similarly, in the documentation system (ORG 2.5), strong alignment is observed, as both frameworks require structured control of documented information, including creation, updating, and accessibility. However, IOSA adds a layer of integration by explicitly linking documentation to the Safety Management System (SMS), ensuring that safety policies, procedures, and responsibilities are formally documented and operationally embedded.

Finally, in the records system (ORG 2.6), partial alignment is identified, as both standards require record control, retention, and accessibility. Nevertheless, IOSA introduces additional requirements related to operational records, safety traceability, and data protection mechanisms, including backup systems and regulatory compliance considerations.

Overall, IOSA demonstrates a more comprehensive and operationally oriented approach, particularly in integrating safety assurance, continuous monitoring, and data-driven decision-making processes. These elements constitute a significant added value compared to ISO 9001, which remains primarily focused on quality assurance and conformity. This explains the relatively high but not complete alignment observed in ORG 2, with an overall score of approximately 2.09.

3.4 ORG 3-Risk Management :

Figure 12: Radar Chart of Alignment levels for Risk Management (ORG3)



Source : Developed by the Authors based on the evaluation grid

The analysis of ORG 3 (Risk Management) reveals the lowest level of alignment between IOSA and ISO 9001:2015, as illustrated by the radar chart, which shows a concentration of scores close to the minimum value. This indicates a significant divergence between the two frameworks, particularly in safety risk management practices. In hazard identification (ORG 3.1), only partial alignment is observed, as ISO 9001 addresses risks and opportunities in a general manner, without requiring a structured and integrated hazard identification system. In contrast, IOSA mandates both proactive and reactive hazard identification processes, including reporting systems, human factors considerations, and operational data collection, which go far beyond ISO 9001 requirements.

In risk assessment and mitigation (ORG 3.2), moderate alignment exists, as both frameworks require risk evaluation and the implementation of corrective actions. However, IOSA adopts a more structured and operational approach, requiring risk analysis based on likelihood and severity, as well as continuous monitoring of mitigation effectiveness, which is not explicitly defined in ISO 9001.

The divergence becomes particularly significant in flight data analysis (ORG 3.3) and specific risk assessments (ORG 3.4), where no alignment is observed. IOSA requires

the implementation of advanced safety tools such as flight data monitoring programs, predictive risk analysis, and detailed operational risk assessments, which are entirely absent from ISO 9001. Similarly, in cybersecurity risk management (ORG 3.6), IOSA introduces risk-based protection of critical operational systems, whereas ISO 9001 does not explicitly address cybersecurity risks within its framework.

In occurrence handling (ORG 3.5), partial alignment is identified, as ISO 9001 requires corrective actions for nonconformities; however, IOSA extends this requirement to include structured investigation of incidents and accidents, regulatory reporting, and proactive identification of safety threats.

Overall, IOSA demonstrates a significantly higher level of maturity and specificity in risk management, integrating a comprehensive Safety Management System (SMS) that includes hazard identification, predictive analysis, operational data monitoring, and safety-driven decision-making. In contrast, ISO 9001 adopts a generic and high-level approach to risk, focused primarily on quality assurance rather than operational safety. This fundamental difference explains the low overall alignment score of ORG 3 (1.40), highlighting a major gap between the two frameworks.

3.5 ORG 4- Improvement and Promotion, Training :

Figure 13: Radar Chart for Alignment Levels for Improvement and Promotion, Training



Source : Developed by the Authors based on the evaluation grid

The analysis of ORG 4 (Improvement, Promotion and Training) reveals the highest level of alignment between IOSA and ISO 9001:2015 among the four domains. The radar chart illustrates a strong convergence in management review processes, with a maximum score of 3, indicating full alignment. Both frameworks require periodic evaluation of the management system to ensure its effectiveness, adequacy, and continuous improvement. ISO 9001 provides a structured approach to management review, including defined inputs and outputs related to performance, resources, and improvement opportunities, which closely correspond to IOSA requirements integrating safety and operational considerations.

In contrast, communication (ORG 4.2) shows moderate alignment, with a score of 2. While ISO 9001 establishes requirements for internal and external communication processes, IOSA places greater emphasis on the dissemination of safety-critical information and the promotion of safety awareness across all operational levels, including external service providers. This reflects IOSA's stronger focus on operational safety communication within the Safety Management System (SMS).

Similarly, training (ORG 4.3) demonstrates partial alignment. ISO 9001 requires organizations to ensure personnel competence and awareness through training and documented evidence. However, IOSA extends these requirements by mandating structured training programs specifically dedicated to safety management, tailored to personnel roles and responsibilities, and including external providers. This ensures a consistent understanding of safety responsibilities across the organization, which is not explicitly required in ISO 9001.

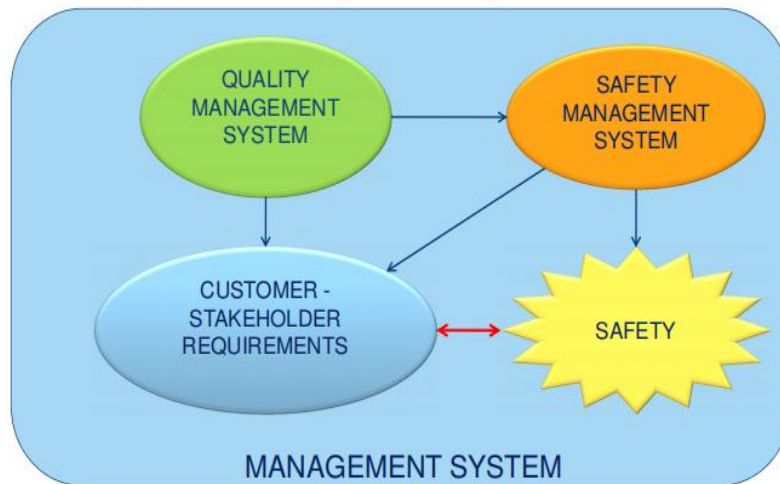
Overall, the radar chart highlights a strong alignment in strategic management and continuous improvement processes, contrasted with moderate alignment in communication and training. This confirms that while ISO 9001 provides a solid foundation for improvement and competence management, IOSA introduces additional safety-oriented requirements that enhance operational effectiveness in the aviation context.

4. Approach to the Integration of ISO 9001 and IOSA Requirements:

According to IATA guidance, Quality Management Systems (QMS) and Safety Management Systems (SMS) are distinct but highly complementary components of aviation management. QMS primarily aims to standardize processes and ensure compliance with customer and regulatory requirements, while SMS focuses on identifying hazards, assessing risks, and maintaining an acceptable level of safety performance. Despite their different objectives, both systems rely on similar mechanisms, including process-based approaches, monitoring, audits, and continuous improvement. IATA emphasizes that safety and quality management must therefore “work closely together” and be embedded within a single organizational management system.

In this perspective, integration does not consist of merging the two systems into one, but rather in ensuring their coordination within an Integrated Management System (IMS). This involves aligning documentation, harmonizing audit processes, and facilitating information sharing between quality and safety functions, while maintaining the specificity of each domain. In the case of Air Algérie, this integration is partially achieved through a unified documentation system; however, operational gaps remain, particularly in audit duplication and performance monitoring. Therefore, the improvement of the system should focus on reducing redundancies, simplifying performance indicators, and strengthening coordination between quality, safety, and security functions, rather than restructuring the entire system.

Figure 14: Integration of Quality and Safety Management Systems within an integrated Management Framework



Source: IATA (Training Material), adapted by the authors

The main elements of comparison and integration between QMS and SMS are summarized in the table below:

Table 7: Comparative Analysis of QMS and SMS and their integration within an integrated Management System

Aspect	QMS (ISO 9001)	SMS (IOSA / Aviation)	Integration Approach
Objective	Customer satisfaction, compliance	Safety, risk control	Align objectives within one system
Focus	Processes and performance	Hazards and risks	Keep both perspectives

Source: Developed by the Authors

Based on the principles outlined above, the integration of Quality Management Systems and Safety Management Systems requires a structured and progressive approach adapted to the organizational context.

The comparative diagnostic analysis conducted in this study, based on the evaluation grid and supported by interviews and field observations, made it possible to identify the

main areas of convergence and divergence between IOSA and ISO 9001:2015 requirements. This combined approach provided both a structured assessment of alignment and a practical understanding of how the systems operate within Air Algérie.

The results indicate that, although certain elements of integration are already established (particularly at the documentation level) several operational challenges remain. These include the duplication of audit processes, the complexity and overload associated with performance indicators, and the imbalance between safety and quality practices. Furthermore, the limited consideration of the security dimension highlights a gap in the overall evaluation and reinforces the need for a more comprehensive approach.

Consequently, it becomes necessary to move from this comparative diagnostic to a set of concrete and operational actions. The following section presents the proposed action plan aimed at improving the coordination, efficiency, and overall performance of the integrated management system within Air Algérie.

5. Recommendation:

Based on the comparative diagnostic analysis, a set of improvement actions is proposed to enhance the integration between quality, safety, and security management systems within Air Algérie.

Table 8: Proposed Action Plan for the Integration of Management Systems

Axis	Identified Issue	Proposed Action	Expected Outcome
Documentation System	Documentation already integrated but lacks clarity between quality, safety, and security processes	Improve cross and referencing structure of procedures	Better usability and system coherence

Audit Processes	Duplication of audits (quality and safety conducted separately)	Implement an integrated audit program and harmonize checklists	Reduced workload and improved efficiency
Performance Monitoring (KPIs)	Excessive number of quality KPIs and limited integration with safety indicators	Reduce KPIs and develop a unified dashboard	Improved decision-making and reduced complexity
Risk Management	Strong safety risk system vs weak quality risk approach	Maintain separate systems but improve coordination between teams	Better consistency and information sharing
Security Dimension	Security not included in evaluation and weakly integrated in system monitoring	Integrate security into audits and performance indicators	More comprehensive management system
Human Resources	High workload for quality team due to KPI monitoring and reporting	Introduce automation tools and optimize workload distribution	Increased efficiency and sustainability

Source: Developed by the Authors

Section 02: Discussion of Results

Within the framework of this study, the research was conducted at Air Algérie, the national airline of Algeria and a key actor in both domestic and international air transport. The organization operates in a highly regulated environment, governed by international and national civil aviation standards, including those established by the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), and the National Civil Aviation Authority (ANAC).

The internship was carried out within the Compliance Monitoring Directorate, which plays a central role in ensuring the organization's conformity with regulatory and operational requirements. This directorate is responsible for overseeing the implementation and continuous improvement of the Quality Management System, the Safety Management System, and the Security Management System, ensuring that all operational activities comply with applicable standards and best practices.

This organizational positioning provided direct exposure to both strategic and operational aspects of management system implementation, enabling a comprehensive analysis of the interaction between ISO 9001:2015 and IOSA requirements. It also facilitated access to relevant data through document analysis, internal reports, and discussion.

The results obtained from the comparative analysis reveal a moderate level of alignment (1.87/3) between ISO 9001:2015 and IOSA requirements, with significant variations across the four analytical domains. These findings are consistent with the literature, which highlights both the complementarity and structural differences between quality management systems and aviation-specific safety frameworks.

First, the relatively high alignment observed in ORG4 (Improvement, Promotion and Training) and ORG2 (Assurance, Monitoring and Documentation Control) confirms the strong convergence between ISO 9001 and IOSA in areas related to continuous improvement, auditing, and documentation control. This result aligns with the findings of (Kugusheva, 2019) who emphasizes that both frameworks share common principles such as internal audits, documentation control, and continuous improvement. Similarly, (Deb, 2007) argues that IOSA incorporates quality management principles derived from ISO 9001, particularly in areas related to process control and performance

monitoring. This explains the strong alignment observed in management review processes and quality assurance mechanisms in the present study.

Moreover, the importance of structured quality systems highlighted in this research is supported by studies such as (Gasimov & V. Ye. Miltsov, 2019, pp. 109-120) which demonstrate that ISO 9001 enhances operational efficiency, regulatory compliance, and interdepartmental coordination in aviation organizations. This reinforces the idea that ISO 9001 provides a solid foundation for organizational structuring, particularly in documentation and performance evaluation processes, as reflected in the results of ORG2.

However, the moderate alignment observed in ORG1 (Management and Control) highlights important structural differences between the two frameworks. While both ISO 9001 and IOSA emphasize leadership commitment and the establishment of a management system, IOSA introduces additional safety-specific requirements such as the designation of accountable executives and safety reporting systems. This finding is consistent with (Karanikas, 2014) who argues that quality management and safety management systems share common foundations but differ in their operational focus. While QMS emphasizes customer satisfaction and process efficiency, safety systems prioritize hazard identification and operational risk control.

The most significant divergence is observed in ORG3 (Risk Management), which recorded the lowest alignment score (1.40). This result clearly reflects the fundamental difference between ISO 9001 and IOSA in terms of risk management maturity. While ISO 9001 adopts a general approach based on risks and opportunities, IOSA requires a comprehensive Safety Management System (SMS) including hazard identification, risk assessment, flight data analysis, and occurrence investigation. This gap is strongly supported by the literature. For instance, (Stroeve, Job Smeltink, , & Barry Kirwan, 2022) emphasize that effective safety management requires structured and proactive risk assessment tools, while (RAT, 2019) demonstrates that airlines implementing SMS and IOSA requirements achieve better safety performance outcomes. Furthermore (Krstic, Slobodan Gvozdenovic, & Petar Miroslavjevic, 2022) highlight the importance of compliance monitoring and data-driven safety analysis in improving risk control and decision-making, elements that are largely absent from ISO 9001.

These findings also confirm the argument advanced in several studies that ISO 9001 alone is insufficient to manage aviation safety risks. As noted by (Adekitan, 2020) neither QMS nor SMS alone is adequate, and an integrated system combining both approaches is necessary to ensure effective risk management and operational performance. This supports the results of the present study, which highlight the need for integration, particularly in risk management processes.

From a broader perspective, the results confirm that IOSA represents a more operational and safety-oriented framework, while ISO 9001 provides a generic and strategic management structure. This distinction is also emphasized by (Gasymov, 2021, pp. 13-26) who argues that integrating safety, security, and quality systems into a unified management system improves efficiency, coordination, and overall organizational performance.

Finally, the overall moderate alignment index observed in this study supports the conclusion drawn in the literature review synthesis, which highlights the lack of empirical studies addressing the practical integration of ISO 9001 and IOSA.

This study therefore contributes to filling this gap by providing a structured comparative analysis and identifying specific areas of convergence and divergence between the two frameworks.

CONCLUSION

The aviation industry operates within a highly complex and regulated environment, where airlines must comply with multiple international and national frameworks, including IOSA, ISO 9001:2015, requirements established by the International Civil Aviation Organization, and oversight from national authorities such as the National Civil Aviation Agency. In this context, the integration of quality, safety, and security management systems has become essential to ensure operational efficiency, regulatory compliance, and a high level of safety and service quality.

This study aimed to analyze the interaction between IOSA requirements and ISO 9001:2015 within the management system of Air Algérie, in order to explore how these frameworks can coexist within a single integrated management system. More specifically, it sought to answer the following research question:

How can an airline certified under IOSA coordinate compliance with ISO 9001:2015 and IOSA requirements within an integrated management system, while ensuring alignment with applicable regulatory frameworks?

To address this issue, a qualitative case study approach was adopted, combining documentary analysis, semi-structured interviews, field observations, and the development of a comparative evaluation grid. This methodology enabled a structured and comprehensive assessment of the level of alignment between IOSA and ISO 9001 requirements, while also capturing the practical realities of system implementation within the organization.

The results revealed a moderate level of alignment (1.87/3) between the two frameworks. Strong convergence was identified in areas such as documentation control, continuous improvement, and audit processes, whereas more significant gaps were observed in risk management and governance-related aspects. These differences are mainly explained by the nature of IOSA, which is operational and safety-oriented, incorporating a structured Safety Management System, compared to ISO 9001, which adopts a broader and more generic process-based management approach.

The analysis also showed that Air Algérie has already initiated elements of integration, particularly through a unified documentation system. However, several operational challenges persist, including the duplication of audit processes, the complexity and fragmentation of performance monitoring systems, and the imbalance between safety

and quality practices. In addition, the absence of the security dimension from the evaluation highlights a limitation in the current assessment and points to the need for a more comprehensive integration approach.

In response to the research question, the findings demonstrate that compliance with IOSA, ISO 9001:2015, and other regulatory frameworks cannot be achieved through the coexistence of independent or fully merged systems. Instead, it requires the implementation of a coordinated integrated management approach, where quality, safety, and security systems remain distinct in their functions but are aligned through shared mechanisms. IOSA and ISO 9001 interact in a complementary manner: IOSA provides a detailed operational and safety framework, while ISO 9001 supports it through structured management practices such as process standardization, documentation control, and continuous improvement. Therefore, IOSA cannot be considered equivalent to ISO 9001, but ISO 9001 clearly complements and reinforces IOSA requirements. The integration of these frameworks relies on practical coordination mechanisms, including integrated audits, harmonized performance indicators, shared documentation systems, and strengthened communication between organizational functions.

Based on these findings, a structured action plan was proposed, focusing on optimizing existing practices rather than creating new systems. The key recommendations include reducing duplication in audit activities, simplifying and integrating performance monitoring systems, improving coordination between quality, safety, and security functions, and progressively incorporating the security dimension into the management system.

Despite its contributions, this study presents certain limitations. The analysis was restricted to the ORG section of IOSA, which limits the generalization of the findings to other operational areas. In addition, the exclusion of the security system from the evaluation grid reduces the overall scope of the assessment. Finally, the scoring approach used to evaluate alignment involves a degree of subjectivity, although it was supported by data triangulation through interviews and observations.

This research opens perspectives for further studies. Future work could extend the analysis to other IOSA sections and explore in greater depth the integration of

requirements established by the International Civil Aviation Organization, particularly in relation to Safety Management Systems and Security Management Systems. Additionally, further research could examine the interaction between quality, safety, and security systems within a broader operational framework, including their relationship with organizational performance mechanisms such as the Performance Improvement Program.

In conclusion, this study demonstrates that IOSA and ISO 9001:2015 are not interchangeable but are fundamentally complementary. Their effective coordination within an integrated management system represents a key lever for enhancing organizational performance, ensuring regulatory compliance, and strengthening safety and quality management in the aviation sector.

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<https://pbs.twimg.com/media/ERzBebaWsAA-59r.jpg>

HLS – High Level Structure for management system standards:

<https://www.qualitiso.com/en/hls-high-level-structure/>

APPENDICES

ANNEX A : Quality Policy

POLITIQUE QUALITÉ

Satisfaire nos clients, les fidéliser et pérenniser notre savoir-faire.

La réussite et la pérennité de notre Entreprise sont tributaires de la confiance que nos passagers nous accordent, de notre capacité à les écouter, à les comprendre et à répondre à leurs attentes et exigences de plus en plus croissantes.

C'est pourquoi, nous nous engageons à aller au-delà des attentes de nos passagers, en leur offrant des services conformes à leurs exigences et dans le strict respect des normes et réglementations Nationales et Internationales applicables dans l'industrie du transport Aérien.

Ainsi, pour accroître la satisfaction de nos passagers, notre défi aujourd'hui est d'améliorer :

- ◆ **La ponctualité de nos vols,**
- ◆ **La communication avec nos clients et parties intéressées,**
- ◆ **Le confort à bord de nos appareils,**
- ◆ **Le professionnalisme de notre personnel, pour un accueil, une orientation, et un service des plus irréprochables.**

À ce titre, et en vue d'améliorer nos performances en adaptant en permanence notre savoir-faire, AIR ALGERIE a mis en place et certifié un Système de Management de la Qualité selon le référentiel : ISO 9001-2015.

De par cette déclaration, En ma qualité de premier responsable d'AIR ALGERIE

Je m'engage à fournir toutes les ressources nécessaires à la mise en œuvre complète et effective de cette politique, au bon fonctionnement de notre Système de Management de la Qualité et à son amélioration continue.

J'invite l'encadrement et l'ensemble du personnel d'AIR ALGERIE, à conjuguer leurs efforts et s'impliquer pour faire face aux défis, atteindre les objectifs arrêtés et garantir ainsi la satisfaction de notre clientèle, source de notre pérennité.


بن حمودة حمزة
الرئيس المدير العام

APPENDIX B: Safety Policy



POLITIQUE DE SÉCURITÉ

En ma qualité de Président Directeur Général, je reconnais que la sécurité constitue une priorité fondamentale et une condition indispensable à l'atteinte de nos objectifs stratégiques.

Nous nous engageons à respecter l'ensemble des exigences légales, réglementaires et normes internationales applicables, tout en visant l'adoption des meilleures pratiques reconnues et l'excellence opérationnelle. En ce sens, la sécurité constitue une responsabilité fondamentale pour l'ensemble des cadres et du personnel, et fera l'objet d'une intégration systématique et d'une amélioration continue des performances de sécurité dans toutes nos activités.

Nous nous engageons à :

- Développer et ancrer dans toutes nos activités une culture positive de la sécurité, fondée sur une gestion efficace et concrète de la sécurité.
- Mettre en œuvre les principes de la culture juste et équitable, favorisant les retours d'expérience sur les événements quotidiens.
- Encourager et soutenir le signalement volontaire, qu'il soit anonyme ou nominatif, des erreurs, événements, incidents ou situations dangereuses, dans le cadre d'une culture de rapports non punitifs.
- Garantir l'absence de sanctions, sauf en cas d'acte illégal, illicite, de négligence grave ou de violation délibérée des règles établies, tout en assurant une communication claire au personnel concernant la politique disciplinaire en vigueur.
- Assurer la protection des données de sécurité, des informations sensibles et des personnes ayant signalé les dangers, en garantissant la confidentialité et la désidentification des rapports.
- Veiller à ce que le personnel soit, formé, compétent en matière de sécurité, possède les compétences requises et exerce des fonctions adaptées à son niveau de compétence.
- Définir clairement pour l'ensemble du personnel leurs responsabilités et obligations en matière de sécurité.
- Veiller à ce que le personnel reçoive des informations adéquates et pertinentes en matière de sécurité.
- Établir des objectifs et indicateurs de performance réalistes en matière de sécurité, en assurer le suivi régulier et l'évaluation continue par la haute direction.
- Veiller à ce que les systèmes et services fournis par des tiers pour soutenir nos opérations respectent nos normes de performance en matière de sécurité.
- Allouer les ressources humaines et matérielles nécessaires à l'atteinte du plus haut niveau de performance en matière de sécurité des services, et assurer la mise en œuvre efficace des stratégies et processus de sécurité.
- Mettre en place et maintenir des processus efficaces d'identification des dangers et de gestion des risques, incluant un système de compte rendu des dangers, en vue d'éliminer ou de réduire les risques pour la sécurité liés à nos opérations.
- Procéder à l'analyse et à l'enquête de tous les rapports et événements liés à la sécurité afin de garantir la mise en œuvre et le suivi d'actions correctives et préventives efficaces.
- Réviser cette politique périodiquement afin d'en garantir la pertinence et l'efficacité continues.

بن حمودة

المدير العام



APPENDIX C: Security Policy



POLITIQUE DE SURETE

«La Sûreté, un engagement et une responsabilité de chacun»

La sûreté est un axe incontournable sur lequel, Air Algérie travaille sans cesse, et qui représente une priorité opérationnelle fondamentale dont la finalité consiste à éviter l'occurrence d'acte illicite visant son exploitation, ses avions, ses installations, ses personnels, ses clients ainsi que le fret transporté. Il est donc indispensable de connaître au mieux les risques en matière de sûreté et de les évaluer pour mettre en œuvre les mesures permettant de prévenir les actes malveillants et illicites, et le cas échéant de traiter les menaces pouvant impacter la compagnie.

La pérennité et la performance de notre système de management de la sûreté se mesurera dans notre capacité à atteindre les objectifs suivants :

- Se conformer aux lois, réglementations nationales/internationales applicables, aux procédures de l'Entreprise et aussi à celles des pays desservis et adopter les meilleures pratiques en matière de gestion de la sûreté,
- Prévenir les situations dangereuses par une évaluation permanente du dispositif de surveillance en matière de sûreté en veillant à l'application des mesures appropriées d'atténuation du risque,
- Evaluer et améliorer de façon continue le système de gestion de la sûreté SeMS afin d'assurer la supervision et le contrôle des fonctions et des activités associées aux normes de sûreté d'Air Algérie et aux exigences du programme national de sûreté de l'aviation ainsi que celles des Etats concernés.

Pour ce faire, nous nous engageons à :

- Fixer des objectifs et des normes de performance en matière de sûreté ;
- Allouer toutes les ressources nécessaires, humaines et matérielles à l'effet d'assurer la sûreté des activités opérationnelles ;
- Promouvoir une culture de sûreté basée sur le professionnalisme, la formation continue et l'information ciblée, le Reporting et au rôle qu'il joue en matière de prévention des risques ainsi que la sensibilisation de l'ensemble du personnel et à leurs responsabilités individuelles et collectives dans la mise en œuvre et le respect des règles de sûreté, tout en garantissant la confidentialité ;
- Encourager le retour d'expérience et la remontée d'une information efficace et opportune tout en assurant l'efficacité du processus de communication qui permet la libre circulation de l'information en toute sécurité ;
- Veiller à ce que la sûreté opérationnelle et la prévention aux risques liés à la cyber menace soient inclus dans la répartition des tâches et des responsabilités des cadres , du personnel comme une fonction impérative ;
- Privilégier dans le choix de nos sous-traitants leurs capacités à répondre aux exigences de la compagnie en matière de sûreté, tout en assurant une surveillance des services fournis par ces derniers ;
- Mettre à jour périodiquement la politique de sûreté afin de garantir sa pertinence et son adéquation avec les évolutions réglementaires et les changements organisationnels opérés dans nos métiers ;
- Assurer des évaluations des risques et des mesures adaptées pour leur maîtrise en définissant des objectifs de progrès, tout en assurant les contrôles et la surveillance associée.

Une revue de Direction en interne de notre SeMS est organisée au minimum une fois dans l'année afin d'évaluer sa mise en œuvre et apporter les améliorations continues et nécessaires au système de gestion de la sûreté.

Le respect de cette politique est obligatoire pour l'ensemble de l'encadrement et du personnel de l'Entreprise, ainsi que pour nos partenaires et sous-traitants.

بن حمودة حمزة
الرئيس المدير العام

APPENDIX D : Interview Guide

	Function/ Name	Questions	Chap ISO 9001	Sec IOSA	
Directorate for QMS Oversight	S.Deputy Director of Compliance, Responsible for QMS Oversight	Can you describe your main responsibilities related to the QMS?	7.1 7.2	1.5.2 1.5.3 1.5.4	
		How do you ensure the implementation of ISO 9001 requirements in your activities?	6.1 9.3 10.3	4.1.1 4.1.2 4.1.3	
		How do you ensure compliance with IOSA requirements?		1.3.1 1.3.2 1.3.3	
		How do you supervise the management of non-conformities?	5.3 6.3 7.4	1.2.1 1.2.3	
	Ham. Deputy Directorate of Audit and Inspection	What actions do you implement to support continuous improvement?	5.2 7.3	1.2.1 1.2.3	
		How are quality audits organized, in your opinion?		1.2.1 1.2.3	
		Should the safety and security processes be integrated into the process mapping?		1.2.1 1.2.3	
	Directorate for QMS Oversight	Ham. Deputy Directorate of Audit and Inspection	Can you explain the internal audit process within the organization?	9.1 9.2 10.2	2.1.1 to 2.1.7
			What types of audits (ISO 9001, IOSA, others) do you conduct?	8.4	1.6.1 1.6.2
			How do you plan quality and safety audits?	8.4 9.1 9.2	2.2.1 to 2.2.4
Directorate for QMS Oversight	T. Deputy Directorate of Study, Analysis, and Improvement	How do you coordinate audits and follow-up of corrective actions?	6.1 9.3 10.3	4.1.1 4.1.2 4.1.3	
		What are the main difficulties encountered during audits?			

	Li. Quality Promotion Department	How do you raise staff awareness of quality requirements? How often do you conduct training or awareness activities? What training and communication programs do you implement? How do you develop a quality culture within the organization?	7.2 7.3	Org 4.3.1 4.3.2
			5.2.2 7.4	4.2.1
Directorate of SMS Oversight	A. Deputy Director of Safety, Responsible for SMS Oversight	Can you describe your role in the Safety Management System (SMS)? How do you ensure compliance with IOSA requirements? Have you been audited under ISO 9001?	7.1 7.2	1.5.2 1.5.3 1.5.4
			6.1 9.3 10.3	4.1.1 4.1.2 4.1.3
			5.3 6.3 7.4	1.3.1 1.3.2 1.3.3
			5.2 7.3	1.2.1 1.2.3
	Ha. Deputy Directorate of Risk Management and Safety Assurance	How do you identify and assess risks related to your activities? How do you ensure incident monitoring and implementation of corrective actions? How do you guarantee safety assurance?	Org 2.4.1 2.4.2	6.1 7.5 10.3
	M. Head of Safety Promotion Department	Can you describe your activities to promote safety culture? What IOSA and ANAC requirements do you apply? How do you ensure alignment of the SMS with IOSA? Do you think it is more effective to promote safety, quality, and security together?	7.2 7.3	Org 4.3.1 4.3.2
			5.2.2 7.4	4.2.1
Directorate of Documentation (QMS/SMS/SMES)	H. Head of Documentation Department for SMS, QMS and SMES	How do you manage documentation related to QMS, SMS, and SMES? How do you ensure document updates and document control? How do you harmonize ISO 9001 and IOSA requirements in document management?	7.5	ORG 2.5.1 2.5.3 2.5.4

		What difficulties do you encounter in this area?		
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APPENDIX E: Observation Grid

Observation Grid

Objective: The objective of observing these elements in the context of integrating IOSA (IATA Operational Safety Audit) and ISO 9001:2015 is to assess the alignment, effectiveness, and maturity of your organization's management systems. These elements serve as observable indicators to evaluate how well the two standards are integrated and implemented in practice.

Observable Element:

Observable Element	Observable Element	Availability	Comments
Management System Documentation	The Policies are visible and accessible	Yes	Quality policy posted in main office, break room, and production areas; digital version maintained on shared server; 9 of 10 interviewed employees confirmed awareness
	Process maps posted or referenced	Yes	Process flowcharts displayed in production, quality, and administrative departments; employees spontaneously referenced maps during interviews; maps show detailed step-by-step procedures
	Organizational roles/responsibilities clearly defined	Partial	Organization chart displayed but reporting lines unclear due to frequent restructuring; 5 of 10 employees expressed confusion about decision-making authority; new employees (last 6 months) particularly uncertain
Process Control	Evidence of process monitoring (logs, records)	No	Some processus are old and needs updating
	Corrective action records visible/accessible	Yes	Corrective action register maintained in quality file system; review of Jan-Mar 2024 shows 12 documented actions; 10 of 12 show documented follow-up and closure

Staff Awareness	Awareness sessions/ communications visible	Partial	The safety department is better organized than the quality department when it comes to awareness spreading because the scope is different.
	Staff understand their role in compliance	Partial	Some employees are unfamiliar with the Quality and Safety policy unless directly linked to department increases understanding
Document Management	Document control system in use (physical/digital)	Yes	Digital document management system implemented; version control evident on sample documents reviewed; obsolete documents properly archived; current documents current
Infrastructure & Resources	Work environment conducive to quality (clean, organized)	Partial	lacks adequate workspace; new employees report difficulty locating necessary equipment and resources
Performance Monitoring	Audit records accessible	Yes	Internal audits conducted quarterly and corrective actions are implemented and verified
	Key Performance Indicators (KPIs) displayed	Yes	KPI board displayed in main office, updated monthly;

APPENDIX F : Evaluation Grid



Evaluation framework based on IOSA and ISO 9001:2015 requirements

Organization: Air Algeria

Evaluators: Sara Boumediene

Evaluation date: 08/ 04/2026

Category	Clause of the evaluation standard		Evaluation	Alignment	Total Score	
	IOSA	ISO 9001v2015				
Management and Control						
Management Overview	ORG 1.1.1	The operator must establish a comprehensive and integrated management system that governs all organizational activities and ensures effective control of operations as well as safety and security outcomes. This system must be fully documented, clearly defining the structure, roles, responsibilities, and interactions across the organization, while ensuring regulatory compliance. It should function as a single, unified system (not siloed) and support continuous improvement, evolving toward the integration of multiple management systems and a process-based, efficiency-driven approach.	4.4	2	1.75	1.66
			4.4.1 – Quality Management System (QMS) The organization is required to set up, apply, maintain, and continuously enhance a quality management system that includes all necessary processes and how they work together. It must identify these processes and ensure they are used throughout the organization by: Defining the required inputs and expected outputs Establishing the order and relationships between processes Setting criteria and methods (such as monitoring and measurement) to ensure processes are effective and controlled Providing the necessary resources and making sure they are available Assigning clear roles, responsibilities, and authorities Considering risks and opportunities in line with clause 6.1 Reviewing processes and making adjustments when needed to achieve intended results Continuously improving both the processes and the overall system			
			4.4.2 – Documented Information As needed, the organization must: Keep documented information to support how processes operate			

				Retain records as evidence that processes are performed as planned			
	ORG 1.1.2	The operator must appoint an Accountable Executive (AE) at senior management level who has ultimate responsibility and accountability for the performance of the management system, particularly the SMS. The AE must have the authority to allocate resources, manage safety and security risks, and ensure that operations comply with AOC conditions and applicable regulations. This role ensures that accountability is placed at the highest decision-making level.		Top management must make sure that roles, responsibilities, and authorities are clearly defined, communicated, and understood across the organization. They must also designate responsibility and authority for: Ensuring the quality management system complies with the requirements of the standard Making sure processes achieve their intended results Reporting on the performance of the quality management system and identifying improvement opportunities, especially to top management Promoting a strong customer-focused approach throughout the organization Maintaining the integrity of the quality management system when changes are planned and implemented	2		
	ORG 1.1.3	Where required by the State, the operator must designate post holders (responsible managers) for key operational areas. These individuals are accountable for managing safety and security risks and ensuring that operations in their areas comply with regulatory requirements and organizational standards. This ensures clear operational accountability distributed across the organization.	5.3		1		
	ORG 1.1.4	The operator must designate a manager responsible for the day-to-day management of the SMS, acting on behalf of the AE. This person ensures the implementation, maintenance, and continuous functioning of the SMS across the organization and serves as the central coordinator for safety-related activities. While this role manages daily SMS operations, overall accountability remains with the AE.			2		
Management Commitment	ORG 1.2.1	The operator must establish a corporate safety policy that demonstrates senior management's commitment to safety and the promotion of a positive safety culture. The policy must be communicated throughout the organization and include commitments to provide adequate resources, ensure continuous improvement of the management system, and periodically review the policy to maintain its relevance.	5.2	5.2.1 – Establishing the Quality Policy Top management must define, implement, and maintain a quality policy that: Fits the organization's purpose, context, and strategic direction Serves as a basis for setting quality objectives Includes a commitment to meet all applicable requirements Includes a commitment to continually improve the quality management system 5.2.2 – Communicating the Quality Policy The quality policy must: Be documented and kept up to date Be communicated, understood, and applied throughout the organization Be accessible to relevant interested parties when appropriate	3	2.33	

	ORG 1.2.2	The operator must implement a safety reporting policy that encourages personnel to report hazards and safety issues. It must define acceptable and unacceptable behaviors, as well as conditions under which disciplinary action does not apply, supporting a Just Culture environment that promotes open and non-punitive reporting.	/		1	
	ORG 1.2.3	The operator must ensure a policy is in place that clearly informs all operational personnel of their obligation to comply with applicable laws, regulations, and operational procedures in all locations where operations are conducted.	7.3	The organization must ensure that all individuals working under its control are aware of: The quality policy The relevant quality objectives How their work contributes to the effectiveness of the quality management system, including the benefits of better performance The consequences of not complying with the quality management system requirements	3	
Role and Responsibility	ORG 1.3.1	The management system must clearly define: -Who is accountable for safety and security decisions. -Responsibilities for compliance with regulations and standards. -Lines of accountability across the organization, including senior management.	5.3	Top management must ensure that roles, responsibilities, and authorities are clearly defined, communicated, and understood throughout the organization. They must also appoint responsible persons to: Ensure the quality management system meets the requirements of the standard Make sure processes produce the expected results Report on the performance of the quality management system and identify opportunities for improvement, especially to top management Promote a customer-focused culture across the organization Ensure the quality management system remains consistent and effective when changes are introduced	2	1.33
	ORG 1.3.2	Procedures must exist to maintain managerial continuity if operational managers (including post holders) cannot perform their duties.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	
	ORG 1.3.3	Clear delegation of authority for interactions with regulators, OEMs, and other operationally relevant external parties.	/	This requirement has no direct equivalent in ISO 9001, as the standard does not define formal delegation of authority for liaison with regulatory authorities or other external aviation entities, limiting itself to general communication and responsibility assignment.	1	
Safety Performance	ORG 1.4.1	The operator must establish a formal process for defining safety objectives that support continuous improvement of the SMS. These objectives must reflect the organization's safety commitments, be communicated throughout the organization, and be regularly reviewed to ensure they remain relevant and effective. (objective)	6.2.1	Set clear, measurable quality objectives aligned with the policy, track and communicate them, and keep proper records.	2	2.00

	ORG 1.4.2	The operator must implement processes to define safety performance indicators and, where applicable, safety performance targets in order to monitor safety performance. These measures are used to assess the achievement of safety objectives and to evaluate the effectiveness of safety risk controls, ensuring continuous monitoring and improvement of safety performance. (INDICATUER)	9.1.1	The organization must identify what needs to be monitored and measured, although detailed specifics are not provided. It must also define appropriate methods for monitoring, measurement, analysis, and evaluation to ensure reliable results, as well as determine when these activities should take place and when the results should be reviewed. Additionally, the organization is required to assess the performance and effectiveness of its quality management system and keep documented evidence of the results.	2		
Resource Management	ORG 1.5.1	The operator must ensure that operational planning defines safety and security objectives, allocates the necessary resources, and considers external requirements such as regulators and OEM instructions. These objectives must be consistent with the safety policy.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	1.71	
	ORG 1.5.2	The operator must provide and maintain appropriate facilities, equipment, workspace, supporting services, and working conditions necessary to ensure safe and secure operations. This includes infrastructure, tools, services, and a suitable working environment that supports human performance and operational safety.	7.1.3	Ensure the organization has and maintains the necessary physical and technological resources to operate processes and deliver conforming products and services.	3		
	ORG 1.5.3	The operator must have a structured selection process to ensure that personnel in safety- and security-critical roles are hired based on appropriate knowledge, skills, training, and experience. This ensures that only qualified individuals are assigned to operationally critical functions.	7.1.2	The organization shall determine and provide the persons necessary for the effective implementation of its quality management system and for the operation and control of its processes.	3		
	ORG 1.5.4	The Operator shall ensure personnel who perform functions relevant to the safety or security of aircraft operations are required to maintain competence on the basis of continued education and training and, if applicable for a specified position, continue to satisfy any mandatory technical competency requirements.	7.2	The organization must identify the competencies required for individuals whose work impacts the effectiveness of the quality management system. It must ensure that these individuals are competent through appropriate education, training, or experience. When necessary, the organization should take steps to develop or acquire the required competence and assess whether these actions are effective. It must also keep documented evidence to demonstrate competence. Such actions may include training, mentoring, reassigning staff, or hiring qualified personnel.	2		
	ORG 1.5.5	The operator must have a policy prohibiting duty performance under the influence of psychoactive substances, preventing their problematic use, and removing affected personnel from operational duties while complying with authority requirements.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1		
	ORG 1.5.6	The operator should ensure that personnel in safety-critical roles are medically and physically fit to perform their duties.	/		1		

	ORG 1.5.7	The operator should have a procedure for screening or testing operational personnel for psychoactive substances where allowed, unless prohibited or already regulated by the State.	/			1	
Outsourcing Management	ORG 1.6.1 (selection)	The operator must have planning processes that define safety and security objectives, ensure adequate allocation of resources, and incorporate external requirements such as regulatory rules and OEM guidance. These planning processes ensure that operational goals are aligned with the safety policy and that sufficient resources are available to support safe and secure operations.	8.4.1	Control outsourced activities, carefully assess suppliers, monitor their performance, and keep records to ensure compliance with requirements.		2	1.50
	ORG 1.6.2 (contrats)	.The operator must execute a contract or agreement with external service providers performing operational functions. .The contract must clearly identify specific, documented requirements that allow the operator to monitor safety and security performance.		There is alignment in principle, but not in structure or level of prescription.		1	
Emergency Response	ORG 1.7.1	The operator must have a corporate emergency response plan to manage and coordinate actions in case of a major aircraft accident or serious disruptive event, ensuring an organized response to protect safety and manage the crisis.		No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope		1	1.000
	ORG 1.7.2	The operator must appoint a qualified and authorized manager responsible for developing, implementing, and maintaining the emergency response plan.				1	
	ORG 1.7.3	If different departments or stations have their own emergency plans, the operator must ensure they are aligned and coordinated with the central corporate emergency response plan.	/			1	
	ORG 1.7.4	The emergency response plan must include coordination with external organizations such as airports, authorities, emergency services, and other relevant entities involved in crisis situations.				1	
	ORG 1.7.5	The operator must define clear procedures and assign responsibilities to ensure a coordinated and structured execution of the emergency response plan during an event.				1	
	ORG 1.7.6	The operator must ensure that in case of an accident, an accurate list of passengers, crew, and cargo (including dangerous goods) can be quickly provided to the authorities.				1	
	ORG 1.7.7	Personnel involved in emergency response must be properly trained and qualified to perform their roles effectively during an emergency situation.				1	

	ORG 1.7.8	The emergency response plan must be regularly tested through exercises and simulations to ensure readiness, identify weaknesses, and improve the system.				1		
	ORG 1.7.9	After any ERP activation (real or exercise), the operator should conduct a debrief to analyze performance, identify issues, and improve the plan.				1		
	ORG 1.7.10	The operator should have a dedicated emergency management center with the necessary space, equipment, and resources to coordinate crisis response effectively.				1		
	ORG 1.7.11	The operator should ensure centralized control of all external communications during emergencies to maintain consistent and controlled messaging.				1		
	ORG 1.7.12	The operator should have ready procedures and resources for crisis support, including command posts, communication systems, humanitarian teams, and assistance for passengers, crew, and families.				1		

Assurance, Monitoring and Documentation Control								
Quality Assurance, Monitoring	ORG 2.1.1	The QA program is a system that checks if everything in the airline is working correctly, safely, and according to rules. .Follows aviation regulations and standards .Meets operational needs .Finds areas that need improvement .Detects operational hazards .Evaluates whether safety risk controls are effective	9.2.2	The organization must plan, establish, implement, and maintain an audit program that defines the frequency, methods, responsibilities, planning, and reporting of audits. This program should consider the importance of processes, any organizational changes, and previous audit results. For each audit, the organization must: -Define the scope and criteria -Ensure auditors are selected to maintain objectivity and impartiality -Report audit results to relevant management -Take necessary corrections and corrective actions promptly The organization must also keep documented evidence of the audit program and its results.		3		
	ORG 2.1.2	A qualified, independent quality assurance manager must be appointed to oversee the program, coordinate with operational managers, and ensure communication of audit results across the organization.				2	2.63	2.09
	ORG 2.1.4	If IOSA registered, the operator must audit all ISARPs at least once per registration period using the correct ISM edition and properly documented audit processes.	9.2	The organization must conduct internal audits at planned intervals to verify that its quality management system complies with both its own requirements and those of the International Standard, and that it is effectively implemented and maintained. To achieve this, the organization is required to establish, implement, and maintain an		3		

	ORG 2.1.5	The operator must establish an audit planning process with sufficient resources to ensure audits are properly scheduled and conducted within defined intervals.		audit program that defines the frequency, methods, responsibilities, planning, and reporting of audits, taking into account the importance of processes, any changes within the organization, and the results of previous audits. For each audit, the organization must determine the scope and criteria, ensure the selection of auditors supports objectivity and impartiality, and communicate the audit results to relevant management. It must also take timely corrective actions where necessary and retain documented information as evidence of both the audit program's implementation and the audit results.	3		
	ORG 2.1.6	Each audit must have a defined scope and objectives, considering regulations, past audit results, and relevant operational safety or security events.			3		
	ORG 2.1.7	A formal process must exist to manage audit findings, including root cause analysis, corrective actions, implementation, and verification of effectiveness.	10.2.1	When a nonconformity occurs, including those arising from complaints, the organization must respond by taking appropriate action to control and correct the issue and address any resulting consequences. It must then assess whether further action is needed to eliminate the root cause in order to prevent recurrence or occurrence elsewhere. This involves reviewing and analyzing the nonconformity, identifying its causes, and determining if similar issues could exist or arise. The organization must implement the necessary corrective actions and evaluate their effectiveness. Where applicable, it should update identified risks and opportunities and make any required changes to the quality management system. All corrective actions must be proportionate to the impact of the nonconformities encountered.	3		
	ORG 2.1.8	Auditors must be impartial and functionally independent from the activities they audit to ensure objectivity.	9.2.2	The organization must ensure that auditors are chosen and audits are carried out in a way that maintains objectivity and guarantees the impartiality of the auditing process.	3		
	ORG 2.1.9	Auditors must be properly trained, qualified, experienced, and regularly evaluated to ensure effective and reliable auditing.	/	This exact scope is not mentioned in ISO 9001	1		
	External Monitoring	ORG 2.2.1	Monitoring of external service providers is a fundamental requirement to ensure that outsourced operational functions comply with the operator's safety and security standards.	8.4.1	The organization must ensure that all externally provided processes, products, and services comply with specified requirements. It is required to establish appropriate controls when external inputs are incorporated into its own products and services, when external providers deliver directly to customers on its behalf, or when a process or part of it is outsourced. In addition, the organization must define and apply criteria for evaluating, selecting, monitoring, and periodically re-evaluating external providers, based on their ability to meet requirements. It must also retain documented information as evidence of these evaluations and any actions taken as a result.	3	1.75

	ORG 2.2.2	The integration of audits as a monitoring tool allows the operator to systematically assess the compliance of external providers performing outsourced operational functions, ensuring adherence to applicable safety and security requirements.	8.4.2	The organization must ensure that externally provided processes, products, and services do not negatively impact its ability to consistently deliver conforming products and services to customers. It must keep these external activities under the control of its quality management system and clearly define the controls applied both to external providers and to the outputs they deliver. In doing so, the organization should consider the potential impact on its ability to meet customer, statutory, and regulatory requirements, as well as the effectiveness of the controls implemented by the external providers. Additionally, it must establish and carry out appropriate verification or other necessary activities to confirm that externally provided processes, products, and services meet the required standards.	2	
	ORG 2.2.3	Establishing an audit process for other operators involved in passenger transport under commercial agreements allows for verifying their compliance with ICAO standards while ensuring continuous monitoring of their safety and security performance.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	
	ORG 2.2.4	Monitoring of partner operators involved in freight transport relies on an appropriate tracking process to ensure that the safety and security requirements of the operator are met, particularly through the evaluation of their performance and compliance with applicable standards.			1	
Product Control	ORG 2.3.1	The operator must have processes to ensure that all safety- or security-critical products acquired from external suppliers meet specified technical requirements before being used, typically through supplier evaluation and product acceptance controls.	8.4.1	The organization shall ensure that externally provided processes, products and services conform to requirements.	2	2.00
Data Management	ORG 2.4.1	The operator must maintain an electronic database to manage audit-related information, including audit details and non-conformities, to support the quality assurance program.	9.2.2	The organization must keep documented information as evidence that the audit program has been properly implemented and to demonstrate the results of the audits.	3	1.50
	ORG 2.4.2	The operator must use an electronic database to manage data from hazard identification and risk management processes to support safety decision-making.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	
	ORG 2.4.3	The operator should have a process to report safety and security incidents to International Air Transport Association's Incident Data Exchange (IDX) for industry-wide analysis and benchmarking.			1	

	ORG 2.4.4	The operator should participate in a flight data sharing program to securely exchange de-identified flight data for identifying safety trends and improving global aviation safety.				1		
Documentation system	ORG 2.5.1	The establishment of a document management system ensures that operational documents are compliant, up-to-date, readable, and accessible, thus providing reliable support for the conduct and control of operations.	7.5	The organization's quality management system must include all documented information required by the standard, along with any additional documentation the organization considers necessary to ensure its effectiveness. The amount and type of documented information may vary depending on factors such as the organization's size, the nature of its activities, the complexity of its processes and their interactions, and the competence of its personnel. When creating or updating documented information, the organization must ensure it is properly identified and described (for example, with a title, date, or reference), presented in an appropriate format and medium, and reviewed and approved for suitability and adequacy.	The organization must also control documented information to ensure it is available and suitable for use when needed, while being adequately protected from risks such as loss of confidentiality, misuse, or loss of integrity. This control must include managing its distribution, access, retrieval, and use, as well as ensuring proper storage and preservation, including maintaining legibility. Changes to documented information must be controlled, such as through version management, and rules must be defined for its retention and disposition. Additionally, documented information from external sources that is necessary for the planning and operation of the quality management system must be identified and controlled. Records kept as evidence of conformity must be safeguarded against unintended changes, and access to documented information must be managed by defining appropriate permissions for viewing and modifying it.	3	2.67	
	ORG 2.5.3	The centralization or coordination of operational documents in a structured system ensures the consistency, harmonization, and standardization of information across the entire organization.				3		
	ORG 2.5.4	The documentation of the safety management system (SMS) is a fundamental element that formalizes the safety policy, processes, and responsibilities, ensuring effective and integrated safety management within the organization.				2		
Records System	ORG 2.6.1	The operator must establish a system for managing operational records that ensures compliance with regulatory requirements, as well as their identification, legibility, retention, accessibility, protection, integrity, and their archiving or deletion through standardized processes, including SMS records.				3	2.00	
	ORG 2.6.2	If records are managed electronically, the operator must ensure regular data backups to prevent any loss and to guarantee the security and availability of information over time.				1		

Risk Management

Hazard Identification	ORG 3.1.1	The operator must implement an integrated hazard identification program across the organization using both reactive and proactive methods to systematically identify safety hazards in all operational areas.	6.1	When planning its quality management system, the organization must take into account internal and external issues as well as the needs and expectations of interested parties, and identify the risks and opportunities that need to be addressed. This is done to ensure the system can achieve its intended results, enhance positive outcomes, prevent or minimize negative effects, and support continual improvement. The organization must then plan appropriate actions to address these risks and opportunities, including how to integrate and implement these actions within its processes and how to evaluate their effectiveness. The actions taken should be proportional to their potential impact on the conformity of products and services. Approaches to managing risks may include avoiding, reducing, sharing, or accepting them based on informed decisions, while opportunities may involve adopting new practices, developing new products, entering new markets, building partnerships, or using new technologies to better meet organizational and customer needs.	2	1.40	1.40
	ORG 3.1.2	The operator must maintain an operational safety reporting system that encourages reporting of hazards and safety concerns, ensures mandatory reporting compliance, and includes analysis and corrective actions to address identified safety issues.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1		
	ORG 3.1.3	The operator should have a confidential reporting system that allows personnel to report safety hazards and human-factor-related issues while ensuring confidentiality, feedback, and appropriate follow-up actions.		1			
	ORG 3.1.4	The operator should implement a program to systematically collect and analyze data from normal line operations (e.g., flight crew observations) to proactively identify operational risks and improve safety.		1			
	ORG 3.1.5	The operator must have a change management process to identify internal and external changes that could affect operational safety and ensure associated risks are assessed and controlled through the SMS.	6.3	When the organization identifies a need to modify its quality management system, these changes must be implemented in a planned and controlled way. During this process, the organization should take into account the objectives of the changes and their possible impacts, ensure that the integrity of the quality management system is maintained, verify that adequate resources are available, and appropriately assign or adjust responsibilities and authorities.	2		

<p style="text-align: center;">Risk Assessment and Mitigation</p>	<p>ORG 3.2.1</p>	<p>The operator must implement an integrated safety risk assessment and mitigation program that analyzes identified hazards, evaluates the associated risks in terms of likelihood and severity, and ensures appropriate mitigation actions are developed, implemented, and monitored across all operational areas</p>	<p>6.1</p>	<p>When planning its quality management system, the organization must consider relevant internal and external issues as well as the needs and expectations of interested parties in order to identify the risks and opportunities that should be addressed. This is necessary to ensure that the system can achieve its intended results, enhance positive outcomes, minimize or prevent negative effects, and support continual improvement. The organization must then define actions to address these risks and opportunities, including how these actions will be integrated into its processes and how their effectiveness will be evaluated. The actions taken should be appropriate to the potential impact on the conformity of products and services. Approaches to managing risks may involve avoiding, reducing, sharing, or accepting them, while opportunities may lead to improvements such as adopting new practices, developing new products, entering new markets, forming partnerships, or using new technologies to better meet organizational and customer needs.</p>	<p style="text-align: center;">2</p>	<p style="text-align: center;">2.00</p>	

	ORG 3.2.2	The operator should establish a process for analyzing safety data in order to predict future risks linked to operational hazards, enabling proactive identification of emerging safety threats and informed decision-making for risk control.		<p>The organization must define what needs to be monitored and measured, as well as the methods to be used for monitoring, measurement, analysis, and evaluation to ensure reliable results. It must also determine when these activities should take place and when the results should be analyzed and evaluated. Based on this, the organization is required to assess the performance and effectiveness of its quality management system and keep documented evidence of the results.</p> <p>In addition, the organization must monitor customer perceptions to understand how well their needs and expectations are being met. It should establish appropriate methods to collect, track, and review this information, which may include surveys, feedback, customer interactions, or market data.</p> <p>9.1 Furthermore, the organization must analyze and evaluate the data obtained from monitoring and measurement activities. The results of this analysis should be used to assess product and service conformity, customer satisfaction, the performance and effectiveness of the quality management system, the effectiveness of planning and actions taken to address risks and opportunities, the performance of external providers, and the need for continual improvement.</p>	2		
Flight Data Analysis (FDA)	ORG 3.3.1	The operator must implement a non-punitive flight data analysis (FDA) program integrated into the SMS to systematically collect and analyze flight data from applicable aircraft in order to identify operational hazards and improve safety.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	1.00	
	ORG 3.3.2	The operator should apply an FDA program to aircraft above 15,000 kg MTOM to ensure systematic monitoring and analysis of flight data for safety improvement.			1		
	ORG 3.3.3	The FDA program must include processes for analyzing flight data, liaising with flight crews, ensuring representative data collection, sharing de-identified safety information, and training qualified personnel to manage the program effectively.			1		
	ORG 3.3.4	The operator must establish standards for managing FDA data, ensuring data integrity, confidentiality, secure storage, structured trend analysis, and proper retention and improvement of data processes.			1		
	ORG 3.3.5	The operator must ensure FDA findings are integrated into the SMS by coordinating hazards, risks, investigations, and airworthiness issues for proper analysis, mitigation, and follow-up actions.			1		

Specific Risk Assessments	ORG 3.4.1	The operator must implement a policy and risk assessment process for transporting items in the cargo compartment, ensuring hazards, aircraft capabilities, operational conditions, packaging, supply chain risks, and dangerous goods quantities are evaluated and mitigated to maintain an acceptable level of safety, particularly regarding fire risk containment.			1	1.00
Occurrence Handling	ORG 3.5.1	The operator must have a structured process to investigate aircraft accidents and incidents, ensure regulatory reporting compliance, identify safety hazards, and implement corrective actions to prevent recurrence and improve safety performance.	10.2	When a nonconformity occurs, including those resulting from complaints, the organization must respond by taking action to control and correct the issue and address any resulting consequences. It must then determine whether further action is needed to eliminate the root causes in order to prevent recurrence or occurrence elsewhere. This involves reviewing and analyzing the nonconformity, identifying its causes, and assessing whether similar issues exist or could arise. The organization must implement the necessary corrective actions and evaluate their effectiveness. Where appropriate, it should update identified risks and opportunities and make any required changes to the quality management system. All corrective actions must be proportionate to the impact of the nonconformity. In addition, the organization must retain documented information as evidence of the nature of the nonconformities, the actions taken, and the results of the corrective actions.	2	2.00
	ORG 3.5.2	The operator must identify and investigate operational irregularities and non-routine events that may indicate underlying safety risks, in order to detect accident precursors and implement preventive actions.			2	
Cybersecurity Risk Management	ORG 3.6.1	The operator should identify critical information and communication technology systems used in operations and implement risk-based cybersecurity measures to protect them from unlawful interference and ensure system integrity and availability.	/	No direct alignment with ISO 9001, as it belongs to the safety management system (SMS) scope	1	1.00

Improvement and Promotion, Training

Management Review	ORG 4.1.1	The periodic review of the management system is an essential requirement to ensure its relevance, adequacy, and effectiveness, while identifying opportunities for improvement and necessary adjustments regarding organization, resources, and risk management.	9.3	Top management must review the organization's quality management system at planned intervals to ensure it remains suitable, adequate, effective, and aligned with the organization's strategic direction. This review must be conducted by considering several key inputs, including the status of actions from previous reviews, changes in internal and external factors, and information related to the system's performance and effectiveness. This information includes trends in customer satisfaction and feedback, the achievement of quality objectives, process performance and product/service conformity, nonconformities and corrective actions, monitoring and measurement results, audit outcomes, and the performance of external providers. The review must also take into account the adequacy of resources, the effectiveness of actions taken to address risks and opportunities, and potential opportunities for improvement. As a result of the management review, top management must make decisions and take actions related to improvement opportunities, any necessary changes to the quality management system, and resource requirements. The organization must also retain documented information as evidence of the outcomes of these management reviews.	3	3	2.33
	ORG 4.1.2	The integration of quality assurance and risk management issues into the management review ensures strategic decision-making aimed at the continuous improvement of operational safety.			3		
	ORG 4.1.3	Continuous monitoring and evaluation of the safety management system (SMS) processes allow for maintaining and sustainably improving overall safety performance.	10.3	3			
Communication	ORG 4.2.1	The Operator shall have a system that enables effective communication of safety and operational information throughout the management system and in all areas where operations are conducted. Such system shall ensure: (i) Personnel maintain an awareness of the SMS; (ii) Safety-critical information is conveyed; (iii) External service providers are provided with information relevant to operations conducted.	7.4	The organization must define the internal and external communications related to its quality management system. This includes determining what information needs to be communicated, when it should be communicated, who should be involved, the methods of communication, and the individuals responsible for carrying out the communication.	2	2	
Training	ORG 4.3.1	The implementation of a training program dedicated to the SMS ensures that personnel have the necessary skills and knowledge to fulfill their safety responsibilities, based on their level of involvement in the system.	7.2	The organization must identify the level of competence required for individuals whose work affects the performance and effectiveness of the quality management system. It must ensure that these individuals are competent through appropriate education, training, or experience. Where gaps exist, the organization should take actions to develop or acquire the necessary competence and evaluate the effectiveness of those actions. Additionally, it must maintain documented evidence to demonstrate competence. Such actions may include training, mentoring, reassigning employees, or hiring qualified personnel.	2	2	

			7.3	The organization must ensure that all individuals working under its control are informed about the quality policy and relevant quality objectives. They should understand how their work contributes to the effectiveness of the quality management system, including the benefits of improved performance, as well as the consequences of failing to comply with the system's requirements.	2		
	ORG 4.3.2	The extension of the training program to external providers ensures a coherent understanding of responsibilities related to the SMS and a consistent application of safety requirements in outsourced activities.	8.4.3	The organization must ensure that all requirements are clearly defined and adequate before being communicated to external providers. It must then communicate these requirements effectively, including the specifications for the processes, products, and services to be delivered. This also includes requirements for the approval of products and services, methods, processes, equipment, and the release of outputs. In addition, the organization must specify any required competence or qualifications, define how external providers will interact with the organization, and establish how their performance will be monitored and controlled. Finally, it must communicate any verification or validation activities that will be carried out by the organization or its customers at the external provider's premises.	2		

