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The Assessment of Safety Performance in the Civil Aviation Industry in Somalia

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APPROVAL

The jury members certify that the study conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality as a dissertation for the degree of Master of science in Aviation Management.

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DECLARATION

I hereby declare that this is my original work and has never been presented for a degree or any award in any university or any academic institution of higher learning. It is all the result of my own effort and under the supervision of Assist. Prof. Dr. Cengiz Mesut Bükeç.

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ABSTRACT

Somalia's prolonged civil unrest has devastated its government's physical infrastructure, including the aviation sector, which is now barely functional. The country is in a reconstruction phase and lacks the infrastructure necessary for providing quality services. Weak capacity building among civil servants and a deteriorating safety situation have contributed to the nation's collapse over the past two decades. The absence of an effective Safety Management System (SMS) has led to numerous airline accidents. This study aims to assess the current safety performance of Somali's civil aviation industry focusing on the implementation and compliance with the SMS functions defined in regulations as well as the literature. Following this objective, a cross-sectional quantitative research design was employed, using survey questionnaires distributed via Google Forms. While stratified random sampling ensures fair representation across different sectors, 123 employees from the aviation industry participated in the research. It is concluded that the overall safety performance in Somali's aviation sector is low, as significant weaknesses are observed in compliance with SMS. It has become clear that there is a need to improve safety management at all levels in order to increase safety performance at the national level.

Key Words: Safety Performance, Civil Aviation Industry, Safety Management Systems.

ÖZ

Somali'de uzun süredir devam eden iç karışıklıklar, havacılık sektörü de dahil olmak üzere hükümetin fiziki altyapısını harap etti ve bu altyapı şu anda neredeyse hiç çalışmıyor. Ülke yeniden yapılanma aşamasındadır ve kaliteli hizmet sağlamak için gerekli altyapıdan yoksundur. Memurlar arasında kapasite geliştirmenin zayıf olması ve kötüleşen güvenlik durumu, son yirmi yılda ülkenin çöküşüne katkıda bulundu. Etkili bir Emniyet Yönetim Sisteminin (SMS) yokluğu çok sayıda havayolu kazasına yol açmıştır. Bu çalışma, yönetmeliklerde ve literatürde tanımlanan SMS işlevlerinin uygulanmasına ve bunlara uyumuna odaklanarak Somali sivil havacılık sektörünün mevcut emniyet performansını değerlendirmeyi amaçlamaktadır. Bu hedefi takiben, Google Formlar aracılığıyla dağıtılan anket anketleri kullanılarak kesitsel niceliksel bir araştırma tasarımı kullanıldı. Tabakalı rastgele örnekleme, farklı sektörlerde adil temsili sağlarken, araştırmaya havacılık sektöründen 123 çalışan katıldı. SMS'ye uyum konusunda önemli zayıflıklar gözlendiğinden, Somali havacılık sektöründe genel emniyet performansının düşük olduğu sonucuna varılmıştır. Ulusal düzeyde emniyet performansının arttırılması için emniyet yönetiminin her düzeyde iyileştirilmesine ihtiyaç olduğu açıkça ortaya çıkmıştır.

Anahtar Kelimeler: Emniyet Performansı, Sivil Havacılık Endüstrisi, Emniyet Yönetim Sistemleri.

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CHAPTER 1
INTRODUCTION

1.1 Research Background

The primary focus of the aviation industry is to ensure safety. Data from Bugayko et al. (2019) reveal that the global civil aviation industry currently has one disaster for every ten million flights, making it the safest mode of transport. The International Civil Aviation Organization (ICAO, 2018) characterizes aviation safety as a condition under which dangers related to aviation activities are minimized and controlled to a satisfactory extent. To enhance safety management, fresh Annex 19 was suggested, which concentrates on safety management at the global, regional, and national levels, encompassing essential organizational structures, policies, and procedures (ICAO, 2006; ICAO, 2016). This Annex includes broad provisions pertinent to safety management tasks that are connected to or directly support the safe operation of aircraft. It underscores the significance of safety management at the national level across various aviation sectors (ICAO, 2016).

Effective data management is essential for enhancing global civil aviation safety. This involves implementing sustainable processes and procedures within industry organizations, including structuring, controlling, and decision-making. The primary goal of data management systems is to meet aviation safety objectives by maintaining data integrity, availability, usability, and protection. By performing safety analyses, decision-makers can make informed managerial decisions (Bugayko et al., 2019).

Ongoing civil unrest in Somalia has had a profound impact on the country's physical infrastructure, particularly its aviation infrastructure. The destruction caused by the conflict has rendered this infrastructure barely functional, which, in turn, has hindered the country's ability to function effectively. Rehabilitating this infrastructure is of utmost importance for providing quality services to citizens. Additionally, Somalia faces significant challenges in building its capacity at the human resource level. Many civil servants are facing a deteriorating safety situation, which has contributed to the country's collapse in 1991 (Ahmed, 2023).

The ongoing civil and terrorism conflicts have led to the exodus of industry staff, resulting in those remaining either past retirement age or deceased. This weakness, coupled with institutional neglect, has caused erasure of the government's institutional memory, as archives and records of processes and procedures have disappeared. Consequently, Somalia's public sector is incomplete and insufficiently followed, with most government institutions operating

on an ad hoc basis, thereby hindering government progress (Ahmed, 2023). Moreover, human resource management is a significant challenge for Somalia, as the government at all levels lacks the necessary number of capable staff to fulfil their functions. Identifying, transparently recruiting, and retaining staff has proven to be a struggle over the past 18 months (UNDP, 2015).

The two decades of conflict have forced many Somali people into serious civil war and displacement. This conflict has led to the collapse of the Somali Civil Aviation Authority (SCAA), which is crucial for improving aviation safety in the country. Its collapse has affected the capacity building within the industry. The country lacks peace, security, and capacity building (IOM, 2011).

Due to the lack of an effective Safety Management System (SMS), the Somali civil aviation industry has experienced numerous airline accidents in recent years. According to the Aviation Safety Network (ASN), the aviation accident rate in Somalia is concerning, with a considerable number of accidents occurring over the years. Since 1919, 93 fatalities have been reported in Somalia. Inadequate maintenance and safety regulations, as well as the use of obsolete aircraft, have played crucial roles in the high accident rates in Somalia (Al-Salem et al., 2016). Moreover, ongoing political unrest and the absence of proper infrastructure due to civil war since 1991 have exacerbated the situation in the aviation sector. In 2022 and 2023, at least two aviation accidents were recorded in Somalia, including a crash involving Jubba Airways, where 16 out of 36 individuals onboard were injured, and a Halla Airline flight that crashed off the runway at Mogadishu's international airport, resulting in minor injuries. Despite these incidents, no study has addressed these safety concerns. Hence, this thesis aims to fill this research void by assessing the current safety performance of the Somali civil aviation industry, focusing on the implementation of and compliance with the SMS.

1.2 Research Problem Statement

The aviation sector in Somalia presents a compelling case for examination, particularly in light of the profound impact of the country's civil unrest on its development. Over the past 25 years, Somalia has transitioned from a functional state to one characterized by severe fragmentation and instability, largely due to the overthrow of the General Siad Barre by clan-based militias in January 1991. This event marked the beginning of a protracted conflict, with various clans vying for power and control over resources leading to widespread lawlessness and anarchy. International efforts to stabilize Somalia during the 1990s, including numerous political and

humanitarian interventions, failed to bring about lasting peace or restore effective governance (Dahir and Sheikh 2024).

The aviation sector, a critical component of national infrastructure and economic activity, has been significantly disrupted by ongoing conflict. The SCAA), along with other aviation institutions and infrastructure, was effectively dismantled as the conflict escalated. National airlines ceased operations and airports fell into disrepair or were commandeered for military use. The collapse of these institutions has profound implications for a country's connectivity, economic development, and international relations. The lack of a functioning regulatory framework and deterioration of safety standards have rendered air travel hazardous, further isolating Somalia from the global aviation network.

Despite the evident civil unrest and disruption of the industry, which destroyed all infrastructure, such as the national flag carrier (Somali Airlines) ceasing operations and the country losing its airspace management, previous research has largely overlooked the specific ways in which civil unrest has affected Somalia's aviation industry. Existing studies tend to focus on broader political and humanitarian issues, neglecting the nuances of how air transportation has been impacted and the long-term consequences for recovery and development. There is a critical need to assess the current safety performance of the Somali Civil Aviation Industry. Understanding the current safety performance of the sector could provide valuable insights for policymakers, international organizations, and stakeholders working towards Somalia's stabilization and economic resurgence.

This research aims to fill this gap by systematically investigating the current safety performance of the Somali Civil Aviation Industry. By doing so, it seeks to contribute to the development of strategies for revitalizing Somalia's aviation sector, enhancing regional connectivity, and fostering economic recovery and growth.

1.3 Research Objectives

To assess the current state of safety performance in Somali civil aviation, identify the factors affecting it, and propose strategies to enhance aviation safety, thereby contributing to the body of knowledge on improving civil aviation safety in developing regions.

1.4 Research Questions

How can the current safety performance of Somali civil aviation be assessed, and which factors influence it, to develop strategies for improving aviation safety in Somalia?

1.5 Research Significance

To academicians:

This research will be valuable to other scholars interested in similar areas and will serve as a foundation for further studies. It will contribute to closing the gap in the current knowledge on safety performance in Somali civil aviation by providing insights into the factors affecting safety performance and proposing strategies for improvement. Additionally, it will serve as an informative resource for readers interested in the safety performance of Somali civil aviation and add to the existing literature. The findings of this research will be crucial for policymakers to address aviation safety concerns.

To policy makers:

This study will be highly significant for international bodies such as the ICAO, SCAA, and the government of Somalia, among others, in formulating effective strategies for managing aviation safety. The research will aid the government and other relevant agencies in identifying the most effective methods for enhancing aviation safety in Somalia. Consequently, it will enable various stakeholders to develop evidence-based policies and interventions to address aviation safety issues.

1.6 Research Hypothesis

This study was guided by a single research hypothesis derived from the research questions and objectives of the study:

Hypothesis: Aviation safety performance is perceived to be high among the respondents, and this perception is significantly influenced by sociodemographic factors such as gender, age, education level, and years of experience.

Description: This hypothesis posits that, according to the study participants' perceptions and reports, aviation safety performance is generally high. It also suggests that there is a statistically significant relationship between the perceived level of aviation safety performance and various sociodemographic variables. Respondents, who are likely experts in the aviation sector, typically have positive opinions about safety practices and performance. The hypothesis aims to determine whether the respondents' perceptions of aviation safety performance are high and if these perceptions are influenced by sociodemographic factors.

Expected Outcome: If the hypothesis is validated, a sizable percentage of respondents would report high levels of aviation safety performance. Additionally, the analysis would reveal significant correlations between aviation safety performance and one or more sociodemographic factors. For instance, seasoned professionals may report higher safety performance, or differences may be observed across various age groups or educational levels, indicating that sociodemographic characteristics play a role in shaping perceptions of aviation safety.

1.7 Research Structure

This thesis comprises five chapters, each dedicated to a distinct aspect of research. The first chapter, the introduction, offers an overview of the research context, focusing on the unique safety challenges confronted by the Somali civil aviation industry. This highlights the paramount importance of addressing these safety issues and delineates the research problems that this study endeavours to resolve.

The introduction chapter establishes the research objective of assessing the current state of safety performance in Somali civil aviation, identifying the factors affecting it, and proposing strategies to enhance aviation safety. This contributes to the body of knowledge on improving civil aviation safety in developing regions. The research question posed is: How can the current safety performance of Somali civil aviation be assessed, and which factors influence it, to develop strategies for improving aviation safety in Somalia? The significance of the research is highlighted by its contribution to closing the gap in current knowledge on safety performance in Somali civil aviation, providing insights into the factors affecting safety performance, and proposing strategies for improvement. Additionally, it serves as an informative resource for readers interested in the safety performance of Somali civil aviation and adds to the existing literature. The findings of this research will be crucial for policymakers in addressing aviation safety concerns. The hypothesis stated is that aviation safety performance is perceived to be high among the respondents, and this perception is significantly influenced by sociodemographic factors such as gender, age, education level, and years of experience.

The second chapter reviews relevant literature and proposes a theoretical framework to guide the present study. It begins with the fundamentals and framework of aviation SMS by explaining the evolution of aviation safety thinking and the organizational accident causation model. It then covers the four components of SMS, the safety performance process, and safety culture. The chapter also discusses the historical development of Somali civil aviation,

regulatory and policy makers, airport infrastructure and standards, national regulations, international agreements, and airline operating requirements and regulations. Additionally, it examines recent incidents in the Somali civil aviation industry. The chapter concludes by presenting the theoretical framework and identifying the research gap that needs to be addressed.

The third chapter elucidates the methodology, including a description of the research design, materials used for data collection, and methods employed to gather data from participants. The study population and targeted sample are outlined, along with the data analysis procedures. This research employed a quantitative research method. Researchers use quantitative methods to interpret the meaning of the data to find potential causal relationships between different variables.

In terms of research design, the study utilized a survey questionnaire. The study's target population comprised 300 aviation workers, of which 123 were randomly selected. This sample includes aviation professionals, regulators, airlines, maintenance personnel, air traffic controllers, and other stakeholders. A stratified random sampling approach was employed to ensure fair representation across these sectors, providing a comprehensive view of the safety performance of the industry.

The data obtained from the participants were analysed using SPSS version 25 to generate descriptive statistics and summarize their characteristics. This study follows fundamental ethical criteria, such as obtaining informed consent, ensuring confidentiality, and protecting privacy. Participants were thoroughly informed of the study's objectives, their rights as respondents, and the voluntary nature of their participation. The confidentiality of the acquired data was carefully preserved, and any personally identifying information was not disclosed without specific prior permission.

The fourth chapter presents the findings of the study and provides an in-depth discussion of the results. The data are interpreted in light of the research questions and objectives and provide insights into the implications of the findings. The study involved a survey of 123 individuals from the Somali civil aviation staff. It tested hypotheses on the link between safety performance and sociodemographic factors, and assessed whether respondents reported high levels of aviation safety performance. The mean overall safety performance score was 93.3 (CI: 89.883–496.7182), indicating a high level of perceived safety. The association between the overall high safety ratings and sex was statistically significant ($p=0.001$). Among the participants, 35

(59.3%) males rated the overall safety of the industry highly, whereas 24 (40.1%) provided similar ratings for Somali civil aviation. No significant association was discovered between high safety evaluations and characteristics such as educational level (p=0.124), marital status (p=0.180), years of professional experience (p=0.642), and age (0.729).

The final chapter, the conclusion, summarizes this thesis. It reflects on the key findings, discusses their significance, and suggests recommendations for future research. This chapter also highlights the study's contributions to the field and proposes potential practical applications for the research outcomes. The recommendations to the Somali civil aviation industry stakeholders are to focus on capacity building and training programs, infrastructure development and modernization, and collaboration with international partner.

CHAPTER 2
LITERATURE REVIEW AND THEOROTICVAL FRAMEWORK

2.1 Fundamentals and Framework of Aviation SMS

A critical aspect of comprehending the essential elements of SMS and its fundamental principles is to analyse its development, historical progression, and accident trends that have influenced its evolution. This section delves into the key factors that have shaped the SMS, including James Reason's organizational accident causation model and the structure and objectives of the SMS. Additionally, this section offers a comprehensive overview of the historical progression of SMS, including the factors that have contributed to its development and accident causation factors that have influenced its evolution.

2.1.1 The Evolution of Aviation Safety Thinking

Maintaining a good air safety record is vital for the success of an airline, as emphasized by Müller et al. (2014). The importance of enhancing safety in the aviation sector has resulted in significant advancements in machinery and software reliability in recent years. However, the reliability of human performance and organizational systems has not yet progressed at the same pace (Müller et al., 2014).

The early years of commercial aviation were characterized by technological constraints and insufficient infrastructure, which impeded the industry's growth. Owing to a lack of oversight and regulation, safety management procedures such as hazard identification and risk management were not prioritized. Although the production targets were met, the industry lacked the necessary means and resources to effectively manage safety, leading to a high incidence of failures and accidents (Müller et al., 2014). At that time, accident prevention and investigation were largely reactive, with measures taken only after the accident occurred. However, with the introduction of more regulations in the 1950s and subsequent advancements in technology and infrastructure, the accident rates began to decline. Adherence to regulations is widely believed to help reduce safety breaches (Müller et al., 2014).

Historically, it was believed that rules could only be broken down into account. While adding legal constraints could help avoid risk, the dynamic nature of the aviation environment makes it difficult to cover all operating possibilities. Accident investigations typically focus on technology failures, with less attention given to human or organizational factors (Cokorilo, 2020). Traditionally, accident causes have been determined by asking what, who, and when, without addressing the crucial aspects of why and how an accident occurred. However, in

recent years, there has been a shift towards understanding the underlying causes and processes of accidents. The early years of aviation safety, up until the 1970s, could be considered the "technical era," during which safety concerns were largely tied to technical aspects (Cokorilo, 2020). At this time, technical failures were common because of the limitations of the technology to meet the demands of mass transportation. Consequently, the primary focus was to discover and resolve technological challenges.

During the 1970s, technological advancements, including radar, jet engines, autopilots, flight directors, and enhanced navigation and performance, have led to a substantial reduction in technical failures (ICAO, 2019). This period marked the beginning of the human era, which focused on human safety factors, resulting in the development of crew resource management (CRM) and line-oriented flight training (LOFT) to decrease human error. Nonetheless, human errors persist and continue to have a significant impact on safety. By the early 1990s, it had been acknowledged that individuals should not be considered in isolation within the operational framework (Bugalia et al., 2019).

It is crucial to investigate various factors that contribute to accidents, including organizational factors, local working conditions, individual risky behaviours, failed defences, and inadequate outcomes. These factors reveal the underlying causes of potential accidents. Consequently, in the event of an accident, it is crucial to prioritize organizational factors, such as the safety culture of the organization, as well as the specific local variables that may have played a role in causing or triggering the accident (Müller et al., 2014). In recent years, many countries and service providers have transitioned from traditional safety measures to more advanced ones, such as State Safety Programs (SSP) and SMS. These measures have led to improved safety outcomes. However, these safety measures primarily focus on individual safety performance and local supervision, often neglecting the broader context of the entire aviation system. This highlights the complexity of aviation systems and the various entities involved in ensuring aviation safety. Several incidents and events have shown that interactions between different organizations can sometimes result in negative outcomes (ICAO, 2018). Figure 1 illustrates the evolution of aviation safety thinking.

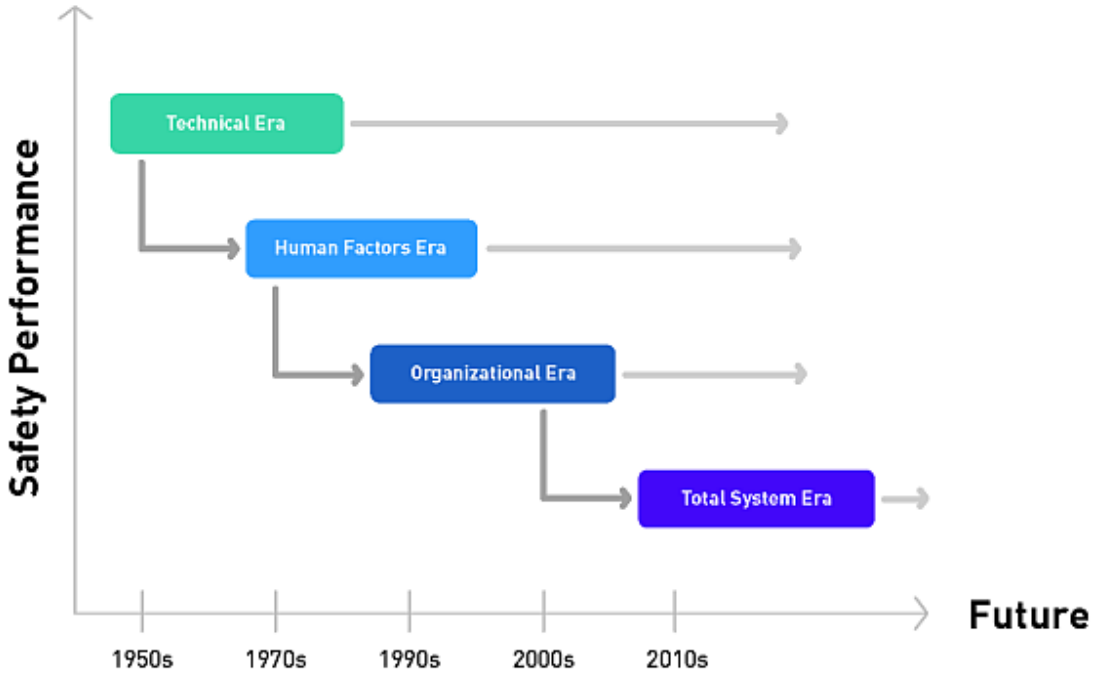

Figure 1: Shows the timeline of the evolution of safety thinking and incorporates these contributing factors.

Source: ICAO, 2018.

2.1.2 The Organizational Accident Causation Model

Organizational Accident Causation theory delves into the intricacies of how complex systems can experience failures that lead to accidents. It posits that these failures are generally not due to a single error or individual mistake but are the result of multiple smaller failures within an organization. These minor failures, which often go unnoticed or appear insignificant in isolation, can align and accumulate, causing a significant accident (Hosseinian and Torghabeh, 2012; Grant et al., 2018).

Analysing the elements that contribute to an accident reveals that it is impractical to attribute the cause to a single factor. Accidents typically arise from a series of enabling factors, each of which must be present before an accident occurs. However, these factors lack the ability to surpass the defence of the system. This underscores the intricacy and resilience of aviation systems, where single-point failures rarely lead to severe consequences owing to protective measures such as regulations, training, and technology (Hudson, 2014). Figure 2 demonstrates that operational errors or disregarded procedures are delayed consequences that overlook managers, workplace conditions, and organizational processes. These issues persist until workplace or organizational conditions improve to foster safety awareness (Müller et al., 2014). Operational failures serve as triggers for latent conditions, in which individuals in complex

systems make mistakes or violate procedures for reasons that often extend beyond individual psychology. These latent conditions remain dormant within the system and become apparent only when the defence of the system is breached (Hudson, 2014).

Active failures are a significant factor in organizational accidents, encompassing mistakes or breaches committed by frontline staff including ground personnel, pilots, and air traffic controllers. These factors directly affect aviation safety and can result in unfavourable consequences. To comprehensively understand the causes of an organizational accident, it is crucial to identify the various stages that contribute to the event. Most latent conditions originate from decision makers and organizational processes, which are often influenced by human biases and constraints, such as budgets and politics. Establishing internal processes to recognize and mitigate these threats is essential (Mitropoulos et al., 2005).

Decisions made by line management can result in insufficient training, violation of maximum working hours, or inadequate protective workplace measures, creating a workforce that lacks the necessary knowledge and skills or is unable to adhere to proper operating procedures. Errors and breaches lead to active failures and potential accidents, ultimately reflecting a deficient safety culture (Roland and Christopher, 2014).

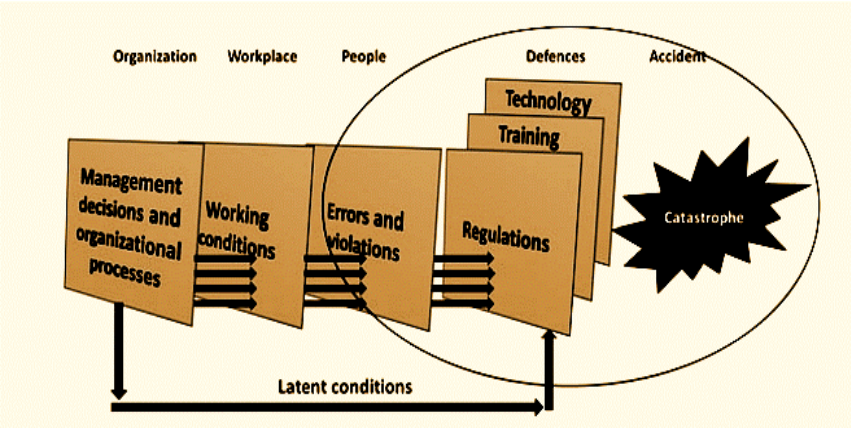

Figure 2: illustrates the Stages Involved in an Organizational Accident

Source: Müller et al., 2014

2.1.3 Safety Management System (SMS)

SMS are comprehensive processes, documents, knowledge systems, and procedures that organizations implement to enhance and maintain safety performance. The aviation industry implements procedures to ensure safe air transport. ICAO, a United Nations body, plays a crucial role in developing Standards and Recommended Practices (SARPs) for a safe, efficient, secure, economically sustainable, and environmentally friendly civil aviation industry. ICAO SARPs for SMS are based on four key components, as outlined in Table 1: component 1 (C1), safety policy and objectives; component 2 (C2), safety risk management; component 3 (C3), safety assurance; and component 4 (C4), safety promotion (ICAO, 2016; ICAO, 2018). Component 1 specifies an organization's safety objectives and the strategies, procedures, and techniques of the SMS designed to achieve these goals, including the roles and responsibilities of the organization's personnel. Component 2 focuses on safety risk management procedures, ensuring that safety hazards inherent in aviation operations are addressed in a way that aligns with the organization's safety performance targets.

Establishing design and operational requirements for a business involves identifying hazards and conducting safety-risk assessments. This process is facilitated by implementing C3, which outlines safety assurance procedures and actions to evaluate the SMS. It is essential to continuously monitor SMS to detect any changes or deviations that could introduce new safety risks or weaken existing risk controls, which can then be addressed through the safety risk management process (C2). Moreover, C4 highlights the significance of training, education, and communication within SMS to cultivate a strong safety culture and ensure that all employees have the necessary knowledge and awareness. The interdependencies between the SMS components reflect the integrated nature of the system, as highlighted by Roland and Christopher (2014) and Stroeve et al. (2022).

Table 1: SMS components for ICAO SARPs

SMS Components	Element	Description
C1. Safety Policy & Objectives	Management commitment	The organization's commitment to safety is evidenced by its safety policy, which includes providing resources for implementation, defining processes for reporting safety incidents, and specifying acceptable and unacceptable behaviour. Safety objectives, which serve as the basis for evaluating an organization's safety performance, highlight its dedication to maintaining a secure work environment.
	Safety accountabilities and responsibilities	One of the crucial tasks of any organization is to appoint a competent executive to oversee the implementation and upkeep of the SMS. Additionally, it is essential to establish a safety accountability framework and designate decision-making tiers with authority to determine an acceptable level of safety risk. Furthermore, it is necessary to document and disseminate safety roles, responsibilities, and documents to ensure everyone is aware of their duties. All these tasks are critical for maintaining a safe work environment and preventing accidents.
	Appointment of key safety personnel	The appointment of a SMS overseer responsible for implementing and sustaining the SMS.
	Coordination of emergency response planning	The development and upkeep of a crisis management plan are closely tied to the

		emergency response tactics employed by relevant organizations in the context of aviation-related accidents and incidents, as well as other comparable situations.
C2. Safety Risk Management	SMS documentation	A manual for SMS has been developed and managed that encompasses policies, objectives, rules, processes, obligations, and authorities associated with the SMS. The manual also comprises operational records for the SMS.
	Hazard identification	Developing and implementing a process for identifying hazards associated with an organization's aviation products or services that incorporates both proactive and responsive strategies is crucial.
	Safety risk assessment and mitigation	Ensuring the assessment, evaluation, and administration of safety risks associated with recognized hazards is critical, and developing and maintaining an effective process is essential.
C3. Safety Assurance	Safety performance monitoring and measurement	Developing and sustaining strategies to improve an organization's safety performance entails linking safety performance indicators to safety performance targets and verifying the effectiveness of safety risk-control measures.
	The management of change	Developing a procedure to pinpoint and eliminate possible safety hazards that could arise from modifications to an organization's aviation goods or services and simultaneously evaluating the degree of risk associated with such alterations.

	Continuous improvement of the SMS	Ensuring the ongoing improvement of an organization's overall performance by regularly evaluating and analysing the effectiveness of its SMS processes.
C4. Safety promotion	Training and education	Developing and sustaining a safety training program that guarantees employees' proficiency in fulfilling their SMS obligations is paramount.
	Safety communication	Developing and sustaining formal channels for transmitting information about SMS, critical safety data, clarification of safety measures, and updates to safety protocols.

Source: Stroeve et al., 2022

Regulatory organizations, such as the Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA), provide safety management standards and guidance materials based on ICAO Standards and Recommended Practices (SARPs) (FAA, 2015). In Somalia, the Somali Civil Aviation Authority (SCAA) serves as the primary regulatory body responsible for developing and implementing civil aviation safety management regulations that align with the ICAO SARPs. The Somali Civil Aviation Act 2020, in Chapter 2, Article 31, the Somali Civil Aviation Act mandates that the SCAA implement a SMS and Quality Management Systems for operators, service providers, and other relevant entities to ensure civil aviation safety in accordance with the ICAO Standards contained in Annex 19: Safety Management System. Furthermore, the Act specifies that the SCAA must establish a National Civil Aviation Safety Program for three-year terms with annual revisions (SCAA, n.d.).

The various elements of an SMS interact with individuals and processes at different levels within an organization, including staff, middle management, and executives (as depicted in Figure 3). In such organizational settings, safety intelligence ensures that managers have access to the necessary information for decision-making, which affects safety. Safety mindfulness involves establishing information flows that enable staff to remain safety conscious during their activities and assist managers in maintaining safety oversight. Safety culture encompasses the norms, values, and practices related to safety and risk shared by everyone in the organization.

The actual level of safety in an organization is reflected in the manner in which operations are performed, or "work as done," rather than "work as imagined," at the sharp end, which is influenced by decisions and operating conditions created by middle and top management at the blunt end. Thus, the level of safety is shaped by safety culture, mindfulness, intelligence processes, and management processes (Stroeve et al., 2022).

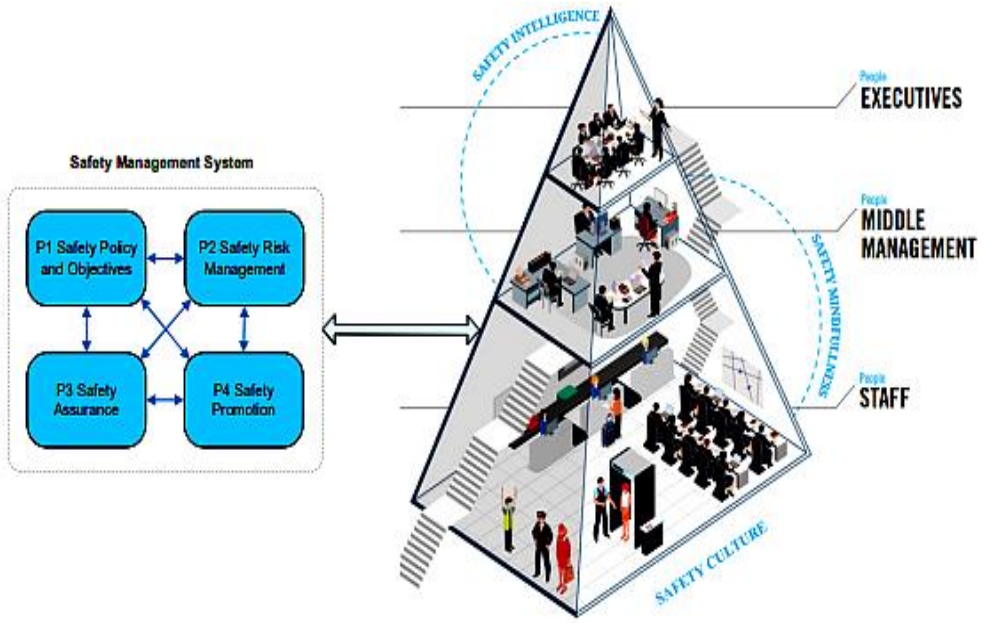

Figure 3: shows Relationship Between a Safety Management System and Safe Performance Within an Organization.

Source: Stroeve et al 2022.

The task of maintaining and documenting an SMS can be challenging, as it involves numerous components that are intricately connected to the design and operation of organizational activities. Despite the comprehensive nature of SMS standards, which cover aspects such as human factors and safety culture, SMSs are often perceived as bureaucratic and disconnected from actual operations. They tend to focus on preventing deviations from procedures rather than effectively supporting safety in real operational contexts. The softer aspects of promoting safety, such as the complex web of informal relationships and factors that influence safety within an organization, are often given limited consideration. This reductionist approach to safety management can result in a fragmented view that separates human and technical factors, thereby undermining a holistic perspective on organizational safety (Reiman & Rollenhagen, 2011).

Safety management from the perspective of Safety-II emphasizes a thorough understanding of the role that humans play in ensuring safety. This approach acknowledges that human

performance, both individually and collectively, is inherently variable, and that this variability is essential for completing tasks within the real-world working environment of organizations. Resilience engineering supports the Safety-II approach by highlighting the capacity of sociotechnical systems to adjust and maintain essential functions despite changes and disruptions and by concentrating on enhancing this adaptive capacity (Stroeve et al., 2022). Resilience engineering emphasizes the significance of human performance variability in response to changing demands and conditions. To foster resilience, organizations engage in activities such as training, creating flexibility, allocating sufficient resources, and establishing a learning culture. The main challenges for organizations in improving their safety performance involve maintaining resilience in the face of changing demands and conditions and advancing informal, human-related, and intangible aspects. However, Safety-II has yet to provide a practical, seamless solution that integrates SMS and operational processes smoothly (Stroeve et al., 2022).

2.1.4 Safety Performance Management Process

The efficient operation of SMS is significantly enhanced by the implementation of Safety Performance Management (SPM). When executed properly, SPM provides management with valuable insights into the organization's performance in achieving safety objectives, enabling data-driven decision-making that is informed and evidence-based. As a crucial component of state safety programs and systems, the SPM ensures that organizational activities and processes attain the desired safety levels by utilizing Safety Performance Indicators (SPIs) to monitor and evaluate safety performance (Mearns et al., 2003). The identification of SPIs can address the challenge that senior management faces in balancing protection with productivity, also known as the 2Ps dilemma. By using this approach, safety risks can be mitigated or eliminated, enabling the organization to meet its safety objectives through appropriate safety measures, including cost-benefit assessments when necessary. The general process of SPM, its connection to Safety Data Collection and Processing Systems (SDCPS), and safety analysis are illustrated in Figure 4. The link to safety promotion highlights the importance of disseminating this information throughout the organization (Cokorilo, 2020).

Effective SPM requires the systematic collection, sorting, storage, and retrieval of safety data through an SDCPS. These data are then processed and analysed to generate useful safety information, which includes tracking whether various SPIs meet their targets (ICAO, 2018). The promotion of safety is a crucial element of the overall process. Without a well-informed and engaged workforce, voluntary reporting rates may be low, depriving the management of a

comprehensive view of the operational risk landscape. A shortage of submitted reports limits the safety team's ability to assess the performance of defined SPIs, making it difficult for management to determine whether business safety performance aligns with its goals (ICAO, 2018). Thus, fostering a strong safety culture in the workplace is imperative to achieve good safety performance in aviation.

Figure 4: illustrates the Safety Performance Management Process.

Source: ICAO, 2018.

2.1.5 Understanding the Significance of Safety Culture

As per Akselsson et al. (2009) and Byrnes (2022), safety culture is defined as a shared set of values related to safety within an organization. These values are divided into three categories: psychological aspects, which encompass the safety climate and attitudes; behavioural aspects, which refer to the actions of individuals within the organization; and situational aspects, such as an organization's SMS. The notion of safety culture originated following an investigation of the catastrophic Chernobyl nuclear power plant accident in Ukraine in 1986. This disaster resulted in the loss of over 30 lives and the spread of radioactive contamination across approximately 400 square miles of Eastern Europe, causing significant damage to neighbouring countries. Owing to political and social pressure in Europe, it has become crucial to identify and analyse the root causes of accidents. The disaster investigators adopted a more comprehensive analysis approach, extending beyond mechanical or engineering failures to encompass individual performance in high-risk industries. This approach entailed examining

employees' behaviour in the workplace and the factors that influenced their attitudes and beliefs regarding safe operations, as discussed by Alsowayigh (2014).

The International Atomic Energy Agency and Organization for Economic Cooperation and Development identified a poor safety culture as a contributing factor to the Chernobyl disaster (Wiegmann, Zhang, et al., 2004). Following this, accident investigators recognized organizational safety culture as a contributing factor to various incidents. Furthermore, organizational safety culture has been implicated in numerous accidents, such as the King's Cross underground fire in London and the Piper Alpha oil platform explosion in the North Sea (Cox & Flin, 1998; Pidgeon, 1998; Taylor, 2010; Wiegmann et al., 2004).

According to Reason (1997), the four essential components of safety culture are learning culture, flexible culture, just culture, and reporting culture. These components collaborate to create an "informed culture." As depicted in Figure 5, these elements interact with each other within a safety culture, allowing room for additional elements. This approach emphasizes the significance of continuous learning for safety, which encompasses both behavioural improvements i.e., safe acts and acts for safety and artifact improvements i.e., safe artifacts and artifacts for safety to enhance an organization's safety (as cited in Akselsson et al., 2009).

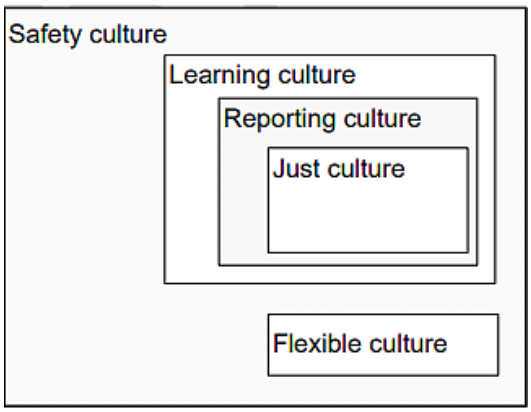

Figure 5: Safety Culture and Reason’s subcultures

Source: Akselsson et al., 2009

A learning culture Knowledge acquisition and retention are essential components of an organization's success (Koornneef & Hale, 2004a, 2004b; Koornneef et al., 2008; Koornneef et al., 2009). This involves learning from various sources, including accidents, incidents, safety audits, research, and other relevant observations, to improve safety and operations. The

importance of shared learning across different departments and teams has been previously emphasized (Koornneef, 2008; Ward, 2009; Koornneef et al., 2009). The final stage in the learning process is the implementation of improvements, which should be emphasized in any safety culture investigation or improvement efforts. This proactive approach entails identifying and addressing weaknesses in the system, including the gap between espoused theories and theories in use (Argyris & Schön, 1974; Koornneef, 2004a). Effective analysis and reporting are crucial for this process, and a good reporting culture is essential, as illustrated in Figure 4, as a subculture of learning culture.

A reporting culture entails the integration of both a just culture and comprehensive reporting of incidents and near misses in terms of both quantity and quality. This encompasses all employees' readiness to report and the organization's capacity to cultivate an environment that motivates reporting through user-friendly forms and templates, adequate training and instructions, feedback to reporters, recognition for outstanding reporting, and continuous management oversight to guarantee proper functioning (Akselsson et al., 2009).

A just culture fosters a learning environment where individuals are not penalized for mistakes or actions that are consistent with their level of experience and training, given the specific circumstances. However, this culture does not condone intentional misconduct, reckless behaviour, or actions that lead to harm. It is important to establish clear procedures for determining the boundaries between acceptable and unacceptable behaviour to maintain trust and encourage reporting. This can be achieved by protecting the identity of the reporter and limiting access to sensitive information to a selected group (Dekker, 2018). Union agreements can provide clarity on the procedures and responsible parties. It is crucial to move beyond acknowledging the idea that "to err is human" and put it into practice in order to create a truly just culture (Akselsson et al., 2009).

A flexible culture is characterized by the ability to transition from a bureaucratic mode to one in which skills, knowledge, and abilities determine who leads or performs a task in difficult situations, such as emergencies, and then shift back when problems are resolved (Akselsson et al., 2009). In this thesis, the safety performance of the Somali Civil Aviation was examined by assessing the SMS and implementation of safety culture in the industry. This study provides an overview of the development of the Somali civil aviation.

2.2 An Overview of Somali civil Aviation development

The Somali aviation industry boasts a distinguished history dating back to the early 1900s during the period of Italian colonial rule. However, the years between 1991 and 2012 saw significant setbacks due to political turmoil and instability, which severely affected the nation's aviation infrastructure. The Italian colonial administration established the first civilian airport in Mogadishu, the capital city, in the 1920s, to facilitate communication and transportation within the country (ICAO, 2007). In the 1930s, the Italian government expanded Somalia's aviation infrastructure by constructing several additional airports and airfields across the country. In 1960, Somalia gained independence from colonial rule (Abdimajid et al. 2022).

After independence, the Somali government established Somali Airlines in 1964 as a joint venture with Alitalia, an Italian national airline. Alitalia was responsible for providing management services, technical support, and training for Somali aviation personnel. Somali Airlines operated both domestic and international flights, with routes extending to Europe, the Middle East, and Africa (Table 2). In the same period, Somalia joined the ICAO and signed the International Services Transit Agreement (Kaplan, 1969).

The outbreak of the civil war in Somalia in 1991 had a devastating impact on the aviation industry, leading to severe disruptions and destruction of aviation infrastructure. Consequently, Somali Airlines ceased operations, and private airlines, such as Daallo Airlines and Jubba Airways, emerged to fill the void (Garowe Online, 2022). To manage civil aviation in Somalia during this period, the United Nations established the Civil Aviation Caretaker Authority for Somalia (CACAS) in Nairobi, Kenya, in 1992, which was tasked with collecting overflight fees and using revenue to improve aviation facilities. After the end of the civil war in 2000, efforts to rebuild the aviation sector led to the re-establishment of SCAA in 2002. In 2018, the Somali government regained control of the country's airspace from the CACAS in Nairobi, coinciding with improvements in airport infrastructure and aviation policies (Simple Flying, 2021).

Table 2: Somali Airlines International Destinations

Country	City	Airport
Djibouti	Djibouti	Djibouti–Ambouli International Airport
Egypt	Cairo	Cairo International Airport
Germany	Frankfurt	Frankfurt Airport
Italy	Rome	Leonardo da Vinci, Fiumicino Airport
Kenya	Nairobi	Jomo Kenyatta International Airport
Qatar	Doha	Doha International Airport
Saudi Arabia	Jeddah	King Abdul-Aziz International Airport
Seychelles	Mahe’	Seychelles International Airport
United Arab Emirates	Abu Dhabi	Abu Dhabi International Airport
Yemen	Aden	Aden International Airport

Source:www.flightglobal.com(1990).

The aviation industry in Somalia has faced significant challenges due to prolonged political instability and security concerns. However, recent years have seen gradual improvements as the government, with the support of international partners, has focused on rebuilding aviation infrastructure. Notably, in collaboration with the Turkish Cooperation and Coordination Agency (TIKA), the Somali government constructed a state-of-the-art terminal at Aden Adde International Airport in Mogadishu, enhancing operational capacity and efficiency for airlines and passengers (Addow, 2011).

The growth of Somalia's aviation sector has become evident through the emergence of international airlines. Between 1991 and 2012, the country experienced a significant decline in commercial aviation activities and passenger movements due to political upheavals, leading to the cessation of all international operations. Nonetheless, private domestic airlines continued to operate. By 2012, the security situation had improved, allowing international flights to

gradually resume. Turkish Airlines was the first international carrier to launch operations in Somalia in over two decades, opening the door for other airlines such as Ethiopian Airlines, Air Djibouti, Kenya Airways, Qatar Airways, Uganda Airlines, and Fly Dubai to enter the market (Mohamed et al., 2019). Currently, seven international and domestic airlines operate within the country (see Table 3).

A significant milestone was achieved in 2023 with the restoration of Class A air traffic control services, which ensures improved air traffic safety and efficiency. This development is expected to attract more airlines and investment to Somalia (IATA, 2023). Despite these positive developments, the aviation sector still faces obstacles such as inadequate airport infrastructure, a shortage of qualified aviation professionals, and ongoing security concerns (Mohamed et al., 2019).

Table 3: International and Domestic Airlines in Somalia

International Airlines	**Domestic Airlines**
Turkish Airlines	Daallo Airlines
Ethiopian Airline	Jubba Airways
Air Djibouti	African Express Airways
Kenya Airways	Freedom Airline
Qatar Airways	
Uganda Airlines	
Fly Dubai	

2.3 Aviation Policy and Regulations in Somalia

Establishing aviation policies and regulations is essential for ensuring the safety and efficiency of aviation activities. The Ministry of Transport and Civil Aviation (MTCA) serves as the primary regulatory authority for the Somali aviation. It is responsible for governing transportation, managing airports and national airlines, and overseeing state-owned enterprises in the transport sector. MTCA's five main tasks include: providing effective, efficient, and sustainable transportation services for Somali citizens; developing national airport services;

monitoring civil aviation requirements and regulations in compliance with ICAO standards; designing and creating essential infrastructure while planning for national and international capacities; and enhancing the economic environment for both domestic and international aviation services (source: motca.gov.so).

SCAA is the government authority that supervises and controls aviation safety, security, airport services, air navigation, and the growth of air transportation in Somalia. SCAA has four main departments: Aviation Regulation and Oversight, Airport Services, Air Navigation Services, and Corporate Services. The Aviation Regulation and Oversight department is responsible for supervising, certifying, and licensing operators (including airlines, airports, AMOs, and ATOs), aviation professionals (such as pilots, engineers, flight attendants, and dispatchers), equipment (aircraft and simulators), and operational systems. The Airport Services and Air Navigation Services departments ensure the delivery of efficient airport and air navigation services, respectively, following the international standards set by ICAO. The Corporate Services department provides administrative and logistical support to the other departments (source: scaa.gov.so).

The director of the airport, who oversees the Department of Airports, is responsible for ensuring the provision of effective and efficient operational services. This department ensures that Somalia's airports and aerodromes comply with ICAO standards and recommended practices, operating as financially sustainable entities. The airport manager of Aden Adde International Airport (AAIA) oversees its operations and supervises 50 other aerodromes and airfields across the country (source: scaa.gov.so). Figure 6 illustrates the structure of the Federal Ministry of Transport and Civil Aviation.

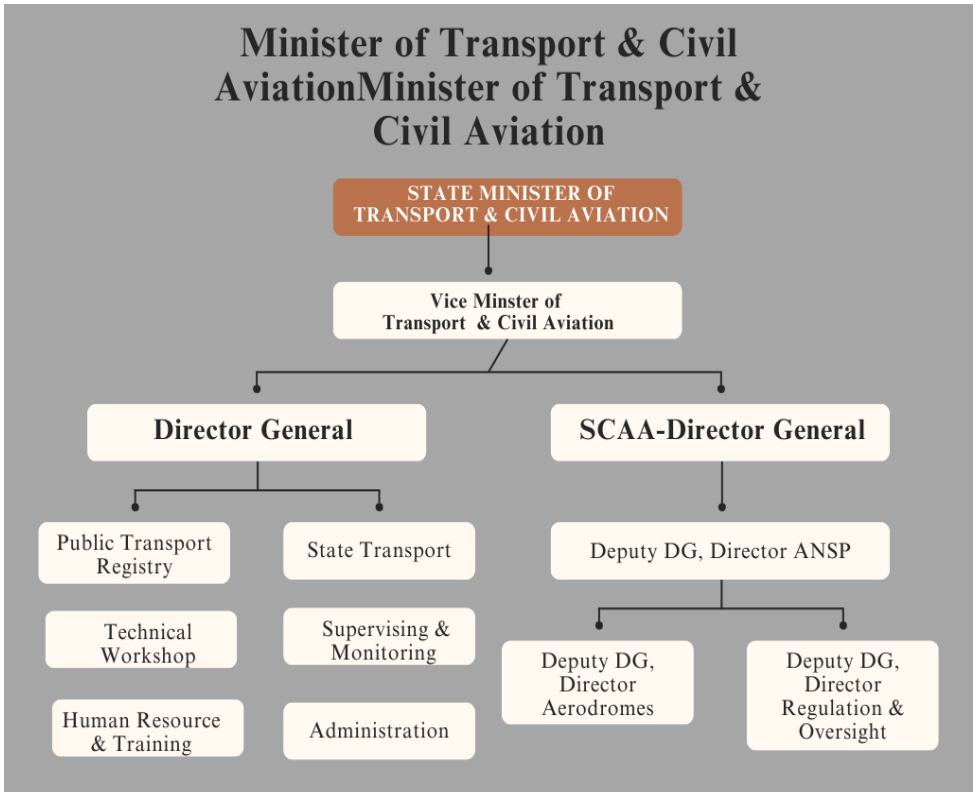

Figure 6: shows The Federal Ministry of Transport and Civil Aviation Structure

Source: Adapted from African Development Bank Group (2018).

2.4 Airport Infrastructure and Standards

Airports are crucial gateways for international travel, tourism, and commerce, facilitating the movement of people and goods across borders. Adequate airport infrastructure is essential for exporting high-value or perishable products. According to the Somalia Aeronautical Information Publication, the Federal Government of Somalia administers all aerodromes, with support from state governments and other agencies. To ensure compliance with minimum standards, both government and private aerodromes must be inspected and authorized in accordance with the Civil Aviation Regulations. Annex 14 of the Chicago Convention provides guidelines for aerodrome standards and services (Somalia Aeronautical Information Publication, 2023).

Currently, Somalia hosts six major airports: Aden Adde International Airport in Mogadishu, Egal International Airport in Hargeisa, Bossaso Airport, Garowe Airport, and Kismayo Airport (African Development Bank Group, 2018). Figure 7 illustrates the distribution of various airstrips and airfields. Mogadishu International Airport, the principal airport serving the capital city, Mogadishu, is overseen by the Somali Civil Aviation Authority. Located approximately 5

km from the city centre, it features a single runway and terminal building with limited facilities, functioning as a hub for both domestic and international flights.

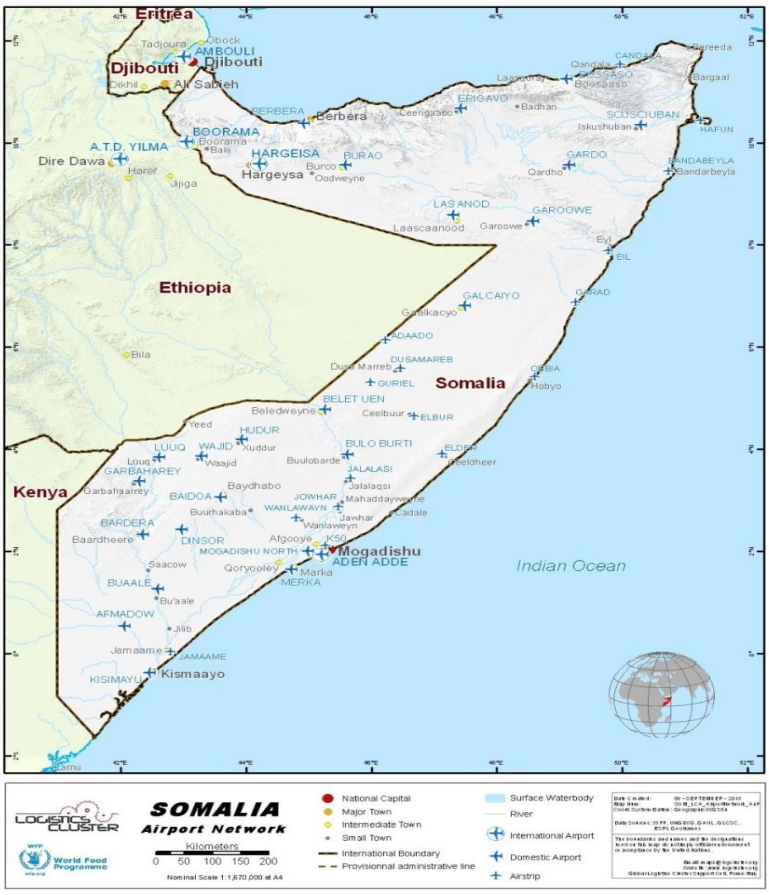

Figure 7: Major Airports and Airstrips in Somalia

Source: African Development Bank Group (2018)

2.5 National Regulations Act

The primary regulatory framework governing Somali civil aviation is the Civil Aviation Act No. 28 of 2020. This Act establishes the legal framework for civil aviation in Somalia, encompassing rules and regulations pertaining to air transport, airport operations, aircraft registration, airworthiness, flight operations, air traffic control, and pilot licensing. Table 7 provides a comprehensive listing of Somalia's civil aviation legislation and regulatory acts (refer to Table 4).

Table 4: National Civil Aviation Regulations Act

NO	Regulation	Reference
1.6.3.1	General	SOMCAR-part 1 of 2021
1.6.3.2	Personnel Licensing	SOMCAR-Part 2 of 2021
1.6.3.3	Approved Training Organization	SOMCAR-Part 3 of 2021
1.6.3.4	Aircraft registration, marking, and environmental monitoring	SOMCAR-Part 4 of 2020
1.6.3.5	Aircraft Airworthiness	SOMCAR-Part 5 of 2021
1.6.3.6	Approved Continuing Airworthiness Organization	SOMCAR-Part 6 of 2021
1.6.3.7	Aircraft Instruments and Navigation Equipment	SOMCAR-Part 7 of 2021
1.6.3.8	Operations	SOMCAR-Part 8 of 2021
1.6.3.9	Air Operator Certificate (AOC)	SOMCAR-Part 9 of 2021
1.6.3.10	Foreign Air Operators	SOMCAR-Part 10 of 2021

Source: Somalia Aeronautical Information Publication (2023).

2.6 International Agreements/Conventions

Joining international civil aviation treaties is crucial for countries as they address a wide range of issues, including aviation safety, security, environmental protection, and economic regulation. These treaties facilitate the negotiation of air service agreements, which enhance

air connectivity and promote economic development through increased trade and tourism. Somalia has ratified only six international civil aviation treaties (see Table 5). It is imperative for Somalia to join additional international civil aviation treaties to fully benefit from the opportunities and protections they offer. Doing so would enhance aviation safety and security, stimulate economic growth, and contribute to a safe and efficient global aviation system.

Table 5: International Agreements/Conventions

	International Convention	Date of Ratification	Effective Date
1.	Convention on International Civil Aviation, concluded in Chicago in 1944	2/3/1964	1/4/1964
2.	International Air Services Transit Agreement, concluded in Chicago in 1944	10/6/1964	10/6/1964
3.	Article 93 bis Montreal,1947	30/9/1964	30/9/1964
4.	Article 45 Montreal, 1954	30/9/1964	30/9/1964
5.	Article 48(a), 49(e) and 61 Montreal, 1954	30/9/1964	30/9/1964
6.	Article 50(a) Montreal, 1961	30/9/1964	30/9/1964
7.	Article 48(a) Rome, 1962	30/9/1964	11/9/1975
8.	Article 50 (a) Montreal, 2016	12/9/2022	-
9.	Article 56 Montreal, 2016	12/9/2022	-
10.	Article 83 bis Montreal,1980	3/4/2023	3/4/2023

Source: Somalia Aeronautical Information Publication (2023).

2.7 Airline operating requirements and regulations

According to the Somalia Aeronautical Information Publication for the year 2023, international flights entering, departing from, or passing through the Mogadishu Flight Information Region (FIR) must comply with prevailing Somali civil aviation regulations. These regulations are in line with the Standards and Recommended Practices outlined in Annex 9 of the Convention on International Civil Aviation's. Foreign airlines operating regular international scheduled flights into or through the Mogadishu FIR must satisfy the following requirements: a) The airline's country of origin must be a signatory to either the International Air Services Transit Agreement and/or the International Air Transport Agreement, both of which include Somalia. b) The airline must be authorized to operate flights under bilateral or multilateral agreements to which both Somalia and the airline's country of origin are contracting parties. a) To operate within or transit through Somalia, the airline must secure a permit from the Somali Civil Aviation

Authority (SCAA). Requests for such permits should be addressed to the Director General of SCAA. b) Upon entry and departure from Somalia, airline operators must submit aircraft documents for clearance. These documents, which consist of general declarations, passenger manifests, and cargo manifests, must adhere to the standard format set by the International Civil Aviation Organization (ICAO) and be completed in legible English. c) For non-scheduled flights in Somalia for the purpose of taking on or discharging passengers, cargo, or mail, operators must obtain permission from the SCAA at least twenty-four hours prior to the intended landing. The application must include details, such as the operator's name and address, aircraft type and registration, nature of the flight, origin, and complete itinerary. d) Commercial air transport aircraft operating in Somalia must comply with the regulations specified in ICAO Annex 6, Part I, which pertain to international commercial air transport. This includes adhering to the guidelines in Chapter 6 regarding the equipment and documents required for flight, and Chapter 7 concerning communication and navigation equipment for airplanes.

2.8 An Overview of Latest Somali Civil Aviation Accidents

Despite the Somali government's efforts to enhance civil aviation safety, several significant obstacles persist, hindering the country's ability to establish a reliable aviation industry. Key challenges include inadequate infrastructure, limited resources, and deficient regulatory frameworks, which pose substantial safety risks and impede progress in the aviation sector. This section reviews recent significant air accidents in Somali Civil Aviation and their underlying causes. According to the Aviation Safety Network (ASN), the aviation accident rate in Somalia has been a persistent concern, with numerous accidents occurring over the years. Since 1919, Somalia has reported 93 fatalities related to aviation accidents. Contributing factors to the high accident rates include inadequate maintenance, lax safety regulations, and the use of outdated aircraft (Al-Salem et al., 2016). Additionally, ongoing political unrest and the lack of proper infrastructure due to the civil war since 1991 have further exacerbated the situation (Addow, 2011).

On May 4, 2020, an Embraer EMB-120RT Brasilia transporting medical supplies crashed while approaching Bardale, Somalia, resulting in the death of all six people on board. The aircraft departed from Mogadishu, stopped at Baidoa, and then proceeded to Bardale. According to Somalia’s Transport Minister, among those on board were captains, co-pilots, flight engineers, trainee pilots, and two airline employees. Ethiopian troops stationed at both Baidoa and Bardale under the (AMISOM) African Union Mission in Somalia were present at the time. AMISOM reported that the aircraft approached from the west instead of the usual east direction and

overflowed the airfield at low altitudes during a go-around period. One witness mentioned that the animals were near the runway. Ethiopian soldiers mistaking the plane for a suicide bomber shot it down with a ZU-23 anti-aircraft cannon (Aviation Safety Network, n.d.).

On July 14, 2020, a DHC-8-400 cargo aircraft crashed at Beledweyne Airport, Somalia. The aircraft hit small mounds used for runway maintenance, igniting a fire that destroyed the aircraft. All three crew members survived, and the flight manifest indicated the plane was carrying food supplies (Aviation Safety Network, n.d.).

On September 19, 2020, a Fokker 50 experienced a runway excursion at Mogadishu Aden Adde International Airport in Somalia, colliding with a concrete perimeter wall. The aircraft, on a cargo flight to Beledweyne, returned to Mogadishu Airport due to hydraulic issues. During landing on runway 05, it veered off and struck the wall, causing serious injuries to both pilots. The Somali Ministry of Transport reported that the aircraft was operated by Silverstone Air Services of Kenya, which had ceased scheduled services in November 2019 after authorities grounded their DHC-8 aircraft (Aviation Safety Network, n.d.).

Air Djibouti Boeing 737 experienced failure of its primary landing gear while attempting to land at Garowe Airport in Somalia. In particular, the Boeing 737-529 aircraft, identified as EY-560, travelled from Djibouti Airport to Mogadishu Airport, with intermediate stops in Hargeisa and Garowe when the event took place. The aircraft, with 39 passengers and five crew members onboard, veered to the right of the runway during landing and came to a halt on its right-hand engine at the edge of the soft ground. It is worth noting that no injuries were reported during this occurrence (Clement, 2020).

On July 21, 2021, an incident involving the Skyward Express DHC-8-106 occurred during an attempted landing at a location on the Kenya and Somali border. The aircraft that departed from Nairobi, Wilson Airport enroute to El Wak in Kenya, is reported to have touched down on an airstrip in Burahache, Somalia, which lies directly opposite El Wak and approximately 18 km east of El Wak Airport (Bonface, 2021).

On November 3, 2021, a Transall C-160NG was destroyed by fire after landing at Dolow Airport, Somalia. The aircraft was transporting humanitarian aid from Mogadishu to Dolow. After a safe landing and parking, the left main landing gear caught fire, which spread and consumed the fuselage (Dominik, 2021).

In July 2022, Jubba Airways Fokker 50 crashed while landing on runway 05 at Mogadishu Aden Adde International Airport (MGQ), Somalia. The Kenyan-registered aircraft (5Y-JXN) was on domestic flight from Baidoa to Mogadishu on July 18. According to the Dutch Safety Board, which supported the Somali-led investigation, the aircraft encountered a windshear at a low altitude during its final approach to runway 05. This led to pilots losing control of the aircraft, causing it to hit the runway hard, flip over, and come to a stop upside down, causing extensive damage. During the crash, the left wing detached, and the fire erupted. Three of the 30 passengers sustained minor injuries, as reported by the safety board in a third-quarter bulletin. The 30-year-old aircraft has a crew of six onboards. Meteorological data from the time of the accident indicated winds of 18 knots from the southwest, suggesting a tailwind component for runway 05 but otherwise good weather conditions (David, 2022).

In September 2022, Freedom Airline Fokker 50 incurred substantial damage to the apron at Nairobi-Jomo Kenyatta International Airport (NBO/HKJK). The Kenyan-registered aircraft (5Y-JXN) was on a domestic flight from Baidoa to Mogadishu on July 18. The Dutch Safety Board, assisting with the Somali-led inquiry, reported that the aircraft encountered windshear at a low altitude during its final approach to runway 05. Following the windshear encounter, the pilots lost control, resulting in the aircraft hitting the runway hard, flipping over, and coming to rest upside down with significant damage (Ministry of Transport, Infrastructure, Housing, and Urban Development, 2022). The left wing separated during the crash sequence, leading to a fire. Three of the 30 passengers sustained minor injuries, and the aircraft carried six crews. Meteorological data indicated 18-knot winds from the south-southwest, implying a tailwind component for runway 05, but overall favourable conditions (Aviation Safety Network, n.d.).

On December 17, 2022, the Somali Civil Aviation Authority (SCAA) reported that an aircraft registered as 5Y-VVY and operated by Blue Bird Aviation crashed while landing at Abudwaq Airfield in central Somalia. The aircraft was carrying six individuals, but thankfully, no fatalities or injuries were reported (Airspace Africa, 2022). The cause of the accident remains undetermined.

In a related incident in December 2022, Ethiopian Airlines Flight ET 379, scheduled to depart from Mogadishu, Somalia, to Addis Ababa, had to cancel its flight because of a bird strike on one of the aircraft engines. The SCAA indicated that the pilot detected an engine issue during the pre-take-off procedure, which led to the aircraft returning to the airport. The root cause was

identified to be a bird strike that impacted the engine. Fortunately, no casualties have been reported (Aero Inside 2023).

These incidents highlight the critical need for effective management of airport vicinities, especially in areas adjacent to airports. Poor management in these zones can significantly jeopardize airport safety and security. One major concern is the attraction of birds, animals, and unauthorized individuals, which can disrupt airport operations. To mitigate these risks and ensure the smooth functioning of airports, it is essential to implement comprehensive and proactive measures, thus maintaining airport safety and minimizing potential hazards.

In July 2023, an Embraer EMB-120 airplane operated by Halla Airlines departed Garowe, Somalia, for passenger flight to Mogadishu, Somalia. The aircraft carried 30 passengers and four crew members when it landed at Mogadishu's airport. Upon landing, the left main gear collapses, causing the plane to veer off the runway to the left, pivot nearly 180 °, and crash into the perimeter fence, resulting in the aircraft breaking into two pieces. One passenger sustained a minor injury. The meteorological conditions at the time showed good visibility, with winds blowing at 17 knots in the west-southwest direction. The aircraft landed on runway 05, encountering a 16-knot tailwind, which led to high ground speed during landing. The Embraer EMB-120 Brasilia is a twin-turboprop, 30-passenger commuter airliner manufactured by the Brazilian company Embraer (Bart Noëth, 2023).

The accidents mentioned above that the industry has been experiencing in recent years necessitate a thorough assessment of the country's safety performance. That is why this thesis addresses this subject by thoroughly analysing the current state of Somali civil aviation safety performance.

2.9 Theoretical Framework

This thesis, titled "The Assessment of Safety Performance in the Civil Aviation Industry in Somalia," is grounded in the SMS framework. The SMS framework represents a comprehensive strategy employed by companies to detect hazards proactively and evaluate safety risks through data and information collection. The primary objective of SMS is to minimize safety risks and prevent aircraft accidents while promoting efficient activity management with a focus on security performance and resource allocation. A well-implemented SMS indicates that a service provider can mitigate safety risks and maintain oversight over national safety in accordance with the ICAO requirements outlined in Annex 19

(ICAO, 2019). The ICAO's SMS Framework consists of four major components (Roelen & Klompstra, 2012; Majid et al., 2022):

2.9.1 Safety Policy and Objectives

The first essential step in implementing the SMS framework is to create a supportive environment that emphasizes safety. This involves formulating a safety policy and objectives that clearly demonstrate senior management's commitment to safety and its goals, as well as establishing the necessary organizational structure. Successful SMS implementation requires management commitment and safety leadership, conveyed through safety policies and the establishment of safety objectives. This commitment is demonstrated through management decisions and resource allocation aligned with safety policies and objectives, thereby fostering a positive safety culture. To ensure the effectiveness of the safety policy, it must be developed and endorsed by senior management and signed by an accountable executive. Consulting key safety personnel and staff representative bodies (such as employee forums and trade unions) is crucial to promote a shared sense of responsibility. This collaboration ensures that the safety policy reflects the needs and concerns of all stakeholders, as emphasized by Hsu et al. (2010) and Mitchison and Papadakis (1999).

2.9.2 Safety Risk Management

Service providers are obligated to implement a Safety Risk Management (SRM) process to address safety risks. This process involves the systematic identification, assessment, and mitigation of hazards in the context of service delivery. Hazards can arise from various factors, such as system deficiencies in design, technical functions, human interfaces, interactions with other processes and systems, and the failure of existing processes or systems to adapt to changes in the operating environment. Analyzing these factors can help identify potential hazards at any stage of the operation or activity lifecycle (Olutuase, 2014). To achieve a high level of safety, it is essential to understand the system and its operating environment, and a detailed description of the system and its interfaces is helpful. Hazards can be identified throughout the operational lifecycle from both internal and external sources. To ensure the effectiveness of safety risk assessments and mitigation measures, they must be reviewed continuously (Darabont et al., 2017).

2.9.3 Safety Assurance

The primary objective of safety assurance is to ensure that the SMS functions as intended and required. This requires the continuous monitoring of processes and operational environments

for any discrepancies or deviations that could result in new safety risks or compromise existing safety risk controls. These inconsistencies are addressed through the SRM process. To optimize the performance of SMS, safety assurance activities should involve the development and implementation of corrective actions to identify safety issues with potential safety consequences. Hsu et al. (2010) and Darabont et al. (2017) provide evidence supporting this claim.

2.9.4 Safety Promotion

Promoting safety is crucial for cultivating a positive safety culture and achieving the service provider's safety objectives through a combination of ongoing technical expertise enhancement via training and education and effective communication and information sharing. Senior management plays a vital role in promoting a safety culture throughout an organization by providing the necessary leadership. It is important to note that merely enforcing policies and procedures or adhering to guidelines is insufficient to achieve effective safety management (Havlovska et al., 2022). Safety promotion significantly influences both individual and organizational behavior and supports the organization's policies, procedures, and processes, thereby promoting a safety value system. To ensure effective two-way communication at all organizational levels, the service provider should establish and implement processes and procedures that enable a clear strategic direction from the top and facilitate open and constructive feedback from all personnel. This "bottom-up" communication approach is critical for fostering a safety culture that values input from all levels of the organization (Uflaz et al., 2022).

The purpose of this theoretical framework section is to justify the selection of the SMS framework over other alternatives such as the Traditional Safety Management approach and Total Quality Management (TQM). There are several reasons for selecting SMS. First, it is proactive in nature and is based on international standards, utilizing holistic risk management for safety purposes. Unlike traditional approaches to safety management, which are often reactive, the SMS framework emphasizes the proactive identification of hazards and mitigation of risks, making it more effective in terms of accident prevention. Furthermore, adherence to ICAO norms ensures global uniformity and compliance with the aviation industry's international aspects. Additionally, fostering an organizational culture that promotes continuous improvement through structured processes makes the SMS framework a strong instrument in the Civil Aviation Safety Performance Management area. The objective of this research is to evaluate every aspect of the SMS within Somali civil aviation by engaging Somali

civil aviation personnel to offer a comprehensive understanding of the current state of the country's SMS.

This theoretical framework, thus, integrates the SMS components with the goal of assessing and improving safety performance in the Somali civil aviation industry, ensuring alignment with international standards and fostering a proactive safety culture.

2.10 Research Gap

Throughout this thesis, it has been demonstrated that the implementation of an SMS not only enhances safety performance but also has the potential to reduce costs for aviation organizations. Most discussions surrounding SMS in aviation emphasize its ability to identify potential accidents, which can result in significant cost savings by preventing expenses associated with repairing damaged equipment, cleaning up accident scenes, and compensating for those involved. An effective SMS helps aviation organizations identify and manage risks more efficiently, leading to a decline in the frequency of accidents and incidents. This reduction not only conserves financial resources, but also bolsters the organization's reputation and can lead to further cost savings through lower insurance premiums. Because of its importance, numerous studies have underscored the significance of SMS in every state's civil aviation sector.

However, in Somalia, which is the geographical focus of this thesis, no prior research has examined the safety management of the country's civil aviation industry. This gap exists despite the challenges of an inconsistent policy framework and the shortage of competent staff that the industry faces, exacerbated by the civil war in 1991, which severely impacted the sector. This study seeks to fill this need by systematically investigating the current safety performance of the Somali Civil Aviation Industry. In doing so, it seeks to contribute to the development of strategies for revitalizing Somalia's aviation sector, enhancing regional connectivity, and fostering economic recovery and growth.

CHAPTER 3
METHODOLOGY

This section provides a comprehensive explanation of the quantitative research methodology used to assess the safety performance of civil aviation in Somalia. The text provides a comprehensive explanation of the research design, methods employed for data collection, techniques used for data analysis, and reasoning behind the selection of this particular methodology. The objective was to clarify how quantitative research can efficiently tackle research inquiries and fulfil the objectives of the study. Furthermore, it emphasizes the ethical considerations that were followed to guarantee the secrecy and dependability of the study.

3.1 Research Design

The research design functions as a detailed plan outlining the specific procedures and techniques utilized by a researcher to conduct a study. Refining research methods that are suitable for the issue and ensuring the effectiveness of the investigation are facilitated (Denning 1997). The SMS questionnaire utilized in this study was modified from the research carried out by the Arish Aviation Authority (2011) on safety culture and SMS to guarantee the questionnaire's validity and clarity. The survey consisted of sections that covered sociodemographic characteristics and many aspects of SMS, including safety policies and objectives, safety risk management, safety assurance methods, safety promotion techniques, and safety culture. The reliability of the customized tool was established through pilot testing in a non-study location. Approval for survey distribution was obtained from the research supervisor before delivering the questionnaires to the participants.

3.2 Data Collection Methods

Data collection included systematically acquiring and measuring data regarding variables of interest to answer research questions, test hypotheses, and assess outcomes. As highlighted in the introduction, this study intends to analyse the current condition of safety performance in Somali civil aviation, identify factors influencing safety performance, and propose strategies for enhancing safety in Somali civil aviation. One research question was formulated to achieve this objective: How can the current safety performance of Somali civil aviation be assessed, and which factors influence it, to develop strategies for improving aviation safety in Somalia? To address this research question and achieve the overall research objectives, secondary and primary data were collected. Secondary data were sourced from research journals, dissertations, and online platforms to synthesize existing studies relevant to the study area. Primary data were gathered through surveys distributed to the key stakeholders in Somalia's

civil aviation industry. Google Forms was used to distribute the surveys to a random sample of Somali aviation workers. These surveys aim to collect quantitative data on various aspects of aviation safety performance, including safety protocols, training procedures, maintenance practices, and regulatory compliance. The survey sought to capture the opinions and experiences of key players in Somalia's civil aviation safety to understand their perspectives on the industry's current safety performance. The study's target population comprised 300 aviation workers, of which 123 were randomly selected. This sample includes aviation professionals, regulators, airlines, maintenance personnel, air traffic controllers, and other stakeholders. A stratified random sampling approach was employed to ensure fair representation across these sectors, providing a comprehensive view of the safety performance of the industry.

To mitigate potential biases in data collection, well-defined data collection tools and online forms were used. The participants were thoroughly informed of the study's objectives, confidentiality measures, and the voluntary nature of their participation through a consent form. Once the participants provided consent, they were given a single response option for their participation. After collecting participants' responses, Data were analysed using SPSS by applying descriptive statistics to assess the features of the data. Inferential statistics, such as chi-square analysis and Cronbach's alpha, were employed to identify important predictors and measure the inter-item reliability. These methods are explored in detail in the following section.

3.3 Data Analysis

The data obtained from the participants were analysed using SPSS version 25 to generate descriptive statistics and to summarize their characteristics. Additionally, a chi-square analysis was employed to identify significant predictors of safety performance within the aviation sector in Somalia, with significance determined at $p < 0.05$. The reliability of each item category related to safety performance was found to be acceptable, with Cronbach's alpha values >70%. Consequently, the sum of all items was included to calculate the overall safety performance.

The quantitative data from the surveys underwent various statistical analyses, including descriptive and correlation analyses. Descriptive statistics were used to summarize data properties, while correlation analysis was performed to assess the relationships between different aviation safety-related variables. A chi-square analysis was also conducted to identify significant predictors of safety performance, maintaining a significance threshold of $p < 0.05$. These analytical methods effectively addressed the research questions posed in this study.

To calculate the mean score and standard deviation for each dimension, the scores for all items relevant to that dimension were summed and divided by the total number of items in that dimension. This process provided the total dimension scores. To verify the consistency in responses across each dimension, Cronbach's alpha was used to test inter-item reliability, with each item category displaying acceptable reliability values of > 70%. Table 6 presents the inter-item reliability ratings for each item within the safety performance category.

Table 6: Safety Performance Rating Item Reliability, 2024

S/No	Item	No of Item	Reliability/alpha
1	Safety policy and objectives	8	0.78
2	Safety risk management	6	0.70
3	Safety assurance process	5	0.74
4	Safety promotion strategy	4	0.72
5	Safety culture rating	9	0.83

The reliability of each item category was strong, exceeding 70% for all items. Survey items were grouped and analysed to produce a mean score for each "dimension" of the SMS, such as management's commitment to safety. This approach allows for a comprehensive analysis of the SMS, rather than simply examining individual survey responses, and enables insightful comparisons across different groups. Evaluations of SMS often aim to determine whether responses to a particular dimension are favourable (Reader et al., 2023). This methodology aids in addressing the study's questions and objectives.

3.4 Ethical Considerations

When performing quantitative research, it is vital to adhere to ethical standards. This study follows fundamental ethical criteria, such as getting informed consent, ensuring confidentiality, and protecting privacy. Participants were thoroughly informed of the study's objectives, their rights as respondents, and the voluntary nature of their participation. The confidentiality of the acquired data was carefully preserved, and any personally identifying information was not disclosed without specific prior permission.

CHAPTER 4
FINDINGS AND DISCUSSIONS

This section outlines the results and discussion derived from this research. Initially, it details the sociodemographic profiles of the participants and the various sub-departments in the Somali Civil Aviation industry where they are employed. Subsequently, it explores SMS and safety culture conducted in this study. The chapter concludes by examining the relationship between sociodemographic factors and overall safety performance.

4.1 Socio-demographic Characteristics of Study Participants

The study of the safety performance of the Somali civil aviation industry included 123 participants. Among them, 92 (74.8%) were male and 31 (25.2%) were female. The majority, 79 (64.2%) were aged 25-34 years, followed by 34 (27.9%) aged 18-24 years. Most of the participants (98 (80.3 %) were single. The predominant occupation was air traffic control, accounting for 35 (28.5%), followed by 20 (16.4%) airport staff. In terms of professional experience, the largest group had 1-5 years (72 participants, 58.5%), while 28 (23.0%) had less than one year. Most participants held a bachelor's degree (78 participants, 63.9%) and 30 (24.4%) held a master's degree (see Table 7).

Table 7: Socio-demographic Characteristics of Research Participants, 2024

S/No	Variable	Category	Number	%
1	Gender	Female	31	25.4
		Male	92	74.8
2	Age	18-24	34	27.9
		25-34	79	64.2
		35-44	5	4.1
		45-54	4	3.3
		55-64	1	.8
3	Marital status	Married	25	20.3
		Single	98	80.3
4		4th-year student of aviation management	4	3.3

Position of the Aviation employee	Aerodrome information management	1	.8
	Aim officer	2	1.6
	Air operator	11	9.0
	Air Traffic Controller	35	28.5
	Air transport management	1	.8
	Aircrew	5	4.1
	Airport Staff	20	16.4
	AIS section officer	1	.8
	Aviation data analyst	1	.8
	Aviation specialist	1	.8
	Cargo Operator	6	4.9
	Economist	1	.8
	Flight Manager	5	4.1
	Flight ops professional	1	.8
	Interns	1	.8
	Maintenance Technician	2	1.6
	Pilot	6	4.9
	Public sector	1	.8
	Regulator	10	8.2
	Safety Manager	8	6.6
	Aeronautical Information Management	1	.8
Years of Professional experience	Less than 1 year	28	23.0

		1-5 years	72	58.5
		6-10 years	19	15.6
		11-15 years	1	.8
		More than 15 years	3	2.5
	Highest education level	High School	8	6.6
		Diploma/associate degree	6	4.9
		Bachelor's degree	78	63.9
		Master's degree	30	24.4
		Doctorate/Ph.D.	1	.8

Source: Primary data (2024)

4.2 Organization of the Study Participant of Somali Civil Aviation industry

The majority of the participants in the study, 66 individuals representing 53.7% of the sample, were employed by the Civil Aviation Authority. Additionally, 25 participants, accounting for 20.5% of the total, worked for airlines, while 24 (19.7 %) were affiliated with airport authorities. (See table 8).

Table 8: Organization of the Study Participant of Somali Civil Aviation industry, 2024

S/No	Variable	Category	Number	%
1	Type of organization	Air Navigation Service Provider (ANSP)	1	.8
		Airline	25	20.5
		Airport Authority	24	19.7
		Civil Aviation Authority	66	53.7
		Consultant	1	.8
		DUB security officer	1	.8
		Last year	1	.8

	Maintenance and Repair Organization (MRO)	2	1.6
	Public sector	1	.8
	Training	1	.8

Source: Primary data (2024)

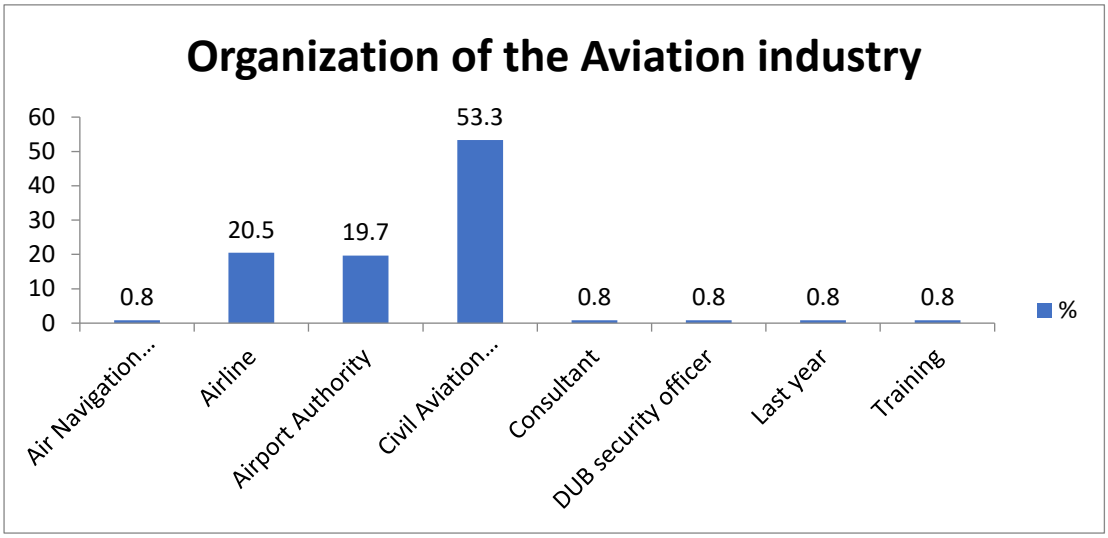

Figure 8: Organization of the Somalia Aviation Industry in 2024.

Source: Primary data (2024)

4.3 SMS Component 1: Safety Policy and Objective

Regarding safety policy and objectives, a significant portion of respondents, approximately 40 individuals (32.8%), felt that the current safety policy effectively met the primary safety objectives within Somalia's aviation industry. Additionally, 51 respondents (41.8%) agreed that safety policies sufficiently addressed specific safety concerns in the aviation sector. Conversely, approximately 37 respondents (30.3%) remained neutral about whether the safety policy adequately addressed the sector's safety concerns (Table 9).

Table 9: Participants' Response Towards the Safety Policy and Objective, 2024

S/No	Variable	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	The current safety policy effectively addresses the key safety objectives	5 (4.1%)	10 (8.2%)	46 (37.7%)	40 (32.8%)	21 (17.2%)
2	The resources allocated to safety policy implementation are adequate for ensuring comprehensive safety measures	5 (4.1%)	30 (24.6%)	28 (23.0%)	44 (36.1%)	15 (12.3%)
3	The Somali state Aviation safety policy aligns with international safety standards	2 (1.6%)	22 (18.0%)	33 (27.0%)	39 (32.0%)	26 (21.3%)
4	The Somali Aviation safety policy align with international best practices	2 (1.6%)	20 (16.4%)	43 (35.2%)	32 (26.2%)	25 (20.5%)
5	The existing safety policy encourages proactive safety measures	4 (3.3%)	24 (19.7%)	33 (27.0%)	45 (36.9%)	16 (13.1%)
6	The current safety policy encourages risk mitigation strategies	3 (2.5%)	26 (21.3%)	35 (28.7%)	42 (34.4%)	16 (13.1%)

7	The safety policy adequately addresses the safety concerns specific	3 (2.5%)	21 (17.2%)	37 (30.3%)	51 (41.8%)	10 (8.2%)
8	The safety policy engages key stakeholders	3 (2.5%)	16 (13.1%)	40 (32.8%)	44 (36.1%)	19 (15.6%)

Source: Primary data (2024)

4.4 SMS Component 2: Safety Risk Management

According to the survey, a significant portion of respondents, 45 (36.9%), concurred that safety risk management practices were incorporated into daily operational activities within Somalia's aviation industry. Additionally, 44 respondents (36.1%) affirmed that these practices effectively promoted a proactive approach to addressing safety risks rather than relying on reactive measures. However, approximately 33 respondents (27.0%) were neutral regarding the effectiveness of safety risk management in fostering a proactive approach to safety risks in the aviation industry (see Table 10).

Table 10: Participant's Response Towards the Safety Risk Management, 2024

S/No	Variable	Response				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	adequately identifies potential safety risks	5 (4.1%)	20 (16.4%)	38 (31.1%)	42 (34.4%)	17 (13.9%)
2	effectively assesses potential safety risks	4 (3.3%)	21 (17.2%)	39 (32.0%)	42 (34.4%)	16 (13.1%)
3	The safety management system effectively mitigates safety risks	3 (2.5%)	26 (21.3%)	39 (32.0%)	43 (35.2%)	11 (9.0%)
4	Encourages a proactive approach to addressing safety risks rather than reactive measures	6 (4.9%)	26 (21.3%)	33 (27.0%)	44 (36.1%)	13 (10.7%)

5	integrates safety risk management practices into daily operational activities	3 (2.5%)	26 (21.3%)	31 (25.4%)	45 (36.9%)	17 (13.9%)
6	fosters a culture of continuous improvement in identifying and managing safety risks	3 (2.5%)	20 (16.4%)	35 (28.7%)	43 (35.2%)	21 (17.2%)

Source: Primary data (2024)

4.5 SMS Component 3: Safety Assurance Process

According to the participants who were surveyed during the evaluation of the safety assurance process, they generally agreed (42 or 34.4%) that it was helpful in facilitating the sharing of safety-related information and best practices within the aviation industry. Furthermore, around 36 or 29.5% of the respondents rated this aspect as neutral, as shown in Table 11.

Table 11: Safety Assurance Process Rating of the Somali Aviation Industry, 2024

		Response				
S/No	Variable	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	ensure compliance with safety regulations and standards	3 (2.5%)	21 (17.2%)	33 (27.0%)	39 (32.0%)	26 (21.3%)
2	promotes transparency and accountability in safety performance monitoring and reporting	4 (3.3%)	28 (23.0%)	31 (25.4%)	37 (30.3%)	22 (18.0%)
3	adequately addresses safety concerns raised by industry stakeholders and the public	4 (3.3%)	27 (22.1%)	36 (29.5%)	38 (31.1%)	17 (13.9%)
4	facilitates the sharing of safety-related information and best practices	3 (2.5%)	22 (18.0%)	36 (29.5%)	42 (34.4%)	19 (15.6%)

5	encourages a culture of continuous learning and improvement in safety performance	5 (4.1%)	26 (21.3%)	30 (24.6%)	38 (31.1%)	23 (18.9%)

Source: Primary data (2024)

4.6 SMS Component 4: Safety Promotion Strategy

According to the participants, the effectiveness of the safety promotion strategy in enhancing awareness and comprehension of safety practices and regulations varied. Specifically, 48 participants (39.3%) found the strategy effective, 31 participants (25.4%) remained neutral, and 21 participants (17.2%) disagreed. Additionally, among those who were neutral about the strategy's effectiveness in cultivating a safety-conscious culture and mindset, 41 participants (33.6%) agreed that the strategy was effective, 37 participants (30.3%) were neutral, and 24 participants (19.7%) disagreed. Furthermore, among those who believed the safety promotion strategy effectively addressed specific safety challenges and cultural factors, 37 participants (30.3%) agreed, 35 participants (28.7%) were neutral, and 25 participants (20.5%) disagreed (see Table 12).

Table 12: Safety Promotion Strategy Rating of the Somalia Aviation Industry, 2024

S/No	Variable	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	The safety promotion strategy raises awareness and understanding of safety practices and regulations	5 (4.1%)	21 (17.2%)	31 (25.4%)	48 (39.3 %)	17 (13.9%)
2	The safety promotion strategy encourages active participation and engagement in safety initiatives	6 (4.9%)	24 (19.7%)	34 (27.9%)	42 (34.4%)	16 (13.1%)
3	The safety promotion strategy effectively fosters a safety-conscious culture and mindset among aviation industry professionals	7 (5.7%)	24 (19.7%)	41 (33.6%)	37 (30.3%)	13 (10.7%)

4	The safety promotion strategy addresses the specific safety challenges and cultural factors	5 (4.1%)	25 (20.5%)	35 (28.7%)	37 (30.3%)	20 (16.4%)

Source: Primary data (2024)

4.7 Safety Culture in the Somalia Aviation Industry

In terms of safety culture ratings, 33 individuals (27.0%) agreed that there was a strong commitment to safety culture within the aviation industry, followed by 27 respondents (22.1%) who strongly agreed. Furthermore, 35 individuals (28.7%) agreed that safety managers in the Somali civil aviation sector encouraged a positive safety culture, 33 (27.0%) remained neutral, and only 23 (18.9%) disagreed (Table 13).

Table 13: Safety Culture Rating of the Somali Aviation Industry, 2024

		Response				
S/No	Variable	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	There is a leadership commitment to a safety culture	8 (6.6%)	31 (25.4%)	23 (18.9%)	33 (27.0%)	27 (22.1%)
2	Safety managers in Somali civil aviation have encouraged a positive safety culture.	7 (5.7%)	23 (18.9%)	33 (27.0%)	35 (28.7%)	24 (19.7%)
3	There is a good safety reporting culture in the Somali Civil Aviation industry	10 (8.2%)	23 (18.9%)	39 (32.0%)	30 (24.6%)	20 (16.4%)
4	The training programs in Somali Civil Aviation prioritize a safety-conscious mindset	8 (6.6%)	22 (18.0%)	35 (28.7%)	40 (32.8%)	17 (13.9%)
5	Employees in the Somali Civil Aviation feel comfortable reporting safety concerns without fear of punishment.	16 (13.1%)	21 (17.2%)	30 (24.6%)	33 (27.0%)	22 (18.0%)
6	Safety communication channels are effective and accessible to all	10 (8.2%)	25 (20.5%)	33 (27.0%)	39 (32.0%)	15 (12.3%)

	levels of staff in Somali Civil Aviation					
7	The Somali Civil Aviation industry regularly conducts safety audits and assessments to identify potential risks	10 (8.2%)	25 (20.5%)	33 (27.0%)	39 (32.0%)	15 (12.3%)
8	The implementation of safety recommendations is swift and efficient in Somali Civil Aviation	11 (9.0%)	24 (19.7%)	31 (25.4%)	43 (35.2%)	13 (10.7%)
9	There is a clear process for the continuous improvement of safety practices within the Somali Civil Aviation industry.	7 (5.7%)	31 (25.4%)	25 (20.5%)	35 (28.7%)	24 (19.7%)

Source: Primary data (2024)

4.8 Relationship Between Socio-demographic Variables and Overall Safety Measures

The average safety performance was observed at 93.3, with a confidence interval (CI) ranging from 89.883 to 496.7182. This mean was selected because of the normal distribution of the data, as indicated by the histogram. The calculation takes into account the total of all 32 safety items. A positive workplace safety culture offers numerous advantages to organizations, such as lower accident and incident rates, decreased sick leave, and enhanced working conditions (Karanikas et al., 2019). Moreover, a positive safety culture encapsulates employees' collective views, perceptions, attitudes, and beliefs about an organization's performance (Karanikas et al., 2019). Research conducted in the United Arab Emirates found that although there was no similar improvement in attitudes at the Second Airport, participants at Sharjah Airport exhibited a significant positive shift in their attitudes toward the safety variables assessed in the Safety Culture Survey. Unfortunately, responses from the Second Airport showed no improvement or reduction (Karanikas et al., 2016).

of the 123 study participants, 18 (30.5%) were aged 18-24, 37 (62.7%) were aged 25-34, and four (6.8%) were aged 35 years or older. The analysis revealed no significant association between age and overall safety rating (p=0.729) (Table 15). Among the participants, 35 males (59.3%) rated the overall safety of the industry, whereas 24 (40.1%) evaluated the safety of Somali aviation. The association between high overall safety rating and sex was statistically significant (p=0.001), as shown in Table 14. Additionally, no significant relationships were

found between a high safety rating and other characteristics such as education level (p=0.124), married status (p=0.180), and years of professional experience (p=0.642).

Table 14: Relationship Between Sociodemographic Variables and Overall Aviation Safety Rating of the Somalia Aviation Industry, 2024

Variable	Category	Overall safety rating		p-value
		Low	High safety	
Age	18-24	16 (25%)	18 (30.5%)	0.729
	25-34	42 (65.6%)	37 (62.7%)	
	>=35	6 (9.4%)	4 (6.8%)	
Sex	Male	57 (89.1%)	35 (59.3%)	0.001
	Female	7 (10.9%)	24 (40.1%)	
Education level	High school & associate degree	7 (10.9%)	7 (10.9%)	0.124
	Bachelor's degree	36 (56.3%)	42 (71.2%)	
	Master's & above	21 (32.8%)	10 (16.9%)	
Marital status	Married	16 (25%)	9 (15.3%)	0.180
	Single	48 (75%)	50 (84.7%)	
Years of Professional Experience	Less than 1 year	14 (21.9%)	14 (23.7%)	0.642
	1-5 years	36 (56.3%)	36 (61%)	
	>5 years	14 (21.9%)	9 (15.3%)	

Source: Primary data (2024)

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study assessed safety performance in the civil aviation industry in Somalia to evaluate the current safety performance of the industry by considering SMS and safety culture. The study involved a survey of 123 individuals from the Somali civil aviation staff. It tested hypotheses on the link between safety performance and sociodemographic factors, and assessed whether respondents reported high levels of aviation safety performance. The mean overall safety performance score was 93.3 (CI: 89.883–496.7182), indicating a high level of perceived safety. The association between the overall high safety ratings and sex was statistically significant (p=0.001). Among the participants, 35 (59.3%) males rated the overall safety of the industry highly, whereas 24 (40.1%) provided similar ratings for Somali civil aviation. No significant association was discovered between high safety evaluations and characteristics such as educational level (p=0.124), marital status (p=0.180), years of professional experience (p=0.642), and age (0.729). The Somali aviation industry currently confronts an absence of qualified employees, including air traffic controllers, maintenance personnel, aviation policymakers, and strategic planners (Itani, 2014).

Most respondents believed that the current safety policy in Somalia's aviation industry effectively addressed key safety objectives, with 40 (32.8%) acknowledging its success. In addition, 51 respondents (41.8%) agreed that the policy adequately addressed industry-specific safety concerns. However, 37 (30.3%) were neutral about whether safety policies addressed safety concerns in the sector, and 33 (27.0%) were neutral about whether safety risk management adequately promoted a proactive approach to addressing safety risks rather than reactive measures in the aviation industry.

In the safety promotion strategy,) participants reported agreeing that the strategy raises awareness and understanding of safety practices and regulations, with 48 (39.3%) reporting a neutral stance, comprising 31 (25.4%) and 21 (17.2%) disagreeing. Those who were neutral about the safety promotion strategy played a crucial role in cultivating a culture of safety awareness and mind-set among aviation industry professionals. Among those who rated it neutral, 41 (33.6%) helped promote a safety-conscious culture, while 37 (30.3%) agreed with the service and only 24 (19.7%) disagreed. Additionally, 35 participants believed that safety managers in Somali civil aviation promoted a positive safety culture (accounting for 28.7% of the total sample). However, 33 participants disagreed with the statement, comprising 27.0% of

the total, whereas 23 individuals (representing 18.9% of the total) neither agreed nor disagreed. The weakness of this study is that, due of its cross-sectional nature, it cannot establish a cause-and-effect relationship. In this case, we attempted to address the linkage problem, but there was still a gap. Additionally, recall bias was attempted during the data collection process. In particular, the developed tool was simple and easy to memorize, which in turn reduced recall biases.

Regarding the safety promotion strategy, participants reported varying opinions. While 48 (39.3%) agreed that the strategy raised awareness and understanding of safety practices and regulations, 31 (25.4%) remained neutral, and 21 (17.2%) disagreed. Those neutral about the safety promotion strategy played a crucial role in cultivating a culture of safety awareness among aviation professionals. Among the neutral respondents, 41 (33.6%) helped promote a safety-conscious culture, while 37 (30.3%) agreed, and 24 (19.7%) disagreed. Additionally, 35 participants believed that safety managers in Somali civil aviation promoted a positive safety culture (28.7% of the total sample), while 33 participants disagreed (27.0%), and 23 individuals neither agreed nor disagreed (18.9%).

5.2 Limitation of the Study

The data for this study was collected through voluntary participation from members of the Somali Civil Aviation who responded to a structured survey questionnaire with close-ended questions. This quantitative approach resulted in limited outcomes as the respondents had restricted options, which constrained their ability to provide comprehensive information. Additionally, there was a potential for participant bias, as respondents might have answered based on what they believed was the correct answer rather than their true beliefs. That is why most participants of the study were rated agree and neutral of the survey questions being asked.

The fundamental limitations of this study are its cross-sectional design, which restricts its capacity to establish cause-and-effect correlations. Despite efforts to address the linkage issues, some gaps remain. This study also encountered challenges related to recall bias. To mitigate this, the data collection process incorporated a simple and easy-to-remember tool that helped reduce instances of recall bias. These limitations can be mitigated using a mixed-method strategy. Alternatively, a qualitative method can be employed to interview the individuals to boost the generalizability of the study. While this study cannot incorporate this method owing to time constraints, it recommends that future research consider this aspect.

5.3 Recommendations for Strategies to Improve Civil Aviation Safety in Somalia

The Somali civil aviation industry demands well-built capacity building and training programs, Infrastructure Development and Modernization, and Collaboration with International Partners. In order to address these matters a holistic strategy must be used in which we will focus on improving skills and capabilities of aviation staffs; adhering to global safety standards as well as cultivating continual enhancement culture.

5.3.1 Capacity Building and Training Programs

it is necessary that comprehensive capacity building and training programs are implemented. These measures should therefore be geared towards enhancing the abilities of those involved in this field for this makes the sector more secure, safe and profitable. This study suggests focus on the fallowing capacity building initiatives:

Development of Specialized Training Programs: The first strategic recommendation is the development of specialized training programmes tailored to address the special needs of the Somali civil aviation industry. These include areas such as air traffic management, safety oversight, and aircraft maintenance. Such programs should be accredited by international aviation authorities (ICAO) to comply with the worldwide standards. To facilitate the development of relevant high-quality curricula, collaborations with reputable aviation training institutions can be sought by established players in the sector.

Strengthening Regulatory and Oversight Capabilities: To make these training programs more effective, it is important to increase the regulatory and oversight capabilities of SCAA. Training workshops or exchange programs with other developed aviation authorities can be the means of doing that. The enforcement of safety standards across the industry will easily be done where regulatory personnel have profound knowledge in aviation safety regulations and compliance.

Encouraging Industry Partnerships: Another important strategy is encouraging government-private sector-international organizations alliances. These linkages could provide funding opportunities, technical expertise and training resources which might not otherwise be available. For example, working closely with international air carriers as well as aircraft manufacturers can enable on-the-job-training experiences and technology sharing among their staffs.

Implementing Continuous Professional Development (CPD): Putting up a CPD framework would ensure that aviation workers are always familiar with prevailing practices in the industry.

This may involve periodic refresher courses, certifications or seminars among others. High competency levels can only be maintained by instituting a mandatory CPD program as well adapting to ever changing face of aviation world.

Leveraging the Technology for Training: It is correct to conclude that current training programs can be made better thank to technologies available in present days. Among these ones there are flying simulators, e-learning systems, and the virtual reality systems that can give practical, hands-on training. It is in this respect that such technologies assist trainees to gain real-life skills in a safe environment hence preparing them adequately for the real conditions.

Monitoring and Evaluation: The last stage involves strengthening the monitoring and evaluation of the training programs to assess their effectiveness. For instance, there should be a systematic process, such as an audit or feedback, that can be done periodically so that once there are observed areas of strength and weaknesses, improvements could be made to meet the planned goals in relation to training objectives. In addition, by so doing, it will also check that the enacted aviation standards are met while at the same time witness the flexibility of such programs to fulfil the future needs of the aviation industry.

5.3.2 Infrastructure Development & Modernization

It is an imperative for strategic infrastructure development and modernization to enable the industry's progress. The current study recommends:

Upgrading Runways, Taxiways, Aprons: The first suggestion is to bring airport facilities in Somalia up-to-date. These modernizations should include runway renewal, improvement of taxi ways and aprons to support enhanced operational performance. It is essential to invest in modern air traffic control systems as well as communications technology that will enhance safety while minimizing the probability of accidents. Such improvements need to be based on global standards so as to lure more airlines from outside the country thus enhancing passengers' confidence.

Developing Regional Airports: Developing regional airports can greatly improve connectivity and economic growth in remote areas. To upgrade regional airports such as terminal buildings, security systems and ground handling services requires strategic investment. By doing this it will not only provide greater air travel access for a higher number of Somalians but also boost local economies with job opportunities being created.

Public-Private Partnerships: Helping public-private partnerships that might offer money and skills for infrastructure development. The use of private sector effectiveness and originality makes this achievable. In other words, there is a requirement for coherent regulatory frameworks with incentives to entice and retain private investments, which should include the involvement of the private sector in such initiatives.

Sustainable and Green Infrastructure: Infrastructural development has to consider sustainability as well as environmental concerns. These involve energy efficient technologies waste management systems and sustainable energy at airports. Thus, by doing this, green infrastructure strategies would not only foster environment conservation but also be in line with global sustainability goals thus enhancing reputation**.**

Establishing Maintenance, Repair, and Overhaul Facilities: MRO facilities originating from Somalia could reduce reliance on overseas services thus boost the preparedness of flying equipment. These should have modern equipment's run by professional mechanics so that good standard is achieved when carrying out airplane repair works. Moreover, MRO competencies within the region would assist in reducing the cost as well as the turn-around time for the aircrafts.

5.3.3 Collaboration with Global Partners

This will entail the strategic alliances to provide industry' requisite skills, technologies and finance for its growth**.** It is imperative the implementation of the fallowing Collaboration:

Formation of Strategic Alliances with International Aviation Authorities: I also recommend that international aviation authorities such as ICAO can help build a relationship with them to afford technical as well as regulatory support. In this respect, formation of such partnership can help Somalia to adopt and apply the international safety standards hence improving the oversight as well as the compliance in the industry. Such collaborations may include simultaneous safety assessment; educational and development activities.

Engaging with International Airlines and Aircraft Manufacturers: Active in global airlines business; it could be a good potential to spread assimilation technology and operating improvements. Such collaborations would enable Somalian flight personnel to get field experience on board, and be conversant with most modern technologies in aviation. Furthermore, Somali government can realize modernization of its aircraft fleet in cooperation with the manufacturers of aeroplanes as well as increasing the effectiveness of aeroplane's maintenance by obtaining access to the new technical support system together with spare parts.

Leveraging development aid and financial support: Thus, financial capacity, as well as active development assistance from international organizations such as the World Bank, African Development Bank, and International Monetary Fund, may support finance significant infrastructure development initiatives and capacity-building initiatives. In other words, it could be invested in rehabilitating airport facilities, including the establishment of an elaborate air-traffic control system. First, this implies that the manner in which these funds are managed should be equally transparent and responsible.

Taking Part in Regional and Global Aviation Forums: Membership in regional aviation associations enables Somalia to remain informed about current trends, products, and processes as well as immediate updates on regulatory requirements affecting the industry. For instance, the (AFCAC) African Civil Aviation Commission or the IATA might provide networking to disseminate information or experiences, which may also be utilized to collectively solve some of the issues. Therefore, these forums will help Somalia convey its intentions to other stakeholders in the international flight segment.

Neighbours' Bilateral Agreements: This is according to the belief that such arrangements when made with neighbouring countries equity improves regional integration. For instance, the two could mean cooperation exercises in the management of airspace, synchronizing on the legal frameworks as well as use of simulated training regimes. This enhanced cooperation within this region will mean that, there will be safer and efficient airlift not only for Somalia but also its neighbours.

Promoting Involvement of the Private Sector: The involvement of private sector through public-private partnerships is suggested to bring investment, innovation and operational efficiency. Infrastructure development, service delivery, technological upgrades are among areas where private companies can help out. A suitable environment for investments with clear laws, incentives and protections for private investors will be important in attracting sustainability of the private sector participation.

Improving International Public Relations and Marketing: The perception of Somalia's aviation industry could be improved by improving international public relations and marketing. More international airlines and tourists can be attracted if successful reforms, safety improvements and infrastructure upgrades are showcased in international media as well as aviation platforms. This can also help raise investor confidence and promote greater cooperation with foreign partners.

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APPENDIX A: Curriculum Vitae

ABDULLAHI SUDI HUSSEIN

PROFILE

I graduated with a Bachelor of Business Administration in Aviation Industry Management from Kasem Bundit University in Bangkok, Thailand, in 2021. Currently, I am pursuing a master's degree in aviation management at the University of Kyrenia in North Cyprus, with an expected graduation date of June 2024. My specialization involves crafting user guides that empower individuals to navigate complex platforms effectively. Leveraging my expertise in software tools such as Articulate Storyline, Camtasia, and Photoshop, I aim to bring clarity and understanding to the user experience.

CONTACT

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+905338402416

EMAIL ADDRESS:
sultanabdalla.su@gmail.com/
k20221030@std.kyrenia.edu.tr

LANGUAGE

- Somali Native)
- English (Fluent)
- Arabic (Intermediate)
- Thai (Elementary)

EDUCATION

2022-2024
Master's degree
I am currently pursuing a master's degree in aviation management at University of Kyrenia, North of Cyprus.
2017-2021
Bachelor's degree
Bachelor of Business Administration in Aviation Industry Management at Kasem Bundit University Bangkok, Thailand.
2015-2016
High School
High School Al-Fajri Primary & Secondary School Mogadishu, Somalia.

WORK EXPERIENCE

2021- Present
Managing administrative and organizational tasks and taking on tasks in the area of Personnel Administration at Invitik-F.Z. E
2022- 2023
Creating the Perfect Training Solutions at Foodics specializes in crafting user guides that empower individuals to effectively navigate complex platforms. Leveraging my expertise in software tools such as Articulate Storyline, Camtasia, and Photoshop, I bring clarity and understanding to the user experience.
April 2021- May 2021
I worked in the Instructional Service Department at Thai Inter Flying Co., Ltd.
March 2020- May 2020
A passenger service agent at Lufthansa Service in Bangkok, Thailand, is responsible for assisting passengers with their travel needs and ensuring a smooth and enjoyable journey.

SOFT SKILLS

- Time Management
- Negotiation and problem solving
- Interpersonal communication
- Planning & Preparation

COMPUTERNSKILLS

- Word
- Excel
- PowerPoint
- Camtasia
- Articulate 360 (Storyline)

APPENDIX B: SURVEY INSTRUMENT

Dear participant, my name is Abdullahi Sudi Hussein, studying University of Kyrenia in Northern Cyprus. I am inviting you to participate in my master's thesis Survey of Comprehensive Approach to Enhancing Civil Aviation Safety Performance in Somalia.

The objective of this research is to analyse the current state safety performance in Somali civil aviation to identify how Somalia can improve its civil aviation safety performance. I assure you that your participation in this study remains confidential. All personal data collected during the Survey will be anonymous, and any identifying information will be removed from the data.

If you have any questions about the research or your participation, you can contact Abdullahi Sudi Hussein at sultanabdalla.su@gmail.com or k20221030@std.kyrenia.edu.tr

General

The questionnaire was divided into two sections, as follows:

1. Section A: Demographic Information

2. Section B: Effective safety management system at state level

    2.1 State Safety Policy Objectives and Resources

    2.2 State Safety Risk Management

    2.3 State Safety Assurance

    2.4 State Safety Promotion

    2.5 Safety Culture

Section 1: Demographic Information Questionnaire

Personal Information

Name of Respondent

Gender

- Male
- Female

Age of Respondent

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or older

Marital Status of respondent

- Single
- Married

Position of Respondent in the Organization

- Pilot
- Air Traffic Controller
- Safety Manager
- Regulator
- Air operator
- Airport Staff
- Cargo Operator
- Aircrew
- Flight Manager
- Maintenance Technician
- Other (Please Specify: _____

Year of Professional Experience of Respondent

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- More than 15 years

Highest Education Level

- High School
- Diploma/associate degree

- Bachelor's Degree
- Master's Degree,
- Doctorate/Ph.D

Type of Organization

- Airline
- Airport Authority
- Civil Aviation Authority
- Maintenance and Repair Organization (MRO)
- Other (please specify): _____

Location Information

City/Region:

- Mogadishu
- Hargeisa
- Kismayo
- Garowe
- Dhusamareb
- Baydhabo
- Other (please specify): _____

Section 2: Effective safety management system at state level

2.1 State Safety Policy Objectives and Resources

Current state safety policy effectively addresses the key safety objectives of the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The resources allocated to state safety policy implementation are adequate to ensure comprehensive safety measures in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The Somali State aviation safety policy aligns with the international safety standards.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The Somali State aviation safety policy aligns with international best practice.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The existing state safety policies encourage proactive safety measures.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The current state safety policy encourages risk-mitigation strategies.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The safety policy adequately addressed safety concerns specific to the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

State safety policies actively involve and engage key stakeholders in the Somali civil aviation.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2.2 State Safety Risk Management

The safety management system in the Somali Civil Aviation Industry adequately identified potential safety risks.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The safety management system in the Somali civil aviation industry effectively assesses potential safety risks.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The safety management system effectively mitigated safety risks in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety management system encourages a proactive approach to address safety risks rather than reactive measures in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The safety management system integrates safety risk-management practices into daily operational activities in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

State safety management systems foster a culture of continuous improvement in identifying and managing safety risks.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2.3 State Safety Assurance

The safety assurance process ensures compliance with safety regulations and standards.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety assurance process promotes transparency and accountability in safety-performance monitoring and reporting.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety assurance process adequately addresses the safety concerns raised by industry stakeholders and the public in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety assurance process facilitates the sharing of safety-related information and best practices in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety assurance process encourages a culture of continuous learning and improvements in the safety performance of the Somali civil aviation industry.

- Strongly Disagree

- Disagree
- Neutral
- Agree
- Strongly Agree

2.4 State Safety Promotion

The state safety promotion strategy raises awareness and understanding of safety practices and regulations in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety promotion strategy encourages active participation and engagement in safety initiatives in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety promotion strategy effectively fosters a safety-conscious culture and mindset among aviation industry professionals in the Somali Civil Aviation Industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The state safety promotion strategy addresses specific safety challenges and cultural factors in the Somali civil aviation industry.

- Strongly Disagree

- Disagree
- Neutral
- Agree
- Strongly Agree

2.5 Safety Culture

A leadership commitment to safety culture exists in the Somali civil aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Safety managers in Somali civil aviation have encouraged a positive safety culture.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

There is a good safety-reporting culture in the Somali Civil Aviation industry.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The training programs in the Somali Civil Aviation prioritize a safety-conscious mindset.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Employees in the Somali Civil Aviation feel comfortable reporting safety concerns without fear of punishment.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Safety communication channels are effective and accessible to all levels of staff in Somali Civil Aviation

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The Somali Civil Aviation industry regularly conducts safety audits and assessments to identify potential risks.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The implementation of safety recommendations is swift and efficient in Somali Civil Aviation

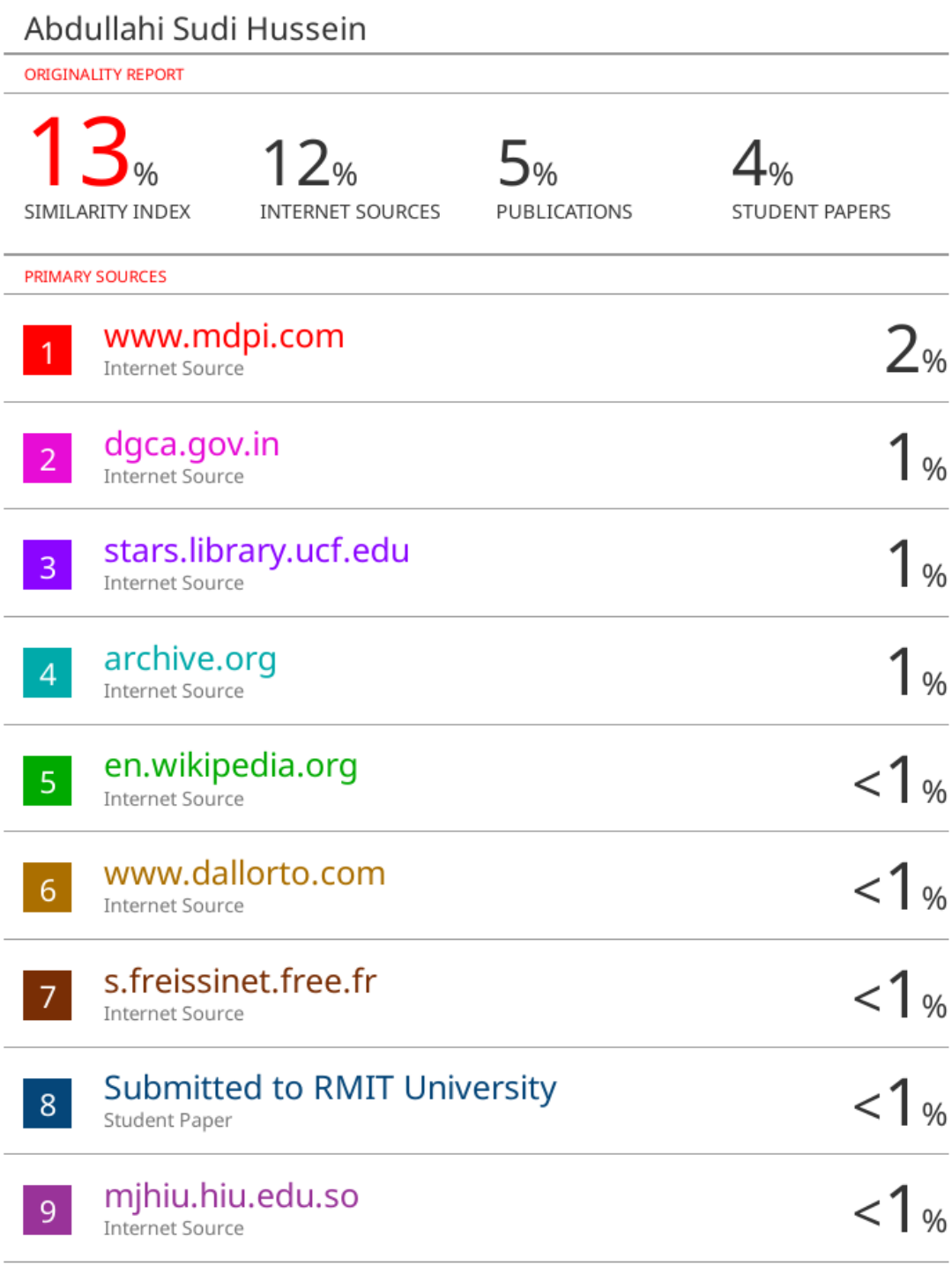
- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

There is a clear process for the continuous improvement of safety practices within the Somali Civil Aviation industry.

- Strongly Disagree

- Disagree
- Neutral
- Agree
- Strongly Agree

APPENDIX C: TURNITIN RESULT



Abdullahi Sudi Hussein

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