FACTORS AFFECTING THE IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEMS BY PRIVATE AIR TRANSPORT OPERATORS IN UGANDA

BY

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DECLARATION

I, Darwin Angudri, declare that this is my original work; and has not been presented to any other university or institution for award of a degree; and throughout the work I have acknowledged all previous work referred to.

Signature: _____**Date**: _____

APPROVAL

This dissertation entitled; Factors affecting the Implementation of Safety Management Systems by Private Air Transport Operators in Uganda has been supervised and submitted for approval under the guidance of Uganda Management Institute supervisors.

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Ms. Jennifer Rose Aduwo

DEDICATION

I dedicate this work to my parents, siblings, wife; Allen, children; Matchella and Matan.

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I take this opportunity to express my gratitude to all my facilitators at Uganda Management Institute (UMI) for their selfless efforts towards ensuring that I get knowledge and value for money during the entire period of my studies at the institute.

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LIST OF ABBREVIATIONS

AC	Advisory Circular
ACI	Airports Council International
APAC	Asia-Pacific
ATO	Air Transport Operator
CAA	Civil Aviation Authority-Uganda
CAA-NZ	Civil Aviation Authority-Newzealand
CAA-UK	Civil Aviation Authority-United Kingdom
CAD	Civil Aviation Department
CANSO	Civil Air Navigation Services Organization
CASA	Civil Aviation Safety Authority
DV	Dependent Variables
FAA	Federal Aviation Authority
GAP	Good Aviation Practice
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IV	Independent Variables
JPDO	Joint Planning and Development Office
KEA	Kampala Executive Aviation
MAF	Mission Aviation Fellowship
MV	Moderating Variables
NGATS	Next Generation Air Transport Systems
SARP	Standards and Recommended Practices
SM-ICG	Safety Management - International Collaboration Group
SPSS	Statistical Package for Social Scientists
SSP	State Safety Program

TC	Transport Canada
TCAA	Tanzania Civil Aviation Authority
UACC	Uganda Air Cargo Corporation
UMI	Uganda Management Institute
USOAP	Universal Safety Oversight Audit Program

ABSTRACT

This study aimed at examining the factors affecting the implementation of Safety Management Systems (SMS) by private Air Transport Operators (ATOs) in Uganda. Specific objectives of the study were; to examine the influence of Management commitment; Organizational safety culture and Regulatory factors on the implementation of SMS by private ATOs in Uganda. A cross sectional survey design was used. The accessible population was 72 respondents, of which 68 respondents formed the sample. Data was collected using questionnaire survey and interview methods. The validity score of 0.921 and reliability score of 0.869 were obtained while 89.7% constituted the overall response rate. All the three variables; management commitment (.767**), organizational safety culture (.713**) and regulatory factors (.372**) were positively related to SMS implementation. For management commitment; it was discovered that there is safety accountability of managers in ensuring all safety requirements are in place and both human and financial resources are allocated towards safe operations. Recommendations made include; creating safety awareness among personnel, clearly defining the roles of the accountable manager and making safety management a core business function. With organizational safety culture, study results revealed respondents exhibiting a sense of belonging within the aviation industry. Recommendations include; reporting of errors without fear of reprisal, access to the analyzed accident and incident reports and developing a safety information system accompanied by staff training on its use. For regulatory factors, it was discovered thatSMS trainings have been tailored towards making the personnel understand SMS and its relevance.Violations of the safety requirements by ATOs are subject to administrative reprimand, depending on nature of incident. Recommendations made include; CAA developing a mechanism to evaluate the effectiveness of its training programs and reviewing its enforcement policy specifically aimed at supporting SMS implementation and ensuring that it harmonizes its stand on the policy, with all the stake holders.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study examined the factors affecting the implementation of Safety Management Systems (SMS) by private Air Transport Operators (ATOs) in Uganda. It was motivated by a 2008 safety audit by the International Civil Aviation Organization (ICAO) which indicated that Uganda's safety rating fell below the required minimum performance level of 70%, even after the implementation of SMS in the contracting states was made mandatory by ICAO two years earlier. In this study therefore, the researcher sought to empirically examine the SMS implementation process. This chapter presents the background of the study, statement of the problem, objectives of the study, conceptual frame work, scope, significance, justification of the study and operational definitions.

1.2 Background to the Study

1.2.1 Historical Background

Historically, aviation safety has been built upon the reactive analysis of past accidents and the introduction of corrective actions to prevent the recurrence of those events (Bayuk, 2007). In retrospect, the history of the progress of aviation safety reliability can be divided into three distinct eras; each with fundamentally differing attributes. In the first era; the technical era, which spans from the pioneering days of the early 1900s until the late 1960s, aviation could be characterized as a fragile system from a safety reliability standpoint. Safety breakdowns, although certainly not daily occurrences, were not infrequent. It was then only logical that safety understanding and accident prevention strategies were mainly derived from accident investigation. There was really no system to speak of; rather the industry functioned because individuals literally took it upon themselves to move it forward. The safety focus was on individuals and the individual management of safety risks, which in turn built upon the foundations provided by intensive training programs (ICAO, 2009).

During the second era; the human era, from the early 1970s until the mid-1990s, aviation became a safe system. The frequency of safety breakdowns diminished significantly, and a more all-encompassing understanding of safety, which went beyond individuals to look into the broader system, was progressively developed. This naturally led to a search for safety lessons beyond those generated by accident investigation, and thus the emphasis shifted to the investigation of incidents. This shift to a broader perspective of safety and incident investigation was accompanied by a mass introduction of technology and an ensuing multiple-fold increase in safety regulations (ICAO, 2009).

From the mid-1990s to the present day; the organizational era, aviation entered its third safety reliability era, becoming an ultra-safe system. From a global perspective and notwithstanding regional spikes, accidents became infrequent to the extent of becoming exceptional events, or anomalies in the system. Serious incidents became fewer and further apart. In concert with this reduction in occurrences, the shift towards a broad systemic safety perspective that had started to emerge during the previous era consolidated itself. Fundamental in this consolidation was the adoption of a business - like approach to the management of safety that involves routine collection and analysis of data, which underlies the rationale of SMS as seen in Figure 1.1 below (ICAO, 2009).
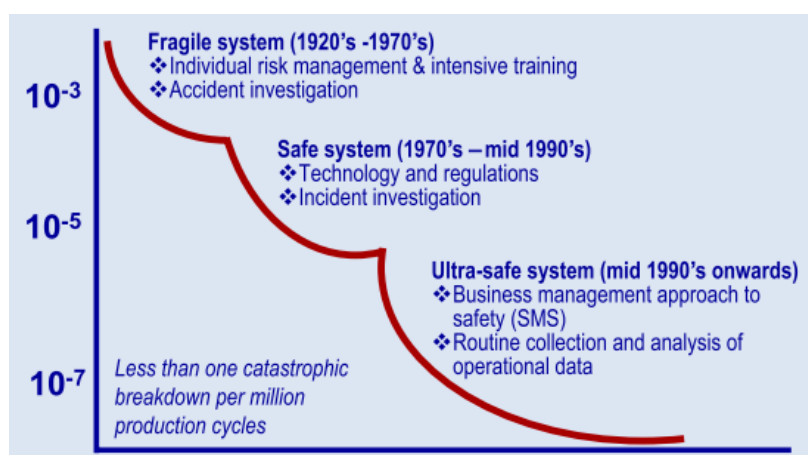
Figure 1.1: The First Ultra-safe Industrial System

Source: ICAO SMS Module N° 3 – Introduction to safety management 2008-11 (E)

1.2.2 Theoretical Background

The study was guided by Reason's (2001) 'Swiss cheese' theory that theorizes a holistic organizational approach that facilitates human error but more as a consequence than a cause. According to this theory, breaches in safety defences are a delayed consequence of decisions made at the highest levels of the system, which remain dormant until their effects or damaging potential are activated by specific sets of operational circumstances. This theory is in line with the SMS concept which has an organizational approach to safety management, as further discussed in chapter two.

1.2.3 Conceptual Background

ICAO (2009) defines SMS as an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. It is a systematic, precise and proactive process for managing safety risks that focuses on human performance, human factors and organizational factors, and integrates into these, as appropriate, quality management techniques and processes to contribute to the achievement of safety satisfaction. As with all management systems, it involves goal setting, planning, documentation, and measuring of performance goals.

Figure 1.2: Four SMS components

Source: FAA (2012), AC No: 150/5200-37A

SMS is comprised of four basic components, which serve as the "basic building blocks of an SMS" Figure 1.2 defines these components and shows how they relate to each other. Safety Policy serves as the foundation of SMS; it documents the operators' means of deploying the SMS. Safety Risk Management (SRM) and Safety Assurance (SA) are the two operational components of SMS. Safety Promotion encompass all three of the other components by ensuring that individuals with a role in SMS are properly trained and that safety issues identified through any of the activities associated with the components are communicated (FAA, 2012).

1.2.4 Contextual Background

In 2003 ICAO adopted the SMS concept and developed a standard which imposes upon states the responsibility to establish safety programs, requiring ATOs, approved maintenance organizations, air traffic service providers and certified aerodrome operators to implement safety management systems effective 2006. Uganda is a signatory to the Chicago Convention on ICAO, and in accordance to Article 37 of the convention, she is obliged to comply with the SMS standard.

For the required compliance to be attained, management involvement at the highest levels is mandatory. Also there is need to articulate a clear policy statement that identifies safety as a core value, the target level of safety and provision of direction through written policies, objectives, goals and standards. In addition, adequate resources and expertise must be provided to address concerns during the identification, classification and implementation (ICAO, 2006). As the aviation regulatory authority in Uganda, Civil Aviation Authority (CAA) should therefore have a SMS policy, distributed to the ATOs and ensure appropriate implementation. In addition, as an Air Navigation Services provider it is required to implement SMS and provide assurance of continued success.

1.3 Statement of the Problem

In November 2006, ICAO made mandatory the implementation of SMS in the contracting states of which Uganda is a member. According to Article 37 of the Chicago Convention, Uganda as a signatory is obliged to comply with the SMS standard. Conversely, management prioritization of production goals over protection (Safety) goals in resource allocation and the lack of organizational safety culture have negatively impacted the SMS implementation process by private ATOs in Uganda. In a bid to ensure equitable resource allocation; among other concerns, ICAO (2009) has emphasized adherence to the perspective of Safety management as a core business function. CAA as the regulatory authority; in the effort to ensure compliance has continuously conducted SMS trainings for all stake holders. However, in the November 2008 safety audit by ICAO, under the Universal Safety Oversight Audit Program (USOAP); conducted every five years, Uganda was rated at only 45.64% compliant with the established regulatory requirements. This rating was far below the required minimum performance level of 70% effective implementation (ICAO, 2008; Kitaka, 2010). For effectual implementation of SMS, there is need for high level management commitment, development of organizational safety culture and enforcement of regulatory compliance. The 2008 safety audit results are possible pointers that; among other factors, CAA as the regulatory authority has not done enough to ensure SMS compliance among ATOs in Uganda, and if not addressed, may lead to repeated occurrence of accidents and incidents. Therefore, it was against this background that the researcher was prompted to empirically examine the factors affecting the implementation of SMS by private ATOs in Uganda.

1.4 General Objective of the Study

The General objective of this study was to examine the factors affecting the implementation of SMS by private ATOs in Uganda.

1.5   Specific Objectives

i.   To examine the influence of Management commitment on the implementation of SMS by private ATOs in Uganda.

ii.   To examine the influence of Organizational safety culture, on the implementation of SMS by private ATOs in Uganda.

iii.   To examine the influence of Regulatory factors, on the implementation of SMS by private ATOs in Uganda.

1.6   Research Questions

i.   How does Management Commitment influence the implementation of SMS by private ATOs in Uganda?

ii.   How does Organizational safety culture influence the implementation of SMS by private ATOs in Uganda?

iii.   How do Regulatory factors influence the implementation of SMS by private ATOs in Uganda?

1.7   Hypothesis of the Study

i.   Management Commitment influences the implementation of SMS by private ATOs.

ii.   Organizational safety culture influences the implementation of SMS by private ATOs.

iii.   Regulatory factors influence the implementation of SMS by private ATOs.

1.8 Conceptual Framework

The conceptual framework shows the main variables of the study; Factors as the Independent Variable (IV), and SMS Implementation as the Dependent Variable (DV).

Independent Variable **Factors**
Management Commitment: - Safety accountability - Resource allocation
Organizational Safety Culture: - Reporting culture - Just culture - Learning culture - Flexible culture - Informed culture
Regulatory Factors - CAA training program - Enforcement policy

Dependent Variable **SMS Implementation**
- Safety policy and objectives - Safety risk management - Safety assurance - Safety promotion

Figure 1.3: Conceptual framework showing the relationships between the IV and DV

Source: CASA (2012); ICAO (2008) and Kitaka (2010): Adopted and modified by the researcher

1.9 Scope of the Study

1.9.1 Geographical Scope

The study was carried out at Entebbe International Airport and Kampala. It covered CAA as the regulatory authority and ATOs licensed and registered in Uganda.

1.9.2 Time Scope

The study had a broad time scope which covered the period from 2006; the year SMS implementation was made mandatory in the ICAO contracting state, to 2013.

1.9.3   Content Scope

The study focused on the Factors affecting the Implementation of SMS by private ATOs in Uganda. In particular, it sought to examine the influence of management commitment, organizational safety culture and regulatory factors on the implementation of SMS. It focused on; factors, as the Independent Variable (IV); SMS implementation, as the Dependent Variable (DV). It was guided by the Accident causation theory by Professor James Reason (1997).

1.10   Significance of the Study

The study findings may be beneficial to CAA, ATOs, flight safety policy makers and administrators as it may help them understand the factors affecting the implementation of SMS concept and guide them in identifying and finding solutions to the associated challenges.

1.11   Justification of the Study

This study was expected to identify gaps in the SMS implementation process by private ATOs in Uganda, with the hope of raising and maintaining Uganda's safety rating above the required minimum performance level of 70% effective implementation by bridging the identified gaps.

1.12   Operational Definitions

Active Failures: are actions or inactions, including errors and violations, which have an immediate adverse effect (ICAO 2009).

Defences: are resources provided by the system to protect against the safety risks that organizations involved in production activities generate and must control (ICAO 2009).

Latent Conditions: are conditions present in the system well before a damaging outcome is experienced, and made evident by local triggering factors (ICAO 2009).

Management: is the organizational responsibility to design, implement and maintain an environment in which individuals, sections, departments and organizations can make their contribution to accomplish selected missions and objectives (Kitaka, 2010).

Management Commitment: is the demonstrated responsibility for, safety in a formal safety policy, which then flows into practical and achievable safety objectives (CASA, 2012).

Private ATOs: are holders of Air Operator Certificate (AOC), that are allowed to use given aircrafts for commercial purposes (CAA-UK, 2008)

Safety: is the state in which the probability of harm to persons or property is reduced to, and maintained at, a level which is as low as reasonably practicable (ALARP) through a continuing process of hazard identification and reduction (CASA, 2012).

Organizational Safety Culture: is a set of enduring values and attitudes regarding safety issues shared by all members of an organization (ICAO, 2009).

SMS: an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures (ICAO, 2009).

State Safety Program (SSP): is an integrated set of regulations and activities aimed at improving safety. It includes specific safety activities that must be performed by the State, and regulations and directives promulgated by the state to support fulfillment of its responsibilities concerning safe and efficient delivery of aviation activities (ICAO, 2009).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter laid emphasis on the literature related to the factors affecting the implementation of SMS by private ATOs in Uganda. The literature was obtained from ICAO technical documents, aviation management books, technical journals, CAA documents and international aviation workshop papers. The discussion covered the variables, objective by objective and was guided by Reason's (2001) 'Swiss Cheese' Theory that theorizes a holistic organizational approach that facilitates human error but more as a consequence than a cause.

2.2 Theoretical Review

According to the 'Swiss Cheese' Theory, breaches in safety defences are a delayed consequence of decisions made at the highest levels of the system, which remain dormant until their effects or damaging potential are activated by specific sets of operational circumstances. Under such specific circumstances, human failures or active failures at the operational level act as triggers of latent conditions (generated by decisions at top management level) conducive to facilitating a breach of the systems inherent safety defenses as seen in Figure 2.1.

The SMS concept, just like the 'Swiss cheese' theory, has an organizational approach to safety management. At managerial level, the concept advocates for proactive identification of safety hazards (latent conditions), the organization must confront, and that in many cases it generates, during delivery of services, and to bring the safety risks of the consequences of these hazards under organizational control (ICAO, 2009). According to Sengupta (2011), the attitudes and actions of management can significantly influence the entire staff, it is therefore critical that these leaders commit to the success of an SMS implementation.

Cooper (2001) asserts that, despite recognition by early researchers of the role management played in accident causation, most practitioners focused almost exclusively on the prominence

of employee's unsafe acts (errors and violations). In the concept advanced by the Reason theory, all accidents include a combination of both active and latent conditions.

Conversely, one implication of the organizational approach according to Reason (2001) has been the tenacious search for latent conditions leading up to an accident. Such prescriptive implementation has serious flaws. Whilst the importance of analyzing human factors throughout the accident sequence is not in question, the dogmatic insistence on identifying the latent conditions could/should be challenged in case where active failures played a major part.
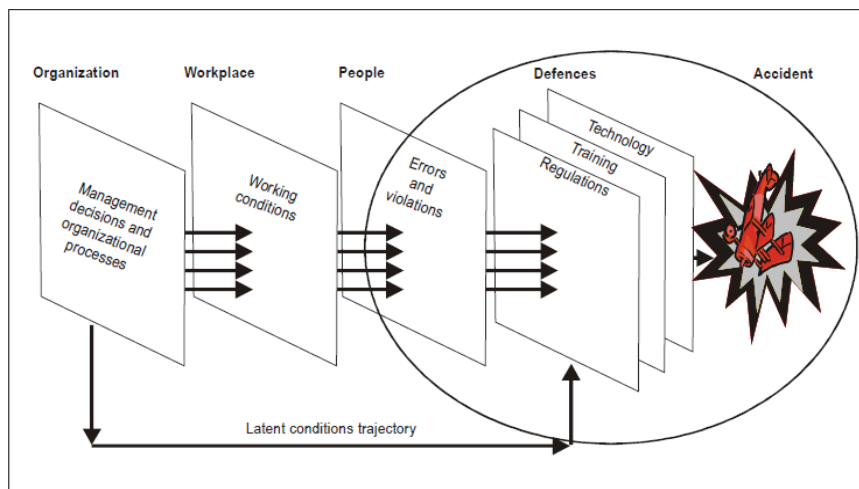
Figure 2.1: A Concept of Accident Causation

Source: ICAO (2009), Doc. 9859 AN/474

Reason's theory is in line with Heinrich (1959), who argued that; injuries are caused by the action of preceding factors (latent conditions) and removal of the central factor (unsafe act) negates these actions and in so doing, prevents accidents and injuries. Shappell and Wiegmann (2000) noted that; in many ways, Reason's theory has revolutionized common views of accident causation. Unfortunately, however, it is simply a theory with a few details on how to apply it in a real-world setting. It never defines what the 'holes in the cheese' really are, at least within the context of everyday operations. Luxhoj & Kauffeld (2003) added that; the theory does not account for the detailed interrelationships among causal factors. Without these distinct linkages, the results are too vague to be of significant practical use.

2.3   Management Commitment and SMS Implementation

The essence of understanding safety management system (SMS) is not just in defining it but effectively implementing it. In today's scenario of rapidly expanding aviation activity, 'Safety' is interpreted with an underline and in bold letters. The importance of safety in aviation is emphasized by strong initiatives by ICAO, Airports Council International (ACI) and state regulators in a multi pronged effort (Sengupta, 2011). The introduction of SMS is one of the most significant regulatory changes management is faced with that will further advance aviation safety globally (SM-ICG, 2011). Management should show commitment to SMS implementation and operations through a safety policy that among other things contains the following: the commitment of senior management to implement SMS, to provide the necessary resources needed for safe operations, to make safety the highest priority, to continually improve safety; to comply with all regulatory requirements related to safety and the encouragement of employees to report safety issues without fear of reprisal (FAA, 2012). Sengupta (2011) further asserts that; the attitudes and actions of management can significantly influence the entire staff; therefore it is critical that these leaders commit to the success of an SMS implementation.

2.3.1   Safety Accountability and SMS Implementation

In a study on SMS implementation at airports in the United States of America (USA), it was observed that, the foundation of the SMS is a policy that spells out the safety management goals and accountabilities (Mokaya and Nyaga, 2009). In most countries, senior management is being held accountable by regulators for safety; as well as financial outcomes. This requires senior managers to clearly identify what they are accountable for through a policy statement – responsibility can be delegated but not the accountability (SM-ICG, 2011).

For effectual SMS implementation, senior management should identify who the accountable manager should be. However, more important are what authorities and responsibilities the accountable manager should have in order to properly account for the safety performance of

the SMS. These authorities and responsibilities include, but are not limited to: full authority for human resources issues; authority for major financial issues; direct responsibility for the conduct of the organization's affairs; final authority over operations under certificate and final responsibility for all safety issues (ICAO, 2009).An accountable manager and his senior management team's role is pivotal to making SMS work and it is important they understand why and how they can make a difference to safety (SM-ICG, 2011).

2.3.2   Resource Allocation and SMS Implementation

In any organization, management is in control of the activities of personnel and of the use of resources that are directly related to, or necessary for, the delivery of services. The organization's exposure to safety hazards is a consequence of the activities directly related to the delivery of services (ICAO, 2009). Regardless of the size, complexity, or type of operation, the success of the SMS depends on the extent to which senior management devotes the necessary time, resources and attention to safety as a core management issue. An SMS will not be effective if it receives attention only at the operational level (CAD, 2012). Setting up and maintaining an SMS will cost depending on the size and complexity of the organization, but an accident will cost far more. History shows that Organizations which have had fatal accidents often do not survive (CASA, 2012).

The perspective of safety management as an organizational process and a core business function clearly places ultimate safety accountability and responsibility at the highest level of aviation organizations. Nowhere are such accountability and responsibility more evident than in decisions regarding allocation of both human and financial resources. Unless safety management is made a core business function, a Management dilemma, simply put, the "dilemma of the two Ps" will arise and this can be characterized as the conflict that would develop at the senior management level because of the perception that resources must be allocated on an either/or basis to what are believed to be conflicting goals: production or protection (safety) goals (ICAO, 2009).
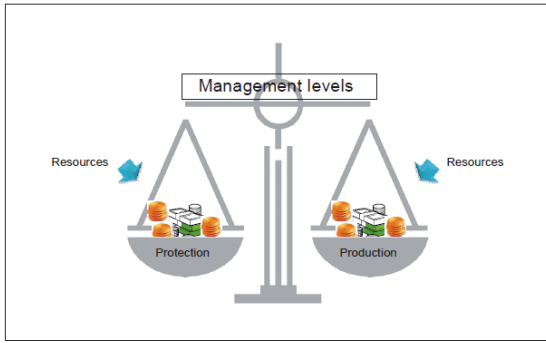
Figure 2.2: Balanced Resource Allocation

Source: ICAO. (2009), Doc. 9859 AN/474

Figure 2.2, depicts a balanced allocation of resources to production and protection goals that results from organizational decision-making processes based on safety management as a core business function. Here, safety and efficiency are not in competition, but closely intertwined. Reason (2004) adds that a balance in resource allocation has to be struck because production and protection each have their limits.

Regrettably, history shows a tendency for organizations to drift into an imbalance in the allocation of resources because of the perception of competition between production and protection. In such cases, protection is usually the loser, with organizations privileging production objectives (ICAO, 2009). Reason (2004) asserts that very low hazard (protection) ventures lead to catastrophe, whereas excessive hazard ventures lead to bankruptcy, as illustrated in Figure 2.3 and Figure 2.4.
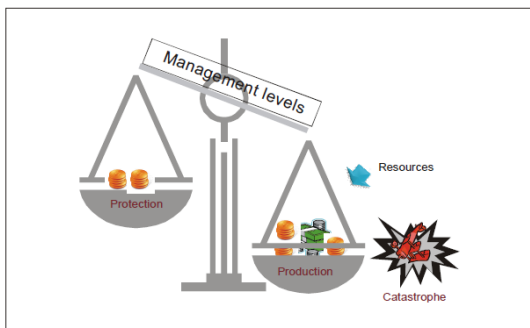
Figure 2.3: Low Resource Allocation towards Protection (safety) Goals

Source: ICAO. (2009), Doc. 9859 AN/474
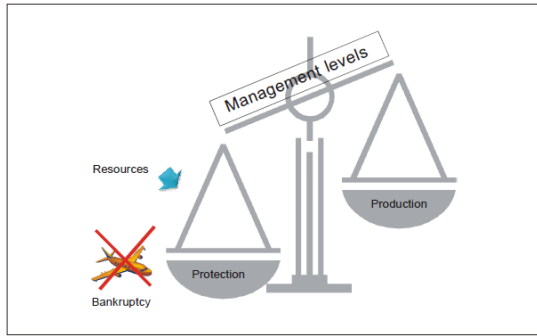
Figure 2.4: Low Resource Allocation towards Production Goals

Source: ICAO. (2009), Doc. 9859 AN/474

In the face of the arguments by the different authorities above, it can therefore be concluded that management commitment, in terms of safety accountability and in resource allocation, is pivotal in the successful implementation of SMS.

2.4   Organizational Safety Culture and SMS Implementation

The creation of a positive safety culture begins with a clear, unequivocal direction from the accountable manager (CAA-UK, 2008). There is a strong relationship between safety culture and a SMS.A SMS consists of a number of defined minimum standards. However, standards are just words on paper; Reason (1998) adds that; an ideal safety culture is the 'engine' that drives the system towards the goal of sustaining the maximum resistance towards its operational hazards, regardless of the leadership's personality or current commercial concerns. While safety culture can be considered to be the oil that lubricates the engine parts (elements of the SMS), ultimately, safety culture is the link between behavior (errors and violations) and the effectiveness of the SMS. An SMS will not be effective unless there is a positive safety culture, which in turn determines how your people will contribute to the SMS and what they think about it (CASA, 2012).

According to ICAO, the characteristics of a 'safe culture', which should guide decision makers in modeling corporate safety culture, include the following:

- Senior management emphasizing safety as part of the strategy of controlling risks.

- Decision makers and operational personnel hold a realistic view of the short- and long-term hazards involved in the organization's activities.

- Those in senior positions do not use their influence to force their views on other levels of the organization, or to avoid criticism.

- Those in senior positions foster a climate in which there is a positive attitude towards criticism, comments and feedback from lower levels of the organization.

- There is an awareness of the importance of communicating relevant safety information to all levels of the organization (and with outside entities).

- There is promotion of appropriate, realistic and workable rules relating to hazards, to safety and to potential sources of damage, which rules are supported throughout the organization.

- Personnel are well trained, and fully understand the consequences of unsafe acts.

2.4.1 Reporting Culture and SMS Implementation

A positive "reporting culture" according to JPDO (2008), helps mitigate errors by encouraging employees to divulge information about safety concerns that they encounter. Reason (1998) describes five important factors in determining the quantity and quality of incident reports: protection from disciplinary proceedings; confidentiality; the separation of the department that collects and analyzes the reports from those with the authority to discipline; rapid, useful, accessible, and intelligible feedback to the reporting community and ease of reporting. CASA (2012) simply looks at reporting culture as an organizational climate in which people are prepared to report their errors and near-misses.

2.4.2 Just Culture and SMS Implementation

Following an incident or accident, a poor safety culture may assign blame to the individual responsible for the last action prior to the problem, which discourages the reporting of unsafe conditions and cooperation in investigations. The healthy alternative to a "blaming culture" is a "just culture," in which employees are held accountable for deliberate violations of the rules

but are encouraged and rewarded for providing essential safety-related information (JPDO, 2008). In retrospect, Reason (1998) asserts that; a culture in which all acts are immune from punishment would lack credibility in the eyes of the work force. He adds that; a prerequisite for a just culture is that all members of an organization should understand where the line must be drawn between unacceptable behavior, deserving of disciplinary action, and the remainder, where punishment is neither appropriate nor helpful in furthering the cause of safety. CASA (2012) similarly talks about a just culture as that where there is an atmosphere of trust. People are encouraged for providing essential safety-related information, but they are also clear about where the line must be drawn between acceptable and unacceptable behavior. A just culture does not tolerate reckless behavior or deliberate malfeasance.

2.4.3 Flexible Culture and SMS Implementation

To adapt effectively to changing demands, an organization must foster a "flexible culture" that allows quick, smooth reactions to non-nominal events. A flexible culture allows all employees to question procedures and behavior, thus making the safety culture self-correcting on every level. The role of, and the inevitability of human error, is acknowledged. When procedures or behavior are questioned, potentially unsafe practices may be interrupted before they result in an actual mishap. In a flexible culture, operational roles and responsibilities become less centralized and more fluid, and all employees feel a shared sense of responsibility for the success of the organization. The result is an organization that is oriented toward goals instead of regulations (JPDO, 2008). An organization can adapt in the face of high-tempo operations or certain kinds of danger - often shifting from the conventional hierarchical mode to a flatter mode (CASA, 2012).

2.4.4 Learning Culture and SMS Implementation

An organization that demonstrates a strong "learning culture" is willing to change based on safety indicators and hazards uncovered through assessments, data, and incidents. Through proactive observation and evaluation, the organization and its employees and policies allow

for continuous learning and improvements to safety. These activities help identify vulnerabilities or weaknesses to organizational safety. Implementing a learning culture can be difficult because it often requires a great deal of coordination, a change in attitudes, and management commitment (JPDO, 2008). To embrace a learning culture, an organization must possess the willingness and the competence to draw the right conclusions from its safety information system and be willing to implement major reforms (CASA, 2012).

2.4.5 Informed Culture and SMS Implementation

The above subcomponents combine to form a safety-conscious, informed organization with the following characteristics: leadership commitment; open communication; just environment; involvement of everyone at all levels of the organization; learning throughout the organization; effective decision-making process; follow-up, feedback, and reporting. These characteristics typify a vibrant safety culture in which each employee sees his/her role as a critical part of the organization's commitment to safety. A vibrant safety culture is built on trust at all levels of the organization working with each other. It depends on the values and behaviors of every individual (JPDO, 2008). However, Reason (1998) stresses that an "informed culture", must involve creating a safety information system that collects, analyses and disseminates information from incidents and near misses, as well as from regular proactive checks on the system's vital signs. Those who manage and operate the system have current knowledge about the human, technical, organizational and environmental factors that determine the safety of the system as a whole (CASA, 2012).

In light of the fact that safety culture is a key ingredient in the success of a SMS, it can hence be concluded based on the above arguments that; without a reporting, just, flexible, learning and an informed culture, success in SMS implementation cannot be registered.

2.5 Regulatory Factors and SMS Implementation

2.5.1 CAA Training Program and SMS Implementation

An early step in implementing a SSP is to develop a training programme for the personnel of the State authority. The training programme should have two basic objectives. The first objective is to provide knowledge of safety management concepts, including the ICAO SARPs. This aspect of training applies to the SSP, overall. The second objective is to develop knowledge to accept and oversee the implementation of key components of an SMS, in compliance with national regulations and relevant ICAOSARPs. This aspect of training aims at supporting SMS implementation (FAA, 2012).

According to the ICAO (2010), the scope of the internal safety training shall be appropriate to each individual's involvement in the SSP and will develop staff knowledge about: ICAO SARPs related to the SSP and SMS; the ICAO SSP framework, its components and elements; related guidance material. The regulatory authority shall also ensure that: ATOs' personnel are fully aware of the SSP and its relationship with the SMS; safety critical information is conveyed to service providers and service providers understand why particular safety actions are taken.

The ATOs shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform the SMS duties. The scope of the safety training shall be appropriate to each individual's involvement in the SMS. The safety manager provides current information and training related to safety issues relevant to the specific operations and operational units of the organization. The provision of appropriate training to all staff, regardless of their level in the organization, is an indication of management's commitment to an effective SMS. Safety training and education should consist of the following: a documented process to identify training requirements; a validation process that measures the effectiveness of training; initial (general safety) job-specific training; indoctrination/initial training

incorporating SMS, including Human Factors and organizational factors; and recurrent safety training (ICAO, 2009).

2.5.2   Enforcement Policy and SMS Implementation

According to the TCAA (2009), SSP Enforcement policy, the first general principle is to develop enforcement procedures that allow service providers to deal with, and resolve, certain events involving safety deviations, internally, within the context of the service provider's SMS and to the satisfaction of the Authority. The second general principle is that no information derived from Safety Data Collection and Processing Systems (SDCPS) established under SMS shall be used as the basis for enforcement action and incriminate persons. Enforcement decisions must: be fair and follow due process; be transparent to those involved; take into account the circumstances of the case and the attitude/actions of the service provider; have consistent actions/decisions for like/similar circumstances; and be subject to appropriate internal and external review.

Regulatory authorities should have a SMS enforcement policy that, enables the regulatory enforcement program contribute to a smooth transition to a SMS framework, by allowing ATOs achieve future compliance through the effective use of internal reporting programs, the analysis of reported events, and the implementation of subsequent corrective measures (TC, 2009). The first step in implementing an SSP specifically aimed at supporting SMS implementation is the development of SMS requirements for service providers (ATOs), as well as guidance material for the implementation of SMS. The second step specifically aimed at supporting SMS implementation is the revision of the civil aviation oversight authority's enforcement policy (ICAO, 2010).

2.6   Summary

The literature has emphasized the importance of management commitment, organizational safety culture and regulatory factors in the Implementation of SMS. Most studies have focused on management commitment as the driving force in the effectual implementation of SMS.

Indeed this is in line with the SMS concept which has the organizational approach to safety management. ICAO (2010) asserts that senior management emphasis on safety as part of the strategy of controlling risks is the foundation of a strong safety culture and the development of SMS requirements for service providers as well as guidance material for the implementation of SMS, is the first step in implementing a SSP (by CAA) specifically aimed at supporting SMS implementation.

The attitudes and actions of management, according to Sengupta (2011), can significantly influence the entire staff. This is through commitment towards SMS implementation, hence enhanced organizational safety culture, which seems to be lacking in the case of Uganda as opposed to other ICAO contracting states. Furthermore, for effectual SMS implementation, there has to be a rigorous capacity development program for all stake holders, conducted in an effort to provide the required skills, competencies and necessary awareness on the utility and benefits of a flawless aviation safety (Mokaya and Nyaga, 2009), which the literature hardly mentions.

The literature can hence be summarized in John O'Brian's words; "No matter how interested individual employees might be or what assistance a manufacturer offers, or how insistent a certificating authority might be, none of these factors will have a significant effect on safety without support from top management", as quoted in SM-ICG (2011).

From the arguments of the various authorities above, it can therefore be concluded that:

- Management commitment positively influences the implementation SMS by private ATOs in Uganda.

- Organizational safety culture positively influences the implementation SMS by private ATOs in Uganda.

- Regulatory factors influence the implementation SMS by private ATOs in Uganda.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the research design, target population, sample size and sampling techniques. It also gives an explanation on the data collection methods, data collection instruments, instrument validity and reliability pre-testing, data collection procedures, data analysis and measurement of variables.

3.2 Research Design

The researcher employed a cross sectional survey design, because this design is recommended for studies that seek information from the field on a study topic over a short period of time from a sample of the population at a particular time (Amin, 2005). A triangulation of quantitative and qualitative research techniques was adopted, in order to exploit the synergies offered by different methodologies (Barifaijo, Basheka and Oonyu, 2010).

3.3 Study Population

The study population comprised of the managing director (1) and two (2) flight safety inspectors of CAA; seven (7) managing directors, seven (7) safety officers twenty (20) licensed pilots and thirty five (35) licensed engineers of certified ATOs (CAA, 2013).

3.4 Sample Size and Selection

A sample size larger than 30 and less than 500 is appropriate for most studies (Sekaran and Bougie, 2010). The sample size in (Table3.1) was selected basing on the Krejcie and Morgan (1970) table as captured from; Barifaijo, Basheka and Oonyu (2010). A total of 68 respondents were used in the study.

Table 3.1: Sample size and selection

S/N	Category	Population (N)	Sample (S)	Sampling Technique
1	CAA Managing Director	1	1	Purposive
2	CAA Flight Safety Inspectors	2	2	Purposive
3	ATOs Managing Directors	7	7	Purposive
4	ATOs Flight Safety Officers	7	7	Purposive
5	Licensed Pilots	20	19	Simple random sampling
6	Licensed Engineers	35	32	Simple random sampling
	Total	**72**	**68**	

Source: CAA (2013); based on the Krejcie and Morgan (1970) table.

3.5 Sampling Techniques

In this study, purposive sampling techniques were used to select the key respondents – CAA managing director (1) and flight safety inspectors (2), ATOs managing directors (7) and flight safety officers (7), because it is best suited for selecting information rich cases for in depth study (Barifaijo, Basheka and Oonyu, 2010). Simple random sampling techniques were used to select licensed pilots (19) and engineers (32). This technique has high generalisability of findings; hence it is suitable for a large study population (Sekaran and Bougie, 2010). The researcher sampled from each proportion of respondents, allocated a number to every member of the accessible population, placed the numbers in a container then picked any number at random. The subjects corresponding to the numbers picked were included in the sample (Mugenda and Mugenda, 2003).

3.6 Data Collection Methods

3.6.1 Questionnaire Survey Method

According to Mugenda and Mugenda (2003), questionnaires are commonly used to obtain important information about the population and each item in the questionnaire is developed to

address a specific objective, research question or hypothesis of the study. A close ended questionnaire with pre-formulated written set of questions to which respondents recorded their answers within rather closely defined alternatives were administered to 58 respondents; flight safety officers (7), licensed pilots (19) and engineers (32). They are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest (Sekaran and Bougie, 2010). The questionnaire variables were determined using a 5 likert scale, with options 5 = strongly agree, 4 = agree, 3 = not sure, 2 = disagree, 1 = strongly disagree (Mugenda & Mugenda, 1999).

3.6.2 Interview Method

An interview is an oral administration of a questionnaire or an interview schedule (Mugenda & Mugenda, 2003). Structured face to face interviews were conducted to gather qualitative data from the CAA managing director (1) and flight safety inspectors (2) and ATOs managing directors (7).This enabled the researcher adopt the questions as necessary, clarify doubts and ensure that the responses were properly understood, by repeating or rephrasing the questions (Sekaran and Bougie, 2010).

3.7 Data Collection Instruments

3.7.1 Questionnaire Survey

A questionnaire (Appendix 1) was used to collect quantitative data, from the respondents.

3.7.2 Interview Guide

An interview guide (Appendix 2) was used to collect qualitative data to supplement the information that will be obtained from the questionnaire responses.

3.8 Pretesting of Instruments

3.8.1 Validity

The questionnaire was subjected to expert face validity and theoretical content validity tests. The researcher used the Content Validity Index (CVI) to get the validity of the instrument used during research.

CVI = $\dfrac{\text{Number of items declared valid by judges}}{\text{Total number of items}}$

CVI = $\dfrac{58}{63}$

CVI = **0.921**

The final result obtained of **0.921** concurs with Amin (2005) who recommended that a minimum CVI of 0.7 indicates validity of the instrument.

3.8.2 Reliability

In order to ensure reliability of the instrument, the researcher chose the internal consistency technique. The technique involved the use of Cronbach's alpha. This is often used to measure the internal consistency which is often the case with attitude instruments that use likert scale (Barifaijo, Basheka and Oonyu, 2010).Results obtained in Table 3.2, reveal a reliability score of 0.869 (87%), derived from ∑alpha scores divide by number of variables (3.479/4). This was in line with Mugenda & Mugenda (2003), who stresses that a coefficient of 0.80 or more implies that there is a high degree of reliability of the data.

Table 3.2: Reliability results

Research variables	Alpha scores	Number of Questions
Management commitment	.912	11
Organizational Safety culture	.769	15
Regulatory factors	.832	8
SMS Implementation	.966	20
Total	**3.479**	**54**

Source: *Field data*

3.9 Data Collection Procedure

The researcher received an introductory letter from the School of Management Science, which letter was used to get permission to collect data. The process was done with the support of one research assistant and took one and a half months. The sampled respondents were physically located, identified and the questionnaires administered to them, while appointments were fixed for meeting some of the key respondents for face to face interviews.

3.10 Data Analysis

3.10.1 Quantitative Data Analysis

According to Sekaran and Bougie (2010), the first step in data preparation is data coding, which involves assigning a number to the participants' responses so they can be entered into a database. Coding sheets were used to transcribe the data from the questionnaire and the data was then keyed in. Questionnaire items were coded in respect to the study variables they relate to. The items were then entered in to the Statistical Package for Social Scientists (SPSS) for transformation. Data was summarized using descriptive statistics. This enabled the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda & Mugenda, 2003).

3.10.2 Qualitative Data Analysis

Notes taken from the interviews were analyzed using the thematic and deduction strategy. The analysis aimed at collecting information on the theme in the question from the respondent response. The respondent's responses were analyzed with the purpose of identifying common trends of agreement or disagreement on the item under discussion (Amin, 2005).

3.11 Measurement of variables

Measurement of variables can be done using the, ordinal and nominal scales. For this study, the ordinal scale was preferred because the information was based on a five likert scale and covered Factors (IV) measured by Management commitment with indicators of safety accountability and resource allocation; organizational safety culture, with reporting culture, just culture, learning culture, flexible culture and informed culture as its indicators and regulatory factors with the dimensions of CAA training program and enforcement policy. On the other hand, SMS implementation (DV) was measured by safety policy and objectives, safety risk management, safety assurance and safety promotion.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1   Introduction

This chapter presents the study findings; response rate, demographic characteristics of the respondents and empirical findings on the factors affecting the implementation of SMS by private ATOs in Uganda. The data analysis was both quantitative and qualitative, with results reflecting the objectives that guided the study.

4.2   Response Rate

Of the fifty eight (58) questionnaires that were administered, only fifty four (54) passed the data response cleanup process for acceptance for data analysis. This represented a response rate of 93.1%. Rejection was due to some questionnaires being partially filled and others questionnaires were unfilled. While of the ten (10) planned interview sessions, seven (7) were conducted constituting a 70% response rate as seen in Table 4.1 below:

Table 4.1: Response Rate

Instrument	Planned	Actual	Percentage (%)
Questionnaires	58	54	93.1
Interview Guide	10	7	70
Total	**68**	**61**	89.7

Source: Field data

The table above shows how questionnaires were distributed and administered and how interviews were conducted. From the statistics presented it can be noted that the overall response rate was 89.7% (61/68*100%). Amin (2005) argues that a response rate equivalent to 50% is good, however that above 70% is excellent.

4.3 Background Characteristics of Respondents

This section represented the background information of the respondents, in regard to their respective organizations, job category and duration of service. This information was considered useful in that it would reveal the professional relevance and knowledge base of the respondents to give informed responses.

4.3.1 Respondents Respective Organizations

The data also revealed the various organizations the respondents worked in. Findings from Table 4.2 reveal that many of the respondents 18.5%, n=10 were from Eagle Air, followed by 16.7%, n=9 from Kampala Executive Aviation (KEA), Air Uganda had 14.8%, n=8 while Air serve had 13%, n=7, similarly Asante had, 13%, n=7 and Uganda Air Cargo Corporation (UACC) had, 13%, n=7. Lastly, Mission Aviation Fellowship (MAF) had the least 11.1%, n=6. These ATOs were chosen because they are not only licensed to operate in Uganda, but also carry the Ugandan registration number. Therefore, their SMS implementation process is directly regulated by CAA – Uganda.

Table 4.2: Respondents by organization

Organization	Frequency	Percent
Air serve	7	13.0
Air Uganda	8	14.8
Asante	7	13.0
Eagle Air	10	18.5
KEA	9	16.7
MAF	6	11.1
UACC	7	13.0
Total	**54**	**100.0**

Source: Field data

4.3.2 Job Category of the Respondents

The respondents' Job category was also considered in the study. The results in Table 4.3 reveal that management and safety/operations had 11.1% each, flight crew had 27.8%, and ground crew formed the majority respondents with 50.0%. These results indicate that responses were from a wide range of professionals with varying knowledge and interpretation of SMS and safety in general.

Table 4.3: Respondents job category

	Frequency	Percent
Management	6	11.1
Safety/Operations	6	11.1
Flight crew	15	27.8
Ground crew	27	50.0
Total	**54**	**100.0**

Source: Field data

4.3.3 Years of Service

Finally, the respondents' number of years of service was also considered in the study. Findings in Table 4.4 comprises of number of years, frequency and percentage. Results reveal that majority had worked for 5 years and below, followed by 35.2%, n= 19 that had worked between 6 to 10 years, 9.3%, n=5 had worked for over 16 years with the least 5.6%, n=3 having worked between 11 to 15 years. This information was considered relevant because respondents with different years of service have varying experience and understanding of aviation safety, therefore giving in depth views into the study.

Table 4.4: Number of years in service

Number of Years	Frequency	Percentage
5 years and below	27	50.0
6 to 10 years	19	35.2
11 to 15 years	3	5.6
Over 16 years	5	9.3
Total	**54**	**100.0**

Source: Field data

4.4   Empirical Findings based on Study Objectives

In this section, the study results on the factors affecting the implementation of SMS by private ATOs in Uganda were presented. The results are summarized and presented based on both descriptive and inferential statistics and supplemented by hypothesis testing. These are based on study objectives: Management commitment and SMS implementation; Organizational safety culture and SMS implementation; Regulatory factors and SMS implementation.

4.4.1   Management Commitment and SMS Implementation

The first objective of the study was to examine the influence of Management commitment on the Implementation of SMS by private ATOs in Uganda. The findings were presented, analyzed and interpreted using a number of indicators as shown in Table 4.5 below. It comprises of questions posed to respondents about management commitment coupled with answers obtained in frequencies, percentages, mean and standard deviation scores. Furthermore, the researcher combined both agree and strongly agree to represent the respondents who agree while strongly disagree and disagree represent those who disagreed. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Table 4.5: Response results on Management Commitment and SMS Implementation

Statements on Management Commitment	Percentage Responses					Mean	Sd
	SA	A	NS	D	SD		
There is a safety policy statement that clearly spells out safety responsibilities and accountabilities	50.0 (27)	50.0 (27)	0.0 (0)	0.0 (0)	0.0 (0)	**4.50**	**.505**
There are Standard Operating Procedures (SOPs) that are strictly adhered to	35.0 (19)	57.0 (31)	2.0 (1)	6.0 (3)	0.0 (0)	**4.22**	**.744**
Safety is of the highest priority within the organization	48.0 (26)	46.0 (25)	4.0 (2)	0.0 (0)	2.0 (1)	**4.39**	**.738**
Senior management is committed to ensuring safety within the organization	43.0 (23)	44.0 (24)	9.0 (5)	4.0 (2)	0.0 (0)	**4.26**	**.782**
There is a commitment to comply with all regulatory requirements related to safety	41.0 (22)	55 (30)	0.0 (0)	4.0 (2)	0.0 (0)	**4.33**	**.673**
Safety is a core function within the organization	37.0 (20)	44.0 (24)	19.0 (10)	0.0 (0)	0.0 (0)	**4.19**	**.729**
The necessary financial resources needed for safe operations are readily available	15.0 (8)	31.0 (17)	44.0 (24)	6.0 (3)	6.0 (2)	**3.48**	**.947**
There is an accountable manager responsible for safety	59.0 (32)	35.0 (19)	2.0 (1)	2.0 (1)	2.0 (1)	**4.48**	**.795**
There are dedicated SMS personnel in the organization	37.0 (20)	53.0 (29)	4.0 (2)	4.0 (2)	2.0 (1)	**4.20**	**.833**
There are data collection & action tracking systems dedicated to safety	22.0 (12)	41.0 (22)	28.0 (15)	4.0 (2)	5.0 (3)	**3.70**	**1.039**
There is routine documentation of all safety incidents	33.0 (18)	50.0 (27)	13.0 (7)	0.0 (0)	4.0 (2)	**4.09**	**.896**

Source: Field data

Key: SA=Strongly Agree; A=Agree; NS=Not Sure; D=Disagree; SD=Strongly Disagree

Sd= Standard deviation

Findings from the table above reveal that all respondents agreed that there is a safety policy statement that clearly spells out safety responsibilities and accountabilities, similarly 92.0%, n=50 respondents agreed while 6.0%, n=3 disagreed that there are Standard Operating Procedures (SOPs) that are strictly adhered to and 94.0%, n=51 respondents agreed that safety is of the highest priority within the organization compared to 4.0%, n=2 who were neutral. The combination of results means that most ATOs have safety policy documents in place. Checklists are strictly followed and safety measures are always instituted prior to any activity. These are some of the indicators of the SMS implementation process. This was supported by one key respondent who said;

> "*Safety policies are in place and there are periodic reviews of these policies in line with changing technology and innovations like the SMS.*"

Majority of the respondents 87.0%, n= 52 indicated positively that senior management is committed to ensuring safety within the organization compared to 9.0%, n= 5 who were not sure and 4.0, n=2 that disagreed. In addition, 96.0% agreed that there is a commitment to comply with all regulatory requirements related to safety compared to 4.0% who disagreed, n=2 and 81.0%, n= 44 agreed thatsafety is a core function within the organization and 19.0, n=10 that neither agreed nor disagreed. The results mean that at strategic level, resources are allocated towards ensuring safety within the organisation, safety policies are drafted and SOPs which they emphasize strict adherence to. The safety function has an accountable manager and well equipped support staff.This was supported by one respondent who said that;

> "*Safety is a very sensitive area and it's the role of management to set up training programs that provide knowledge of safety management concepts including ICAO SARPS.*"

Results from the above table further reveal that 45.0%, n=25 agreed that financial resources needed for safe operations are readily availablecompared to 44.0%, n=24 that were not sure and 19.0%, n=10 that disagreed. Similarly, 94.0%, n=51 indicated positively that there is an

accountable manager responsible for safety while 2.0%, n=1 neither agreed nor disagreed and 4.0%, n=2 were neutral. These revelations clearly show that key tasks in safety operations are identified and resources allocated to during budgeting, although 44.0%, n=24 expressed ignorance, possibly because they are not directly involved in finance related matters. There always is a person in charge of resources allocated towards safety, also known in the SMS perspective as the accountable manager. This is in line with a respondent who commented that;

> "*Resources are allocated aimed at effective SMS implementation and to ensure that the SMS is performing to requirements.*" Another interviewee added that; "*For any key activities to take place, resources need to be available.*"

Majority of the respondents 90.0%, n=49 agreed that there are dedicated SMS personnel in the organization, with 6.0%, n=3 respondents disagreeing and 4.0%, n=2 respondents not sure. Sixty three percent (63.0%), n=34 respondents indicated positively that there are data collection & action tracking systems dedicated to safety while 28.0%, n=15 respondents neither agreed nor disagreed, 9.0%, n=5 respondents disagreed. Further, 83.0%, n=45 respondents were positive about the question that there is routine documentation of all safety incidents, 13.0%, n=7 respondents were undecided and 4.0%, n=2 respondents disagreed. The findings mean that personnel are well trained, professional and ethical while executing their duties and responsibilities, systems like black box whose data is always downloaded after flights and analyzed are checked more frequently while incidents are recorded. Records of all safety incidents are stored for future reference. This coincides with a statement made by one of the key respondents who stressed that;

> "*All safety incidents are investigated, available recordings listened to, the personnel statements taken and all this is documented.*"

4.4.1.1 Correlation results for Management Commitment and SMS Implementation

The researcher sought to establish whether a relationship existed between management commitment and implementation of SMS, this was done with the support of the Pearson correlation product moment technique. Table 4.6 below reflects the results that emerged. It comprises of variables; Management commitment and Implementation of SMS, Level of significance (sig., at 95%) and N stands for number of respondent who returned the questionnaires and the Pearson correlation (R=.767**), sig (=000) N (=54). The R value of .767** reveals that a positive relationship exists between management commitment and the implementation of SMS by private ATOs in Uganda.

Table 4.6: Correlation Results for Management Commitment and Implementation of SMS

	Management Commitment	SMS Implementation
Management Commitment Pearson Correlation	1	.767**
Sig. (2-tailed)		.000
N	**54**	**54**
Implementation of SMS Pearson Correlation	.767**	1
Sig. (2-tailed)	.000	
N	**54**	**54**

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field data

This means that there is safety accountability of managers in ensuring all safety requirements are in place and both human and financial resources are allocated towards provision safe operations. This implies that management is committed to proper safety policy implementation, effective safety risk management, safety assurance and safety promotion. Hence a positive effect on the SMS implementation process.

4.4.1.2   Regression results for Management Commitment and SMS Implementation

A regression analysis; the model summary in particular was used to establish the variation or effect Management Commitment had on SMS Implementation. The results that emerged are clearly reflected in the table below:

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.767[a]	.588	.580	.41682

a. predictors: (constant),Management Commitment

Source: Field data

The model summary table above comprises of values; R, R squared, adjusted R square and standard error of the estimate; where R=.767, R^2=.588, adjusted R^2= .580 as and standard error=.41682using the predictor; Management commitment. The adjusted R^2 value of (.580) meant Management commitment was found to have a 58.0% effect on implementation of SMS and the remaining percentage of 42.0% was attributed to other factors.

4.4.1.3   Hypothesis Results for Objective One

The correlation test results in Table 4.6 indicate that management commitment and the implementation of SMS have a strong positive relationship with a Pearson correlation (R) of +0.767. This relationship is significant as indicated in the regression coefficient statistical analysis results in Table 4.7, which also indicates that management commitment influences the implementation of SMS by a magnitude of 58.0%. Therefore, these results support the first hypothesis that "Management Commitment influences the implementation of SMS by private ATOs in Uganda".

4.4.2 Organizational Safety Culture and SMS Implementation

Respondents provided answers on a number of questions asked about organizational safety culture. The responses are shown in Table 4.11 below, which comprises of questions posed to respondents about organizational safety culture coupled with answers obtained in frequencies, percentages, mean and standard deviation scores. The researcher combined both agree and strongly agree to represent the respondents who agree while strongly disagree and disagree represent those who disagreed. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Table 4.8: Response results on Organizational safety culture and SMS Implementation

Statements on Organizational Safety Culture	Percentage Responses					Mean	Sd
	SA	A	NS	D	SD		
Employees are prepared to freely report their errors without fear of reprisal	13.0 (7)	32.0 (17)	32.0 (17)	22.0 (12)	2.0 (1)	**3.31**	**1.025**
Employees are protected from disciplinary proceedings	17.0 (9)	20.0 (11)	50.0 (27)	11.0 (6)	2.0 (1)	**3.39**	**.960**
There is rapid, useful, accessible, and intelligible feedback to the reporting community	7.0 (4)	43.0 (23)	39.0 (21)	9.0 (5)	2.0 (1)	**3.44**	**.839**
The department that collects and analyzes incident reports is separated from those with the authority to discipline	17.0 (9)	18.0 (10)	30.0 (16)	30.0 (16)	5.0 (3)	**3.11**	**1.176**
Employees are held accountable for deliberate violations of the safety rules	48.0 (26)	50.0 (27)	0.0 (0)	2.0 (1)	0.0 (0)	**4.43**	**.690**
Employees are encouraged and rewarded for providing safety-related information	6.0 (3)	26.0 (14)	46.0 (25)	15.0 (8)	7.0 (4)	**3.07**	**.968**

	SA	A	NS	D	SD	Mean	Sd
Employees feel a shared sense of responsibility for the success of the organization	33.0 (18)	50.0 (27)	15.0 (8)	2.0 (1)	0.0 (0)	**4.15**	**.737**
Senior positions foster a climate in which there is a positive attitude towards criticism	13.0 (7)	37.0 (20)	35.0 (19)	13.0 (7)	2.0 (1)	**3.46**	**.946**
There is willingness to change based on safety indicators and hazards uncovered through assessments, data, and incidents	26.0 (14)	67.0 (36)	7.0 (4)	0.0 (0)	0.0 (0)	**4.19**	**.552**
There is proactive observation and evaluation of the organization, its employees and policies	7.0 (4)	50.0 (27)	39.0 (21)	0.0 (0)	4.0 (2)	**3.57**	**.792**
Safety information system that collects, analyses and disseminates information	20.0 (11)	33.0 (18)	41.0 (22)	4.0 (2)	2.0 (1)	**3.67**	**.911**
There is the willingness and the competence to draw the right conclusions	28 (15)	52.0 (28)	17.0 (9)	4.0 (2)	0 (0)	**4.04**	**.776**
Senior positions use their influence to force their views on other levels	2.0 (1)	9.0 (5)	33.0 (18)	44.0 (24)	11.0 (6)	**2.46**	**.884**
communicating safety information is within and outside of the organization	24.0 (13)	70.0 (38)	4.0 (2)	2.0 (1)	0 (0)	**4.17**	**.575**
There is promotion of appropriate, realistic and workable rules relating to hazards and to potential sources of damage	24.0 (13)	59.0 (32)	13.0 (7)	4.0 (2)	0 (0)	**4.04**	**.726**

Source: Field data

Key: **SA**=Strongly Agreed; **A**=Agreed; **NS**=Not Sure; **D**=Disagree; **SD**=Strongly Disagree

Sd= Standard deviation

Findings from the table above reveal that 45.0%, n=24 respondents agreed that they are always prepared to freely report their errors and near-misses without fear of reprisal, however 32.0%, n=17 respondents were not sure and 24.0%, n=13 disagreed. More, 50%, n=27 respondents that neither agreed nor disagreed that they are protected from disciplinary proceedings after voluntary incident reporting, 37.0%, n=20 respondents agreed while 13.0%,

n= 7 respondents disagreed. Similarly, 50.0%, n=27 respondents agreed that there is rapid, useful, accessible, and intelligible feedback to the reporting community, while 39.0%, n=21 respondents were not sure and 11.0%, n=6 disagreed. Finally, there were mixed responses obtained where 35.0%, n=19 respondent both agreed and disagreed respectively to the statement that the departments collect and analyze incident reports are separated from those with the authority to discipline while 30.0%, n=16 respondents neither agreed nor disagreed. This is attributed to the fact that, most employees are well trained aviation professionals and understand that it is ethical to always report any errors and violations. On the other hand, the many that were not sure implies that the errors are rare and there is no direct punishment administered to violators. More so, incidents that are recorded are analyzed and feedback given to the staff. Lastly, on the mixed responses about collection and analysis of incident reports; for any incident, a committee is setup to investigate, such committees comprise of varying personnel. The findings can be supplemented by an interviewee who argued that;

> "*Owing to the importance of recording all safety incidents, employees are always encouraged to report without fear of reprisal*". Another interviewee added that; "*Incident reports are handled by management and disciplinary action is taken or waived after thorough analysis of the report*".

Majority of the respondents 98%, n=53 agreed that employees are held accountable for deliberate violations of the safety rules compared to only 2.0%, n=1respondent who disagreed. Similarly, 46.0%, n=25 respondents neither agreed nor disagreed that they are encouraged and rewarded for providing essential safety-related information, 22.0%, n=12 respondents disagreed and 21.0%, n= 11 respondents agreed. In addition, 83%, n=45 respondents agreed that they share sense of responsibility for the success of the organization, 15.0%, n=8 respondents were not sure while 2.0%, n=1 respondent disagreed. More, 50.0%, n=27 respondents agreed that those in senior positions foster a climate in which there is a positive attitude towards criticism while 35.0%, n=19 respondents were undecided and 15.0%, n=8 respondents disagreed respectively. This is attributed to the fact that in most if not all ATOs,

any deliberate violations go with penalties. The respondents were not aware of any incentives being given to those who provide essential safety-related information. Respondents exhibited a sense of belonging within the aviation industry. There are daily and weekly debriefs held, stressing the negatives and how to improve on them. One of the respondents said;

> "*A lot of caution has to be taken in the aviation industry, this is evident with the level of professionalism exhibited by the employees*" while another said, "*Much as employees are encouraged to freely report essential safety related information, there are no rewards attached.*"

Findings from the Table 4.8 above further reveal that 93.0%, n=50 respondents agreed that there is willingness to change based on safety indicators and hazards uncovered through assessments, data, and incidents existed compared to 7.0%, n=4 respondents that were not sure. Further, a portion of respondents, 57.0%, n=31 agreed that there is proactive observation and evaluation of the organization, its employees and policies, 39.0%, n=21 respondents were not sure and 4.0%, n=2 respondents disagreed. Similarly, much as 53.0%, n=29 respondents agreed that there is a safety information system that collects, analyses and disseminates information from incidents and near misses, 41.0%, n=22 respondents were not sure and 6.0%, n= 3 respondents disagreed respectively. Lastly, 80.0%, n=43 respondents indicated that there is the willingness and competence to draw the right conclusions from safety information systems, this was followed by 17.0%, n=9 respondents that were neutral and 2.0%, n=1 respondent that disagreed respectively meaning incidents are recorded, analyzed and documented and then feedback availed to personnel. This feedback is used to make necessary improvements in the way of work. Periodic performance reviews, appraisals are carried out in order to improve the services. Based on the key findings, the personnel are willing to make improvement and they have the necessary capabilities to make the changes. This is in harmony with a statement where an interviewee said that;

> "D*uring these performance reviews, incident and accident reports are further analyzed and recommendations made for improvement.*" Another respondent further asserted

that; "*Their personnel have got the necessary training and therefore have the capability to make the necessary improvements based on the feedback from the analysis of the incident and accident reports.*"

Majority of the respondents, 44%, n= 30 disagreed that those in senior positions use their influence to force their views on other levels of the organization and to avoid criticism, 33.0, n=18 respondents were neutral and 11.0%, n=6 respondents agreed. On the other hand, 94.0%, n=51 respondents agreed that there is an awareness of the importance of communicating safety information within and outside of the organization, 4.0%, n=2 respondents were neutral while 2.0%, n=1 respondent disagreed. Similarly, 73.0%, n= 45 respondents agreed that there is promotion of appropriate, realistic and workable rules relating to hazards and to potential sources of damage compared to 13.0%, n=7 respondents that were neutral and 4.0%, n=2 respondents that disagreed. This implies that management encourages open criticism within most of the ATOs in order to enhance safety. Majority of the personnel are well aware of the dangers associated with keeping safety related information to one's self. In order to minimize safety incidents, there has to be clear and unambiguous set of guidelines for hazard control. One key respondent added that;

"M*uch as management encourages open criticism*, *not all employees are free to question procedure and behavior within the organization.*"

4.4.2.1 Correlation results for Organizational Safety and SMS Implementation

The researcher sought to establish whether a relationship existed between organizational safety culture and implementation of SMS, this was done with the supported of the Pearson correlation product moment technique as shown in Table 4.9below. It comprises of variables; Organizational Safety and SMS Implementation, Level of significance (sig., at 95%) and N stands for number of respondent who returned the questionnaires and the Pearson correlation (R=.713**), sig (=000) N (=54). The R value of .713** reveals that a reporting, just,

learning, flexible and informed culture are likely to result into effectual SMS implementation.

Table4.9: Correlation Results for Organizational Safety and SMS Implementation

		Organizational Safety Culture	SMS Implementation
Organizational Safety	Pearson Correlation	1	.713**
	Sig. (2-tailed)		.000
	N	**54**	**54**
Implementation of SMS	Pearson Correlation	.713**	1
	Sig. (2-tailed)	.000	
	N	**54**	**54**

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field data

4.4.2.2   Regression results for Organizational Safety Culture and SMS Implementation

A regression analysis; the model summary in particular was used to establish the variation or effect Organizational Safety Culture had on Implementation of SMS. The results that emerged are reflected in the table below:

Table 4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.713[a]	.508	.499	.45552

a. predictors: (constant),Organizational Safety Culture

Source: Field data

The model summary table above comprises of values; R, R square, adjusted R square and standard error of the estimate; where R=.713, R^2=.508, adjusted R^2= .499 as and standard error=.45552using the predictor; Organizational Safety Culture. The adjusted R^2 value of (.499) meant Organizational Safety Culture was found to have a 49.9% effect on SMS Implementation and the remaining percentage of 50.1% was attributed to other factors.

4.4.2.3 Hypothesis Results for Objective Two

The correlation test results in Table 4.9 indicate that organizational safety culture and the implementation of SMS have a strong positive relationship with a Pearson correlation (R) of +0.713. This relationship is significant as indicated in the regression coefficient statistical analysis results in Table 4.10, which also indicates that organizational safety culture influences the implementation of SMS by a magnitude of 49.9%. Therefore, these results support the second hypothesis that "Organizational safety culture influences the implementation of SMS by private ATOs in Uganda".

4.4.3 Regulatory Factors and SMS Implementation

Respondents provided answers on a number of questions asked about regulatory factors. These responses are shown in Table 4.11as both frequencies and percentages. The table comprises of questions posed to respondents about regulatory factors coupled with answers obtained in frequencies, percentages, mean and standard deviation scores. More so, the researcher combined both agree and strongly agree to represent the respondents who agreed while strongly disagree and disagree represent those who disagreed. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

On whether there is a training programme in place that provides knowledge of safety management concepts, including the ICAO SARPs yielded; 82.0%, n=44 respondents agreed, followed by 11.0%, n=6 respondents that were not sure and 7.0%, n=4 respondents that

disagreed. Similarly, 87.0%, n=47 respondents agreed that there is a training programme to develop knowledge to accept and oversee the implementation of key components of a SMS, with 9.0%, n=5 respondents not sure and 4.0%, n=2 respondents disagreed. In addition, 57.0%, n=31 respondents agreed that human and organizational factors in the context of SMS are clearly spelt out in the SMS training packages whereas 37.0%, n=20 respondents were undecided and 6.0%, n=3 respondents disagreed. Finally, 57.0%, n= 31 respondents neither agreed nor disagreed that a mechanism is in place to evaluate the effectiveness of the training programs compared to 33.0%, n=18 respondents that agreed and only 9.0%, n=5 respondents disagreed.

Table 4.11: Response results on Regulatory Factors and SMS Implementation

Statements on Regulatory Factors	Percentage Responses					Mean	Sd
	SA	A	NS	D	SD		
There is a training programme in place that provides knowledge of safety management concepts, including the ICAO SARPs	34.0 (18)	48.0 (26)	11.0 (6)	7.0 (4)	0.0 (0)	**4.07**	**.866**
There is a training programme to develop knowledge, accept and oversee the implementation of key SMS components.	26.0 (14)	61.0 (33)	9.0 (5)	4.0 (2)	0.0 (0)	**4.09**	**.708**
Human and organizational factors in the context of SMS are clearly spelt out in the SMS training packages	20.0 (11)	37.0 (20)	37.0 (20)	6.0 (3)	0.0 (0)	**3.72**	**.856**
There is a mechanism in place to evaluate the effectiveness of the training programs	7.0 (4)	26.0 (14)	57.0 (31)	9.0 (5)	0.0 (0)	**3.31**	**.748**
There are developed SMS requirements for service providers, as well as guidance material for the implementation of SMS	22.0 (12)	48.0 (26)	24.0 (13)	4.0 (2)	2.0 (1)	**3.85**	**.878**

	SA	A	NS	D	SD		
Civil aviation oversight authority has a revised enforcement policy specifically aimed at supporting SMS implementation	15.0 (8)	26.0 (14)	50.0 (27)	7.0 (4)	2.0 (1)	**3.44**	**.904**
Gross negligence, willful deviation and so forth are dealt with through established enforcement procedures	15.0 (8)	57.0 (31)	24.0 (13)	2.0 (1)	2.0 (1)	**3.81**	**.779**
Senior management is held accountable by the regulatory authority for safety	24.0 (13)	30.0 (16)	41.0 (22)	6.0 (3)	0.0 (0)	**3.72**	**.899**

Source: Field data

Key: **SA**=Strongly Agreed; **A**=Agreed; **NS**=Not Sure; **D**=Disagree; **SD**=Strongly Disagree

Sd= Standard deviation

The results mean that in order to effectively implement SMS there is a need to educate personnel through organising trainings about the SMS requirements. SMS trainings have been tailored towards making the personnel understand SMS and its relevance. As a result of improved technology, conventional Safety incidents are related to human and organisational factors, therefore it's important to keep on emphasizing those factors in the training programs. Furthermore, evaluations of the training programs should be carried out in order to make improvements where necessary. One of the interviewees said that;

> "*There is a training program in place with developed SMS requirements for service providers (ATOs) aimed at effective SMS implementation.* While another lamented that; "*These training programs are branded in order to make personnel understand the relevance of SMS.*"

Furthermore, 70.0%, n=38 respondents agreed that there are developed SMS requirements for service providers, as well as guidance material for the implementation of SMS, however 24.0%, n=13 respondents were not sure and 6.0%, n= 3 respondents disagreed. Further, half of

the respondents 50.0%, n=27 were not sure whether civil aviation oversight authority has a revised enforcement policy specifically aimed at supporting SMS implementation, 9.0%, n= 5 disagreed and 41.0%, n=22 agreed respectively. In addition, 72.0%, n= 39 respondents agreed that gross negligence, willful deviation and so forth are dealt with through established enforcement procedures, 24.0%, n=13 respondents were not sure. Asked whether senior management is held accountable by the regulatory authority for safety; 54.0%, n= 29 respondents agreed followed by 41.0%, n= 22 were not sure whereas 6.0%, n=3 respondents disagreed. This means the regulatory authority has guidance materials in place and has provided the ATOs with the same. Furthermore, SMS being a new concept in safety management, CAA as the regulatory authority has to amend the existing safety policies in order to accommodate the SMS concept. Coupled with that, violations of the safety requirements by ATOs are subject to administrative reprimand, depending on nature of incident and for any safety misconduct or incident senior management has to explain to the regulatory authority why it happened. One key respondent asserted that;

> "*The regulatory authority has a safety policy which is not of much help in the SMS implementation*" another added that, "*Operators strive on their own in order to ensure they effectively implement SMS.*" While another interviewee stressed that; "*There is an emphasis by the regulatory authority, on holding senior management accountable for safety.*"

4.4.3.1 Correlation results for Regulatory Factors and SMS Implementation

The researcher sought to establish whether a relationship existed between regulatory factors and implementation of SMS, this was done with the supported of the Pearson correlation product moment technique. Table 4.12 below shows results that emerged and comprises of variables; Regulatory factors and Implementation of SMS, Level of significance (sig., at 95%) and N stands for number of respondent who returned the questionnaires and the Pearson correlation (R=.372**), sig (=006) N (=54). The R value of .372** reveals that regulatory factors and implementation of SMS were positively related to one another meaning that more

of SMS Training Programs through organizing workshops, conferences among others and an enforcement policy with penalties like denial of license renewal to violators, are likely to lead to effectual SMS Implementation.

Table 4.12: Correlation Results for Regulatory factors and Implementation of SMS

		Regulatory factors	SMS Implementation
Regulatory factors	Pearson Correlation	1	.372**
	Sig. (2-tailed)		.006
	N	**54**	**54**
Implementation of SMS	Pearson Correlation	.372**	1
	Sig. (2-tailed)	.000	
	N	**54**	**54**

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field data

4.4.3.2 Regression results for Regulatory Factors and SMS Implementation

A regression analysis; the model summary in particular was used to establish the variation or effect regulator factors had on Implementation of SMS. The results that emerged are reflected in the table below:

Table 4.13: Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.372[a]	.132	.122	.60301

a. predictors: (constant),Regulatory factors

Source: Field data

The model summary table above comprises of values; R, R squared, adjusted R square and standard error of the estimate; where R=.372, R^2=.132, adjusted R^2= .122 as and standard error=.60301using the predictor; regulatory factor. The adjusted R^2 value of (.122) meant regulatory factor was found to have a 12.2% effect on Implementation of SMS and the remaining percentage of 87.8% was attributed to other factors.

4.4.3.3 Hypothesis Results for Objective Three

The correlation test results in Table 4.12 indicate that regulatory factors and the implementation of SMS have a positive relationship with a Pearson correlation (R) of +0.372. This relationship is insignificant as indicated in the regression coefficient statistical analysis results in Table 4.13, which also indicates that regulatory factors influence the implementation of SMS by a magnitude of 12.2%. Therefore, these results support the third hypothesis that "Regulatory factors influence the implementation of SMS by private ATOs in Uganda".

4.5 Empirical Findings on the Dependent Variable

4.5.1 SMS Implementation

Respondents provided answers on a number of questions asked about SMS implementation. These responses are shown in Table 4.12 as both frequencies and percentages. The table comprises of questions posed to respondents about SMS implementation coupled with answers obtained in frequencies, percentages, mean and standard deviation scores. More so, the researcher combined both agree and strongly agree to represent the respondents who agreed while strongly disagree and disagree represent those who disagreed. Further, the mean values above three (>3.00) reveal agreement while the scores below three (<3.00) reveal disagreement in responses, similarly, the standard deviation scores less than one (<1) reveal communalities well as scores above one (>1) reveal divergences.

Table 4.14: Response results on SMS Implementation

Statements on Regulatory Factors	Percentage Responses					Mean	Sd
	SA	A	NS	D	SD		
There is a SMS with defined components established, maintained and adhered to	46.3 (25)	46.3 (25)	3.7 (2)	3.7 (2)	0.0 (0)	**4.35**	**.731**
There is a safety policy in place that is approved and promoted by the accountable manager.	48.1 (26)	44.4 (24)	5.6 (3)	1.9 (1)	0.0 (0)	**4.39**	**.685**
The accountable manager has the responsibility for ensuring that the SMS is properly implemented	38.9 (21)	51.9 (28)	5.6 (3)	3.7 (2)	0.0 (0)	**4.26**	**.732**
The accountable manager has control of the resources required to ensure the proper performance of the SMS	27.8 (15)	20.4 (11)	44.4 (24)	3.7 (2)	1.9 (1)	**4.24**	**4.107**
There is an emergency procedure appropriate to the size, nature and complexity of the organization	18.5 (10)	59.3 (32)	18.5 (10)	0.0 (0)	3.7 (2)	**3.89**	**.839**
The organization has a predictive, proactive and reactive method that provides for the capture of internal safety information.	27.8 (15)	38.9 (21)	24.1 (13)	5.6 (3)	3.7 (2)	**3.81**	**1.029**
There is a structured process for the analysis of risks associated with identified hazards.	16.7 (9)	31.5 (17)	42.6 (23)	7.4 (4)	1.9 (1)	**3.54**	**.926**
The reports are reviewed at the appropriate level of management	16.7 (9)	55.6 (30)	24.1 13)	1.9 (1)	1.9 1)	**3.83**	**.795**

There is a feedback process to notify contributors on receipt of their reports and to share the results of the analysis	20.4 (11)	37.0 (20)	29.6 (16)	11.1 (6)	9.6 (1)	**3.63**	**.996**
The organization has risk management control strategies.	22.2 (12)	46.3 (25)	24.1 (13)	7.4 (4)	0.0 (0)	**3.83**	**863**
There is a process in place to monitor and analyze safety trends	14.8 (8)	48.1 (26)	27.8 (15)	5.6 (3)	3.7 (2)	**3.65**	**.935**
The organization has implemented self-evaluation processes, such as regularly scheduled safety audits, surveys, reviews, and studies	24.1 (13)	33.3 (18)	35.2 (19)	5.6 (3)	1.9 (1)	**3.72**	**.960**
There is an independent audit function with the authority required to carry out an internal evaluation	14.8 (8)	33.3 (18)	38.1 (21)	7.4 (4)	5.6 (3)	**3.44**	**1.022**
There is a procedure outlining requirements for timely corrective and preventive action in response to audit results	13.0 (7)	42.6 (23)	35.2 (19)	5.6 (3)	3.7 (2)	**3.56**	**.925**
The organization performs periodic management reviews of safety critical functions and relevant safety issues.	11.1 (6)	38.9 (21)	38.9 (21)	5.6 (3)	3.7 (2)	**3.49**	**.912**
The organization's safety training is incorporated into indoctrination training upon employment	14.8 (8)	55.6 (30)	14.8 (8)	9.3 (5)	5.6 (3)	**3.65**	**1.031**
The safety training ensures that all personnel understand their responsibilities and accountabilities.	27.8 (15)	59.3 (32)	11.1 (6)	1.9 (1)	0.0 (0)	**4.13**	**.674**

	SA	A	NS	D	SD		
There are communication processes in place that permit the SMS to function effectively	14.8 (8)	61.1 (33)	16.7 (9)	7.4 (4)	0.0 (0)	**3.83**	**.771**
There is a process for the dissemination of safety information throughout the organization.	22.2 (12)	51.9 (28)	18.5 (10)	5.6 (3)	1.9 (1)	**3.87**	**.891**
There are communication processes commensurate with the size and scope of the organization	24.1 (13)	64.8 (35)	9.3 (5)	0.0 (0)	1.9 (1)	**4.09**	**.708**

Source: Field data

Key: **SA**=Strongly Agreed; **A**=Agreed; **NS**=Not Sure; **D**=Disagree; **SD**=Strongly Disagree

Sd= Standard deviation

On whether there is a SMS with defined components established, maintained and adhered to; 92.6%, n=50 respondents agreed, followed by 3.7%, n=2 respondents that were, respectively not sure and disagreed. Similarly, 92.6%, n=50 respondents agreed that there is a safety policy in place that is approved and promoted by the accountable manager, with 5.6%, n=3 respondents not sure and 1.9%, n=1 respondents disagreed. In addition, 90.8%, n=49 respondents agreed that the accountable manager has the responsibility for ensuring that the SMS is properly implemented and is performing to requirements whereas 5.6%, n=3 respondents were undecided and 3.7%, n=2 respondents disagreed. Coupled with that, 48.2%, n=26 respondents agreed that the accountable manager has control of the financial and human resources required to ensure the proper performance of the SMS, while 44.4%, n=24 were not sure and 5.6%, n=3 disagreed. Finally, 77.8%, n=42 agreed that there is an emergency response procedure appropriate to the size, nature and complexity of the organization, whereas 18.5%, n=10 and 3.7%, n=2 respondents were respectively not sure and disagreed. These findings were supported by one key respondent who said that;

"Having a SMS is a key requirement for license renewal and every operator is required to submit a copy of its SMS policy to the regulatory authority", while another added that; *"Every operator is required to have a SMS and an accountable manager who is charged with the responsibility of making sure that the SMS works"*.

Furthermore, 66.7%, n=36 respondents agreed that the organization has a predictive, proactive and reactive method that provides for the capture of internal safety information, however 24.1%, n=13 respondents were not sure and 9.3%, n= 5 respondents disagreed. Further, 48.2%, n=26 respondents agreed that there is a structured process for the analysis of risks associated with identified hazards, 42.6%, n=23 were not sure and 9.3%, n=5 disagreed. In addition, 72.3%, n= 39 respondents agreed that reports are reviewed at the appropriate level of management and the reporting processes are simple, accessible and commensurate with the size of the organization, 24.1%, n=13 respondents were undecided and 3.8%, n=2 disagreed. Asked whether there is a feedback process to notify contributors that their reports have been received and to share the results of the analysis; 57.4%, n= 31 respondents agreed, 29.6%, n= 16 were not sure and 13.0%, n=7 disagreed. This means that the operators capture and analyse safety data, which data is reviewed at the management level and feedback is sent to the employees. One interviewee asserted that;

"All safety incidents are reported and related reports are submitted to senior management. Where necessary, a committee is usually set up to investigate such incidents and make recommendations to prevent future re-occurrence".

The findings further indicate that, 68.5%, n=37 respondents agreed that the organization has risk management control strategies that include corrective/preventive mitigation action of risks to an acceptable level, however 24.1%, n=13 respondents were not sure and 7.4%, n=4 respondents disagreed. More so, 62.9%, n=34 respondents agreed that there is a process in place to monitor and analyze safety trends, 27.8%, n=15 were not sure and 9.3%, n=5 disagreed. In addition, 57.4%, n= 31 respondents agreed that the organization has

implemented self-evaluation processes, such as regularly scheduled safety audits, safety surveys, safety reviews, and safety studies, 35.2%, n=19 respondents were undecided and 7.5%, n=4 disagreed. About whether there is an operationally independent audit function with the authority required to carry out an effective internal evaluation program; 48.2%, n=26 respondents agreed, 38.1%, n=21 were not sure and 13.0%, n=7 disagreed. Coupled with that, on whether there is a procedure outlining requirements for timely corrective and preventive action in response to audit results, 55.6%, n=30 respondents agreed, 35.2%, n=19 were not sure and 9.3%, n=5 disagreed. Half of the respondents agreed that, the organization performs periodic management reviews of safety critical functions and relevant safety issues that arise from the internal evaluation program while 38.9%, n=21 were not sure and 9.3%, n=5 disagreed. With the majority in agreement, this means that the operators have risk management control strategies and audit functions aimed at carrying out effective internal evaluation programs.

Last but not least, 70.4%, n=38 respondents agreed that the organization's safety training is incorporated into indoctrination training upon employment, however 14.8%, n=8 respondents were both not sure and in disagreement. In line with that, 87.1%, n=47 respondents agreed that the safety training ensures that all personnel understand their responsibilities and accountabilities in regards to all safety management processes, decisions and actions, 11.1%, n=6 were not sure and 1.9%, n=5 disagreed. In addition, 75.9%, n= 41 respondents agreed that there are communication processes in place within the organization that permit the safety management system to function effectively, 16.7%, n=9 respondents were undecided and 7.4%, n=4 disagreed. About whether There is a process for the dissemination of safety information throughout the organization and a means of monitoring the effectiveness of this process; 74.1%, n=40 respondents agreed, 18.5%, n=10 were not sure and 7.5%, n=4 disagreed. Finally, on whether there are communication processes (written, meetings, electronic, etc.) commensurate with the size and scope of the organization, 88.9%, n=48 respondents agreed, 9.3%, n=5 were not sure and 1.9%, n=1 disagreed. This implies that the

operators do conduct safety trainings for all employees and have mechanisms in place for monitoring the effectiveness of such trainings. One key respondent added that;

> *"ICAO and IATA in conjunction with regulatory authorities usually conduct training of trainers workshops, not only on SMS but also on other safety related subjects in which representatives are sought from all stake holders".*

4.6 Summary

The analysis of the primary data indicates that the predictor variables; management commitment, organizational safety culture and regulatory factors all have a positive relationship with SMS implementation. It also indicates that out of the three, management commitment and organizational safety culture had the strongest relationship and their functions had significant influence on SMS implementation, unlike regulatory factors that registered an insignificant influence. It can therefore be concluded that, while regulatory factors had a positive relationship with SMS implementation, the regulatory authority and ATOs policy makers and implementers should focus more on management commitment and organizational safety culture, for effectual SMS implementation. This claim is supported by Sengupta (2011) who asserts that; "because the attitudes and actions of management can significantly influence the entire staff, it is therefore critical that these leaders commit to the success of an SMS implementation".

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1   Introduction

This section comprises the summary, discussion, conclusions and recommendation of the study based on the specific objectives of the study. These include examining the influence of Management commitment on SMS implementation; examining the influence of organizational safety culture, on SMS implementation and examining the influence of Regulatory factors on SMS implementation, by private ATOs in Uganda.

5.2   Summary of the Study Findings

5.2.1   Management Commitment and SMS Implementation

The study examined how management commitment influences the implementation of SMS by private ATOs in Uganda. Management commitment was decomposed into safety accountability and resource allocation. A review of literature was carried out and the study was cross-sectional survey in design. It was found to have a positive relationship with SMS implementation, with a Pearson correlation (R) value of 0.767. In the regression results, management commitment was found to have a 58.0% effect on SMS implementation.

5.2.2   Organizational Safety Culture and SMS Implementation

The study further examined how organizational safety culture influences the implementation of SMS by private ATOs in Uganda. Organizational safety culture was decomposed into reporting culture, just culture, learning culture, flexible culture and informed culture. A review of relevant literature was carried out and the study was cross-sectional survey in design. Similarly, organizational safety culture was found to have a positive relationship with SMS implementation, with a Pearson correlation (R) value of 0.713. The regression results also indicated that organizational safety culture had a 49.9% effect on SMS implementation.

5.2.2 Regulatory Factors and SMS Implementation

Finally, the study examined how regulatory factors influence the implementation of SMS by private ATOs in Uganda. Regulatory factors were decomposed into CAA training program and enforcement policy. A review of related literature was carried out and the study was cross-sectional survey in design. Regulatory factors were found to have a positive relationship with SMS implementation, though rather weak compared to management commitment and organizational safety culture; with a Pearson correlation (R) value of 0.372. The regression results also indicated that regulatory factors had only a 12.2% effect on SMS implementation.

5.3 Discussion of the findings

5.3.1 Management Commitment and SMS Implementation

A number of responses obtained from the field data reveal that many of the respondents were in agreement with the questions that were posed. The findings also have a link to the different authors or scholars` writing about management commitment. For instance, 77% respondents agreed that management is committed to ensuring safety while 94.0% respondents indicated that safety was the highest priority. For effectual SMS implementation, the staff should be 100% aware about management commitment and safety being of the highest priority. The above figures are a clear manifestation that management should do more in order to ensure awareness. Sengupta (2011) asserts that; the attitudes and actions of management can significantly influence the entire staff; therefore it is critical that these leaders commit to the success of SMS implementation.

In another instance, 94.0% indicated positively that accountable managers exist to oversee and ensure that SMS requirements are met and 90.0% respondents revealed that dedicated SMS personnel existed. On the other hand, much as 46.0% agreed that financial resources were available, 44.0% expressed ignorance, while 10.0% disagreed about financial matters. The majority respondents on the contrary raises doubt on the existence of financial resources. This is contrary to the contention by CAD (2012) that; regardless of the size, complexity, or type of

operation, the success of the SMS depends on the extent to which senior management devotes the necessary time, resources and attention to safety as a core management issue. An SMS will not be effective if it receives attention only at the operational level. The 6% and 10% respectively who either disagreed or were neutral about the existence of an accountable manager responsible for safety and dedicated SMS personnel in the organization is an indication that some personnel are ignorant about the reporting channels within the organization. This negatively affects the successful implementation of SMS.

All respondents indicated that; there is a safety policy statement that clearly spells out safety responsibilities and accountabilities. This links well with the FAA, (2012) which stresses that management should show commitment to SMS implementation and operations through a safety policy that among other things contains the following: the commitment of senior management to implement SMS, to provide the necessary resources needed for safe operations, to make safety the highest priority, to continually improve safety; to comply with all regulatory requirements related to safety and the encouragement of employees to report safety issues without fear of reprisal.

5.3.2   Organizational Safety Culture and SMS Implementation

Organizational safety culture was found to have a positive relationship with the implementation of SMS. This finding was supported by a number of responses that were given by respondents and the corresponding literature review drawn from chapter two. For instance 45.0% agreed that employees are prepared to freely report their errors without fear of reprisal while 50.0% indicated that there is rapid, useful, accessible, and intelligible feedback to the reporting community. The findings relate to JPDO (2008) which stipulates that a positive "reporting culture" helps mitigate errors by encouraging employees to divulge information about safety concerns that they encounter. However, about the department that collects and analyzes incident reports being separated from those with the authority to discipline. Majority, 65.0%, were either neutral or disagreed. This is contrary to one of Reason's (1998) five

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important factors in determining the quantity and quality of incident reports; "the separation of the department that collects and analyzes the reports from those with the authority to discipline". It is clear that most employees fear to freely report their errors so as to avoid being reprimanded. This negatively impacts on the effective implementation of SMS.

Ninety eight percent (98.0%) agreed that employees are held accountable for deliberate violations of the safety rules. This is in line with Reason (1998), who asserts that; a culture in which all acts are immune from punishment would lack credibility in the eyes of the workforce. He adds that; a prerequisite for a just culture is that all members of an organization should understand where the line must be drawn between unacceptable behavior, deserving of disciplinary action, and the remainder, where punishment is neither appropriate nor helpful in furthering the cause of safety. CASA (2012) similarly talks about a just culture as that where there is an atmosphere of trust. People are encouraged to provide essential safety-related information, but they are also clear about where the line must be drawn between acceptable and unacceptable behavior. A just culture does not tolerate reckless behavior or deliberate malfeasance.

To adapt effectively to changing demands, an organization must foster a "flexible culture" that allows quick, smooth reactions to non-nominal events. A flexible culture allows all employees to question procedures and behavior, thus making the safety culture self-correcting on every level. The findings indicated that 83.0% of the employees feel a shared sense of responsibility for the success of the organization. Furthermore, the role of the human and the inevitability of human error is acknowledged. When procedures or behavior are questioned, potentially unsafe practices may be interrupted before they result in an actual mishap. In a flexible culture, operational roles and responsibilities become less centralized and more fluid, and all employees feel a shared sense of responsibility for the success of the organization. The result is an organization that is oriented towards goals instead of regulations (JPDO, 2008).

Interesting results obtained indicate that 93.0% expressed the willingness to change based on safety indicators and hazards uncovered through assessments, data, and incidents. More, 57.0% indicated that proactive observation and evaluation of the organization, its employees and policies were done more frequently. JPDO, (2008) clearly highlights that an organization that demonstrates a strong "learning culture" is willing to change based on safety indicators and hazards uncovered through assessments, data, and incidents. Through proactive observation and evaluation, the organization and its employees and policies allow for continuous learning and improvements to safety. These activities help identify vulnerabilities or weaknesses to organizational safety. Implementing a learning culture can be difficult because it often requires a great deal of coordination, a change in attitudes, and management commitment. The fact that only 50% agreed that there is rapid, useful, accessible, and intelligible feedback to the reporting community, is an indication that not all personnel get a feedback about the analyzed accident and incident reports, which is a bottle neck to effectual SMS implementation.

Further, 53.0% indicated that there existed a safety information system that collects; analyses and disseminates information with 94.0% responding positively that communicating safety information is within and outside of the organization. The findings relate with JPDO (2008) which stipulates that a combination of issues formed a safety-conscious, informed organization with characteristics including: leadership commitment; open communication; just environment; involvement of everyone at all levels of the organization; learning throughout the organization; effective decision-making process; follow-up, feedback, and reporting. These characteristics typify a vibrant safety culture in which each employee sees his/her role as a critical part of the organization's commitment to safety. Reason (1998) stresses that, an "informed culture", must involve creating a safety information system that collects; analyses and disseminates information from incidents and near misses, as well as from regular proactive checks on the system's vital signs. Those who manage and operate the system have current knowledge about the human, technical, organizational and environmental factors that

determine the safety of the system as a whole (CASA, 2012). For effective SMS implementation, there should be organization wide knowledge on all safety matters. The fact that 47% are either unaware or disagree that there is a safety information system that collects; analyses and disseminates information is contrary to the former.

5.3.3 Regulatory Factors and SMS Implementation

Regulatory factors were found to have a positive relationship with implementation of SMS. Findings from the previous chapter reveal that 87.0% respondents agreed that there exist a training programme to develop knowledge to accept and oversee the implementation of key components of a SMS, while 82.0% were positive that their training programme provides knowledge of safety management concepts, including the ICAO SARPs. This links well with the FAA (2012) which highlights that implementing an SSP is to develop a training programme for the personnel of the State authority. The training programme should have two basic objectives. The first objective is to provide knowledge of safety management concepts, including the ICAO SARPs. The second objective is to develop knowledge to accept and oversee the implementation of key components of an SMS, in compliance with national regulations and relevant ICAO SARPs. This aspect of training aims at supporting SMS implementation. However, the fact that majority (66%) do not agree that, there is a mechanism in place to evaluate the effectiveness of the training programs implies that, such a mechanism may not be in place. Therefore, the effectiveness of these training programs cannot be determined.

Interesting results revealed that 50.0% neither agreed nor disagreed that civil aviation oversight authority has a revised enforcement policy specifically aimed at supporting SMS implementation. Further, 54.0% agreed that management was held accountable by the regulatory authority for safety. This is however contrary to the TCAA (2009) which stresses, that; in a SSP enforcement policy, the first general principle is to develop enforcement procedures that allow service providers to deal with, and resolve, certain events involving

safety deviations, internally, within the context of the service provider's SMS and to the satisfaction of the authority. The fact that majority did not agree that, civil aviation oversight authority has a revised enforcement policy specifically aimed at supporting SMS implementation, only confirms what some key respondents said;

> "*The regulatory authority has only set up a safety policy which is not of much help in the SMS implementation*" and "*Operators strive on their own in order to ensure they effectively implement SMS*".

This obviously has a negative impact on successful SMS implementation.

According to TC (2009), regulatory authorities should have a SMS enforcement policy that, enables the regulatory enforcement program contribute to a smooth transition to a SMS framework, by allowing ATOs achieve future compliance through the effective use of internal reporting programs, the analysis of reported events, and the implementation of subsequent corrective measures. The second general principle is that no information derived from Safety Data Collection and Processing Systems (SDCPS) established under SMS shall be used as the basis for enforcement action and incriminate persons. Enforcement decisions must: be fair and follow due process; be transparent to those involved; take into account the circumstances of the case and the attitude/actions of the service provider; have consistent actions/decisions for like/similar circumstances; and be subject to appropriate internal and external review (TCAA, 2009).

5.4   Conclusions of the findings

The November 2008 safety audit by ICAO, under the USOAP, where Uganda was rated below the required minimum performance level of 70% effective implementation seemed to have raised safety awareness within the aviation industry in Uganda. This is clearly reflected in the study findings which reveal a positive correlation between the predictor variables and SMS Implementation.

5.4.1 Management Commitment and SMS Implementation

Management commitment was found to have a positive relationship with SMS implementation. It was discovered that, there is safety accountability of managers in ensuring all safety requirements are in place and both human and financial resources are allocated towards provision safe operations. This implies that management is committed to the implementation of SMS. Therefore, it can be confidently concluded based on the study findings that effectual SMS implementation, can only be achieved if management commits and allocates both human and financial resources towards SMS.

5.4.2 Organizational Safety Culture and SMS Implementation

Organizational Safety Culture was found to have a positive relationship with SMS implementation. Respondents exhibited a sense of belonging within the aviation industry. Based on the key findings, the personnel are willing to make improvement and have the necessary capabilities to make the changes. Majority of the personnel are well aware of the dangers associated with keeping safety related information to one's self. The correlation results reveal that reporting, just, learning, flexible and informed cultures are likely to result into effectual SMS implementation. Similarly, it can be concluded based on the study findings that, the success of a SMS depends a lot on a positive organizational Safety Culture.

5.4.3 Regulatory Factors and SMS Implementation

Regulatory factors were found to be positively related to the implementation of SMS by private ATOs in Uganda. CAA provides essential safety training programs through organizing workshops, conferences among others and an enforcement policy with penalties like denial of license renewal to violators. All the above are likely to lead to success in SMS Implementation. Although the relationship between regulatory factors and SMS implementation was rather insignificant, it can nonetheless be concluded that, effectual SMS implementation cannot be achieved without the input of the regulatory authority.

5.5   Recommendations

Being a new concept in aviation safety management, effectual SMS Implementation has been the focus of ICAO in the recent past, as far as aviation safety is concerned. CAA should endeavor to enforce SMS Implementation among stakeholders, if it is to raise and maintain Uganda's safety rating above the required minimum of 70%. During the course of the study the researcher came up with the following recommendations based on study objectives:

5.5.1   Management Commitment and SMS Implementation

Management should ensure that all the personnel are 100% aware about management commitment to ensuring safety within the organization and safety being of the highest priority.

The accountable manager responsible for safety and dedicated SMS personnel in the organization should have their roles clearly defined and personnel should be well educated on the reporting channels so as to have a smooth flow of safety related information and resources.

Safety management has to be made a core function/department within the organization. This will enable effective allocation of resources – both financial and human towards safety management during the budgeting process.

5.5.2   Organizational Safety Culture and SMS Implementation

Employees should be encouraged to freely report their errors without fear of reprisal. This can be achieved through a statement issued and endorsed by top management, protecting and waiving penalties to those who voluntarily report their errors and violations.

All personnel in the organization should have free access to and/or get feedback about the analyzed accident and incident reports. This will enable them debrief their errors and violations and improve their work performance accordingly.

A safety information system that collects; analyses and disseminates information should be developed and all personnel should be trained on how to in-put, process and retrieve information from the system.

5.5.3 Regulatory Factors and SMS Implementation

CAA should develop a mechanism to evaluate the effectiveness of its training programs. This can be achieved through questionnaires and evaluation forms issued to all the stake holders.

CAA should review its enforcement policy specifically aimed at supporting SMS implementation and ensure that it harmonizes its stand on the policy, with the operators and other stake holders.

5.6 Limitations of the study

Access to information was a major challenge, as there is hardly any published work in academic journals related to SMS. Therefore, the researcher relied more on anecdotal evidence based on industry reports. This was attributed to the fact that the SMS concept is still new in the aviation industry and in Uganda; this could be the first study of its kind.

The researcher was unable to obtain a bigger sample size because many of the targeted population were based in foreign countries and others were inactive because their licenses had expired. However, the researcher managed to reach some of the respondents based in the Republic of South Sudan and was able to administer the questionnaires and conduct some interviews from there.

Some respondents kept information confidential and it was not until the researcher made them understand the relevance of the study that they eventually opened up. This was attributed to the fact that the study concerned safety which is a very sensitive area in aviation.

5.7   Contribution of the study

This study is an addition to the exiting body of knowledge about SMS. Although air transport is among the safest means of transport, risk is a constant reality as is true of any human activity and in effect aviation operations are prone to accidents. In order to keep safety risks at acceptable levels, modern safety management practices are shifting from a purely reactive to being more proactive and predictive.SMS is process-driven and proactive, and must be infused into the management system of ATOs for desired effects on safety. Furthermore, CAA can use the study findings to enhance flight safety, uplift and maintain Uganda's safety rating above the required minimum, so as to compete effectively in the global aviation industry.

5.8   Area for further research

This study focused on the factors affecting the implementation of SMS by private ATOs in Uganda and the findings indicate that the predictor variables analyzed have a positive influence on SMS implementation. Further research could include the effect of additional variables like employee training among others on SMS implementation and include approved maintenance organizations, air traffic service providers and certified aerodrome operators in the study. This would give a comprehensive picture on the level of SMS compliance in the aviation industry of Uganda as a whole.

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Appendix I: Questionnaire

Dear Respondent;

I am a postgraduate student undertaking a Masters in Management Studies (Logistics and Transport Management) at Uganda Management Institute (UMI). This questionnaire is for a survey to acquire data on the Factors affecting the implementation of Safety Management Systems (SMS) by private Air Transport Operators (ATOs) in Uganda. Information obtained would be used for purely academic purposes and treated with absolute confidentiality. Kindly tick as appropriate and comment where necessary, because your answer determines the validity of this study.

 Thank you for your time.

Darwin Angudri

Section A: Personal data

Please tick (√) and comment as appropriate

1. Name (optional): ....

2. Which company do you work for? ....

....

3. What is your job Category?

    a. Management   ❏   c. Flight crew   ❏

    b. Safety/Operations   ❏   d. Ground crew   ❏

4. How many years have you worked in the above company?

    a. (Less than 5 yrs)   ❏   c. (11 – 15 yrs)   ❏

    b. (6 – 10 yrs)   ❏   d. (16 yrs and above)   ❏

Section B: Factors

Please tick (√) the most suitable scale (1-5) out of the alternatives provided for each statement in Section B and C.

Key: 5 - Strongly Agree (SA),

     4 - Agree (A),

     3 - Not Sure (NS),

     2 - Disagree (D),

     1 - Strongly Disagree (SD):

S/N	STATEMENT	SCALE				
		SA	A	NS	D	SD
A.	**Management commitment and SMS implementation**	5	4	3	2	1
1	There is a safety policy statement that clearly spells out safety responsibilities and accountabilities					
2	There are Standard Operating Procedures (SOPs) that are strictly adhered to					
3	Safety is of the highest priority within the organization					
4	Senior management is committed to ensuring safety within the organization					
5	There is a commitment to comply with all regulatory requirements related to safety					
6	Safety is a core function within the organization					
7	The necessary financial resources needed for safe operations are readily available					
8	There is an accountable manager responsible for safety					
9	There are dedicated SMS personnel in the organization					
10	There are data collection & action tracking systems dedicated to safety					
11	There is routine documentation of all safety incidents					

S/N	STATEMENT	SCALE				
		SA	A	NS	D	SD
B. Organizational safety culture and SMS implementation		5	4	3	2	1
1	Senior management places strong emphasis on safety as part of the strategy of controlling risks					
2	Employees are always prepared to freely report their errors and near-misses without fear of reprisal					
3	Employees are protected from disciplinary proceedings after voluntary incident reporting					
4	There is rapid, useful, accessible, and intelligible feedback to the reporting community					
5	The department that collects and analyzes incident reports is separated from those with the authority to discipline					
6	Following an incident or accident, blame is assigned to the individual responsible for the last action prior to the problem					
7	Employees are held accountable for deliberate violations of the safety rules					
8	Employees are encouraged and rewarded for providing essential safety-related information					
9	Employees freely question procedures and behavior, thus making the safety culture self-correcting on every level					
10	Operational roles and responsibilities are centralized					
11	Employees feel a shared sense of responsibility for the success of the organization					
12	Those in senior positions foster a climate in which there is a positive attitude towards criticism					
13	There is willingness to change based on safety indicators and hazards uncovered through assessments, data, and incidents					
14	There is proactive observation and evaluation of the organization, its employees and policies					
15	There is the willingness and the competence to draw the right conclusions from safety information systems					

S/N	STATEMENT	SCALE				
16	There is a safety information system that collects, analyses and disseminates information from incidents and near misses					
17	Those in senior positions use their influence to force their views on other levels of the organization and to avoid criticism					
18	There is an awareness of the importance of communicating safety information within and outside of the organization					
19	There is promotion of appropriate, realistic and workable rules relating to hazards and to potential sources of damage					
20	Personnel are well trained, and fully understand the consequences of unsafe acts					

S/N	STATEMENT	SCALE				
		SA	A	NS	D	SD
	C. Regulatory Factors and SMS implementation	5	4	3	2	1
1	There is a training programme in place that provides knowledge of safety management concepts, including the ICAO SARPs					
2	There is a training programme to develop knowledge to accept and oversee the implementation of key components of a SMS					
3	Human and organizational factors in the context of SMS are clearly spelt out in the SMS training packages					
4	There is a mechanism in place to evaluate the effectiveness of the training programs					
5	There are developed SMS requirements for service providers, as well as guidance material for the implementation of SMS					
6	Civil aviation oversight authority has a revised enforcement policy specifically aimed at supporting SMS implementation					
7	Gross negligence, willful deviation and so forth are dealt with through established enforcement procedures					
8	Senior management is held accountable by the regulatory authority for safety					

Section C: SMS Implementation

S/N	STATEMENT	SCALE				
		SA	A	NS	D	SD
A.	**Safety policy and objectives**	5	4	3	2	1
1	There is a SMS with defined components established, maintained and adhered to					
2	There is a safety policy in place that is approved and promoted by the accountable manager; is periodically reviewed and clearly indicates which types of operational behaviors are acceptable or unacceptable					
3	The accountable manager has the responsibility for ensuring that the SMS is properly implemented and is performing to requirements					
4	The accountable manager has control of the financial and human resources required to ensure the proper performance of the SMS					
5	There is an emergency response procedure appropriate to the size, nature and complexity of the organization					
B.	**Safety risk management**	5	4	3	2	1
6	The organization has a predictive, proactive and reactive method that provides for the capture of internal safety information including hazard identification, occurrences and other data relevant to safety risk management					
7	There is a structured process for the analysis of risks associated with identified hazards, expressed in terms of severity, and probability of occurrence					
8	The reports are reviewed at the appropriate level of management and the reporting processes are simple, accessible and commensurate with the size of the organization					
9	There is a feedback process to notify contributors that their reports have been received and to share the results of the analysis					

10	The organization has risk management control strategies that include corrective/preventive mitigation action of risks to an acceptable level					
C.	**Safety assurance**	**5**	**4**	**3**	**2**	**1**
11	There is a process in place to monitor and analyze safety trends					
12	The organization has implemented self-evaluation processes, such as regularly scheduled safety audits, safety surveys, safety reviews, and safety studies					
13	There is an operationally independent audit function with the authority required to carry out an effective internal evaluation program					
14	There is a procedure outlining requirements for timely corrective and preventive action in response to audit results					
15	The organization performs periodic management reviews of safety critical functions and relevant safety issues that arise from the internal evaluation program					
D.	**Safety promotion**	**5**	**4**	**3**	**2**	**1**
16	The organization's safety training is incorporated into indoctrination training upon employment					
17	The safety training ensures that all personnel understand their responsibilities and accountabilities in regards to all safety management processes, decisions and actions					
18	There are communication processes in place within the organization that permit the safety management system to function effectively					
19	There is a process for the dissemination of safety information throughout the organization and a means of monitoring the effectiveness of this process					
20	There are communication processes (written, meetings, electronic, etc.) commensurate with the size and scope of the organization					

Appendix II: Interview Guide

1. Organization: ....
2. Appointment: ....
3. Number of years of service in the above Organization?

    a. (10 yrs and below) ☐   c. (11 yrs and above) ☐

4.   Management commitment and SMS implementation
- How is senior management committed to ensuring safety within the organization?
- Is there an accountable manager responsible for safety? What are his responsibilities?
- Do you have data collection & action tracking systems dedicated to safety?

5.   Organisational safety culture and SMS implementation
- How are the cases of errors and near-misses handled within the organization?
- Tell me about the collection and analysis of incident reports and discipline?
- How free are employees in questioning procedures and behavior within the organization?

6.   Regulatory factors and SMS implementation
- What has the regulatory authority done in order to ensure compliance?
- Is there a SMS training programme in place? What are the components?
- Tell me about the SMS requirements for service providers?

7. Safety policy and objectives
- Tell me about the organization's/industry's safety policy?

8. Safety risk management
- How is safety risk managed within the organization/industry?

9. Safety assurance
- How are the safety critical functions and relevant safety issues handled?

10. Safety promotion
- What programs are in place to promote safety within the organization/industry?

INTERVIEW DATA RECORD SHEET

Statement No. ……………

Respondent answer scale rating   Agree ☐   Disagree ☐

Notes:

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Statement No. ……………

Respondent answer scale rating   Agree ☐   Disagree ☐

Notes:

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Statement No. ……………

Respondent answer scale rating   Agree ☐   Disagree ☐

Notes:

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Statement No. ……………

Respondent answer scale rating   Agree ☐   Disagree ☐

Notes:

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Appendix III: Field Attachment Letter

UGANDA MANAGEMENT INSTITUTE

Telephones:	256-41-4259722 /4223748 /4346620	Plot 44-52, Jinja Road
	256-31-2265138 /39 /40	P.O. Box 20131
	256-75-2259722	Kampala, Uganda
Telefax:	256-41-4259581 /314	Website: http://www.umi.ac.ug
E-mail:	admin@umi.ac.ug	

Your Ref:

Our Ref: **G/35**   **22 July 2013**

TO WHOM IT MAY CONCERN

MASTERS IN MANAGEMENT STUDIES DEGREE RESEARCH

Mr. Darwin Angudri is a student of the Masters Degree in Management Studies of Uganda Management Institute 28th Intake 2012/2013 specializing in Logistics and Transport Management, **Reg. Number 12/MMSLTM/28/038.**

The purpose of this letter is to formally request you to allow this participant to access any information in your custody/organisation, which is relevant to his research.

His Research Topic is: *"Factors Affecting the Implementation of Safety Management Systems by Private Air Transport Operators in Uganda"*

Gerald Karyeija (PhD)
AG. DEAN, SCHOOL OF MANAGEMENT SCIENCES

Appendix IV: Krejcie and Morgan Mathematical Table (1970)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size

"S" is sample size.