COMPLIANCE WITH INTERNATIONAL AVIATION SECURITY STANDARDS ON ORIGINATING PASSENGER SECURITY IN UGANDA: A CASE STUDY OF ENTEBBE INTERNATIONAL AIPORT SECURITY PROGRAMME

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DECLARATION

I, Manyifu Michael, solemnly declare to the best of my knowledge that this dissertation is my original work and has not been presented to any higher institution of learning. Any reference to the work of others is duly acknowledged.

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APPROVAL

This research dissertation titled, ***"COMPLIANCE WITH INTERNATIONAL AVIATION SECURITY STANDARDS ON ORIGINATING PASSENGER SECURITY IN UGANDA: A CASE STUDY OF ENTEBBE INTERNATIONAL AIRPORT SECURITY PROGRAMME"*** has been developed under my supervision and is ready for examination.

Signed: 

Dr. EDAKU CHARLES

SUPERVISOR

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ACRONYMS

AFCAC : African Civil Aviation Commission

AI : Artificial Intelligence

AODB : Airport Operations Database

APOC : Aviation Police Officers and Constables

APSS : Airline Passenger Security Screening

ASM : Aviation Security Manager

ASPL : Airport Security Programme

ATM : Air Traffic Management

AVSEC : Aviation Security

CAAA : Civil Aviation Authority Act

CAMFSU : Civil Aviation Management and Flight Safety in Uganda

CAMP : Continuous Airworthiness Maintenance Programme

CAO : International Civil Aviation Organization

CCTV : Closed-circuit television

CMMS : Computerized Maintenance Management System

CNS : Communication Navigation Surveillance

CT : Computed Tomography

DIA : Dubai International Airport

DRC : Democratic Republic of Congo

EAC : East African Community

EIA : Entebbe International Airport

EIASP : Entebbe International Airport Security Programme

FAA : Federal Aviation Administration

GLR : Great Lakes Region

HBS : Hold Baggage Screening

HBSS : Hold Baggage Security Screening

IATA : International Air Transport Association (IATA)

ICT : Information and Communications Technology

IED : Improvised Explosive Device

MoFA : Ministry of Foreign Affairs

MoWTU : Ministry of Works and Transport Uganda
NAP : National Academies Press
NASEM : National Academies of Sciences, Engineering and Medicine
NGFWs : Network Security by Deploying Next-Generation Firewalls
NTII : New Technologies and Implementation Issues
PAF : Pan Am Flight
RBS : Risk-Based Security
RQA : Research Questions Approach
SMS : Safety Management System
SSP : State Safety Program
TOCC : Terminal Operations Control Centre
TSA : Transportation Security Administration
TSA : Transportation Security Administration
UBS : Uncovered Baggage Segments
UCAA : Uganda Civil Aviation Authority
UFS : Uncovered Flight Segments
UPASU : Uganda Police Aviation Security Unit
UPS : Uncovered Passenger Segments
USFAA : United States Federal Aviation Administration
USAP-CMA : Universal Security Audit Program- Continuous Monitoring Approach

ABSTRACT

The study was about compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport. Guided by the following objectives, to assess the relationship between screening of originating passengers and aviation security at Entebbe International Airport, examine the relationship between access control and aviation security at Entebbe International Airport, and analyze the measure of influence of compliance on aviation security at Entebbe International Airport, and obtaining data from 95 key informants, the **s**tudy revealed that the number of originating passengers has been rising, meaning that even their hand baggage and cargo have been increasing. Entebbe International Airport is a bustling hub of activity, serving as a gateway for thousands of passengers and their baggage daily. With increased air travel comes the need for robust airport security measures to keep the airport, passengers, cargo/baggage and crews' safe at all times. At Entebbe International Airport undertakes a number of screening and surveillance programmes namely passenger pre-board screening, hold baggage screening, non-passenger screening, use of Closed-circuit television (CCTV) also known as video surveillance, security bollards as well as undertaking routine and call-in or unscheduled, maintenance checks. There is access control which entails controlling admittance to certain parts of the airport, whereby some are only accessible to only authorized staff or personnel for example the security offices, while only people of certain ranks are authorize to reach certain points. Through an established regulatory framework to guide security operations, for example aviation security relies on a comprehensive set of laws, regulations and guidelines put in place band enforced by AVSEC (UCAA) handed down by ICAO and IATA. The compliance with the established security protocols help to identify and mitigate potential risks such as unauthorized access to security rooms and data, cargo processing areas, prohibited items or threats from within the aviation system. Regular inspections and audits help identify vulnerabilities in the prevailing security programmes and allow for timely corrective actions, so being a fact that AVSEC (Aviation Security) carries out a vulnerability assessment at the airport on a regular and reliable basis. The security leadership at the airport evaluates the effectiveness of security measures and identify any gaps in procedures, immediately have them plugged in order to enhance security. Aviation security leadership inspects and audits the security process in order to identify the areas of strengths and weaknesses in order to develop contingency measures in order to get rid of lapses. The aviation security (AVSEC) leadership has been instrumental in identifying respondents to safety hazards. The study recommends that there should be an established and dedicated airport screening lanes to handle those passengers posing an elevated risk and for those passengers with special needs, there should be introduction of a more aggressive, visible, and unpredictable checkpoint procedures such as random pat-down and hand-wand screening and there should be continued development of new technology at checkpoints to better detect concealed items.

CHAPTER ONE
BACKGROUND TO THE STUDY

1.0 Introduction

This chapter describes the introductory part of the study; specifically contains the background to the study, problem statement, objectives of the study, research questions, scope of the study, and significance of the study as well as the conceptual framework.

1.1 Background to the study

This study was about compliance with international aviation security standards on originating passenger security focusing on Entebbe International Airport Security Programme. The nexus between Entebbe International Airport Security Programme and aviation security is crucial, because civil aviation has been in the focus of unscrupulous activities like terrorism for more than 70 years (Malik, 1998; Enerstvedt, Springer and Cham, 2017). In response to terrorist attacks, aviation security measures have been continuously refined and improved (Elias, 2010). This was mainly based on minimizing the risk of known threats. Whenever a security-related incident occurred, weaknesses of the security system were identified, resulting in the adaptation of existing measures or the addition of new ones to improve aviation security.

1.1.1 Conceptual perspective

Lee (2024) stated that the aviation industry is a complex and highly regulated sector, with security being a top priority. Aviation security protocols are designed to protect passengers, crew members, and aircraft from potential threats, such as terrorism, hijacking, and sabotage. In this comprehensive guide, we will explore the importance of aviation security protocols, their historical context, and the key stakeholders involved.

Aviation security refers to measures taken to keep aircraft and their passengers and crew safe. Aviation security has existed throughout most of the history of aviation. But various events throughout history have led to heightened security for those traveling on board aircraft. Further, according to the International Civil Aviation Organization (ICAO, 2019), aviation security protocols encompass a range of measures designed to prevent and respond to security threats. These measures include passenger screening, baggage screening, aircraft security, and intelligence gathering. The importance of these protocols cannot be overstated, as they help to ensure the safety of millions of passengers and crew members every year.

According to Merriam-Webster Dictionary, security is the state of being secure, freedom from danger or fear, and protection against sabotage, crime, attacks and so on. William O'Toole et al (2019), opined that, security is the planning process that designs and creates the framework for supporting the trust placed by the public in those managing their safety at an event. From these definitions, security is a state of being secure from all forms of danger through a conscious process of creating security frameworks that guarantee public trust and confidence. Aligning the definitions to Abraham Maslow's Hierarchy of Needs Theory, which states that the second most important need of man is safety and security, will help us to understand why countries, organizations, and individuals place prime importance on security and security studies. No wonder, security is seen from the perspectives of people, assets, and information.

According to Samantha Costanzo Carleton (2021) security incorporates data collection, analysis, leadership, and systematic thinking to identify and protect against a wide range of threats, including both man-made and natural causes of disasters and other shocks. Several security networks of systems and frameworks have existed to examine, research, and analyze security problems to gain greater insights into the management of security locally, internationally, and collaboratively.

In Eroukhmanoff (2018), it was revealed that Airport safety is now more complex, as commercial, private aviation and hobbyist drones and planes take to the air. Take the four-day shutdown of London Gatwick in 2018, or when drones in California grounded helicopters fighting the fires in October 2019 with illegal flights. Addressing these new challenges often entails new, expensive technology systems, training and collaboration between air traffic management, police and the military to establish a viable system that avoids disruptions and safeguard general safety. As technology transforms, the way we live, work and travel, airport Security and safety is critical to ensure airports and the aircraft and people passing through them are as secure and safe as possible.

According to Weed (2020), although, airport safety and airport security are two distinct topics, improving security also means safety. Airport safety encompasses several areas, including aircraft firefighting and rescue, air shows, dealing with foreign objects or debris, airport runways, runway incursions, overall systems, signs and minimizing wildlife hazards. Often stemming from issues brought on by scarce resources, aviation safety contains some economic

imperative, while aviation managers must ensure the safety of their employees even against that budget constraint. The National Business Aviation Association groups safety into top safety issues and foundations for safety, which are practices and behaviors that form a foundation to support safety, including risk management, ensuring fitness for duty, safety leadership and technical excellence. These core skills ensure aviation professionals are best equipped to mitigate the safety issues airports must contend with (Akcay Samet; Breckon Toby, 2017).

Aviation is heavily regulated by local agencies, customs and border protection regulations, and national agencies. National agencies that regulate safety include Federal Aviation Administration (FAA), Transportation Security Administration (TSA), Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA). Unfortunately, demands and expectations from these many agencies are not always in lockstep, and airport professionals must navigate competing demands. The FAA and the International Civil Aviation Organization (ICAO) establish rules for the industry; however, the ICAO aims to develop global standards, which it must enforce through establishing procedures and applying other techniques to encourage compliance. For instance, through the Standards and Recommended Practices (SARPs), the ICAO establishes a foundation for global aviation safety that aims to support managing safety risks (Bradshaw Kelsey, 2020).

There are also two major policies in aviation, which are the Global Aviation Safety Plan (GASP), which establishes a plan for continuous improvement by developing aviation safety management components, beginning with a core system and expanding to become increasingly predictive, and the Global Air Navigation Plan (GANP), which connects continuous safety improvement with modernizing navigation, boosting efficiency and eliminating emissions in the process (Swidey Neil, 2020).

Aviation safety reporting systems support better safety by cultivating greater awareness within the airport. The mandatory reporting systems happens when major safety events occur, such as an in-flight engine failure or a crew member is suddenly too sick to perform her duties, the National Transportation Safety Board (NTSB) mandates these types of major safety threats to be reported. Voluntary reporting systems involve reporting for front-line personnel to highlight risks or hazards that may not otherwise be known can support better preparedness and safety.

Allowing employees to submit these reports in a confidential, anonymous manner can also support a voluntary system (Bradshaw Kelsey, 2020).

Although there are many causes of airport safety risks, airport leadership can employ a Safety Management System (SMS) to adopt a broader, more strategic view in addition to assessing a single system. An SMS allows for airport leadership to look at multiple systems and establish a holistic and proactive approach to address them through policy, process, procedures, and practices that improve safety across the airport (Koerner Brendan, 2013). An SMS should include four components, which are safety policy to establish a commitment to safety and outline methods, processes, and structures in pursuit of safety goals; safety assurance to assess how strategies are working and isolate new risks, safety risk management to assess the need for new or adjusted controls considering the evaluation of potential risk, and safety promotion to support training, communication and any other actions necessary to cultivate an overall environment of safety (Yu Roger, 2010). One key facet of an SMS is the ability to collect safety data, which can then drive more effective efforts in the future. The FAA collects this data and champions voluntary safety reporting to help better identify risks in the future and decrease accidents, violations and overall risks. As air transportation continues to grow, aviation safety will become increasingly vital, and safety management systems that can effectively support airports in detecting and addressing safety issues will be essential.

Large numbers of people pass through airports every day. This presents potential targets for terrorism and other forms of crime because of the number of people located in one place (Rimmer, David. 2011). Similarly, the high concentration of people on large airliners increases the potentially high death rate with attacks on aircraft, and the ability to use a hijacked airplane as a lethal weapon may provide an alluring target for terrorism such as during the September 11 attacks. Airport security attempts to prevent any threats or potentially dangerous situations from arising or entering the country. If airport security does succeed then the chances of any dangerous situation, illegal or prohibited items or threats entering into an aircraft, country or airport are greatly reduced. As such, airport security serves several purposes: to protect the airport and country from any threatening events, to reassure the traveling public that they are safe and to protect the country and their people.

According to Luo (2022), travelers are prohibited to pass the security checkpoint with liquids, including water that is over 100 milliliters (3.4 U.S. fl oz). This is due to the risk of liquid explosives such as nitroglycerin which is colourless and indistinguishable from water. It is undetectable with the security X-ray and would pose great threat if brought on board. Monte R. Belger (2013) of the U.S. Federal Aviation Administration notes that the goal of aviation security is to prevent harm to aircraft, passengers, and crew, as well as support national security and counter-terrorism policy.

While some countries may have an agency that protects all of their airports such as Australia, in which the Australian Federal Police polices the airport (AFP.gov.au: 2008), in other countries the protection is controlled at the state or local level. The primary personnel will vary and can include a police force hired and dedicated to the airport for example the Irish Airport Police Service, a branch (substation) of the local police department stationed at the airport, members of the local police department assigned to the airport as their normal patrol area, members of a country's airport protection service for example the TSA, police dog services for explosive detection, drug detection and other purposes; while other resources may include security guards, paramilitary forces and military forces (Heitz Geremy; Chechik Gal, 2010).

In passenger security screening, travelers are screened by metal detectors and/or millimeter wave scanners. Explosive detection machines used include X-ray machines and explosives trace-detection portal machines (a.k.a. puffer machines). In some cases, detection of explosives can be automated using machine learning techniques (Heitz Geremy; Chechik Gal, 2010; Mery Domingo, 2015, and Akcay Samet; Breckon Toby, 2017). In the United States, the TSA is working on new scanning machines that are still effective searching for objects that are not allowed in the airplanes but that do not depict the passengers in a state of undress that some find embarrassing. Explosive detection machines can also be used for both carry-on and checked baggage. These detect volatile compounds given off from explosives using gas chromatography (Staples Edward, 2001).

Computed tomography and walk-through body scanning (Thz radiation) may also be done. Artificial intelligence systems are also being used, for example for translation service on information stations around the airport and for reducing the time airplanes spend at the gate between flights by monitoring and analyzing everything that happens after the aircraft lands

(Weed Julie, 2020). In the future, it may also be used in conjunction with CT machines and Thz radiation detectors. It may also be used for use with biometric deployment across touch points and of new solutions, such as risk-based screening and intelligent video analytics.

A recent development is the controversial use of backscatter X-rays to detect hidden weapons and explosives on passengers. These devices, which use Compton scattering, require that the passenger stand close to a flat panel and produce a high resolution image (Rapiscan Secure 1000: Rapiscansystems.com. Retrieved, 2011). A technology released in Israel in early 2008 allows passengers to pass through metal detectors without removing their shoes, a process required as walk-through gate detectors are not reliable in detecting metal in shoes or on the lower body extremities. Alternately, the passengers step fully shoed onto a device which scans in under 1.2 seconds for objects as small as a razor blade (Israel's Magshoe provides a step ahead in security solutions, 2018). In some countries, specially trained individuals may engage passengers in a conversation to detect threats rather than solely relying on equipment to find threats.

A single backscatter scan exposes the target to between 0.05 and 0.1 microsievert of radiation. In comparison, the exposure from a standard chest x-ray is almost 100 times higher (Pam Harrison, 2013). While airport security measures are crucial for ensuring passenger safety, they inadvertently introduce hygiene challenges. A study at Helsinki-Vantaa airport during the 2015-2016 flu seasons pinpointed the plastic security screening trays, frequently used in security checks, as a significant vector for the spread of respiratory viruses. The study emphasizes the need for enhanced sanitation practices in these areas (Insider.com, 2023; Ikonen et al., 2018).

Generally people are screened through airport security into areas where the exit gates to the aircraft are located. These areas are often called secure, sterile and airside (in contrast to landside outside security). Passengers are discharged from airliners into the sterile area so that they usually will not have to be re-screened if disembarking from a domestic flight; however they are still subject to search at any time. Airport food outlets have started using plastic cups and utensils as opposed to cups made out of glass and utensils made out of metal to reduce the usefulness of such items as weapons. Many airports issue an airside pass to their employees, a secure keycard that allows employees to enter the secure area (Checkback International, 2018). Employees requiring an airside pass are subject to numerous security checks, including a criminal records

check and proof of identity (Airside Pass Screening: UK Employee Checks, 2018). They are of course not allowed to use it when they shall fly themselves. Also aircraft crew shall be screened.

In the United States non-passengers were once allowed on the concourses to meet arriving friends or relatives at their gates, but this is now greatly restricted due to the September 11 terrorist attacks. Non-passengers must obtain a gate pass to enter the secure area of the airport. The most common reasons that a non-passenger may obtain a gate pass is to assist children and the elderly as well as for attending business meetings that take place in the secure area of the airport. In the United States, at least 24 hours notice is generally required for those planning to attend a business meeting inside the secure area of the airport. Other countries, such as Australia do not restrict non-travelers from accessing the airside area, however non-travelers are typically subject to the same security scans as travelers (Australian Government Department of Infrastructure and Transport, 2011).

Sensitive areas in airports, including airport ramps and operational spaces, are restricted from the general public. Security Identification Display Area spaces require special qualifications to enter. Systems can consist of physical access control, gates or more passive systems that monitor people moving through restricted areas and sound an alert if a restricted area is entered (Systems Human Recognition: MFlow-Queue Measurement & Passenger Validation for Airports, 2014).

According to Schneier (2004), throughout the world, there have been a few dozen airports that have instituted a version of a trusted traveler program. Proponents argue that security screening can be made more efficient by detecting those people who are threats and then searching them. They argue that searching trusted, verified individuals should not take the amount of time it does. Critics argue that such programs decrease security by providing an easier path to carry contraband through (Systems Human Recognition: MFlow-Queue Measurement & Passenger Validation for Airports, 2014).

Another critical security measure used by several regional and international airports is that of fiber optic perimeter intrusion detection systems. These security systems allow airport security to locate and detect any intrusion on the airport perimeter, ensuring real-time, immediate intrusion notification that allows security personnel to assess the threat and track movement and engage

necessary security procedures (Adesta Selected to Provide Security Systems for Washington Dulles International Airport, Newswire, 2009; Pro Security Zone, 2009).

Aviation Safety is a condition where the requirements for safety and utilization of airspace, aircraft, airports, air transportation, flight navigation and other supporting facilities and public facilities are met. Security and safety in a civil aviation is very important and also depends on the security of the airport that departed the aircraft. Given the many threats from acts of unlawful interference both on the ground and in the air and also other supporting installations at an airport (merdeka.com: 2020). The rise of terrorism has created new requirements in the travel, meetings and special events industries for enhanced security. The responsibility for security both in the office, at hotels and at event sits is largely the owner of these facilities. Only the appointed DMC has a multiple view of all aspects of a project or customer visit from the airport to hotel to event venues and return to the airport once more (Checkback International, 2018). While the DMC is not responsible for all aspects of the transaction, it is the responsibility to oversee and advise customers in all aspects of security, both positive and negative. Company personnel must manage these responsibilities in close consultation with the various parties.

1.1.2 Historical perspective

In S&T Snapshots-Human Factors: Deception Detection, Department of Homeland Security (2011) aviation security protocols have evolved significantly due to major security incidents, particularly hijackings and terrorist attacks. Initially, basic measures like passenger screening were introduced, but the events of September 11, 2001, led to a comprehensive overhaul, including enhanced screening, air marshals, and the creation of the Transportation Security Administration (TSA). In the pre-1970s, airport security was minimal, with little to no screening or ID checks; in the 1970s the world witnessed hijackings which prompted the introduction of metal detectors and x-ray machines for passenger and baggage screening; in the 1980s there were mainly terrorist bombings of aircraft, like the Pan Am Flight 103 bombing, led to the development of international standards and electronic security measures; in 1988 the ICAO formulated Annex 17, establishing international aviation security standards, and the US FAA issued Part 107; September 11, 2001 event resulted in a complete overhaul of aviation security worldwide, while in the post-9/11, the TSA has been established in the US, federal screeners replaced private security companies, and enhanced screening procedures, including stricter passenger and baggage checks, were implemented. Technology like biometric identification

systems (fingerprint and facial recognition) is becoming increasingly common and security protocols are constantly being refined. (Basu Mohana, 2021).

Aviation security protocols have evolved significantly from basic measures like sky lanterns to the complex, layered systems in place today. Key milestones include the establishment of the International Civil Aviation Organization (ICAO) in 1947, which set a global framework for aviation safety and security, and the introduction of metal detectors, X-ray machines, and explosive detection tools in response to hijackings. The 9/11 attacks prompted major changes, leading to enhanced intelligence sharing and a stronger focus on preventing attacks. The use of sky lanterns for recreational and military purposes demonstrates early understanding of basic principles of flight and their potential applications. The development of aircraft and the need for safety regulations led to the Air Commerce Act of 1926 in the US, requiring pilot and aircraft licensing, accident investigations, and safety rules. The Chicago Convention in 1944 established ICAO, promoting harmonization and standardization of airspace use for safety and efficiency. This led to Annex 17, focusing on aviation security standards.

The history of aviation security regulations is closely tied to major security incidents. For example, the hijacking of four commercial aircraft on September 11, 2001, led to a significant overhaul of aviation security regulations worldwide. In response to this incident, governments and regulatory agencies implemented new security measures, such as enhanced passenger screening and increased air marshal presence on flights. In 2010, the TSA introduced enhanced pat-down procedures in response to a foiled plot to detonate a bomb on a flight. However, these procedures were criticized for being overly invasive and violating passengers' right to dignity (Transportation Security Administration: TSA, 2022). In 2017, the use of biometric screening at airports raised concerns about privacy and data protection.

Uganda's aviation security protocols have evolved from basic measures in the early days of air travel to a more comprehensive system aligned with international standards. Key developments include the establishment of the Directorate of Civil Aviation in 1949, the construction of Entebbe International Airport, and the formation of the Civil Aviation Authority (CAA) in 1991. The CAA is now responsible for ensuring aviation safety and security, including implementing the National Aviation Safety Plan and the Civil Aviation (Security) Regulations (Civil Aviation Security Regulations, 2022).

Air transport in Uganda began with flying boats delivering mail to Port Bell, an extension of Wilson Airways in Kenya. The Directorate of Civil Aviation (DCA) was formed in 1949 to oversee civil aviation activities. Entebbe International Airport was established in 1947 and commissioned in 1952. Following Uganda's independence, civil aviation services were initially managed by the DCA and various government departments. The need for a more centralized and efficient system led to the establishment of the Uganda Civil Aviation Authority (UCAA) in 1991 (Wesaka Anthonny, 2020).

Uganda became a member of the International Civil Aviation Organization (ICAO) in 1967. This membership requires Uganda to align its aviation security measures with ICAO's Standards and Recommended Practices (SARPs). The National Civil Aviation Security Programme (NCASP) outlines Uganda's commitment to enhancing aviation security and reducing fatalities. The Civil Aviation (Security) Regulations, 2022 provide a framework for safeguarding against acts of unlawful interference with civil aviation. The Directorate of Safety, Security and Economic Regulation (DSSER) within the UCAA is responsible for aviation security, including licensing, enforcement of regulations, monitoring airline performance, and advising the government on air transport policies (Civil Aviation Security, Amendment Regulations, 2024).

The UCAA is currently undertaking initiatives to amend the Civil Aviation (Security) Regulations to incorporate changes in ICAO SARPs. Uganda's aviation security protocols continue to evolve to meet the ever-changing threats and challenges in the aviation industry. The focus remains on international cooperation, compliance with regulations, and the implementation of robust security measures to ensure the safety and security of air travel (Tajuba Paul, 2015).

According to Lee (2025), several airports and airlines have successfully implemented balanced security protocols. For example Singapore's Changi Airport has implemented a risk-based approach to security, using advanced technologies such as biometric screening and predictive analytics to identify potential security threats. The airline industry has implemented a range of initiatives to improve security while respecting human rights, such as the International Air Transport Association (IATA) Security Toolkit, which provides guidance on security best practices.

Before the 1960s, the aviation industry was confronted with technical challenges to safety in the skies (Holmes Marcus, 2011). The situation changed dramatically between 1968 and 1972 when a total of 326 cases of hijacking occurred, which at that time were mostly politically motivated. The Tokyo Convention (1963), tshe Hague Convention (1970), and the Montreal Convention (1970) resulted in standards and recommended practices for international civil aviation to prevent acts of unlawful interference against civil aviation. They were first adopted by the International Civil Aviation Organization (ICAO) Council in March 1974 and designated as Annex 17 to the Chicago Convention. Moreover, the ICAO Aviation Security Manual (Doc 8973) was developed to assist member states in implementing Annex 17 by providing guidance on how to apply its standards and recommended practices. Since then, Annex 17 and Doc 8973 are constantly being reviewed and amended considering new threats and technological developments. The United States Federal Aviation Administration (FAA) introduced an anti-hijacking program in 1973 based on comprehensive screening of 100% of passengers and their luggage at airports. It was the beginning of electronic security screening and the implementation of the magnetometer (today, the walk-through metal detector; WTMD) as standard practice for passenger screening. In combination with this search, a given percentage of passengers were controlled more extensively by applying a full body pat down, which can be regarded as an early deployment of unpredictability (Civil Aviation Security, Amendment Regulations, 2024).

As a result of the Electronic Security Screening, the number of cases of hijack markedly reduced. During the 1980s, a shift from bargaining toward deliberate crashing was observed, which escalated in December 1988 with the tragedy of Lockerbie, in which an improvised explosive device (IED) was detonated in the hold of the aircraft of Pan Am Flight 103. The tragedy, which caused the death of all 259 passengers and crew on board and 11 people on the ground gained substantial media presence. As a result, standards were established for hold baggage screening (HBS), including the worldwide deployment of explosive detection systems for hold baggage. In the September 11, 2001 terrorists used knives, which in those times could be brought on an aircraft, to take over the cockpit (cockpit doors were not protected) and to hijack multiple aircrafts, which were then used as weapons of mass destruction. The post-9/11 era involved the immediate adaption of both law and security systems; for example, knives were declared as

prohibited articles, and protected cockpit doors were introduced. In addition, large investments were made in screening technology and training of personnel. These adaptions in security protocols and regulations were a direct consequence of the terrorist attack and resulted in stricter aviation security for all passengers (not risk-based; reactive regulation). In 2006, the liquid bomb plot of eight terrorists who planned to bomb seven airplanes with destinations to the U.S.A. and Canada was uncovered by British authorities before the terrorists could use the improvised liquid explosive devices. This resulted in restrictions on liquids in hand luggage, and the development and deployment of new detection technology (Civil Aviation Security, Amendment Regulations, 2024).

On one hand, the implementation and standardization of security measures and new processes led to a higher level of security; on the other hand, it resulted in an increased predictability of the security system. Aviation security systems were tailored to react to past incidents and threats by the implementation and refinement of measures that were standardized in order to reach security goals effectively. Two consequences of a reactive security approach were the reduction in the number of attacks from a current type of threat and the creation of new threats that are probably unknown by the system. In other words, as long as new standards and processes are created upon known incidents, the aviation security systems will remain one foot behind. Therefore, a more proactive paradigm that is based on unpredictability has become important.

The Old Entebbe airport which is used by Uganda's military forces was the scene of a hostage rescue operation by Israeli Sayeret Matkal, dubbed Operation Entebbe, in 1976 after an Arab-German hijacking of Air France Flight 139 following a stopover in Athens, Greece, en route to Paris from Tel Aviv. The scene of that rescue was the old terminal, which has been demolished, except for its control tower and airport hall. According to a 2006 published report, plans were made to construct a domestic passenger terminal at the site of the old airport (Mayor of Entebbe: Old Terminal will not be demolished, Israel Today, 2006). Since 2002, international passenger traffic at the airport has increased annually, except for 2009 when the Great Recession caused a small decline and 2014 (Khisa Isaac, 2013).

1.2.3 Theoretical perspective

The study is guided by the Paris School of Security Theory.

According to Langwald (2021), the school believed in a multidisciplinary approach to the study of security by using conceptual and operational tools from the realms of international relations, sociology, and criminology. Didier Bigo is one of the prominent promoters of the school. The main contribution of the Paris school is adding to the speech acts analysis of securitization on the importance of security practices based on the sociological approaches of Bourdieu and Foucault. Another branch of the Paris school of thought is the Ontological Security thought led by Jennifer Mitzen (2006), who opined that states do not only seek physical security but also ontological security, or security of the self. Further, she said, the study of security should focus on the relationship between anxiety and identity. It is argued that both the Paris School and Ontological Security approach can be understood as part of a broad range of constructivist perspectives in international relations theory.

Furthermore, Bigo and Mitzen do not only share the analytical focus on insecurity but also the affiliation with the theory of practices. For instance, the Paris School argues that agency is influenced by an individual's "habitus'', which is similar to the identity and basic trust element of the ontological security approach. That is, habitus refers to a semi-conscious orientation that individuals have towards the world, which forms the basis for practice. In addition, Bourdieu said, the habitus is "a system of durable, transposable dispositions, which integrates past experiences and functions at every moment as a matrix of perception, appreciation, and action.

Examining the concepts of identity and habitus about the state's role, the Paris, and Ontological Security Schools, said identity and habitus are crucial for securitization processes. Hence both schools of thought agree that states are ontological security-seekers, either about other states or their citizens. Though, the Paris School in their slight opinion, said the state today, does not have the same authority as before, arising from the de-differentiation of internal and external realms of security, which created close cooperation between internal and external security agencies, resulting in the emergence of a transnational network of security professionals. Hence Bigo argued that it is no longer tenable to maintain the classical notion of the state in security issues because of the transnationalization of police and military bureaucracies.

In addition, the Paris/Ontological theorists examined 'Anxiety and Unease' in world politics. Lining on the sociological concept of "risk society'' by Ulrich Beck, Bigo adopted it and linked it to the politics of unease and said that the attempt to obtain maximum security always provokes

maximum insecurity because certain groups can justify and impose a political program by assessing what can be designated as an object of fear or risk. Mitzen also refers to it as "existential anxiety", which in her words, can be controlled through the process of 'management of unease'. The schools also shared their perspectives on security methodology, the Paris School argued for security and insecurity to be analyzed as a process of (in) securitization based on security practices. These practices are forms of social interactions that are "derived'' from objective relations, rules of the game, which are neither directly visible nor conscious.

According to Senyonyi (2022), from the foregoing, the Paris /Ontological Schools of Security Studies made considerable efforts to link the concept of identity and the concept of habitus that are today's security realm, understood to be having the power to frame the process of securitization. Again, focusing on the notion of 'insecurity', there is acknowledgement of the importance of stability for the identity of a state in a world of anxiety and unease. Nonetheless, the Paris School focused on the notion of a transnational field of security professionals and the use of technologies while the ontological security approach focused on the emotional and psychological implications of threats to identity.

The Paris/Ontological theories with the introduction of a multidisciplinary concept to the study of security had opened research study opportunities in analyzing security issues using a multidisciplinary approach. As the study constructs show, Aviation security must encompass measures aimed at ensuring that certain acts of unlawful interference with aviation security is intended to prevent such as prevention of unlawful seizure of aircraft, prevention of sabotage, prevention of hostage taking, terrorism, and prevention of attacks on airport facilities. Hence the study examined the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security.

1.1.4 Contextual perspective

In a global context of aviation security, the threat of terrorism has significantly influenced stringent security measures where by the International Civil Aviation Organization (ICAO) has set standards and protocols which all contracting states must follow (Rimmer David, 2011). The ICAO defines the implementation of security measures in order to increase their deterrent effect and their efficiency, by applying them at irregular frequencies, different locations and/or with varying means, in accordance with a defined framework.

According to Mery (2015), unforeseeable security controls, that is, random searches, have been part of security systems for a longtime for example full body pat down on a random basis since introduction of magnetometer/walk through metal detector, but have recently received greater attention in form of explicitly formulated unpredictability concepts. A traditional security system follows a multi-layered approach for an example in which every layer represents a security measure working as a barrier to prevent acts of unlawful interference. However, every layer also involves loopholes representing vulnerabilities of the system. Such security gaps could result, for example, from predictability of the system or are simply not covered by security controls. Unpredictability could address these loopholes by varying the security controls.

That notwithstanding, the geopolitical landscape in the Great lakes region possesses a threat potential characterized with running conflicts in Eastern Democratic Republic of Congo, Sudan, Somalia, South Sudan, and also Uganda's own national security concerns make Entebbe International Airport a potential target thereby requiring heightened vigilance (Byemboijana Muhamadi, 2024).

In March 2022, online and print media reported that the Chinese-built cargo center, capable of handling 100,000 metric tons of cargo, had begun commercial operations. This had replaced the old cargo facility with capacity of 50,000 metric tons, originally converted from an old aircraft hangar (Huaxia, 2022). Since then, the airport has increased its passenger-handling capacity from 2 million to 3.5 million annually. In July 2024, the Nile Post reported that Tristar Energy Limited, had completed the construction of underground storage tanks with storage capacity of 12,000,000 litres (12,000 m3) of aviation fuel and pipelines, which were ready for commercial commissioning.

Uganda is a signatory to the Chicago convention on International Civil Aviation and it is one of the five East Africa Community partner state (Baguma Raymond, 2014). It is therefore under obligation to develop and implement International Standards and Recommended Practices. It is required to ensure that there is an institution entrusted with the responsibility to ensure effective control and continued compliance with the established Civil Aviation Standards within the scope of the country's civil aviation activities scope. To ensure that the safety system is appropriate and compliant with the established international standards, ICAO (Muganga Eve, 2023) subjects each state to a repetitive five yearly compulsory audit. The compulsory audit assessing the level

of compliance and implementation of International standards and recommended practices is the Universal Security Audit Program Continuous Monitoring Approach (USAP-CMA). A poor security performance audit result is an indication of an ineffective state's civil aviation management system.

Entebbe International Airport

Entebbe International Airport is the only international airport in Uganda. It is located about 6 kilometers (3.7 mi) southwest of the town of Entebbe, on the northern shores of Lake Victoria (Road Distance Between Entebbe Town And Entebbe International Airport: Google Maps, 2020). This is approximately 40 kilometers (25 mi) by road south-west of the central business district of Kampala, the capital city of Uganda. The headquarters of the Civil Aviation Authority of Uganda have been relocated to a new block off the airport highway (Entebbe-Kampala Expressway and Tunnel Road), but adjacent to the airport terminals (Location of the Civil Aviation Authority Head Office, Entebbe, Uganda: Google Maps, 2020).

Entebbe International Airport was opened by the British Colonial authorities. According to the website of the Uganda Civil Aviation Authority, due to the airport's location on Lake Victoria and the existing facilities, the colonial government decided that the most optimal location for aviation traffic was Entebbe (Uganda Civil Aviation Authority, 2023). On 10 November 1951, the airport was formally reopened after its facilities had been extended. Runway 12/30 was now 9,900 feet (3,000 m), in preparation for services by the de Havilland Comet (Movietone, 1951, Retrieved, 2018). The new main terminal building of the airport was designed by Yugoslav Montenegrin architect Aleksandar Keković and built by Energoprojekt holding in 1972-1973 period (Niebyl Donald, 2020).

Passenger facilities include a left-luggage office, banks, automated teller machines, foreign exchange bureaux, restaurants, and duty-free shops (Adude Paul, 2023: Whichairline.com: Archived and Retrieved, 2014). During the period between 1 January 2024 and 30 June 2024, Entebbe International Airport handled a total of 1,069,224 international passengers (527,692 arrivals and 541,532 departures). During the same period the airport handled 32,794 metric tons of cargo of which 22,380 metric tons were exports and 10,414 metric tons were imports (Kazibwe Kenneth, 2024).

Aviation security protects airport patrons, passengers, cargo, physical and telecommunication infrastructures as well as all technology and employees from unintentional, malicious threats such as bombings, hijacking, shootings or direct aircraft attacks (Schneier Bruce, 2004). Aviation security must encompass measures aimed at ensuring that certain acts of unlawful interference with aviation security is intended to prevent such as prevention of unlawful seizure of aircraft, prevention of sabotage, prevention of hostage taking and prevention of attacks on airport facilities. Hauser (2020) noted that aviation security programs include the Air Marshal Program, the Federal Flight Desk Officer program, Secure Flight, Baggage screening, technology and passenger screening, increased intelligence and Airport Safety Issues. This study examined the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security.

1.3 Problem statement

According to Sloan and Bersia (2006), an airport security access control system employs an array of authentication techniques to confirm a person's identity and their baggage before allowing them into the airport including emigration channels and related sections. These methods include biometric identification, badges, key fobs, access cards, and smart phones, among others, X-ray and so on. Access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking to leave and entry into the country. These readers communicate with the access control system to verify identification. Based on the credentials presented, the system then authorizes or denies access to the restricted area, ensuring that only authorized personnel and baggage can exit (Gürhan Deniz, 2021). However, a number of loopholes like connivance between travelers and AVSEC staff have been reported, which allows for easy exit for some unscrupulous characters who use leverage in this case. Even with the emigration rule and regulations (2022) in place, Uganda Civil Aviation Authority still faces a number of challenges such as terrorism, trafficking in narcotics and persons, smuggling, gun, explosives, mental unstable persons, and impersonator which challenges the security screening of originating passengers, crew, hold and cabin baggage. These weaknesses a lot put compliance with international and national standards in disrepute as well causing imbalance between airport safety and security. For example, on 30th April 2013, Shirat Nandawula was arrested for illegal trafficking of 1.2 Kgs of heroin at Robert International

Airport in Monrovia, Liberia and was convicted to four years in a Liberian prison, Iryn Namubiru who had originated at Entebbe International Airport was arrested at Narita International Airport in Japan for illegal possession of drugs. Further, on 1st July 2014, Daily Monitor (Opolot) reported that two Ugandans had been executed in China for trafficking illegal drugs (Damulira Omar and Ngobi Ham Andrew), on 11th January 2021, Moses Kasujja announced that 38 Ugandans imprisoned in the United Arab Emirates were released from AL Awiir central jail after a protracted negotiations, eleven of them were women and three are serving life sentences for drug trafficking to UAE, but they all originated from Entebbe Airport. In addition, Trumpet news of 20th July 2021, reported that in March 2021, a Uganda Airlines plane of flight UR521 was impounded at Mogadishu International Airport for carrying a shipment of alcohol to Somalia against Somalia law. With the few incidents as highlighted above, pertinent questions arise as to whether the effect of Entebbe International Airport security programme which is the main policy for aviation security and meets international standards.

Security screening of originating passengers, crew, hold and cabin baggage is legally guided by standards and recommended practices but despite this the public has been slow and sluggish in appreciating airport security, although with some steadfast developments. On numerous occasions security at Entebbe International Airport has intercepted guns, restricted articles when poorly packed, narcotics, mentally unstable persons, victims of traffickers and arrested the perpetrators. However, despite these efforts, inefficiencies, vulnerabilities, delays, compliance issues, technical gaps, human factors, or specific threat detection failures within the current security screening processes for originating passengers, crew, hold and cabin baggage at Entebbe International Airport may compromise overall aviation security and hinder the airport's operational effectiveness. The most inconvincible fact, which is the basis of this study is that airport security has on a consistent approach, been criticized by the unschooled members of public for a professional service they do. Fortunate to note is the factual truth that a midst these constructive and arbitrary challenges from the public, selfish political and security sycophants, airport security has struggled tooth and nail to retain its professionalism, impartiality and dignity. This academic research is intended to analyze security screening of originating passengers, crew, and hold and cabin baggage at Entebbe international airport and there after provide appropriate recommendations to stakeholders, especially the Uganda Civil Aviation Authority and its agencies. Therefore the above mentioned challenges is the basis for conducting this research to

examine the compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport.

1.3 Objectives of the study

1.3.1 General objective

To examine the compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport

1.3.2 Specific objectives

The following specific objectives shall guide the study;

1) To assess the relationship between screening of originating passengers and aviation security at Entebbe International Airport
2) To examine the relationship between access control and aviation security at Entebbe International Airport
3) To analyze the measure of the influence of compliance on aviation security at Entebbe International Airport

1.4 Research Questions

The following specific objectives shall guide the study;

1) What is the relationship between screening of originating passengers and aviation security at Entebbe International Airport?
2) To examine the relationship between access control and aviation security at Entebbe International Airport?
3) To analyze the measure of influence of compliance on aviation security at Entebbe International Airport?

1.5 Hypothesis of the study

H0: There is no significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport

H1: There is significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport

1.6 Scope of the Study

1.6.1 Geographical Scope

Entebbe International Airport (IATA: EBB, ICAO: HUEN) is the only international airport in Uganda. It is located about 6 kilometers (3.7 mi) southwest of the town of Entebbe, on the northern shores of Lake Victoria. This is approximately 40 kilometers (25 mi) by road south-west of the central business district of Kampala, the capital city of Uganda (Niebyl Donald, 2020). The headquarters of the Civil Aviation Authority of Uganda have been relocated to a new block off the airport highway (Entebbe–Kampala Expressway and Tunnel Road), but adjacent to the airport terminals, with Coordinates being 00°02′41″N 032°26′35″E.

1.6.2 Content Scope

The study examined the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security through gathering data on the relationship between screening of originating passengers and aviation security, the relationship between access control and aviation security and the measure of influence of compliance on aviation security at Entebbe International Airport. The subject scope further covered the effectiveness of Security Screening Procedures in detecting prohibited items, assessing potential security threats to airport such as Terrorism, illegal trafficking and other security breaches, the performance of screening technologies such as X-Ray machines, Baggage handling system , implementation of security regulatory oversight of security screening processes, personnel training, and providing recommendations for improvement. In addition, the study heavily interrogates the challenges faced by aviation security at Entebbe international airport while paying very close attention to and prioritizing practical and realistic changes as the solution towards the development of a robust aviation security system in Uganda. In essence, the study provides a comprehensive assessment of the security screening aiming to identify areas for improvement and enhance overall airport security.

1.6.3 Time Scope

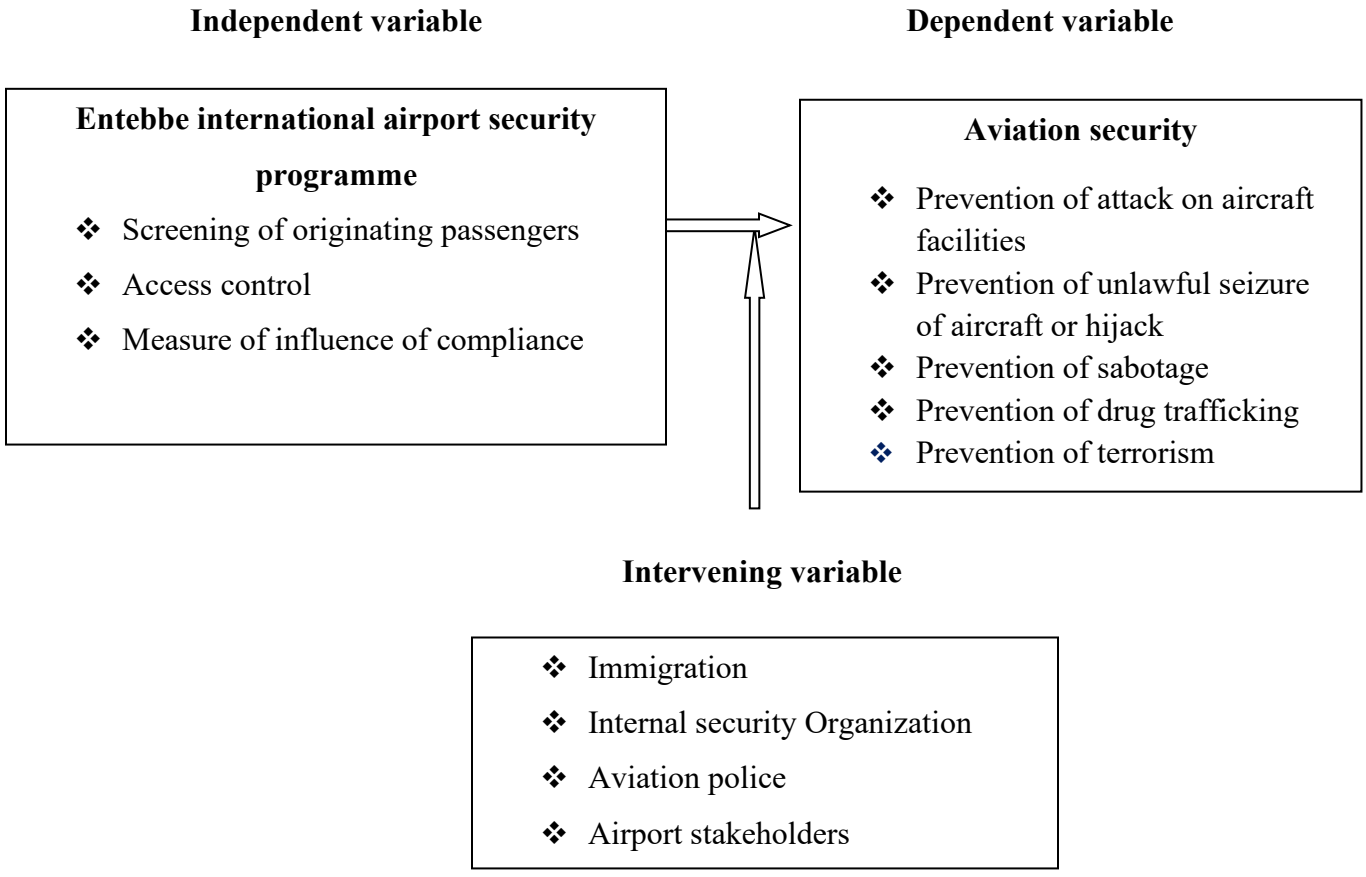
The researcher devolved into the temporal aspects of Entebbe International Airport Security Programme and aviation security, assessing the screening of originating passengers, crew, hold and cabin baggage at Entebbe International Airport for a temporal scope of five years from December 2020 to June 2025.

1.7 Significance of the Study

The significance of the study is multifaceted, and aims at preventing unlawful interference such terrorism, hijack, sabotage, smuggling, and other criminal activities against civil aviation.

Ensures operational efficiency through assessing the effectiveness of screening technologies and procedures in quickening workflows and reduce delays, complying with national and international aviation security standards, identification of emerging security threats and develop proactive counter or adaptive mitigation measures to stay ahead of potential threats/risks, and also to appreciate that aviation security.

1.8 Conceptual framework



Source: Researcher, 2025

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter reviews the literature related to Airport Security Programme and aviation security. The chapter comprises the literature survey which identifies the gaps, theoretical review, literature review which identifies what other scholars have used to study a similar problem in a related environment elsewhere and the conceptual framework which provides the framework of analysis for the study.

2.1 Literature survey

This section focused on the previous studies on Airport Security Programme and aviation security with the aim of indentifying the gaps which were filled by this study;

A study by Byamugisha (2018) focused on establishing the effect of incentives on employee performance in CAA with the objective of identifying the types of incentives offered to CAA employees, examining the relationship between incentives and employee performance in CAA, and examining other factors that have an effect on employee performance in CAA. Both secondary and primary data were used. The analysis was carried out using tables and frequencies. The researcher was guided by the following data collection methods; a self-administered questionnaire, interview guide, review of secondary data and focus group discussion. The results on the types of incentives available to employees of CAA indicated that there are mainly seven types of incentives offered to CAA employees. These incentives include: salary, housing, overtime, transport, mileage, paid annual leave and study leave. Furthermore, results on the relationship between employee performance and incentives indicated that there is consensus amongst technical staff, technicians and support staff on all issues concerning incentives and performance. Results revealed that there are other factors that have an effect on employee performance other than incentives and these include job satisfaction, loss of control over work, no clear goals from management, assigned creativity goals, supervisory support and job characteristics. The conclusion of the study was that in CAA, the types of incentives offered to employees are seven. There is a positive relationship between incentives and employee performance. Job satisfaction, loss of control over work, no clear goals from management, assigned creativity goals, supervisory support and job characteristics were other factors affecting employee performance other than incentives. The study recommended that employees should be

accorded all incentives that are provided for in the Collective Bargaining Agreement Between The Civil Aviation Authority And Amalgamated Transport And General Workers' Union, there is need for continuous and regular provision of incentives to improve performance and productivity for all categories of staff, and that other factors such as job satisfaction, loss of control over work, no clear goals from management, assigned creativity goals, supervisory support and job characteristics need to be taken into consideration for enhanced employee performance in UCAA.

A 2010 study by Luwemba et al., on Civil Aviation Management and Flight Safety in Uganda, examined how civil aviation management influences flight safety in Uganda. Civil aviation management was conceptualized and limited to planning, organizing and controlling functions of the Scientific Management Theory. The contextual scope was limited to Flight Safety, excluding Communication Navigation Surveillance (CNS); Air Traffic Management (ATM); and Airport Safety which are also major dimensions of civil aviation management. It was a cross- sectional survey in design; and it adopted triangulation of qualitative and quantitative research methodologies, techniques and strategies. The study used primary and secondary data collection methods; and it had a response rate of 86%. Descriptive, correlation and multiple regression statistical analysis methods were employed to analyze the data. A multiple regression analysis model summary result of .996 R Square indicated that flight safety is explained by civil aviation management to a magnitude of 99.6%; the coefficient results indicated that civil aviation management accounts for 98.6% of variance in flight safety. Civil aviation planning function account for 32.7% variance; organizing functions account for 45.7%; while controlling functions account for 20.2%. It was observed from the study findings and analysis results, that flight safety is almost 100% dependent on the effectiveness of the civil aviation management system in place. It was therefore recommended that; Uganda's civil management system and regulations should be kept compliant and updated with international standards all the time. The State Safety Program (SSP) requirements should be issued and the Safety Management System (SMS) mandatory implementation enforced, in order to promote pro-active and predictive safety management to minimize civil aircraft major incidents and accidents.

2.2 Theoretical Review

The study is guided by the Paris School of Security Theory

According to Langwald (2021), the school believed in a multidisciplinary approach to the study of security by using conceptual and operational tools from the realms of international relations, sociology, and criminology. Didier Bigo is one of the prominent promoters of the school. The main contribution of the Paris school is adding to the speech acts analysis of securitization on the importance of security practices based on the sociological approaches of Bourdieu and Foucault. Another branch of the Paris school of thought is the Ontological Security thought led by Jennifer Mitzen (2006), who opined that states do not only seek physical security but also ontological security, or security of the self. Further, she said, the study of security should focus on the relationship between anxiety and identity. It is argued that both the Paris School and Ontological Security approach can be understood as part of a broad range of constructivist perspectives in international relations theory.

Furthermore, Bigo and Mitzen do not only share the analytical focus on insecurity but also the affiliation with the theory of practices. For instance, the Paris School argues that agency is influenced by an individual's "habitus'', which is similar to the identity and basic trust element of the ontological security approach. That is, habitus refers to a semi-conscious orientation that individuals have towards the world, which forms the basis for practice. In addition, Bourdieu said, the habitus is "a system of durable, transposable dispositions, which integrates past experiences and functions at every moment as a matrix of perception, appreciation, and action.

Examining the concepts of identity and habitus about the state's role, the Paris, and Ontological Security Schools, said identity and habitus are crucial for securitization processes. Hence both schools of thought agree that states are ontological security-seekers, either about other states or their citizens. Though, the Paris School in their slight opinion, said the state today, does not have the same authority as before, arising from the de-differentiation of internal and external realms of security, which created close cooperation between internal and external security agencies, resulting in the emergence of a transnational network of security professionals. Hence Bigo argued that it is no longer tenable to maintain the classical notion of the state in security issues because of the transnationalization of police and military bureaucracies.

In addition, the Paris/Ontological theorists examined 'Anxiety and Unease' in world politics. Lining on the sociological concept of "risk society'' by Ulrich Beck, Bigo adopted it and linked it to the politics of unease and said that the attempt to obtain maximum security always provokes

maximum insecurity because certain groups can justify and impose a political program by assessing what can be designated as an object of fear or risk. Mitzen also refers to it as "existential anxiety", which in her words, can be controlled through the process of 'management of unease'. The schools also shared their perspectives on security methodology, the Paris School argued for security and insecurity to be analyzed as a process of (in) securitization based on security practices. These practices are forms of social interactions that are "derived'' from objective relations, rules of the game, which are neither directly visible nor conscious.

According to Senyonyi (2022), from the foregoing, the Paris /Ontological Schools of Security Studies made considerable efforts to link the concept of identity and the concept of habitus that are today's security realm, understood to be having the power to frame the process of securitization. Again, focusing on the notion of 'insecurity', there is acknowledgement of the importance of stability for the identity of a state in a world of anxiety and unease. Nonetheless, the Paris School focused on the notion of a transnational field of security professionals and the use of technologies while the ontological security approach focused on the emotional and psychological implications of threats to identity.

The Paris/Ontological theories with the introduction of a multidisciplinary concept to the study of security had opened research study opportunities in analyzing security issues using a multidisciplinary approach. As the study constructs show, Aviation security must encompass measures aimed at ensuring that certain acts of unlawful interference with aviation security is intended to prevent such as prevention of unlawful seizure of aircraft, prevention of sabotage, prevention of hostage taking and prevention of attacks on airport facilities. Hence the study examined the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security.

Abraham Maslow's Hierarchy of Needs theory

In Abraham Maslow's Hierarchy of Needs, security needs form the second level, following the fundamental physiological needs. These needs encompass the desire for a safe, stable, and predictable environment, including protection from harm, threats, and instability. Maslow believed that once basic survival needs are met, individuals focus on achieving safety and security before pursuing higher-level needs like social belonging and self-esteem. The key aspects of safety and security in Maslow's theory are physical safety which includes protection

from physical harm, danger, and threats to one's well-being; order and predictability including a sense of order, structure, and control in one's environment contributes to feelings of safety and security; emotional safety including feeling safe from emotional harm, abuse or instability is also a critical part of this level.

The security needs manifest through having a safe place to live, feeling secure in one's home, and having protection from intruders or harm and workplace safety through feeling safe and secure in one's job, having fair treatment, and not experiencing harassment or danger.

According to Deniz Gürhan (2021), Abraham Maslow came to the fore with his “Hierarchy of Requirements Theory” in 1943. While he was creating this theory, he made important determinations about human nature. According to Maslow's Hierarchy of Needs Theory, the concept of security is defined as a person's need to feel safe and secure. The person must be safe in an environment where there is no security threat. Terrorism has reached a global level in the world and crime rates have increased due to income inequality. Compared to the period in which Maslow made these determinations, it is clear that the importance of the determinations made now will be intensified. McKay (2010) noted that Maslow's second tier on his Hierarchy of Needs is safety and security. Being able to feel safe and secure is a primal need that we all face and that must be met before we can face other higher levels of need. You only need to walk down a dark alley at night or get into a car crash to know that when you feel unsafe nothing else matters. In that moment of lack of safety you are unable to think about anything else. That work meeting or that great new business idea is completely forgotten about as you try to bring yourself to safety. There are three types of safety that Maslow highlights physical safety, emotional safety, and financial safety.

Safety is one of our basic, evolutionary needs. Most of our decisions and actions are based on sustaining or improving our circumstances. While we may not be in constant danger like early man, we are no less driven by the need for safety for us and our loved ones. This drive is carried over into user and consumer behavior. For this reason, products must not only be sold to us with strong indications that they will protect us from potential threats, but they must back these claims up with clear evidence that they do, in fact, offer some protection and/or shelter.

Safety is an evolutionary need, which is often manifested in what we refer to as the “fight or flight” response. Environmental information is used to determine whether we are safe in which

case, we will usually stay or unsafe which will typically encourage us to leave that is flight or attempt to change our current circumstance that is fight. When environmental information suggests there is some potential threat to us, our family, loved ones, our property, or something else we hold dear, we experience an emotional response, which sensitizes so we are ready for action. While the stakes might not be as high, we are no different from early man in this respect.

As the title suggests, physical safety refers to your body being safe where it is. If you are not physically safe, that means that your life is in peril which will detract from your quality of life, your ability to think, and increase your stress hormone levels. There are basics for physical safety that include shelter and other things but those are pretty much taken care off in today's society. However, there are still physical safety requirements that a self-actualized person needs to be able to accomplish to meet his/her safety needs for example security of the airport and its passengers.

According to Cummins (2017), security is and will continue to be a major risk concern. While implementation of security measures can be very technical, it is important that business leaders understand that security management is about risk management. We started this chapter with an overview of risks and means of mitigation. In subsequent sections, we discussed the critical applications of encryption, access control protocols, and management of access authorizations. We also demonstrated the need for computer-based facilities for effective management control of access authorization. A consistent, enterprise-wide security infrastructure is essential for management of the increased interactions and access points of shared services in an agile enterprise.

Mitigation of security risks has adverse effects (Cummins Fred, 2017). The implementation of a security infrastructure has a one-time cost. On-going maintenance, vigilance and threat, or intrusion response have on-going costs. Business and IT changes require careful review to prevent the introduction of new exposures. This caution and associated costs can be barriers to innovation and agility, and policies such as least privilege and compartmentalization can stand in the way of exploration of innovative ideas. Management must balance the risks against costs and the ability to respond to business challenges and opportunities. Risk cannot be eliminated, if all the technical mechanisms are implemented, trust remains a key factor. People develop the

applications, implement the security mechanisms, perform business activities, and make business decisions that can be sources of risk.

Copenhagen Security Theory

The Copenhagen Security Theory was developed by the Copenhagen School of Security Studies, a brainchild of the Copenhagen Conflict and Peace Research Institute, founded in 1985, to support and strengthen multidisciplinary research on peace and security. The main thrust or theoretical contribution of Copenhagen Security Theory is the notion or concept of 'securitization' and 'de-securitization'. The chief proponent of the concept is Ole Waver in the 1990s. Other contributors to the theory in security analysis include Buzan, Weaver, and De Wilde in their book, 'Security: A New Framework Analysis'. Initially, the Copenhagen School of Security Study focused their research on international security and the military, to solve military problems amongst states, and measured security in terms of military capabilities or the level of military power in readiness to ward off threats and protect the state from insecurity.

In the 1990s the Copenhagen School shifted its research focus and called for the expansion of security studies/research to include human, environmental, societal, economic, and political fields. Consequently, the five areas became the core of securitization theory thereby establishing a multidisciplinary approach to the study of security problems and arriving at security solutions. That is the school's main argument was the need for broadening and widening the security matter. Justifying the expansion, Buzan (1998), opined that more power is required to provide more security and survival. In describing the components of securitization, Scott Nicholas Romaniuk (1998), said that securitization comprises three distinct phases; the creation of an existential threat called the speech act; the commencement of special/emergency/extraordinary actions to secure and protect the referent object against the existential threat, and the receiving of the speech act by one or more audiences.

Examining the relationship between speech and the concept of security, Munster (2012), says that Copenhagen school unlike traditional understanding of the concept of security, perceive that security is a speech act and security threats are created by speech act. This is because speech and the attributed meaning is a crucial elements in understanding the threat by the listening audience, who accepts and adopts the speech as a legitimate threat and justifies its securitization.

Describing the contribution of the theory to understanding and learning security, Victor Oliveira (2020) quoting Marina Guedes Duque, in her article 'The Role of the Copenhagen School's Synthesis in International Security Studies', stated that "the Copenhagen group carried out a productive synthesis of both the traditionalist and critical aspects of international security as well as the realistic and constructivist approaches to International Relations Theory''. Laying further credence to the theorists of Copenhagen School, Scott Nicholas Romaniuk (1998), said the proponents speak of the issues of security in terms of different facets of contemporary international politics and societies.

The school, through its security (study) theory truly addressed a wide spectrum of issues and events that affect the world today and people living within it' This capacity to examine and analyze objects and events within the international system using various sectors represents one of the main pillars of the Copenhagen School''. Again, Victor Olivera (2020), stated that the main theoretical contribution, the concept of securitization is presented as the most relevant and original. Essentially, the concept of securitization is characterized by the idea that the themes that are established as objects of security and receive the status of a threat in a particular social context are, first, built from a process of social interpretation about the problem, and created through a political agenda that turns this issue into a securitized problem. Peeping into a post-cold war era, the theory helps us to gain insight into international security, as it is faced with new challenges called, new security threats in the form of terrorism and cyber-security. That understands of securitization and the adoption of the theoretical concept of security categorization becomes relevant and useful in understanding several contemporary dilemmas, which underscores another important of the Copenhagen School.

Like every theoretical postulation, Copenhagen Security Theory suffered criticisms. Lene Hansen (2000), in the article "The Little Mermaid's Silent Security Dilemma and the Absence of Gender in the Copenhagen School, "argued that the Copenhagen School fails to adequately include gender in its security scholarship''. Zilovic (2013) argued that Copenhagen's framework for analyzing security issues is very narrative, and the principles for distinguishing security and non-security issues are unclear. Moreover, their explanation for securitization moves believes that the process of securitization is illogical.

Stritzel (2007) states that the core idea of Copenhagen school is focused on three main elements of the speech act, and that's; the securitizing actor, and the audience, and the relation between these three are not clear and exporters of Copenhagen haven't provided enough knowledge to explain the nature of the relationship between them. Does (2013) criticized the ideas of the speech act and securitization theory due to their limitations and emphasized specifically speech act theory, furthermore, states that academic efforts in this domain don't serve the issues in the real world. Finally, the theory is criticized for failing to domesticate security threat because what constitutes a security threat in one country may not necessarily be considered a threat in another country and do not proffer security solutions to security problems, but rather, what the actors designed as the objectives.

The criticism of Copenhagen's theory of security studies notwithstanding, it is important to state that the framework contributed immensely to the understanding and gaining of insight into the concept of security and its postulations that security should be studied from a multidisciplinary view is a universal standard.

Welsh Security Theory

Welsh School of Critical Security Theory otherwise called Aberystwyth School was developed at Aberystwyth University in Wales. The Critical Security Studies School is an amalgamation of feminist school, post-positivism, and the Welsh School of Thought. The most important contribution of the school to security theory is the concept of 'emancipation realism'. The chief proponents of the concept are Ken Booth, Richard Wyn Jones, and Andrew Linklater. They tried to expand social theory using social transformation to study and analyze factors that are obstacles to human emancipation. In their view, security is emancipation and 'emancipation is security' because it is only when people are secure that they can feel free from emancipation constraints. The school postulated that both the state, and other actors such as individuals, society, and women should be involved in discussing and considering security matters. Hence, they emphasized that common threats can only be managed with the establishment of common institutions, interests, and practices.

Boot (1991) outlined the conceptual framework of emancipation and said an effective tool for securing people is by removing those obstacles to their freedom. Gaan (2010), said ''The concept

of emancipation as presented by the Welsh theorists, seeks to reshape the strategy and tactics of resistance, develop communities, give hope to humanity, and reconstruct international relations with multiple insecurities caused by environmental issues, poverty, and violence.

Diakaya (2015), noted that for Welsh security theory to achieve true security, it is dependent on the process of emancipation and without emancipation, accomplishing true security would be impossible. The theorists also questioned what they called the gender-blind security approach, and the military-focused approach of traditional security learning. They challenged the traditional and realist approaches that believe that security is equal to the military and inevitable without military power. Sincerely, the emancipatory approach of Welsh theory focuses on human security, human rights, and military instrumentalities, absence of war and threat of war, political oppression, poverty, and poor education, amongst other constraining elements. The Welsh security theory was greatly influenced by the Gramscian critical approach and the Frankfurt school of critical social theory. Like the Copenhagen theorists, the Welsh scholars shared in the belief that security sturdy and analysis should be expanded due to the complex threats of the post-cold war era to include environmental degradation, economic recessions, and population growth for instance. Supporting the notion of emancipation, Jurgen Habermas states that communication and interaction are important steps to reach an emancipated society. Jurgen Habermas further said that an ideal speech community, open to all people, and accepting all claims to be legitimate and equal, is an important condition for emancipation.

According to Nunes (2012), Welsh schools have ‘’successfully explored the nature of the relationship between security theory and political order from reviewing the concept of security from that context, which it’s not possible to distinguish security from our understanding about how politics works or should work’’. Bilgin (2008), opined that Welsh schools seeking to politicize security and reject the idea of Copenhagen school about de-securitization and the concept of security because they are seen traditionally security as a state’s concern, thus state act toward security doesn’t mean is for specific goal or securitization an issue. In summary, the Welsh school of thought believed that individuals should be the object of security reference, not states.

Nonetheless, the Welsh security theory of emancipation is criticized because of its lack of clarity and the complexities of understanding and justifying the connection between security and

emancipation. It is difficult to explain how emancipation transformed into security and how it could be used as a universal concept for solving security problems. McDonald (2012) said Boot's argument about the relationship between security and emancipation without doubt is unfit, even vague and limited because international relations by their nature are dynamic due to lack of information and enough details for analysts to recognize emancipatory imperative might be uneasy when people see them in real.

2.3 Review of historical and empirical studies

2.3.1 The relationship between screening of originating passengers and aviation security

Historically, airline passenger screening functions have focused on checkpoint screening using magnetometers to detect metallic weapons on passengers and X-ray systems to examine carry-on items. These methods have changed little since they were first implemented at commercial airports in the United States during the early 1970s. Recently, however, new initiatives to expand the role of TSA personnel beyond traditional physical screening of passengers and their belongings, as well as initiatives to improve screening efficiency and effectiveness through the deployment of new technologies, have been implemented and are being tested. These changes are coming about largely in response to recommendations and statutory requirements to address threats posed by explosives carried by passengers or in their carry-on items (United States Government Accountability Office, Aviation Security, 2007).

Addressing the identified need to effectively detect explosives on passengers and in carry-on items will likely require considerable investment and resources. However, policymakers and aviation security planners have not yet agreed upon a clear strategy and well-defined plan for evolving airline passenger screening functions to incorporate new technologies, capabilities, and procedures to more effectively and efficiently detect explosives, weapons, and other threat objects as well as individuals who may pose a threat to aviation security. Significant policy issues related to allocating resources and funding passenger screening initiatives, adequately addressing human performance issues in the design of future passenger screening systems, and developing effective strategies for deploying next generation screening technologies (United States Government Accountability Office: Aviation Security, 2007).

Policy issues for airport passenger screening

According to the United States Government Accountability Office, TSA's Staffing Allocation Model, the TSA faces a number of ongoing challenges to maintain and improve upon the effectiveness and efficiency of passenger screening functions. These challenges include addressing projected airline passenger traffic growth and its potential impacts on screening operations, optimizing screening efficiency and throughput and minimizing passenger wait times, identifying and addressing potential airport space constraints for screening checkpoints and equipment, improving the capability to detect explosives at passenger checkpoints as recommended by the 9/11 Commission which called for legislation, developing strategic plans for addressing identified technology and human factors needs related to passenger screening, and defining funding requirements to implement these strategic plans. There are numerous policy issues regarding the strategies and approaches for addressing these ongoing challenges.

Space constraints at airports

Space constraints within airports are likely to become an increasing concern for the TSA as it seeks to increase the number of screening lanes to meet projected growth in the number of airline passengers. These constraints are also likely to become an increasingly important issue as the TSA is seeking to reconfigure checkpoints over the next several years to accommodate new screening technologies (National Commission on Terrorist Attacks Upon the United States; The 9/11 Commission Report, 2004). The TSA is also seeking to expand the footprint of the screening checkpoint queue and screening lanes to provide a more relaxed atmosphere for travelers and provide behavioral detection officers (BDOs) with additional space to mingle and interact with passengers in an effort to improve the detection of suspicious behavior and possible hostile intent. These factors may combine to result in a considerably larger footprint for screening checkpoints compared to current configurations, particularly at older airports constructed when passenger volume was considerably less and the footprint of screening checkpoints was quite small (Statement of Cathleen A. Berrick, Director, Homeland Security and Justice Issues, Before the Committee on Commerce, Science, and Transportation, 2008). Optimizing the layout of screening checkpoints at these airports may require a considerable investment in redesigning and expanding airport facilities to accommodate proposed future changes to screening checkpoints that are intended to optimize efficiency and performance

across the entire network of commercial airports.4 Particular challenges may be encountered at smaller regional airports that have limited capability and access to resources to expand, as well as at large airports with older terminals that were not initially designed with these new security challenges in mind.

Improving explosive detection at passengers checkpoints

The 9/11 Commission recommended that the TSA give priority attention to implementing technology and procedures for screening passengers for explosives, something not currently done routinely at screening checkpoints. Provisions to improve checkpoint technologies to detect explosives were included in the Intelligence Reform and Terrorism Prevention Act of 2004, to address the issue of detecting explosives carried by passengers, the TSA tested walk-through trace detection portals, known as explosives trace portals (ETPs), and has implemented procedures for conducting pat-down searches of passengers for explosives. Full deployment of the walk-through trace detection portals, or puffer machines, for use in secondary screening of selected passengers had been part of the TSA's strategy for screening passengers for explosives, but this initiative has been put on hold due to maintenance issues with deployed systems. The effectiveness of the strategy has also been brought into question by the foiled plot to bomb U.S. bound airliners using liquid explosives uncovered in August 2006. The TSA is working to identify strategies and technologies that more completely address the explosives threat posed by passengers and carry-on items (Ayşen Güldürdek, 2009). In addition to keeping up with increased volumes of people passing through airport screening checkpoints and improving upon screening efficiency, the TSA faces significant challenges in addressing 9/11 Commission recommendations and statutory mandates to improve the ability to detect explosives and bomb-making components carried on passengers and in carry-on items. There are lingering concerns that, without a significant investment to improve the detection of concealed explosives and non-metallic weapons at passenger checkpoints, considerable vulnerabilities will persist.

The TSA is pursuing a wide variety of technologies to address the challenge of detecting explosives at passenger screening checkpoints. These technologies include walkthrough explosive trace detection portals, whole body imaging (WBI) systems, bottle liquid scanners, cast and prosthesis scanners, shoe scanners, advanced technology (AT) X-ray systems, and explosives detection systems (EDS) tailored for carry-on screening applications. These various

technologies will complement, and in some cases replace, existing checkpoint tools such as magnetometers, hand wands, and explosives trace detection (ETD) equipment. Under the TSA's current budget plans, in the near term, deployment of this technology will be concentrated at the nation's largest airports and will often be limited to use on those passengers selected for secondary screening or to resolve alarms set off during primary screening (Schewe Eric, 2022).

Langwald (2021) noted that full scale deployment of technologies to screen all passengers and carry-on items for explosives and other concealed items will involve a considerably larger investment over the long term. However, a specific long term investment and technology deployment strategy has not yet been agreed upon. While these various technologies have reached a level of maturity where they can be operationally deployed, achieving an end state in which all passengers are screened unobtrusively to detect a broad range of threat objects raises a number of policy issues related to the privacy of passengers as well as a long term investment strategy for implementing future checkpoint concepts.

Strategic planning for addressing technology

The challenges to improving screening capabilities stem from the 9/11 Commission's recommendations to improve the detection of explosives on passengers and address human factors considerations related to screener performance (National Commission on Terrorist Attacks upon the United States: The 9/11 Commission Report, 2004). Four years after these recommendations were issued, the Government Accountability Office (GAO) reported that only limited progress had been made in fielding explosives detection technologies at passenger checkpoints, and the TSA lacks a strategic plan for the acquisition and deployment of screening technologies.6 Moreover, covert testing at passenger checkpoints continues to provide evidence that, despite the considerable federal spending on airline passenger screening since the 9/11 terrorist attacks, the system remains vulnerable, particularly to the threat posed by adversaries attempting to sneak improvised explosive devices (IEDs) or components to assemble such devices through security checkpoints and onboard passenger airliners. These vulnerabilities reflect the lack of adequate technologies deployed at checkpoints capable of detecting explosives materials, as well as limitations in screener performance that is influenced by a variety of human performance factors.

Cost of funding

Deploying new technologies and reconfiguring screening lanes to incorporate these technologies and optimize performance and efficiency will likely cost more than $500,000 per screening lane based on TSA average unit costs for candidate technologies (DHS TSA FY2009). This cost only considers the direct costs for screening lane technology acquisition and installation, and does not include any costs associated with expanding or reconfiguring airport terminals to accommodate new checkpoint designs. Given that there are more than 2,000 screening lanes in operation throughout the United States, the total cost to upgrade screening checkpoints is likely to exceed one billion dollars in equipment costs alone. Additionally, the costs to operate and maintain this screening equipment are likely to cost tens of thousands of dollars each year per screening lane. Based on these rough estimates, it is apparent that current funding levels for Checkpoint Support will not support a full-scale, near-term deployment of emerging passenger checkpoint technologies. Congress may consider various funding options to expand or accelerate the deployment of these checkpoint technologies. If such options are not pursued, it will likely take ten years or more to achieve full system-wide deployment. At present, the TSA has adopted a strategy of focusing its efforts to deploy new checkpoint screening technologies on larger airports. However, since the aviation screening system in the United States operates using a single gateway concept, meaning that passengers are only screened once at their originating airport, focusing investments solely on larger airports could result in persisting vulnerabilities at smaller regional airports. These vulnerabilities may further persist without a strategy and commitment to future funding for system-wide deployment of advanced technology systems for detecting explosives and nonmetallic threat items at checkpoints.

Check point screening human performance

The aviation security system is a human system involving extensive reliance on human perception, performance, decision making, and judgment. This is particularly true with regard to checkpoint screening functions where passenger and carry-on screening involve human resource intensive activities to detect and resolve potential threat items. An underlying challenge related to proposed checkpoint expansion and enhancements is addressing ongoing human performance

concerns to improve the detection of dangerous items at checkpoints and incorporate human factors considerations in the design and operator training for next generation checkpoint technologies and procedures. Screener performance is a continuing concern as covert testing results have repeatedly demonstrated existing weaknesses in screening procedures and capabilities that could potentially be exploited by terrorists or criminals seeking to attack the aviation system (Nie, Batta, Drury & Lin, 2009). These weaknesses may reflect a combination of policies, procedures, technology capabilities, and screener human performance, although weakness in screener human performance has been emphasized as a particular concern which can be affected by various factors.

The layered-security concept employed by the Transportation Security Administration (TSA) to secure commercial aviation from attack by terrorist groups consists of 21 different measures. Underpinning these measures is the belief that any one of the measures is sufficient to deter or disrupt a terrorist plot, and when interleaved, the totality of these measures provides a resilient and robust defense in depth. According to the TSA, "in combination their security value is multiplied, creating a much stronger, formidable system" (Transportation Security Administration-TSA, 2011a). These measures can generally be grouped into categories based in general by type or location of the security steps. Categories include intelligence; checkpoint screening of passengers and accessible property; checked-baggage screening; random security measures and security measures on board the aircraft.

A wide range of human factors considerations pertaining to screening procedures, training, fatigue and alertness, human perception and detection capabilities, and judgment and decision making can have a significant effect on the overall effectiveness of passenger checkpoint screening as well as baggage screening operations (American Civil Liberties Union, TSA Pat-down Search Abuse, 2004). The humans that operate the system, particularly the screening workforce, have long been regarded as a potentially highly fallible and vulnerable element of the aviation screening system. This should not be construed as a reflection on the dedication and commitment of individual screeners to performing this critical job function. Rather it reflects a combination of the complex challenges faced by screeners, limitations in human perception and performance, resourceful adversaries who may employ artful concealment methods, and competing job pressures to accurately detect threat objects while maintaining an efficient flow of

passengers through security checkpoints. Adversaries seeking to carry out hijackings or bombings by carrying explosive devices, bomb making components, or handheld weapons through screening checkpoints may attempt to exploit various limitations on human perception and performance that may compromise security. A variety of factors may contribute to these human performance limitations, including inadequate training, lack of motivation and job satisfaction, fatigue, and workplace conditions, as well as general human perception and performance limitations.

Covert test-screening

Much of the concern over the performance of airport screening operations has arisen from information that has been made public regarding the results of covert testing operations. Covert testing using rudimentary mock bombs and guns started soon after screening checkpoints were first established in the early 1970s. Following the bombing of Pan Am flight 103 in December 1988, the FAA began more sophisticated "red team" tests to identify weaknesses in screening performance and other aspects of aviation security. The term red team harkens back to the Cold War era military exercises where red teams – so designated in reference to the Soviet Union's red flag and the association of red with communist groups – adopted strategies and tactics of an enemy force in simulations and war games. The use of aviation security red team testing was suspended for a period of time following the 9/11 attacks, largely over concerns that red team practices could potentially put testers in danger or cause significant panic among passengers because of the acute focus on aviation security and the lingering public fear following the attacks. In 2003, the TSA's Office of Internal Affairs and Program Review (OIAPR) resumed covert testing of passenger screening checkpoints, checked baggage screening operations, and airport access control measures. At present, this function falls under the responsibility of the TSA's Office of Investigations (TSA-OI). In addition to nationwide covert testing conducted by the TSA-OI, Federal Security Directors (FSDs) at each airport are to perform local covert testing. The local testing was initially called the Screener Training Exercises and Assessments (STEA), but is now known as the Aviation Screening Assessment Program (ASAP) and has been revamped to better reflect the types of threat objects that may be used by terrorists based on the latest intelligence and threat information.

While specific performance metrics for covert testing are considered security sensitive, various media reports of test results suggest that failure rates are often quite high, particularly with respect to screeners missing simulated improvised explosive devices and explosive components. For example, it has been reported that during tests conducted in 2006, TSA screeners missed fake bombs 75% of the time at Los Angeles International Airport (LAX), and 60% of the time at Chicago O'Hare Airport (ORD).12 The TSA contends that the results, on the surface, appear discouraging, but are a reflection of highly sophisticated concealment methods being used by testers to uncover specific system vulnerabilities so that corrective action can be taken. According to the TSA (2011) as security officers adapt and begin to consistently discover covert testing methods, testers start all over again, creating more difficult and harder-to-detect tests. This years' long game of cat and mouse more closely simulates real terrorist probing and operations and keeps officers alert and informed of the latest techniques and improvements. The TSA points out that this type of testing is fundamentally different from the static, unchanging performance evaluations that were employed prior to the 9/11 attacks. Since the present day test protocols are constantly changing, the TSA has primarily used them to provide a snapshot of specific vulnerabilities in the system. It has not systematically assessed whether screener performance is improving or getting worse over time, although it asserts that improvements have been made. According to the TSA, the covert testing methods are primarily used as a tool for assessing and identifying areas where performance improvements are needed and are potentially achievable through additional training, operational emphasis, or procedural redesign.

The TSA covert tests of passenger screening checkpoints annually during FY2008 and FY2009 in an effort to continually identify vulnerabilities and take corrective action to improve checkpoint screening based on the latest intelligence and information regarding terrorist weapons and explosives that pose a threat to commercial aviation and methods for concealing these threat objects.14 While specific test results are considered security sensitive information, it has been reported that current failure rates are comparable to those observed in 1987 when screeners failed to detect about 20 percent of concealed items during on-the-job performance testing (Department of Homeland Security, Office of Inspector General, Review and Audit of the Transportation Security Administration's Use of Pat-Downs in Screening Procedures-REDACTED, 2005). However, the TSA asserts that the testing methods used at that time were in no way comparable to current covert testing methods.

Concerns over advance warning given prior to covert testing and screener performance evaluations has been a longstanding issue (Jeanne Meserve and Mike M. Ahlers, 2008). While media reports have suggested that some recent TSA covert tests were leaked to screeners, the TSA maintains that its procedures are designed to minimize the likelihood that screeners will be tipped off regarding a covert test operation, while providing appropriate notification to TSA airport level management and local law enforcement to ensure that the tests are conducted safely. Nonetheless, cases of screeners being tipped off regarding covert testing have been documented. For example, in 2004, the DHS IG found that screeners at the Jackson-Evers International Airport in Mississippi had been given information regarding upcoming covert tests, including details about the gender and race of the testers, the type of test items being used, and the location of test items on the tester and in carry-on and checked baggage.

While the investigators were subjected to secondary screening for unrelated reasons in some instances, pat-down searches and other secondary screening methods failed to detect the improvised explosives or prohibited items (Transportation Security Administration, Covert Testing, 2009). In other instances, screeners challenged the investigators for failing to fully comply with various procedures, including procedures regarding permissible quantities and packaging of liquids. The GAO concluded that its tests clearly demonstrate that a terrorist group, using publicly available information and few resources, could cause severe damage to an airplane and threaten the safety of passengers by bringing prohibited IED and IID components through security checkpoints (Kehaulani Goo, 2004). In reviewing these results, the TSA has acknowledged checkpoint vulnerabilities related to human performance, screening procedures, and checkpoint technologies. The GAO asserted that improvements in these areas may further reduce the risks to commercial aviation posed by IEDs and IIDs. While the GAO's specific recommendations focusing on ways to improve screener detection of threat objects made to the TSA were not publicly divulged, the GAO also urged the TSA to take the following actions to enhance checkpoint screening operations establish dedicated airport screening lanes to handle those passengers posing an elevated risk and for those passengers with special needs, introduce more aggressive, visible, and unpredictable checkpoint procedures, such as random pat-down and hand-wand screening and continue to develop new technology at checkpoints to better detect concealed items (Kehaulani Goo, 2004).

X-ray imagery and carry-on baggage screening performance

Current generation X-ray systems provide significantly higher resolution than systems that were deployed at airports in the 1990s and prior. However, these systems only provide a single view angle, typically an overhead view, of screened items. Nonetheless, in addition to increased image resolution, image coloration and other image enhancement features allow screeners to more easily differentiate organic and metallic materials and provide the capability to use color contrast to better differentiate certain elements of the X-ray image. For example, the coloration allows organic materials to stand out from inorganic materials making it easier to detect dense organic matter that may be indicative of an IED, and provides differential coloration of metals to allow for easier detection of metallic weapons. In addition to selective coloration, newer X-ray systems allow for a wide array of image enhancement functions to highlight or turn off and declutter certain features in a process known as image "stripping." However, some research has shown that individual image enhancements do not necessarily improve IED detection compared to viewing of the original X-ray image, suggesting that the greatest advantage derived from current single-view X-ray systems may be their improved image resolution.24 Nonetheless, viewing multiple image enhancements in combination such as stripping out organic items or metallic items, or displaying a negative image can potentially help resolve image ambiguities and possibly improve detection. While currently deployed X-ray systems have these capabilities, time pressures at busy screening checkpoints may often preclude detailed examination using various combinations of these image enhancement capabilities.

Object orientation in the X-ray view is often a key determinant to whether an object will be recognized or detected. Prohibited items, such as guns and knives, presented at odd viewing angles can often be missed, even by highly trained screeners. At present, the main tool to address detection performance of objects presented at difficult-to-recognize view angles is through the use of computer-based training using TIP imagery of threat items presented at various view angles. Since threat object recognition and detection is a skill that is likely to continually improve with experience and exposure to both TIP imagery and artfully concealed real-world threat items, retention of high-performing experienced X-ray screeners is likely to remain a key component of maintaining high levels of screening performance.

Passenger check point efficiency

While the ability to detect threats is the primary metric for evaluating passenger checkpoint system performance, maintaining checkpoint efficiency has also been given a high priority. However, the well documented phenomenon of speed-accuracy trade-offs in human performance highlight the fact that increasing system throughput can lead to missed threats and a deterioration of system effectiveness. Therefore, policymakers and aviation security strategists have generally focused on striking a balance between maintaining reasonable wait times and high levels of threat detection (Bennie G. Thompson, 2007). While research and engineering has focused on optimizing screening lane efficiency and effectiveness, longstanding wait time objectives have been set by policy, largely based on what is regarded as reasonable to expect by the traveling public.

Kutz (2007) revealed that it has been the Department of Transportation's and the TSA's longstanding goal that passengers should not wait, on average, more than 10 minutes to pass through an airport security checkpoint. This can be traced back to the objectives laid out for checkpoint efficiency by then Secretary of Transportation Norman Mineta in 2002 as responsibility for checkpoint screening functions was being turned over to the TSA. The challenge in determining the number of checkpoints that will meet specified wait time criteria largely derives from the variability and fluctuation in daily and hourly passenger volumes. Typically a representative busy hour is picked to model the passenger demand for screening. The TSA has identified a variety of methods for selecting the busy or peak hour to be used in modeling passenger screening demand.

Integration of Artificial Intelligence

According to Ingram (2024), the integration of AI-driven baggage monitoring systems has marked a major advancement in airport security, particularly in the early identification of prohibited items and hazardous materials. These intelligent systems use machine learning to adapt and improve detection accuracy over time, reducing human error and expediting the screening process. As global threats become more sophisticated, such technology is important in minimizing risks posed by concealed weapons, explosives, or biological hazards. Peregrine (2025) also notes that more than 70% of East African airports have recently upgraded their

security infrastructure with AI-enhanced scanners and predictive threat analysis software. These upgrades have reportedly resulted in a 30% reduction in passenger processing time, indicating a dual benefit of improved safety and efficiency. In addition, smart detection systems allow for real-time threat data sharing between terminals and international airports, increasing collective vigilance. Through using AI to analyze behavioral patterns and baggage contents simultaneously, authorities can make informed decisions faster. Enhanced surveillance cameras powered by AI are also now tracking suspicious movement in high-risk zones. These proactive systems reduce the response time of security personnel and provide higher situational awareness. Compliance with ICAO standards has pushed airports globally to adopt this technology, leading to widespread upgrades.

The integration of 3D Computed Tomography (CT) scanners into airport security systems has enhanced passenger screening efficiency (Parasuraman, 2018). National Academies of Sciences, Engineering, and Medicine. 1996. Airline Passenger Security Screening: New Technologies and Implementation Issues. Washington, DC: The National Academies Press. Unlike traditional 2D X-ray machines, CT scanners provide high-resolution, three-dimensional images that allow security personnel to rotate and zoom in on baggage contents, improving threat detection accuracy.

Biometric identification system

This advancement has led to a notable reduction in false alarms, streamlining the screening process and minimizing unnecessary delays. In parallel, the adoption of biometric identification systems, particularly facial recognition technology, has further optimized screening procedures. According to Mackie (2020), these systems offer rapid and accurate identity verification, reducing the time passengers spend at checkpoints. For instance, Delta Airlines reported that facial recognition reduced security interactions from 25 seconds to approximately 10 seconds, majorly expediting the boarding process. Moreover, the implementation of biometric systems has been associated with a decrease in operational costs and an improvement in overall passenger experience.

According to Delio (2023), the aviation industry has witnessed surge in cyber threats, with a 24% increase in cyber-attacks during the first half of 2023, showing the sector's vulnerability to

digital threats. These attacks have targeted critical systems, including air traffic control and passenger data platforms, demonstrating the need for robust cyber security measures. In response, over 50% of airlines have enhanced their network security by deploying next-generation firewalls (NGFWs) and advanced encryption models to prevent data breaches and hacking attempts. More so, the rise of wireless connectivity in aviation systems has increased cyber risks, leading to a 35% surge in demand for AI-driven wireless security solutions.

To handle these challenges, many airports and airlines are investing in Security Operations Centers (SOCs) that provide automated threat monitoring and incident response capabilities (Peregrine, 2025). These centers enhance the ability to detect and mitigate cyber threats in real-time, ensuring the safety and security of aviation operations. Furthermore, the adoption of cloud-based cyber security solutions has increased by 40%, enabling real-time threat detection and centralized data protection. This shift allows for more agile responses to emerging threats and ensures that critical systems remain protected against evolving cyber risks.

Earl, L. (2017) reported that security personnel who complete standardized programs show a 72% improvement in their threat detection capabilities. This Substantial enhancement underscores the effectiveness of structured training in equipping staff with the necessary skills to identify and mitigate potential security threats. Equally, Wood (2023) observes that specialized training programs have increased staff efficiency by 25%, ensuring that frontline workers are adept at identifying potential threats and responding effectively. These tailored programs focus on specific security challenges, providing employees with the expertise to handle various scenarios proficiently. Moreover, research indicates that companies investing in comprehensive training programs experience a 20% increase in productivity and a 15% reduction in service errors, which directly contributes to improved operational efficiency. This shows the broader organizational benefits of investing in employee development.

Clarke (2023) indicates the growing reliance on biometric technologies such as fingerprint scanning and facial recognition for identity verification in airports. These systems are increasingly used to authenticate both passengers and airport employees, enhancing security by preventing unauthorized access to restricted zones. Biometric verification ensures that access is granted based on unique biological traits, making impersonation or identity fraud extremely difficult. For employees, this provides a secure method of tracking access to sensitive areas such

as control rooms, baggage handling sections, or runways. For passengers, these technologies are integrated at multiple checkpoints, from check-in kiosks to boarding gates, eliminating the need for repeated document checks. Peregrine (2025) stresses, the role of biometric touch points in enhancing the passenger journey through airports. Facial recognition systems, in particular, have become a cornerstone of seamless identity verification from curb to gate. These touch points placed at check-in, security, and boarding automatically match a passenger's live facial image with stored passport or visa data, eliminating the need for manual document checks.

Risk-Based Security management

According to Braun (2019) Risk-Based Security (RBS) represents a paradigm shift in aviation security, moving from a uniform, one-size-fits-all approach to a more nuanced, intelligence-driven strategy. This model prioritizes resources based on assessed risk levels, allowing for more efficient and targeted security measures. According to the Transportation Security Administration (TSA, 2007), RBS practices expedite screening for known and trusted travelers while focusing resources on higher-risk individuals, enhancing overall security effectiveness. Implementing RBS has led to weighty improvements in passenger throughput and satisfaction. For instance, TSA PreCheck® has reduced average wait times from 8.9 minutes to 2.4 minutes in dedicated lanes, demonstrating the efficiency gains of risk-based screening. To the same effect, the "Checkpoint of the Future" initiative aims to integrate advanced technologies and data analytics to further refine risk assessments and resource allocation, ensuring a balance between security and passenger convenience. This approach not only enhances security measures but also optimizes operational efficiency, making it an important component of modern aviation security strategies (Jeppe, N. 2015).

Automated screening

Ingram (2024) emphasizes the transformative role that automated systems play in modernizing airport security and streamlining passenger processing. Mechanical scanning systems such as automated body scanners, baggage X-rays, and biometric identification gates perform screening tasks faster and more accurately than human agents. These systems reduce the time each passenger spends at security checkpoints, minimizing bottlenecks and long queues. The automation reduces human error and subjectivity, leading to a more consistent screening process.

Ingram points out that this not only improves efficiency but also enhances the overall passenger experience. As passenger numbers grow, the need for speed and precision becomes critical. Human screeners are slowed by fatigue, inconsistency, or communication issues, whereas machines operate continuously with standardized performance. Many of these systems also integrate with airport databases in real-time, enabling quicker decision-making and flagging potential threats instantly (Welna, 2017). Automated sorting of luggage ensures that bags are screened and routed appropriately without delays. This improves baggage handling accuracy and prevents missed connections.

2.3.2 The relationship between access control and aviation security

According to the Ministry of Works and Transport Uganda (2023), the integration of advanced data communication systems at Entebbe International Airport has substantially improved the reliability and accuracy of air traffic control operations. These systems complement traditional voice communication by enabling the digital exchange of flight data between aircraft and control towers. This dual-layered communication reduces the chances of miscommunication, especially during high-traffic periods. SML News Uganda (2024) reports that the enhanced infrastructure has not only increased operational efficiency but also fortified cyber security by limiting vulnerabilities tied to manual communication errors. Real-time data transmission allows for quicker decision-making, which is vital during emergency situations or security alerts. These digital systems support encrypted communication channels, further protecting sensitive flight information. The result is a more coordinated and secures flow of aircraft in and out of Entebbe.

Credentials and readers

According to Sloan and Bersia (2006), an airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections. These methods include biometric identification, badges, key fobs, access cards, and smart phones, among others. Mobile credentials, which are gaining widespread popularity, leverage advanced technologies such as cloud-based software and QR codes to manage access to restricted areas effectively. These authentication measures are exclusively provided to those with proper authorization and securely kept in a database overseen by the airport access control system. Access control readers are strategically placed at different entry points throughout an airport to authenticate the identities of those seeking entry. These readers communicate with the

access control system to verify identification. Based on the credentials presented, the system then authorizes or denies access to the restricted area, ensuring that only authorized personnel can enter (Gürhan Deniz, 2021).

Infrastructure

An airport access control system requires an all-encompassing infrastructure to function effectively and efficiently. This infrastructure's foundation comprises hardware components such as servers, network equipment, and software applications and seamless integration with other security measures. Typically, the system is centralized and administered through a Security Operations Centre (SOC, Gürhan Deniz, 2021). Here, the distribution of access control readers, administration of credentials, and vigilant monitoring of all access attempts are overseen. The infrastructure must be safe, dependable, and able to handle many access attempts.

Physical access barriers

The airport access control system's integrity depends on physical barriers that impede unauthorized access. These barriers, encompassing gates, turnstiles, doors and locks, roped-off sections, and other physical impediments, deter unauthorized access to restricted areas. The barriers are designed with tamper-resistant features and are difficult to breach, ensuring maximum protection. In many cases, physical barriers are integrated with access control readers, offering an extra layer of protection (Merino Isidoro, 2023). For instance, a gate may require a valid credential and biometric identification, like a fingerprint, to gain entry. This multi-layered approach ensures that only authorized personnel gain access.

Perimeter access control and management

According to Halpern (2022), perimeter access control is another critical feature of an airport's access control system. The airport perimeter is the first line of defense against unauthorized entry into the airport facility. A perimeter access control system is designed to monitor and control access to the airport perimeter. A comprehensive perimeter access control system typically comprises surveillance cameras, motion sensors, and other detection devices. The system is further fortified with physical barriers like fences, walls, or bollards strategically placed to deter and prevent unauthorized access attempts to the airport perimeter.

Implementation of automated systems

The implementation of automated systems at Entebbe International Airport has greatly strengthened its cyber security framework. Major systems such as the Airport Operations Database (AODB), Computerized Maintenance Management System (CMMS), and the Terminal Operations Control Centre (TOCC) have modernized operational procedures, minimizing vulnerabilities and enhancing security oversight. According to the Uganda Civil Aviation Authority (2024), these innovations have enabled seamless coordination between departments and supported timely threat detection. The TOCC, in particular, functions as a centralized nerve center for monitoring real-time data from across the airport. This integration allows for swift identification and response to any potential cyber threats or anomalies. Digital Uganda (2023) further reports that automation has extensively reduced human error, a major vulnerability in traditional airport security processes. With reduced manual interference, surveillance is more consistent, reliable, and responsive. Collectively, these technologies ensure that both staff and public at airport and passengers benefit from a safer and more secure airport environment.

According to the International Civil Aviation Organization (ICAO, 2021), aligning airport operations with global cyber security standards is important for defending against the growing complexity of cyber threats in aviation. Entebbe International Airport has adopted these international benchmarks to enhance its digital security framework and promote interoperability with global aviation systems. This alignment includes implementing standard protocols for data protection, system access, and cyber incident response. Wow fare Travel Insights (2024) notes that Entebbe's commitment to global best practices has positioned it as one of East Africa's more secure and technologically prepared airports. Through applying these standards, the airport ensures that its cyber security policies meet or exceed international expectations, minimizing risks posed by both internal and external threats. This also facilitates more seamless collaboration with international partners during risk mitigation efforts.

At Entebbe International Airport, cyber security regimes have played an important role in handling the risk of insider threats. A major strategy has involved implementing rigorous background checks and thorough vetting processes to ensure that only trusted individuals access restricted zones and sensitive information. According to Nkumba University (2022), these measures are part of a broader airport security policy aimed at closing internal loopholes that

could be exploited. Insider threats often overlooked poses severe risks to both operational integrity and passenger safety. To counter this, the airport has enhanced monitoring systems and restricted data access to essential personnel only. Uganda Civil Aviation Authority (2023) notes that frequent staff audits and access control updates have helped detect irregularities before they escalate. These measures support a zero-tolerance approach to internal sabotage or negligence. The result is a more resilient airport security framework. Passengers and operations alike benefit from this enhanced layer of internal protection.

According to the Uganda Civil Aviation Authority (2023), Entebbe International Airport has embraced a proactive safety culture by institutionalizing regular cyber security audits and emergency response drills. These activities are designed to uncover vulnerabilities before they are exploited and to reinforce readiness among all airport departments. The drills simulate a range of potential threats, including cyber-attacks, data breaches, and operational failures, preparing staff to respond effectively under pressure. SML News Uganda (2023) indicates that these efforts are part of the airport's broader strategy to strengthen its safety protocols and ensure regulatory compliance. Involving both technical personnel and frontline staff, the audits provide actionable insights that inform system upgrades and policy adjustments. This continuous improvement process not only improves the airport's cyber security resilience but also reassures travelers of their safety. Through emphasizing preparedness over reaction, Entebbe fosters a culture of accountability and vigilance, protecting both transit and originating passengers.

Uganda Civil Aviation Authority (2024) asserts that the establishment of the Terminal Operations Control Centre (TOCC) at Entebbe International Airport has greatly improved coordination among critical airport stakeholders. These include security agencies, immigration officers, air traffic controllers, and airline operators. Acting as a centralized command hub, the TOCC streamlines communication and facilitates real-time information sharing. This setup ensures that any potential cyber security threats or operational disruptions are detected and addressed swiftly. Clarke, R. (2023) reports that the TOCC has reduced response time during security incidents and improved situational awareness across departments. It also supports integration with surveillance systems and digital communication platforms, enhancing operational efficiency. Through enabling collaborative decision-making, the TOCC helps maintain order and continuity during high-risk events.

The implementation of advanced real-time monitoring systems at Entebbe International Airport has considerably enhanced its ability to detect cyber incidents as they occur. According to Ahmed, A., & Nartey, J. (2019), these systems allow for the rapid identification of potential threats, minimizing delays in response time and preventing disruptions to airport operations. With continuous surveillance, airport security personnel quickly assess and handle security incidents, whether they are data breaches or malware attacks. Dannatt, R. (2022) reveals that this proactive approach reduces the risk of widespread damage by enabling prompt mitigation measures. The ability to respond to cyber security incidents immediately ensures that passenger safety is prioritized, even in the face of evolving threats. This streamlined incident response also safeguards critical airport operations, reducing the chances of operational shutdowns and delays. As a result, the airport maintains a secure environment for both passengers and staff, reinforcing its role as a secure transit hub.

2.3.3 The measure of influence of compliance on aviation security

According to aviation consultant Maria Jenkins (2022), providing passengers with straightforward and accessible information greatly reduces confusion and increases adherence to security protocols, particularly regarding restricted or dangerous items. The airport's policy outlines specific penalties for non-compliance, which acts as a deterrent while also reinforcing the seriousness of aviation security. Entebbe International Airport has improved passenger compliance and overall security through the implementation of clear guidelines for baggage and personal items, which detail what can and cannot be carried in hand luggage or checked baggage.

According to global security expert David Klein (2023), airports that prioritize transparency in baggage regulations are more likely to prevent accidental breaches, such as passengers unknowingly carrying restricted items into secure zones. Entebbe signage, announcements, and digital communication channels are part of this approach, ensuring that all travelers are informed before reaching the screening check point. This clarity not only streamlines the security process but also minimizes delays caused by non-compliant baggage.

According to ICAO (2023), harmonization of security measures across member states strengthens the global aviation security framework and prevents vulnerabilities that are exploited across borders. Entebbe International Airport ensures its security policies align with international aviation standards by maintaining active collaboration with global regulatory bodies such as the

International Civil Aviation Organization (ICAO). This partnership guarantees that the airport's protocols for prohibiting restricted items are consistent with global best practices, ensuring seamless integration with international travel requirements. The Uganda Civil Aviation Authority (UCAA), in conjunction with ICAO, conducts frequent compliance audits and capacity-building programs to ensure that Entebbe's policies are both current and effective (UCAA, 2022). These cooperative efforts lead to periodic updates in screening procedures, technology adoption, and personnel training, ensuring that Entebbe remains at the forefront of international aviation security.

Security Governance

Governance is a framework of rules and practices used by an organization to ensure accountability, fairness, and transparency among an organization's stakeholders. Organizational stakeholders may consist of the board, executives, management, employees, financiers, customers, government, and the community (Sezal Mustafa, 2019). The corporate governance framework consists of explicit and implicit agreements between the organization and stakeholders, for distribution of responsibilities, rights, and rewards. Thus, the framework provides procedures for reconciling the sometimes conflicting interests of stakeholders in accordance with their duties, privileges, and roles, with procedures for proper supervision, control, and information flow.

Controls

Lussier (2009) noted that whatever security management plan, security governance system, or other systems are put into place, there needs to be a priori developed, defined, and measurable controls. Controls and their measurement are perhaps the most difficult processes to achieve in security management. It is often suggested that success in security leads to a reduction in the perceived need of security and, therefore, resources. Thus, without such measurable controls, there is little to counter such resource reductions. Sezal (2019) noted that security professionals and some security management plans tend to discuss controls as if they were only physical security strategies. However, controls are as much about developing, defining, measuring, and adjusting the performance of the whole system, using people, processes, and physical and technological elements. There are defined steps in the control system process, which commence with setting objectives and standards followed by measuring performance, that are compared against the predefined standards from which corrective or reinforcement can take place.

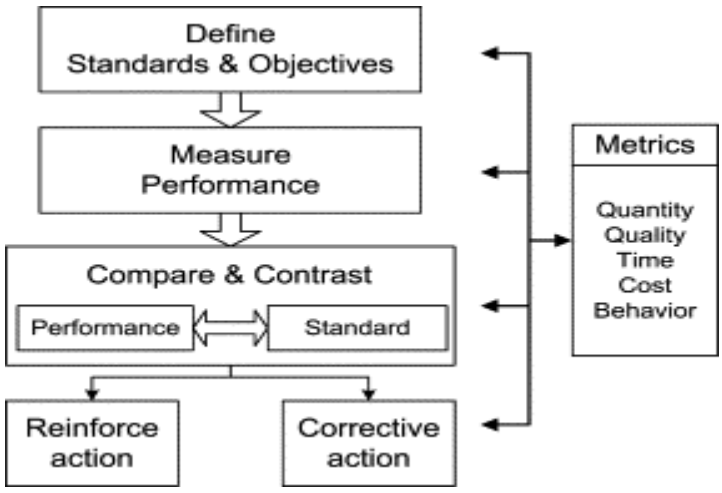


Figure 2.1: Setting controls within security management

Objectives and standards is the commencing point, which needs to measure performance in the areas of quantity, quality, time, costs, and behavior, such as quantity considers the metric output of people, processes, or functions for example, the number of words a secretary types or the number of classes a teacher teaches; quality considers how well a job or task has been performed, for example, for a secretary the number of typed errors, or for a teacher the level of student evaluation. Quality is perhaps the most difficult to establish and the most subjective, but can be the most insightful and relevant for security; time considers how quick a task was completed or whether it met a deadline; for example, the number of words per minute a secretary types or the time period a teacher takes to return assessments and cost considers the monetary value of completing a task for example, how much does it cost for a secretary to type *x* number of words, or for a teacher, the funding provided per student (Lussier, 2009).

Security metrics and performance management

Metrics, as defined by controls, allows a systems performance to be measured. Nevertheless, measuring security is perhaps one of the most difficult management functions to achieve, in part, due to its very nature and subjectivity. The ability to measure more traditional elements, for example loss prevention, is valid, but in the corporate environment security has to be more strategic. Therefore, subjective processes such as security risk management, business continuity, value of security, and reputation have to be measured in some meaningful way. Metrics should be contextually specific to allow decision-makers to understand and take action. Thus, a metric should be a consistent measurement, cheap to extract, and expressed in a quantitative format and

in at least one unit of measure (Jaquith, 2007). One method is to consider parts of the security management plan, for example, the physical security components.

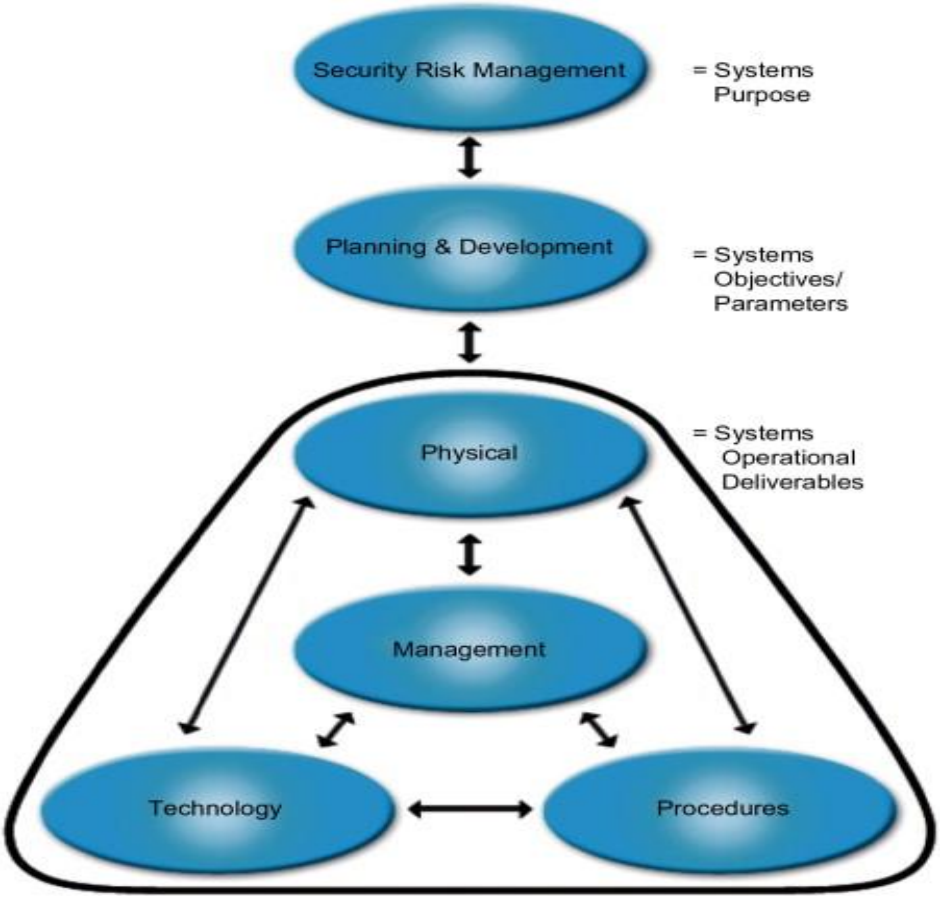


Figure 2.2: Physical security management system (Adjusted from Coole and Brooks, 2011)

Coole and Brooks (2011) wrote that using the control standards of quantity, quality, time, costs, and behavior, security metrics can be developed and measured. Quantity (quantitative and metric) considers the metric output of people, processes or functions; quality (subjective and qualitative) considers how well a task has been performed, time (quantitative and metric) considers how quickly a task was completed or whether it met a deadline, cost (quantitative and metric) considers the monetary value of completing a task, behavior (quantitative and qualitative) considers what employees should do.

According to Whitaker (2023) an international security analyst, such prompt enforcement is important in deterring intentional breaches and ensuring that security policies are taken seriously

by all passengers. Smith (2022) points out that a global aviation security expert, emphasized that such technologies are now a standard requirement in international airports, playing an important role in deterring smuggling attempts and ensuring compliance with security regulations. Entebbe's integration of these systems demonstrates its alignment with global aviation security practices while addressing local security concerns. The use of automated detection also speeds up the screening process, minimizing delays without compromising security.

On a local level, the Uganda Civil Aviation Authority (UCAA), in collaboration with Uganda Police Aviation Security Unit, has established legal frameworks and operational protocols to ensure swift response to violations (UCAA, 2023). Entebbe International Airport enforces strict legal consequences for individuals who attempt to bring prohibited items into restricted areas, reinforcing its commitment to security compliance. Offenders face immediate actions that may include arrests, monetary fines, or flight denial, depending on the severity of the violation. These measures are in line with ICAO's global standards, which mandate clear punitive consequences to prevent and respond to security threats effectively.

Entebbe International Airport has enhanced its security protocols through the implementation of stricter checks on restricted items, playing a critical role in safeguarding passengers and aviation staff. According to Nsubuga (2022), the airport employs advanced screening technologies such as millimeter-wave scanners and explosive trace detection systems, which are complemented by thorough manual inspections to identify and intercept prohibited items like firearms, explosives, and edged weapons. These multi-layered checks ensure that no unauthorized or dangerous materials are brought into secure zones or onto aircraft. Musoke (2023) also reveals that Entebbe's security personnel undergo frequent training and certification along with international standards to stay abreast of emerging threats and detection techniques. The airport's alignment with protocols set by the International Civil Aviation Organization (ICAO) reinforces its commitment to upholding global aviation security benchmarks.

Entebbe International Airport has majorly improved its security measures through the enhanced use of technology for item detection, a strategy that has proven vital in preventing security breaches. According to Tumwine (2023), the airport has adopted advanced screening tools such as full-body scanners, high-resolution X-ray machines, and chemical trace detectors, which are capable of identifying concealed threats including explosives, sharp objects, and restricted

liquids. These systems increase the accuracy of item detection and reduce human error during inspections. These innovations make it increasingly difficult for individuals to bypass detection with concealed items.

At Entebbe International Airport strict regulations are enforced on the transportation of liquids, gels, and hazardous materials as part of its comprehensive security policy aimed at mitigating threats to aviation safety. In accordance with guidelines issued by the International Civil Aviation Organization (ICAO), passengers are only permitted to carry liquids in containers of 100ml or less, all of which must fit into a single, transparent resealable plastic bag. This regulation is designed to prevent the concealment of liquid explosives and aligns with global aviation security practices.

The Uganda Civil Aviation Authority (UCAA, 2023) has reinforced these measures by conducting regular audits and sensitization campaigns to ensure that both airport staff and passengers comply with the rules. According to ICAO (2022), such liquid restrictions are critical in preventing terrorist attacks similar to past incidents involving liquid-based explosive devices. Through strictly monitoring and limiting hazardous substances, Entebbe International Airport majorly reduces potential threats to aircraft, ensuring a secure and a safer travel environment.

The Airport has strengthened its security framework by implementing passenger education and awareness campaigns aimed at promoting compliance with airport regulations. According to Nakato (2023), a public relations officer at the Uganda Civil Aviation Authority, these campaigns use posters, public announcements, and digital media to inform travelers about prohibited items and the rationale behind such restrictions. This proactive approach not only improves passenger cooperation but also reduces delays and enhances overall security efficiency.

Lwanga (2022), a security training coordinator at Entebbe Airport, also emphasized that when passengers understand the importance of these rules, they are less likely to unknowingly carry restricted items into secure areas. These education efforts have helped foster a culture of shared responsibility between airport staff and travelers, making security processes smoother and more effective. The institution also places strong emphasis on the continuous training of its security personnel to ensure they are well-equipped to detect and respond to existing threats. This commitment includes frequent workshops and simulations that focus on the use of modern

scanning technologies, such as explosive trace detectors and full-body scanners, as well as behavioral analysis techniques to identify suspicious behavior.

According to Kamya (2023), a senior training officer at the Uganda Civil Aviation Authority, the airport's security personnel undergo mandatory refresher courses every six months to stay updated on global threat trends and detection strategies. In line with this, international aviation security consultant Roberts (2022) notes that the effectiveness of an airport's security infrastructure greatly depends on the skill level and preparedness of its personnel. Through hands-on training with the latest tools and real-world scenarios, Entebbe ensures that its security teams are not only knowledgeable about current regulatory requirements but are also capable of making quick, accurate decisions in high-pressure situations.

Ongoing training programs for airport staff at Entebbe International Airport have played a critical role in strengthening its cyber security defenses. As Lartey, J., & Osei, S. (2021) note, these programs equip employees with essential skills to identify, mitigate, and respond to potential cyber threats, ensuring the airport is always prepared for emerging risks. Frequent training sessions also keep staff updated on the latest cyber security protocols, ensuring they quickly recognize and handle new types of cyber-attacks. The African Civil Aviation Commission (AFCAC, 2022) indicates that a well-trained workforce is vital to a proactive security posture, as it helps reduce the human error factor often exploited by cybercriminals. This culture of vigilance is particularly important in high-stakes environments like airports, where the safety of passengers is paramount. Through fostering preparedness across all levels of staff, Entebbe International Airport enhances its overall resilience against cyber threats. The proactive approach ensures that airport personnel can immediately respond to any incident, reinforcing the airport's commitment to maintaining the safety and security of both passengers and operations.

2.4 Gaps identified and filled

None of the studies by Byamugisha (2018) and Luwemba et al., (2010) focused on the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security, and besides there was scarcity of prior researches related to the theme of the current study. Therefore, there were knowledge, methodical and theoretical gaps identified and filled by the study;

2.4.1 Knowledge gap

The previous studies have not focused on assessing the Airport security programme, particularly Entebbe International Airport, therefore a knowledge gap existed which had to be filled by elaborating about the security measures for screening of originating passengers, crew, and baggage to prevent prohibited items from being carried into airport security restricted areas or onto aircraft.

2.4.2 Methodical gap

No previous research in a related area had used the Research Questions Approach, so this particularly research adopted and used it to accomplish the methodology.

2.4.3 Theoretical gap

The lack of a clear theory made the researcher to provide theoretical information/data on the relationship between screening of originating passengers and aviation security, the relationship between access control and aviation security as well as measures influencing compliance on aviation security at Entebbe International Airport to the accomplishment of the study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

This chapter covers the research design, the research approaches, the study population, the sample size and sample selection, sampling techniques, methods and techniques of data collection, reliability and validity of the research instruments, procedure of data collection, data management and analysis and interpretation, ethical considerations and anticipated limitations of the study.

3.1 Research approach

The study used both quantitative and qualitative research approaches (mixed approach) which sought for numerical data as well as opinions, attitudes and thoughts as well as the observed knowledge about the phenomena. Data collection involved in-depth interview and questionnaires administration a support by Amin (2017).

3.1.1 Quantitative approach

The quantitative technique assisted to designate the present situations and inspect the recognized relations between the study variables. The technique was used for sampling, gathering data, ensuring data quality and analyzing data. A cross section research strategy was used since data was collected from respondents at a solitary or a single point of time. It permitted the establishment of several data collection methods across respondents (Sekaran, 2003). It also offered a methodical explanation that was accurate and evidence based.

3.1.2 Qualitative approach

The study also deployed qualitative technique which helped to review relevant literature on, and help to limit the scope of this study, framework, identified theories and findings by other authors or researchers as presented in chapter two. According to Sekaran (2013), qualitative research used several techniques, including interviews, focus groups, and observation. Interviews were structured, with open-ended questions on a topic, and the interviewer adapted the responses. Structured interviews had predetermined number of questions that every participant was asked. The qualitative approach facilitated the study to collect detailed facts about the study concepts through structured interview questions that served in this case.

3.2 Research design

The research was carried out through a case study research design. According to Crowe et al., (2011), a case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. The case study approach is particularly useful to employ when there is a need to obtain an in-depth appreciation of an issue, event or phenomenon of interest in its natural real-life context. The case study approach was used because it put into consideration the constraints of cost, it was created quickly, administered easily and used to collect information on a wide range of issues that included personal facts, attitudes and opinions in line with the theme of the study.

3.3 Study and Target population

3.3.1 Study population

According to Mugenda (2016), a study population is a complete set of individual subjects with some common physical features. Polit and Hungler (1999) noted that the study population is an aggregate or totality of all the objects, subjects, or members that conform to a set of specifications.

3.3.2 Target population

Barnsbee and Son (2018) states that target population is the group of individuals that the intervention intends to conduct research in and draw conclusions from. In cost-effectiveness analysis, characteristics of the target population and any subgroups should be described clearly. The study considered the administrators and staff of Uganda Civil Aviation Authority (as broken down in the table below).

Table 3.1: Study population

Population Category		**Number**
Administrators	Director General	01
	Spokesperson/Publicist	01
	Director Human Resource and Administration	01
	Managers of Departments (selected)	07
Staff	AVSEC (Aviation Security) personnel (selected)	60
	Immigration Officers/ (selected)	25
Total		**95**

3.4 Sampling

According to Ben-Shlomo et al., (2013), sampling is a method that allows researchers to deduce information about a population based on results from a subset of the population, without having to investigate every individual. Reducing the number of individuals in a study reduces the cost and workload, and may make it easier to obtain high quality information, but this has to be balanced against having a large enough sample size with enough power to detect a true association. Ben-Shlomo (2013) states that there are two types of sampling methods:

3.4.1 Probability sampling

Probability sampling involves random selection, allowing the researcher to make strong statistical inferences about the whole group. All the members have an equal opportunity to be a part of the sample with this selection parameter.

3.4.2 Non-probability sampling

Non-probability sampling involves non-random selection based on convenience or other criteria, which allows the researcher to easily collect data. This makes it difficult for all elements of a population to have equal opportunities and be included in a sample, but only those elements deemed to have exclusively vital and unique information were considered through the purposive or judgmental sampling technique.

3.5 Sampling techniques

3.5.1 Census technique

According to Kukutai (2014), census sampling/complete enumeration, involves collecting data from every member of a population. Census techniques involve data collection from all the population used for the research, which means that every single member of the population is used for data collection. The census sampling technique is used where information is collected from a few selected units of the population including Director, Managing Director, Accountants, Permanent Staff, Casual Labourers and the customers. Here the statistical investigation ensures complete (or 100%) enumeration or complete survey. This involved the collection of demographic data on gender, age of respondents, literacy levels and so on.

3.6 Sources of data collection

According to McMillan & Schumacher (2001), the common data collection methods include surveys, interviews (telephone, face-to-face or focus group), observations, focus groups, experiments, and secondary data analysis. The data collected through these methods can then be analyzed and used to support or refute research hypotheses and draw conclusions about the

study's subject matter. The researcher collected data through both primary and secondary data methods.

3.6.1 Primary data

Primary data means first-hand information collected by an investigator for the first time, is original and more reliable. For example using Questionnaires and Interviews enabled the researcher to obtain first hand information from respondents. The methods of collecting primary data were in form of direct personal investigation, interviews, and the Questionnaire was filled by respondents.

3.6.2 Secondary data

Secondary data refers to second-hand information; it was not collected by the researcher, but rather was obtained from already published or unpublished sources like dissertations, magazines, online reports, textbooks, and other accessible literature.

3.7 Data Collection Methods

To exhaustively obtain and collect data, questionnaires, interview, and documentary checklist methods were used.

3.7.1 Questionnaire

A questionnaire method involves the use of a self-administered questionnaire as a tool to collect primary data from respondents. A questionnaire is a set of written questions or statements to which the research subjects are to respond to provide data which are relevant to a research topic. The Questionnaires were structured with open ended questions, and were formulated from the objectives. Data collection began with administering of the research questionnaire to 95 respondents. The Questionnaires were accompanied by the introductory letter detailing the research study with a consent form and was signed by all respondents. Respondents were given ample time to fully fill the Questionnaire and there after researcher the researcher collected them back. The study used Questionnaire method because of the nature of the data which was collected sought for feelings and perceptions of respondents in regard to the study objective and the available time. The Questionnaire method also permitted collection of data from a relatively bigger population of respondents in a short period, was cheap to administer compared to other methods, and a more detailed data and individual experience were obtained.

3.7.2 Interview

According to George (2022) an interview is a qualitative research method that relies on asking questions in order to collect data. Interviews involve two or more people, one of whom is the interviewer asking the questions. There are several types of interviews, often differentiated by their level of structure. Structured interviews have predetermined questions asked in a predetermined order. The structured interview approach generated high response rates in the research since all questions were developed based on the subthemes of the study, and the respondents were asked to explain. In case an unclear answer was given, search for follow up information was done to allow the researcher acquire the best firsthand information.

This involved face to face discussion with specific respondents such as managers in relation to the study. An interview method had a rigorous set of questions in the interview guide as an instrument. The interview was used to get clear and more detailed information. This was used to clarify the data collected from questionnaires or document checklist, and add more information which was got from questionnaires. The interviewing took five working days as the schedule of two respondents was interviewed daily for forty minutes individually to ensure confidentiality even though all information was recorded for copy out in future. The advantage of using interview method was that it allowed on-spot explanations, adjustments and variation were introduced during data collection process. In addition, it gave respondents a chance to answer questions unlimitedly and flexibly, therefore it was an appropriate method to use to collect data.

3.7.3 Document Review

Document review method was used to collect secondary data. Under this method, the researcher reviewed documents to obtain recorded information that was related to the issue under investigation. The documents reviewed included reports and other already available related literature both in soft copy and hardy copy. This method was used because it enabled the researcher to access data at his convenient time, obtain data that is thoughtful in that the informants gave attention in obtaining them and enabled the researcher to obtain data in the language of the respondent (Oso and Onen, 2008).

3.8 Data collection tools/ Instruments

3.8.1 Self-administered questionnaire

The self-administered questionnaire was developed and delivered by the researcher to the respective respondents. The questionnaire guide contained questions seeking answers regarding

organizational culture and employee performance. Respondents were asked to fill the Questionnaires and the researcher picked them after they were full completed. The Questionnaire guide was used because it allowed greater uniformity in the way questions are asked, ensuring greater compatibility in the responses (Cooper and Schindler, 2006). The structured questions were anchored on a five-point Likert scale, where respondents were required to indicate their views on a scale of 1 to 5, and with 1representing Strongly disagree, 2 for Disagree, 3 for Not sure, 4 for Agree and 5 for Strongly agree.

3.8.2 Interview guide

An interview guide was used to collect data from key informants through face-to-face discussions which were conducted in English with respondents. The interview guide comprised structured questions drafted from the study sub-themes /objectives. The responses assisted in clarifying data collected by the structured questionnaire since it involved a face-to-face interaction and provides a wide range of views.

3.8.3 Document Review Check List

Document Review Checklist was a guide used by the researcher to review documents both in hard copy and electronic including reports and already available related literature.

3.9 Data Quality Control

Data collected was validated through validity and reliability to ensure accuracy and consistency. The data collection instruments were be tested to ensure validity and reliability.

3.9.1 Reliability

Middleton (2019) stated that reliability refers to how consistently methods of data collection measure something, and if the same result can consistently be achieved by using the same methods under the same circumstances, the measurement is considered reliable. Petty et al., (2009), reliability pertains to the consistency of measurements across time, instruments, and different observers. It is vital for ensuring that research results are replicable and trustworthy. High reliability indicates that the findings are stable and dependable, while low reliability raises concerns about the accuracy of the data collected.

Qualitatively the reliability of the data collection instruments was obtained through a pilot test to guarantee uniformity and independency and its capability to collect data that accurately answered the study objectives and which these answers were subjected to a reliability analysis. The reliability of the questionnaire was established by correlating the findings with other data sources. The study will use the Test-Retest Reliability, which is the extent to which this is

actually the case for example a measure that produces highly inconsistent scores over time cannot be a very good measure of a construct that is supposed to be consistent.

3.9.2 Validity

Amin (2015) define validity as to the honesty of the conclusions or the degree a research instrument is applicable in evaluating the intended purpose. According to Middleton (2019), validity refers to how accurately a method measures what it is intended to measure, so if research has high validity that means it produces results that correspond to real properties, characteristics, and variations in the physical or social world. High reliability is one indicator that a measurement is valid, so if a method is not reliable, it probably is not valid, but if it is valid, the method is reliable.

Under this study, the validity index was calculated by the assistance of the research supervisor to evaluate the validity of the instruments. This was calculated using the formula.

$$C.V.I=\frac{Numberofitemsrelevant}{Totalnumberofitemsinquestionnaire}X100$$

$$CVI=\frac{30}{33}\ X\ 100$$

CVI= 90.9%

According to Amin (200), a CVI above 0.7 (70%) suggests that a research instrument is binding. This recommended that all questions used to evaluate the study variables was appropriate in gagging the intended and thus the tools were considered binding if the constant determination is 0.7 and above.

According to Heale and Twycross (2015), Construct validity refers to whether one can draw inferences about test scores related to the concept being studied. Correlations were conducted to determine the extent to which the different instruments measure the same variable.

3.10 Data Presentation and Analysis

According to Kombo & Tromp (2006) data analysis is done to prepare primary data for presentation and statistical reference. Raw data collected will be processed by editing, coding, classification and tabulated to be analyzed. A qualitative analysis was used to analyze data, according to Cohen (2016), qualitative data analysis comprises of accounting and organizing for collected data in a manner that make sense to respondent's definition of themes, noting patterns

and situations. According to Oso and Onen (2008), data presentation is a process of comparing two or more data sets with visual aids, such as graphs and tables.

Adesina (2022) wrote that data analysis tools used for analyzing the raw data which must be processed further, therefore, the processes or analyzing data usually helps in the interpretation of raw data and extracts the useful content out of it. Oso and Onen (2008) noted that the transformed raw data assists in obtaining useful information. And using keywords from the literature helped the study to contextualize data analysis in empirical studies, which enabled the researcher to link between study variables. Data analysis concentrated on responding to the study question based on the study data to be collected from all the data collection methods which were deployed. The analyzed data was interpreted and presented in frequency tables.

3.11 Ethical Considerations

Honesty: The researcher avoided making fabricating or mis-presenting study information to endorse the integrity and evade errors. Similarly, plagiarism system was used to avoid plagiarism cases in the study.

Informed consent: The researcher considered the research values of voluntary participation and protection of respondents from any possible harm.

Anonymity: The researcher interviewed the respondents individually to ensure that respondents' privacy was protected.

Confidentiality: The study protected intimate information such as institution's reports. And where necessary verbal assurance was given to respondents that recorded information was under no conditions going to be given over to their research supervisors.

3.12 Limitations and delimitations of the Study

a) Some of the respondents were initially reserved with information, but when they confirmed that the research was purely for academic purposes, they gave out the necessary information necessary for the research work.
b) Time allocated for this research was relatively short. However, the little time that was available for research was planned and fully utilized to gather as much relevant data as possible in order to come up with a reliable report.
c) Dissertation needs funding for transportation, stationeries, accommodation, feeding and others which was a constraint to the researcher. The problem was solved by the

researcher utilizing a small sample size to able to collect and analyze much data at a minimal cost.

d) Some respondents did not return the questionnaires in time, while others were not willing to take part in the study. The researcher solved this limitation by parallel using secondary data in order to close the gaps.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATIONS OF FINDINGS

4.0 Introduction

This chapter focuses on the presentation, analysis and interpretations of findings about the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security. The researcher obtained data from 95 respondents about their variables, the relationship between screening of originating passengers and aviation security, the relationship between Access control and aviation security and the measure of the influence of compliance on aviation security at Entebbe International Airport.

4.1 Demographic characteristics of the respondents

In research personnel characteristics of respondents have very significant role to play in expressing and giving the responses about the problem, keeping this in mind, in this study a set of respondents' background information namely, the gender, marital status, age groups, level of education and others, the details are presented, analyzed and interpreted below;

4.1.1 Gender of respondents

The study findings on the respondents' gender are presented in Table 4.1;

Table 4.1: Gender of the respondents

		Frequency	Percent	Cumulative Percent
Valid	Male	62	65.3	65.3
	Female	33	34.7	100.0
	Total	95	100.0	

Source: Primary data, 2025

The study findings regarding the gender of respondents revealed that 65.3% of the respondents were males and 34.7% were females. There were more male respondents because most of the officers at Entebbe International airport offices are males while also males were more willing to take part in the study. However, despite this difference in gender composition of the respondents, all respondents availed data viable for this study.

4.1.2 Age Group of the respondents

The study findings on the Age Group of the respondents are presented in Table 4.2;

Table 4.2: Age Group of the respondents

		Frequency	Percent	Cumulative Percent
Valid	20 – 29 years	28	29.5	29.5
	30 – 39 years	31	32.6	62.1
	40 – 49 years	26	27.4	89.5
	50 years +	10	10.5	98.9
	Total	95	100.0	

Source: Primary data, 2025

Findings in table 3.4 below represents the age groups of the respondents, where 28(29.5%) were between 20-29 years, 31(32.6%) were between 30-39 years, 26(27.4%) were between 40-49 years and 10(27.4%) were between 50 years and above. Most of the respondents were from the age of 30-39 years. The study revealed that all respondents were mature enough to give enough and accurate information which enabled the researcher to obtain valuable data for this study.

4.1.3 Level of education

The study findings on the level of education of respondents are presented in Table 4.3;

Table 1.3: Level of education

		Frequency	Percent	Cumulative Percent
Valid	Certificate	27	28.4	28.4
	Diploma	24	25.3	53.7
	Degree	38	40.0	93.7
	Masters and above	6	6.3	100.0
	Total	95	100.0	

Source: Primary data, 2025

In relation to the table 4.3 below, it was established that the education level attained by the respondents at Entebbe International Airport, and their responses were; 27(28.4%) had attained certificates these include Uganda Advanced Certificate of Education (UACE) and other forms of certificates), 24(25.3%) had diplomas as their highest level of education, 38(40%) had bachelor degree holders, and 6(6.3%) had masters degree holders and more. The study revealed that the

respondents' clearly understood and interpreted the questionnaire contents effectively, hence providing relevant information for the study.

4.1.4 Department of the respondents

The findings on the department from where the respondents are based are presented in Table 4.4;

Table 4.4: Department of the respondents

		Frequency	Percent	Cumulative Percent
Valid	Management	9	9.5	9.5
	Executive	9	9.5	18.9
	Accounting and Finance	17	17.9	36.8
	Human Resource	21	22.1	58.9
	Aviation Security	17	17.9	76.8
	Fire and rescue	22	23.2	100.0
	Total	95	100.0	

Source: Primary data, 2025

According to the table 4.4 below, the study found out that, 9(9.5%) were in management department, 9(9.5%) were executives, 17(17.9%) worked under accounting and finance, 21(22.1%) were under human resource department, 17(17.9%) were from Aviation Security department and 22(23.2%) were from Fire and Rescue. This implies that, the questionnaires were adequately distributed, hence providing relevant information necessary to the study.

4.1.5 Years of experience

The study findings on the years of experience of respondents in the operations of the Airport are presented in Table 4.5;

Table 4.5: Years of experience

		Frequency	Percent	Cumulative Percent
Valid	0-1 year	19	20.0	20.0
	2 - 3 years	42	44.2	64.2
	4 - 5 years	27	28.4	92.6
	5 years +	7	7.4	100.0
	Total	95	100.0	

Source: Primary data, 2025

Regarding the years of experience, the study found out that 20.0% of the respondents had served at the Airport for 0 to 01 year, 44.2% had served for 2 to 3 years, 28.4% had served for 4-5 years and 7.4% had served for 5 years and more. Most respondents had served for 2 to 5 years, and because they do work which brings various aviation experiences ranging from handling airport matters to large scale and high profile cases like aviation security, prevent any acts of terror and respond when it becomes necessary. So they had acquired wide experience to avail relevant data for this study.

4.2 Findings on the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security

Before, aviations implemented various security measures, and in the wake of the 9/11 attacks, governments in the United States (US) and elsewhere in the world implemented additional aviation security measures. Although the rhetoric of risk-assessment is often heard, actual policy was driven to reassure frightened populations that air travel was still safe. The challenge in dealing with insecurity including investing the scarce resources to maximum benefit. This inevitably requires difficult choices, including risk assessment which provided an essential framework for making such choices and be applied more consistently to aviation security under International Civil aviation Organization (ICAO) and International Air Transport Association (IATA). The aim is to assist airlines by simplifying processes and increasing passenger convenience while reducing costs and improving efficiency. The intention helps airlines to operate safely, securely, efficiently and economically under clearly defined rules. Airport security has evolved dramatically over the years, leading to various types of airport security systems being implemented worldwide. These security measures begin before passengers enter the airport terminal and continue until they board their flights. Airports now employ advanced tools to detect and prevent threats, including X-ray machines, metal detectors, full-body scanners and explosive detection devices. The findings on the relationship between screening of originating passengers and aviation security, the relationship between access control and aviation security and the measure of influence of compliance on aviation security at Entebbe International Airport.

4.2.4 The relationship between screening of originating passengers and aviation security at Entebbe International Airport

The study findings on the relationship between screening of originating passengers and aviation security at Entebbe International Airport are presented, analysed and interpreted below;

4.2.1 Passenger traffic through Entebbe International Airport between 1991 and 2024

Secondary data provided by Uganda Civil Aviation Authority (2025) revealed that since 2002, international passenger traffic at the airport has increased annually, except for 2009 when the Great Recession caused a small decline and 2014. During the period between 1 January 2024 and 30 June 2024, EBB handled a total of 1,069,224 international passengers (527,692 arrivals and 541,532 departures). During the same period the airport handled 32,794 metric tons of cargo of which 22,380 metric tons were exports and 10,414 metric tons were imports.

Table 4.6: Showing passenger traffic through Entebbe International Airport between 1991 and 2024

Year	Passengers	Difference
1991	118,527	
1992	130,704	+10.3%
1993	148,502	+13.6%
1994	191,706	+29.1%
1995	254,335	+32.7%
1996	296,778	+16.7%
1997	326,265	+9.9%
1998	334,681	+2.6%
1999	344,686	+3.0%
2000	343,846	-0.2%

2001	343,722	0.0%
2002	362,075	+5.3%
2003	416,697	+15.1%
2004	475,726	+14.2%
2005	551,853	+16.0%
2006	643,330	+16.6%
2007	781,428	+21.5%
2008	936,184	+19.8%
2009	929,052	–0.8%
2010	1,023,437	+10.2%
2011	1,085,609	+6.1%
2012	1,238,536	+14.1%
2013	1,343,963	+8.5%
2014	1,332,499	-0.9%
2015	1,390,000	+4.3
2016	1,420,000	+2.2%
2017	1,650,000	+16.2%
2018	1,840,264	+11.5%
2019	1,980,000	+7.6%

2020	565,541	-71.4%
2021	941,688	+66.5%
2022	1,574,405	+67.2%
2023	1,930,000	+22.6%
2024	2,243,104	+16.1%

Source: Uganda Civil Aviation Authority, 2015

According to the study, it was revealed that since 1991, the number of originating passengers has been rising, meaning that even their hand baggage and cargo have been increasing. Similarly, the number of passengers generally has been rising, although in 2020 when Covid-19 struck and caused temporary closure of the airport/ flights, there has been a steady rise in the number of originating passengers.

4.2.2 The various types of Airport Security

The data presented in this sub-section was obtained through interviews and from secondary sources. It is thematically presented, analyzed and interpreted in here;

According to respondents, Entebbe International Airport is a bustling hub of activity, serving as a gateway for thousands of passengers and their baggage daily. However, with increased air travel comes the need for robust airport security measures to keep the airport, passengers, cargo/baggage and crews' safe at all times. Entebbe International Airport Expansion: Airport Technology (2018) revealed that in order to ensure better uncompromised security at the airport, AVSEC (Aviation Security) undertakes a number of screening and surveillance programmes namely passenger pre-board screening, hold baggage screening, non-passenger screening, use of Closed-circuit television (CCTV) also known as video surveillance, security bollards as well as undertaking routine and call-in or unscheduled, maintenance checks.

Passenger pre-board screening

The researcher was informed that there are always as a must the pre-board screening activities which are a vital security check in airport operations and serves as the first line of defense against potential threats. According to respondents,

The passengers are screened using metal detectors and X-ray equipment at various airport security checkpoints as they prepare and go through the routine checks when they are preparing to board the aircrafts. This is intended to ensure that no prohibited passengers and items make it onboard as it would jeopardize the life of the passengers and the crew as well as cause destruction of the aircraft.

According to Uganda Civil Aviation Authority (improved in 2020) regulations pertaining to screening, the screening procedures often include pat-down procedures which are used to determine if prohibited items or other threats to aviation transportation security are concealed on the passenger who intends to board a flight. Further, there are also handheld metal detectors and explosives trace detection. These are used during check-in where the passengers must present valid identification and boarding passes. Further still, immigration and visa verification are also conducted to confirm they can leave Uganda for another country. In addition, the carry-on items undergo X-ray scanning to detect whether or not there are prohibited objects. Respondents revealed that this comprehensive approach highlights how airport security screening is essential to keeping flights safe. Furthermore, the pre-boarding screenings also apply to personal carry-ons or baggage, whereby passengers' items are scanned by X-ray machines to look for any prohibited objects that may not be or are not allowed on the plane (s) or in the airport area.

Hold baggage screening

In the Uganda Civil Aviation Authority (improved in 2020) regulations, it is well stipulated as in practice that the hold baggage security screening (HBSS) system takes a multi-pronged approach to security to check passengers' bags for prohibited items before they board the plane. The researcher was further informed that all checked bags are thoroughly inspected before passengers go through security checkpoints or gates or desks before the passenger eventually boards. Ina addition, the X-ray, computer tomography (CT), and explosive detection systems (EDS) screening used on passenger baggage are also used on checked luggage, and a physical search is conducted where necessary. Then after the baggage is thoroughly checked, it is taken to the aircraft.

Non-passenger screening

According to the Uganda Civil Aviation Authority (improved in 2020) regulations and the modulus operandi, there is non-passenger screening which applies to all airport personnel

accessing restricted areas such as pilots, flight attendants, baggage handlers, caterers, maintenance crews and other authorized staff. According to respondents,

> *non-passengers mentioned in here undergo random checks and must clear security checkpoints using the walk-through metal detectors, full-body scanning (scanners), hand-held metal detectors, explosives trace detection devices as well as pat-downs and physical inspections on their bodies and their luggage.*

Respondents revealed that,

> *these thorough measures are critical components of airport security procedures, guaranteeing that all individuals within airport premises adhere to these strict security protocols.*

Closed-circuit television (CCTV), also known as video surveillance

At Entebbe International Airport, modern security systems currently rely on heavily engaged closed-circuit television technology for comprehensive surveillance of the interior and exterior. The closed-circuit television cameras are installed throughout the terminals, walking allays, parking areas and restricted zones, allowing security teams to monitor all activities for 24hours and days, throughout (24/7). The researcher discovered that the technology behind Closed-circuit television systems has greatly improved as nowadays, the airport has obtained and installed models which have autonomous facial recognition capabilities. These smart Closed-circuit television systems are suited for the airport, which is a common point of departure. The system is used to monitor suspicious human movements, behaviours and any other suspicious individuals and activities, then notify authorities of their movements and whereabouts so that the Aviation security personnel, army and police can necessarily intervene.

According to the Uganda Civil Aviation Authority (improved in 2020) regulations, there is a strict system for aircraft to be properly maintained, repaired, overhauled, and inspected as time goes on. The Uganda Civil Aviation Authority sets this system in place following ICAO rule and regulations. It is up to airlines and other aviation operators to implement the system and ensure it is being followed because failure, there are consequences. Preventing damage to aircraft and working to keep that aircraft flying safely is what is aimed at.

Security bollards

Nearly all major airports in the world have roadways leading to and around the terminal. However, some areas of the airport are off-limit to unauthorized vehicles for safety reasons.

Bollards and barriers are installed at the airport's entrances and around its terminals to restrict vehicle traffic and prevent hostile vehicle attacks. In line with the findings, Weed (2020) noted that security bollards are also used in many airports to prevent unauthorized vehicle access into aircraft hangars, and warehouse floors and to keep cars off runways. There are two types of security bollards: permanent and collapsible. Collapsible bollards are integrated with third-party apps and use Identification (ID) passes to allow appropriate access when required.

The airport security is a complex, multi-layered system requiring meticulous planning, constant updates, and coordination of multiple airport security measures. Schneier (2004) warned that relying on just one security method is insufficient, but integrating all types ensures maximum protection. Moreover, the airport adapts to evolving threats in the aviation industry by investing in innovative airport security systems and consulting with security experts to identify improvements and minimize risks.

4.2.3 The key elements of aviation security at the Airport

The researcher discovered the key elements of aviation security at Entebbe International Airport, whereby people were identified as the first line including trained and competent personnel, who from the time of recruitment and orientation are equipped with the necessary knowledge and skills which make them essential for implementing and maintaining security procedures; further, processes which are clear and effective including screening procedures, access control as well as emergency response plans which are very critical to aviation security, and thirdly the equipment which involves reliable security equipment such as screening devices and surveillance systems which are necessary for effective security operations in all areas and spots of the Airport.

Table 4.7: The screening devices consist of aviation security technology and/or airline personnel details

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	16	16.8	16.8
	Disagree	15	15.8	32.6
	Not Sure	12	12.6	45.3
	Agree	43	45.3	90.5
	Strongly Agree	9	9.5	100.0
	Total	95	100.0	

Source: Primary data, 2025

Knowing that originating passengers are those Airline passengers for whom the Airport is the point of origin in their air travel itinerary, the findings revealed that 16.8% of the respondents

strongly disagreed, 15.8% disagreed, 12.6% were not sure, 45.3% agreed and 9.5% strongly agreed. Although 32.6% disagreed, 54.8% agreed that there are various classified and non-classified security gadgets that are used for screening passengers so that they do not carry contraband and any harmful or unauthorized materials or equipment from Entebbe International Airport. The examples of devices include metal detectors, explosive detection systems, use of the canine unit (dogs) and hand searches by airport security officials, known as Aviation Security (AVSEC). The device capacity is an integrated upper limit of how many passengers or bags can be processed by a device in a given period of time. In order to be more effective, some detectors are determined as a risk group (a pre-assigned subset of devices through which a passenger may be processed before boarding an aircraft). Further, there is use of the computer-aided passenger prescreening system which assigns each passenger an assessed threat value, which quantifies the risk associated with the characteristics of the passenger, with the threat values varying between zero and one. Being a highly sensitive security border post or centre in the international aviation, the screening devices consist of aviation security technology and/or airline personnel details so that they can capture and report the exact information about passengers.

Table 4.8: There is effective Transportation Security Administration (TSA) screening at the airport

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	11	11.6	11.6
	Disagree	12	12.6	24.2
	Not Sure	8	8.4	32.6
	Agree	39	41.1	73.7
	Strongly Agree	25	26.3	100.0
	Total	95	100.0	

Source: Primary data, 2025

Emerging as one of the for legislatively mandated aviation security protocols after the September 11th attack on United States (New York), Transportation Security Administration (TSA) screening has become popular at the airport, whereby 67.4% of the respondents agreed that currently, under strict and conscious approach, passengers and their carry-on baggage are

screened to ensure prohibited items such as knives, firearms, incendiary devices, weapons, dangerous goods, explosives, and other threat items are not carried onto the aircraft. Although 24.2% disagreed stating that sometimes cases of smuggling ivory, gold and drugs have been reported to have been successful, but at Entebbe International Airport, all originating passengers must go through this screening before boarding a flight. This includes going through a metal detector or full-body scanner as well as having carry-on bags and personal items scanned, and potentially being subject to a pat-down search. This is to ensure that only eligible persons and baggage are allowed on to the flight. This minimizes the omen of hijacks, arson, suicide and use of improvised explosions on board the aircraft when it is airborne. The fear that originating passengers can be used in smuggling drugs and the contraband also makes it necessary to have them thoroughly checked so that there is assured safety on the flight.

Table 4.9: Transportation Security Administration uses millimeter wave advanced imaging technology and walk-through metal detectors to screen passengers

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	11	11.6	11.6
	Disagree	15	15.8	27.4
	Not Sure	12	12.6	40.0
	Agree	41	43.2	83.2
	Strongly Agree	16	16.8	100.0
	Total	95	100.0	

Source: Primary data, 2025

The study findings in table 4.8 revealed that Transportation Security Administration is intended for through body and baggage check, thus 60.0% agreed that it (TSA) uses millimeter wave advanced imaging technology and walk-through metal detectors to screen passengers. Many refer to them as X-rays because of their ability to thoroughly eye with optics whatever could be carried in the baggage, including micro-materials. The millimeter wave advanced imaging technology safely screens passengers without physical contact for metallic and non-metallic

threats, including weapons and explosives, which may be concealed under clothing. Passengers are screened using metal detectors and X-ray equipment at airport security checkpoints, ensuring no prohibited items make it onboard. This has ensured augmented security for and in regard to originating passengers so that they travel as customers and not threats to the aviation security (AVSEC) and the security of the countries they intended to visit.

Table 4.10: Baggage screening security device deployment involves the allocation of baggage screening security devices and the assignment of selectee baggage

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	15	15.8	15.8
	Disagree	14	14.7	30.5
	Not Sure	7	7.4	37.9
	Agree	38	40.0	77.9
	Strongly Agree	21	22.1	100.0
	Total	95	100.0	

Source: Primary data, 2025

Results of the study on whether baggage screening security device deployment involves the allocation of baggage screening security devices and the assignment of selectee baggage, 15.8% of the respondents strongly disagreed, 14.7% disagreed, 7.45 were not sure, 40.0% agreed and 22.1% strongly agreed. Thus with 62.1% in agreement, it means that the baggage screening security device deployment involves the allocation of baggage screening security devices and assignment of selectee baggage that should be screened for the set of flight segments especially one that is a source of suspicion between Entebbe International Airport and other airports, at a flight segment or flight takeoff and landing of the aircraft from Entebbe Airport to another (destination). Using the following illustration, secondary data revealed that the takeoff and landing of an aircraft from Airport A (for example Entebbe International Airport) to Airport B (for example Dubai International Airport, UAE) with no intermediate stops counts as a single flight. Further, relating to secondary sources, it was revealed that a selectee is said to be on a direct route if his flight path and is composed of one flight segment or on a connecting route if his flight path is composed of two or more flight segments. Indeed, the findings reveal that all

baggage screening occurs at origin at Entebbe International Airport, as no baggage is screened in transit along a connecting route. Therefore, it is agreeable that baggage screening security device deployment involves the allocation of baggage screening security devices and the assignment of selectee baggage.

Table 4.11: There is multilevel screening to capture the false and true or clear rate associated with various flagged threats by the aviation security procedures

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	16	16.8	16.8
	Disagree	15	15.8	32.6
	Not Sure	12	12.6	45.3
	Agree	43	45.3	90.5
	Strongly Agree	9	9.5	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings of the study revealed that 16.8% of the respondents strongly disagreed, 15.8% disagreed, 12.6% were not sure, 45.3% agreed and 9.5% strongly agreed. This means that 54.8% agreed that there are multilevel screenings to capture the false and true or clear rate associated with various flagged threats by the aviation security procedures. Using the human security, artificial intelligence, canine and other remote sensing technologies, these multilevel screening problems capture the false and clear rate associated with a false clear which represents an event where a passenger who represents a threat is not flagged by the aviation security procedures, but can be used as a lead to get to the root of the problem. Further, the false clear rate is the proportion in both the short and long-run process where passengers who represent a threat that are cleared by aviation security procedures as a bait to capture contraband and unacceptable business. And using the following example drawn from secondary sources and assimilated to probable reality at Entebbe International Airport,

> *"…….suppose that the aviation security procedures use a single device in the following way where the device screens each passenger twice, and passengers are allowed to board*

only if they are cleared both times, when an alarm is sounded by the first pass through the device, the passenger is not screened a second time. The device has a false clear rate of 0.10 and a false alarm rate of 0.05. Assume that there is independence between each pass through the security device, that is whether an alarm sounds during the first pass through is not correlated with whether the alarm sounds on the second pass through…first, the passengers who are a threat will be considered".

The probability that they will pass the security procedures is determined by whether or not they are cleared by both passes through the security devices. This is equivalent to

= (Probability cleared on first pass) (Probability cleared on second pass)

= (0.10)(0.10) = 0.01

In other words, the procedure has an overall false clear rate of 1%, which means that 99% of passengers who are a threat will be flagged by the security procedures. This overall false clear rate is much lower than the false clear rate of the device by itself.

Now the passengers who are not a threat will be considered. They are flagged by security if they either are flagged on the first pass, in which case they will not be screened by the device a second time or they are cleared on the first pass and flagged on the second pass.

This is equivalent to

= (Probability flagged on first pass) + (Probability cleared on first pass)(Probability flagged on second pass

= 0.05 + (1-0.05)(0.05) = 0.0975

In other words, the overall false alarm rate is 9.75%, almost twice as large as the individual false alarm rate. In other words, 90.25% of passengers who are not a threat pass the security procedures.

This multilevel screening to capture the false and true clear rate associated with various flagged threats by the aviation security procedures is crucial in ensuring that human security, artificial intelligence and remote sensing technologies which threaten any charlatans, impostor and

threats. Hence, multilevel screening is crucial for betterment of aviation security at Entebbe International Airport.

Table 4.12: The partial baggage screening problems address how to deploy a certain number of explosive detection system to screen already checked baggage in order to minimize the risk associated with the unscreened bags

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	11	11.6	11.6
	Disagree	12	12.6	24.2
	Not Sure	7	7.4	31.6
	Agree	53	55.8	87.4
	Strongly Agree	12	12.6	100.0
	Total	95	100.0	

Source: Primary data, 2025

According to the study, 11.6% of the respondents strongly disagreed, 12.6% disagreed, 7.4% were not sure, 55.8% agreed and 12.6% strongly agreed that there exists an explosive detection system which includes automatic detection, using the necessary computer hardware and software to monitor passenger and baggage movement, orienting and positioning equipment, calibration methods, and maintenance procedures to ensure that any unwanted material and equipment, and persons are easily detected and apprehended where necessary. Further, secondary sources show that the partial baggage screening problems address how to deploy a certain number of explosive detection systems to screen some checked baggage in order to minimize the risk associated with the unscreened bags. In this case, the researcher found out that these security performance measures identified work in conjunction with the Federal Aviation Administration responsible for the regulation and oversight of civil aviation as well as operation and development of the national airspace system for quantifying risk and measuring baggage screening security device utilization for a given set of flights carrying both selectee and non-selectee passengers under the uncovered flight segment, the uncovered passenger segment and the uncovered baggage segment. For example suppose that for a given Airport station, there are three departing flights, each to a distinct destination. Moreover, suppose that the number of passengers and selectee bags

on these flights is Flight 1: 100 passengers, 5 selectee bags Flight 2: 40 passengers, 2 selectee bags Flight 3: 20 passengers, 1 selectee bag. Therefore, depending on which measure is chosen, the security of the system can be determined to be optimal. The findings therefore revealed that the partial baggage screening problems address how to deploy a certain number of explosive detection system to screen already checked baggage in order to minimize the risk associated with the unscreened bags.

Table 4.13: Baggage screening security devices and operations at the airport provides an important defense against terrorist actions targeted at commercial aircraft

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	17	17.9	17.9
	Disagree	15	15.8	33.7
	Agree	48	50.5	84.2
	Strongly Agree	15	15.8	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings on whether baggage screening security devices and operations at the airport provides an important defense against terrorist actions targeted at commercial aircraft revealed that 17.9% of the respondents strongly disagreed, 15.8% disagreed, 50.5% agreed and 15.8% strongly agreed; thus with 66.3% in agreement implies that the baggage screening security devices at Entebbe International Airport provide an important defense against terrorist actions targeted at commercial aircraft as they offer real time and faster detection capacities.

Table 4.14: The baggage screening security device deployment problem are defined using the Uncovered Baggage Segments (UBS), Uncovered Flight Segments (UFS), and Uncovered Passenger Segments (UPS) performance measures

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	9	9.5	9.5
	Disagree	15	15.8	25.3
	Not Sure	10	10.5	35.8
	Agree	49	51.6	87.4
	Strongly Agree	12	12.6	100.0
	Total	95	100.0	

Source: Primary data, 2025

The results revealed that 9.55 of the respondents strongly disagreed, 15.8% disagreed, 10.5% were not sure, 51.6% agreed and 12.6% strongly agreed, that the model favoured for baggage screening at Entebbe International airport aviation security deployment is categorized under Uncovered Baggage Segments (UBS), Uncovered Flight Segments (UFS), and Uncovered Passenger Segments (UPS) which perform as measures to handle individual baggage screening have been effective in ensuring that baggage screening capacity is in place, screening devices operate well at the airport for each of the departing flights, the direct originating selectee bags on each flight are well screened, the connecting originating selectee bags on each flight are well screened, and a proper baggage screening security device allocation budget is in place. This helps to optimally determine where to assign the different baggage screening security devices and all the selectee baggage to screen.

Table 4.15: There is much selectee baggage to screen on flights at Entebbe International Airport as it provides hub airport services

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	13	13.7	13.7
	Disagree	18	18.9	32.6
	Not Sure	8	8.4	41.1
	Agree	44	46.3	87.4
	Strongly Agree	12	12.6	100.0
	Total	95	100.0	

Source: Primary data, 2025

In the great lakes region, with such volatility and Uganda playing a central role in its security architecture, it is crucial to know that there is need for very careful screening of all passengers, baggage and cargo that goes through Entebbe International airport. Therefore, with 58.9% of the respondents in agreement, it means that at the airport all peak hours coincide so that any selectee bags and cargo onto a flight has to be checked thoroughly. It also has to be remembered that in practice, a transferring selectee bag at Entebbe International Airport may originate from any airport and transfer through Entebbe airport. Specifically, a bag can transfer from one airport to Entebbe Airport where it would require careful screening to ensure safety and security.

4.2.2 The relationship between access control and aviation security at Entebbe International Airport

A smooth-running security management and access control system must prevent manipulations that could be dangerous to airport security, passengers, or aviation safety. Smooth operations are guaranteed at all times even with high passenger volumes. The study findings on the relationship between access control and aviation security at Entebbe International Airport are presented, analyzed and interpreted here;

Table 4.16: The airport access control system requires an all-encompassing infrastructure to function effectively and efficiently

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	10	10.5	10.5
	Disagree	9	9.5	20.0
	Not Sure	12	12.6	32.6
	Agree	43	45.3	77.9
	Strongly Agree	21	22.1	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings in table 4.15 revealed that 10.5% of the respondents strongly disagreed, 9.5% disagreed, 12.6% were not sure, 45.3% agreed and 22.1% strongly agreed. Although 20.0% disagreed, the fact is that with majority in agreement (67.4%), it is true that the airport needs physical security barrier such as Aviation Police Officers and Constables, personnel, Information and Communications professionals and experts to manage computerized security systems, Canine Units, fast call centers, barricades, barbered wires and other physical barriers as well as surface and air reconnaissance support to control access so that only authorized personnel can access certain parts of the Airport. Therefore it is right to state that the access control system requires an all-encompassing infrastructure to function effectively and efficiently.

Table 4.17: Access control entails controlling admittance to certain parts of the airport and tracking the movement of persons throughout the airport

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	15	15.8	15.8
	Disagree	19	20.0	35.8
	Not Sure	8	8.4	44.2
	Agree	42	44.2	88.4
	Strongly Agree	11	11.6	100.0
	Total	95	100.0	

Source: Primary data, 2025

Aviation security should not end at checking those originating passengers and their baggage, but rather ensuring that the entire airport is under proper surveillance at all times. Findings therefore show that 15.8% of the respondents strongly disagreed, 20.0% disagreed, 8.4% were not sure,

44.2% agreed and 11.6% strongly agreed. Much as 35.8% disagreed, 55.8% agreed that access control entails controlling admittance to certain parts of the airport, whereby some are only accessible to only authorized staff or personnel for example the security offices, while only people of certain ranks are authorize to reach certain installations like Diplomat way, the areas were weapons are stored (armory), cargo stores and warehouses, ensuring also that there is tracking of the movements of all persons throughout the airport using camera surveillance and human surveillance. This guarantees that security challenges are indentified early in time and can be diffused, as well as having robust contingency programmes in place all the time for example Fire and rescue services.

Table 4.18: By ensuring that users only have access to what they need to perform their job functions, organizations can minimize the risk of internal threats and accidental data leaks

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	15	15.8	15.8
	Disagree	13	13.7	29.5
	Not Sure	7	7.4	36.8
	Agree	39	41.1	77.9
	Strongly Agree	21	22.1	100.0
	Total	95	100.0	

Source: Primary data, 2025

According to the findings, 15.8% of the respondents strongly disagreed, 13.7% disagreed, 7.4% were not sure, 41.1% agreed and 22.15 strongly agreed. Although 29.5% disagreed, 63.2% agreed that the airport users only have access to what they need to perform their job functions for example tools from the stores, information support, organizations can minimize the risk of internal threats and accidental data leaks. Here the system is kept under lock and key where only the supervisors and authorized staff are allowed to access certain points and premises. And additionally, authorization helps in enforcing compliance with security policies and regulatory requirements at all times at this sensitive installation.

Table 4.192: Access control keeps confidential information such as customer data and intellectual property from being stolen by bad actors or other unauthorized users

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	12	12.6	12.6
	Disagree	6	6.3	18.9
	Not Sure	9	9.5	28.4
	Agree	44	46.3	74.7
	Strongly Agree	24	25.3	100.0
	Total	95	100.0	

Source: Primary data, 2025

The results of the study revealed that 12.6% of the respondents strongly disagreed, 6.3% disagreed, 9.5% were not sure, 46.3% agreed and 25.3% strongly agreed. The findings show that much as 18.9% of the respondents disagreed, 71.6% agreed which mean that indeed access control keeps confidential information such as customer data and intellectual property from being stolen by bad actors or other unauthorized users who would use the opportunity to hack into the computer systems or steal micro chips, computers, airlines data and support data exfiltration by employees and keeps web-based threats at bay. Thus, access control keeps confidential information such as customer data (for airlines and clients) and intellectual property from being stolen by bad actors or other unauthorized users.

Table 4.20: The airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	23	24.2	24.2
	Disagree	9	9.5	33.7
	Not Sure	13	13.7	47.4
	Agree	24	25.3	72.6
	Strongly Agree	26	27.4	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings revealed that 24.2% of the respondents strongly disagreed, 9.5% disagreed, 13.7% were not sure, 25.3% agreed and 27.4% strongly agreed. Although 33.7% disagreed and 13.7% were not sure, 52.7% agreed that the airport access control system employs an array of

authentication techniques to confirm a person's identity before allowing them into restricted airport sections. This includes the use of sign in using the Biometric System by all companies for their staff, the use of Personal Tags and Identification Cards and Passes, periodic renewal of identification cards and passes and so on. Every rare and open public areas has certain access control identification and authorization such as VIP, VVIP, Cargo, aircraft and so on. Since the airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections as such.

Table 4.21: Access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	20	21.1	21.1
	Disagree	10	10.5	31.6
	Not Sure	8	8.4	40.0
	Agree	32	33.7	73.7
	Strongly Agree	25	26.3	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings on whether access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry revealed that 21.1% of the respondents strongly disagreed, 10.5% disagreed, 8.4% were not sure, 33.7% agreed and 26.3% strongly agreed. Although 31.6% disagreed and 8.4% were not sure, 60.0% agreed that access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry, and these include Cameras, Radar system, Radiosons for weather and climate communication, Walkie Talkies and mobile cellular phones are all used to monitor the interior and the exterior of the Airport facilities.

Table 4.223: The airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	13	13.7	13.7
	Disagree	19	20.0	33.7
	Not Sure	5	5.3	38.9
	Agree	44	46.3	85.3
	Strongly Agree	14	14.7	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings revealed that 13.7% of the respondents strongly disagreed, 20.0% disagreed, 5.3% were not sure, 46.3% agreed and 14.7% strongly agreed, meaning that the airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access. For example at the VIP and VVIP, there are physical barriers erected to stop any unauthorized access to the place/area, also as one drives in into the airport, there are security check points where all movements are monitored and unauthorized accessed stopped, cargo areas is not accessed easily, and it is quite hard for civilians to access the Old Airport. All this is done to keep the airport secured at all times. Hence, it is clear that the airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access.

Table 4.23: The airport has its access control system's integrity reinforced by human security barriers that impede unauthorized access

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	13	13.7	13.7
	Disagree	19	20.0	33.7
	Not Sure	5	5.3	38.9
	Agree	44	46.3	85.3
	Strongly Agree	14	14.7	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings revealed that 13.7% of the respondents strongly disagreed, 20.0% disagreed, 5.3% were not sure, 46.3% agreed and 14.7% strongly agreed. This means that although 33.7% of the respondents disagreed, 61.0% agreed that indeed, the airport has its access control system's

integrity reinforced by human security barriers that impede unauthorized access. These include uniformed soldiers and police officers, plain clothed soldiers, Uniformed AVSEC (Aviation Security) Operatives and other unrecognized security officers as well as private company security like Saracen, who are all employed by the state and private organizations to secure their installations and ensure that the Airport is free from any insecurity. So it is right to state that the airport has its access control system's integrity reinforced by human security barriers that impede unauthorized access.

4.2.3 The measure of influence of compliance on aviation security at Entebbe International Airport

According to Luo (2022), compliance with aviation security regulations is crucial for maintaining a safe and secure operating environment. Non-compliance can create vulnerabilities, potentially leading to security breaches and endangering passengers and personnel. Regular inspections, audits, and enforcement activities, alongside robust security programs and risk assessments, are essential for measuring and ensuring compliance. The study findings on the measure of influence of compliance on aviation security at Entebbe International Airport are presented, analyzed and interpreted in this section;

Table 4.244: There is an established regulatory framework to guide security operations at the Airport

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	20	21.1	21.1
	Disagree	17	17.9	38.9
	Not Sure	6	6.3	45.3
	Agree	37	38.9	84.2
	Strongly Agree	15	15.8	100.0
	Total	95	100.0	

Source: Primary data, 2025

According to the study, findings on whether there is an established regulatory framework to guide security operations at the Airport revealed that 21.1% of the respondents strongly disagreed, 17.9% disagreed, 6.3% were not sure, 38.9% agreed and 15.8% strongly agreed. Although 39.0% disagreed and 6.3% were not sure, 54.7% agreed that indeed there is an established regulatory framework to guide security operations, for example aviation security relies on a comprehensive set of laws, regulations and guidelines put in place band enforced by

AVSEC (UCAA) handed down by ICAO and IATA. Indeed compliance with these rules and regulations ensure that there is a consistent and standardized approach to security across Entebbe International Airport at all times for 24 hours and 7 days every week. There should be no security lapses, lest terrorists and other inadequacies end up appearing. So it is confirmed that much as some people cannot observe the rules and regulations in written form, but they apply, hence the fact that there is an established regulatory framework to guide security operations at the Airport.

Table 4.25: AVSEC involves in risk identification, assessment, management and mitigation

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	19	20.0	20.0
	Disagree	9	9.5	29.5
	Not Sure	12	12.6	42.1
	Agree	43	45.3	87.4
	Strongly Agree	12	12.6	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings on whether AVSEC (Aviation Security) involves in risk identification, assessment, management and mitigation revealed that 20.0% of the respondents strongly disagreed, 9.5% disagreed, 12.6% were not sure, 45.3% agreed and 12.6% strongly agreed. Although 29.5% disagreed, the fact is that with 57.9% in agreement, it implies that compliance with the established security protocols help to identify and mitigate potential risks such as unauthorized access to security rooms and data, cargo processing areas, prohibited items or threats from within the aviation system. In line with the findings, Rimmer (2016) and Luo (2022) noted that Airport security attempts to prevent any threats or potentially dangerous situations from arising or entering the country. They further noted that if airport security does succeed then the chances of any dangerous situation, illegal items or threats entering into an aircraft, country or airport are greatly reduced. As such, airport security serves several purposes that is to protect the airport and country from any threatening events, to reassure the traveling public that they are safe and to protect the country and their people. Hence the fact that AVSEC involves in risk identification, assessment, management and mitigation.

Table 4.26: The AVSEC carries out a vulnerability assessment at the airport

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	13	13.7	13.7
	Disagree	14	14.7	28.4
	Not Sure	9	9.5	37.9
	Agree	44	46.3	84.2
	Strongly Agree	15	15.8	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings revealed that 13.7% of the respondents strongly disagreed, 14.7% disagreed, 9.5% were not sure, 46.3% agreed and 15.8% strongly agreed. In as much as 28.4% of the respondents disagreed, 9.5% were not sure and 62.1% agreed which means that regular inspections and audits help identify vulnerabilities in the prevailing security programmes and allow for timely corrective actions, so being a fact that AVSEC (Aviation Security) carries out a vulnerability assessment at the airport on a regular and reliable basis.

Table 4.27: The AVSEC security leadership surveys and tests the various security applications at the airport emigration

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	12	12.6	12.6
	Disagree	12	12.6	25.3
	Not Sure	6	6.3	31.6
	Agree	39	41.1	72.6
	Strongly Agree	26	27.4	100.0
	Total	95	100.0	

Source: Primary data, 2025

The results of the study on whether AVSEC security leadership surveys and tests the various security applications at the airport emigration revealed that 12.6% of the respondents strongly disagreed, 12.6% disagreed, 6.3% were not sure, 41.1% agreed and 27.4% strongly agreed. With 68.5% in agreement, it means that the security leadership at the airport evaluates the effectiveness of security measures and identify any gaps in procedures, immediately have them plugged in order to enhance security. This is effectively done by the Aviation Security

leadership who undertake several surveys and tests in order to beef up the security applications at the airport emigration through all stages.

Table 4.285: The AVSEC security leadership allows and leads security enforcement

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	22	23.2	23.2
	Disagree	17	17.9	41.1
	Not Sure	9	9.5	50.5
	Agree	38	40.0	90.5
	Strongly Agree	9	9.5	100.0
	Total	95	100.0	

Source: Primary data, 2025

The findings of the study on whether Aviation Security leadership allows and leads security enforcement revealed that 23.2% of the respondents strongly disagreed, 17.9% disagreed, 9.5% were not sure, 40.0% agreed and 9.5% strongly agreed. With 41.1% in disagreement and 49.5% in agreement means that there have been instances of security breaches, although it is not common, when non-compliance is identified, appropriate enforcement actions, such as warnings or penalties become necessary. Therefore, it can be summed up in this case that AVSEC (Aviation Security) leadership allows and leads security enforcement in order to ensure that all departments and physical places in and around the Airport are well secured.

Table 4.29: The AVSEC security leadership manages security breaches

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	14	14.7	14.7
	Disagree	11	11.6	26.3
	Not Sure	10	10.5	36.8
	Agree	41	43.2	80.0
	Strongly Agree	19	20.0	100.0
	Total	95	100.0	

Source: Primary data, 2025

The results of the study on whether AVSEC security leadership manages security breaches revealed that 14.7% of the respondents strongly disagreed, 11.6% disagreed, 10.5% were not sure, 43.2% agreed and 20.0% strongly agreed. Although 26.3% disagreed and 10.5% were not sure, 63.2% agreed that in case of security breaches or failure to comply with regulations, there

are possibilities that security breaches, potentially leading to acts of terrorism or unlawful interference can easily occur or take place. So it is right to state that aviation security leadership manages security breaches with the intention to continuously improve or boost security management.

Table 4.30: The AVSEC security leadership inspects and audits the security process

		Frequency	Percent	Cumulative Percent
Valid	Strongly Disagree	17	17.9	17.9
	Disagree	18	18.9	36.8
	Not Sure	10	10.5	47.4
	Agree	36	37.9	85.3
	Strongly Agree	14	14.7	100.0
	Total	95	100.0	

Source: Primary data, 2025

The results of the study revealed that 17.9% of the respondents strongly disagreed, 18.9% disagreed, 10.5% were not sure, 37.9% agreed and 14.7% strongly agreed. Although 36.8% disagreed and 10.5% were not sure, but 52.6% agreed that Aviation security leadership inspects and audits the security process in order to identify the areas of strengths and weaknesses in order to develop contingency measures in order to get rid of lapses. So it is true that aviation authorities conduct regular inspections and audits to assess the level of compliance by airlines, airports and other aviation stakeholders.

According to interviews and secondary sources, the aviation security (AVSEC) leadership has been instrumental in identifying respondents to safety hazards. And non-compliance can lead to safety hazards, such as inadequate security procedures or poorly maintained security equipment. Respondents revealed that,

> *"…the AVSEC security leadership ensures that there is continuous improvement…monitoring compliance allows for the identification of areas needing improvement and the implementation of best practices"*

Compliance with aviation security regulations is not merely a matter of adherence to rules, but rather a fundamental aspect of maintaining a safe and secure operating environment for passengers, personnel, and the public.

4.2.4 Testing Hypothesis

This section provides the hypothesis (H0: There is no significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport, and H1: There is significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport) testing process using the ANOVA, Model summary and Regression Analysis;

Table 4.316: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.978(a)	.956	.956	.26046

a. Predictors: (Constant), Entebbe International Airport Security Programme

Source: Primary data, 2025

The findings from the model summary show that R. Square at .956 and Adj. R Square at .956 and Sig. 000, it shows that there is significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport.

Table 4.32: Regression

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.513	.070		7.317	.000
	Appraisal outcomes utilization	.912	.020	.978	45.188	.000

a. Dependent Aviation security

Source: Primary data, 2025

From the regressions above, with Beta (.978), and Sig. 000, although H_0: there is no significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport, the study findings show that *(H_1),* there is significant compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport.

Table 4.33: Anova

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	138.524	1	138.524	2041.939	.000[a]
	Residual	6.309	93	.068		
	Total	144.833	94			

a. Predictors: (Constant), Airport Security Programme

b. Dependent Variable: Aviation security

Source: Primary data, 2025

From the Analysis of Variance, with regression of Mean square at 138.524 and residual .068 and Sig. 000; there is a significant and positive correlation between the compliance of Aviation Security programme with international aviation security standards and originating passenger security at Entebbe International Airport

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter consists of the summary, conclusion and recommendations on the compliance of Aviation Security programme with international aviation security standards on originating passenger security at Entebbe International Airport. The sections of the chapter are thematic guided under the relationship between screening of originating passengers and aviation security at Entebbe International Airport; the relationship between access control and aviation security at Entebbe International Airport and the measure of influence of compliance on aviation security at Entebbe International Airport.

5.1 Summary

Below is the summary of the findings;

5.1.1 The relationship between screening of originating passengers and aviation security at Entebbe International Airport

The study revealed that since 1991, the number of originating passengers has been rising, meaning that even their hand baggage and cargo have been increasing. Similarly, the number of passengers generally has been rising, although in 2020 when Covid-19 struck and caused temporary closure of the airport/ flights, there has been a steady rise in the number of originating passengers. Entebbe International Airport is a bustling hub of activity, serving as a gateway for thousands of passengers and their baggage daily. However, with increased air travel comes the need for robust airport security measures to keep the airport, passengers, cargo/baggage and crews' safe at all times. Entebbe International Airport Expansion: Airport Technology (2018) revealed that in order to ensure better uncompromised security at the airport, AVSEC (Aviation Security) undertakes a number of screening and surveillance programmes namely passenger pre-board screening, hold baggage screening, non-passenger screening, use of Closed-circuit television (CCTV) also known as video surveillance, security bollards as well as undertaking routine and call-in or unscheduled, maintenance checks.

The passengers are screened using metal detectors and X-ray equipment at various airport security checkpoints as they prepare and go through the routine checks when they are preparing to board the aircrafts. This is intended to ensure that no prohibited passengers and items make it onboard as it would jeopardize the life of the passengers and the crew as well as cause

destruction of the aircraft. According to Uganda Civil Aviation Authority (improved in 2020) regulations pertaining to screening, the screening procedures often include pat-down procedures which are used to determine if prohibited items or other threats to aviation transportation security are concealed on the passenger who intends to board a flight. Further, there are also handheld metal detectors and explosives trace detection. These are used during check-in where the passengers must present valid identification and boarding passes. Further still, immigration and visa verification are also conducted to confirm they can leave Uganda for another country. In addition, the carry-on items undergo X-ray scanning to detect whether or not there are prohibited objects. Respondents revealed that this comprehensive approach highlights how airport security screening is essential to keeping flights safe.

There is hold baggage security screening system takes a multi-pronged approach to security to check passengers' bags for prohibited items before they board the plane. The researcher was further informed that all checked bags are thoroughly inspected before passengers go through security checkpoints or gates or desks before the passenger eventually boards. Ina addition, the X-ray, computer tomography and explosive detection systems screening used on passenger baggage are also used on checked luggage, and a physical search is conducted where necessary. Then the modulus operandi, there is non-passenger screening which applies to all airport personnel accessing restricted areas such as pilots, flight attendants, baggage handlers, caterers, maintenance crews and other authorized staff. Non-passengers mentioned in here undergo random checks and must clear security checkpoints using the walk-through metal detectors, full-body scanning (scanners), hand-held metal detectors, explosives trace detection devices as well as pat-downs and physical inspections on their bodies and their luggage. These thorough measures are critical components of airport security procedures, guaranteeing that all individuals within airport premises adhere to these strict security protocols.

The study revealed that modern security systems currently rely on heavily engaged closed-circuit television technology for comprehensive surveillance of the interior and exterior. The closed-circuit television cameras are installed throughout the terminals, walking allays, parking areas and restricted zones, allowing security teams to monitor all activities for 24hours and days, throughout (24/7). The researcher discovered that the technology behind Closed-Circuit Television systems has greatly improved as nowadays, the airport has obtained and installed

models which have autonomous facial recognition capabilities. These smart Closed-Circuit Television systems are suited for the airport, which is a common point of departure. There is a strict system for aircraft to be properly maintained, repaired, overhauled, and inspected as time goes on. The Uganda Civil Aviation Authority sets this system in place following ICAO rule and regulations. It is up to airlines and other aviation operators to implement the system and ensure it is being followed because failure, there are consequences.

Bollards and barriers are installed at the airport's entrances and around its terminals to restrict vehicle traffic and prevent hostile vehicle attacks. In line with the findings, Weed (2020) noted that security bollards are also used in many airports to prevent unauthorized vehicle access into aircraft hangars, and warehouse floors and to keep cars off runways. There are two types of security bollards: permanent and collapsible. Collapsible bollards are integrated with third-party apps and use Identification passes to allow appropriate access when required. Schneier (2004) warned that relying on just one security method is insufficient, but integrating all types ensures maximum protection. Moreover, the airport adapts to evolving threats in the aviation industry by investing in innovative airport security systems and consulting with security experts to identify improvements and minimize risks.

According to the study, the key elements of aviation security at Entebbe International Airport, whereby people were identified as the first line including trained and competent personnel, who from the time of recruitment and orientation are equipped with the necessary knowledge and skills which make them essential for implementing and maintaining security procedures. The processes which are clear and effective including screening procedures, access control as well as emergency response plans which are very critical to aviation security, and the equipment which involves reliable security equipment such as screening devices and surveillance systems which are necessary for effective security operations in all areas and spots of the Airport.

According to the study, there are various classified and non-classified security gadgets that are used for screening passengers so that they do not carry contraband and any harmful or unauthorized materials or equipment from Entebbe International Airport. The examples of devices include metal detectors, explosive detection systems, use of the canine unit (dogs) and hand searches by airport security officials, known as Aviation Security (AVSEC). The device capacity is an integrated upper limit of how many passengers or bags can be processed by a

device in a given period of time. In order to be more effective, some detectors are determined as a risk group (a pre-assigned subset of devices through which a passenger may be processed before boarding an aircraft). Further, there is use of the computer-aided passenger prescreening system which assigns each passenger an assessed threat value, which quantifies the risk associated with the characteristics of the passenger, with the threat values varying between zero and one. With 67.4% in agreement, under strict and conscious approach, passengers and their carry-on baggage are screened to ensure prohibited items such as knives, firearms, incendiary devices, weapons, dangerous goods, explosives, and other threat items are not carried onto the aircraft. Although 24.2% disagreed stating that sometimes cases of smuggling ivory, gold and drugs have been reported to have been successful, but at Entebbe International Airport, all originating passengers must go through this screening before boarding a flight. This includes going through a metal detector or full-body scanner as well as having carry-on bags and personal items scanned, and potentially being subject to a pat-down search. This is to ensure that only eligible persons and baggage are allowed on to the flight. This minimizes the omen of hijacks, arson, suicide and use of improvised explosions on board the aircraft when it is airborne.

With 60.0% in agreement, there is use of millimeter wave advanced imaging technology and walk-through metal detectors to screen passengers. Many refer to them as X-rays because of their ability to thoroughly eye with optics whatever could be carried in the baggage, including micro-materials. The millimeter wave advanced imaging technology safely screens passengers without physical contact for metallic and non-metallic threats, including weapons and explosives, which may be concealed under clothing. Passengers are screened using metal detectors and X-ray equipment at airport security checkpoints, ensuring no prohibited items make it onboard. The baggage screening security device deployment involves the allocation of baggage screening security devices and assignment of selectee baggage that should be screened for the set of flight segments especially one that is a source of suspicion between Entebbe International Airport and other airports, at a flight segment or flight takeoff and landing of the aircraft from Entebbe Airport to another (destination). Using the following illustration, secondary data revealed that the takeoff and landing of an aircraft from Airport A to Airport B with no intermediate stops counts as a single flight. Further, relating to secondary sources, it was revealed that a selectee is said to be on a direct route if his flight path and is composed of one

flight segment or on a connecting route if his flight path is composed of two or more flight segments. Indeed, the findings reveal that all baggage screening occurs at origin at Entebbe International Airport, as no baggage is screened in transit along a connecting route.

According to the study, there are multilevel screenings to capture the false and true or clear rate associated with various flagged threats by the aviation security procedures. Using the human security, artificial intelligence, canine and other remote sensing technologies, these multilevel screening problems capture the false and clear rate associated with a false clear which represents an event where a passenger who represents a threat is not flagged by the aviation security procedures, but can be used as a lead to get to the root of the problem. Further, the false clear rate is the proportion in both the short and long-run process where passengers who represent a threat that are cleared by aviation security procedures as a bait to capture contraband and unacceptable business.

The study revealed that there exists an explosive detection system which includes automatic detection, using the necessary computer hardware and software to monitor passenger and baggage movement, orienting and positioning equipment, calibration methods, and maintenance procedures to ensure that any unwanted material and equipment, and persons are easily detected and apprehended where necessary. Further, secondary sources show that the partial baggage screening problems address how to deploy a certain number of explosive detection systems to screen some checked baggage in order to minimize the risk associated with the unscreened bags. The findings therefore revealed that the partial baggage screening problems address how to deploy a certain number of explosive detection system to screen already checked baggage in order to minimize the risk associated with the unscreened bags. The baggage screening security devices at Entebbe International Airport provide an important defense against terrorist actions targeted at commercial aircraft as they offer real time and faster detection capacities.

The model favoured for baggage screening at Entebbe International airport aviation security deployment is categorized under Uncovered Baggage Segments (UBS), Uncovered Flight Segments (UFS), and Uncovered Passenger Segments (UPS) which perform as measures to handle individual baggage screening have been effective in ensuring that baggage screening capacity is in place, screening devices operate well at the airport for each of the departing flights,

the direct originating selectee bags on each flight are well screened, the connecting originating selectee bags on each flight are well screened, and a proper baggage screening security device allocation budget is in place. The airport all peak hours coincide so that any selectee bags and cargo onto a flight has to be checked thoroughly. It also has to be remembered that in practice, a transferring selectee bag at Entebbe International Airport may originate from any airport and transfer through Entebbe airport. Specifically, a bag can transfer from one airport to Entebbe Airport where it would require careful screening to ensure safety and security.

5.1.2 The relationship between access control and aviation security at Entebbe International Airport

The airport needs physical security barrier such as Aviation Police Officers and Constables, personnel, Information and Communications professionals and experts to manage computerized security systems, Canine Units, fast call centers, barricades, barbered wires and other physical barriers as well as surface and air reconnaissance support to control access so that only authorized personnel can access certain parts of the Airport. Access control entails controlling admittance to certain parts of the airport, whereby some are only accessible to only authorized staff or personnel for example the security offices, while only people of certain ranks are authorize to reach certain installations like Diplomat way, the areas were weapons are stored (armory), cargo stores and warehouses, ensuring also that there is tracking of the movements of all persons throughout the airport using camera surveillance and human surveillance. According to 63.2% of the respondents who agreed that the airport users only have access to what they need to perform their job functions for example tools from the stores, information support, organizations can minimize the risk of internal threats and accidental data leaks. Here the system is kept under lock and key where only the supervisors and authorized staff are allowed to access certain points and premises. According to 71.6%, indeed access control keeps confidential information such as customer data and intellectual property from being stolen by bad actors or other unauthorized users who would use the opportunity to hack into the computer systems or steal micro chips, computers, airlines data and support data exfiltration by employees and keeps web-based threats at bay. Thus, access control keeps confidential information such as customer data for airlines and clients, and intellectual property from being stolen by bad actors or other unauthorized users.

The study revealed that airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections. This includes the use of sign in using the Biometric System by all companies for their staff, the use of Personal Tags and Identification Cards and Passes, periodic renewal of identification cards and passes and so on. Every rare and open public areas has certain access control identification and authorization such as Very Important Persons (VIP), Very Very Important Persons (VVIP), Cargo, aircraft and so on. Since the airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections as such. Access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry, and these include Cameras, Radar system, Radiosons for weather and climate communication, Walkie Talkies and mobile cellular phones are all used to monitor the interior and the exterior of the Airport facilities. The airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access. For example at the VIP and VVIP, there are physical barriers erected to stop any unauthorized access to the place/area, also as one drives in into the airport, there are security check points where all movements are monitored and unauthorized accessed stopped, cargo areas is not accessed easily, and it is quite hard for civilians to access the Old Airport. All this is done to keep the airport secured at all times. Hence, it is clear that the airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access. The airport has its access control system's integrity reinforced by human security barriers that impede unauthorized access. These include uniformed soldiers and police officers, plain clothed soldiers, Uniformed AVSEC (Aviation Security) Operatives and other unrecognized security officers as well as private company security like Saracen, who are all employed by the state and private organizations to secure their installations and ensure that the Airport is free from any insecurity.

5.1.3 The measure of the influence of compliance on aviation security at Entebbe International Airport

According to the study, there is an established regulatory framework to guide security operations, for example aviation security relies on a comprehensive set of laws, regulations and guidelines put in place and enforced by AVSEC (UCAA) handed down by ICAO and IATA. Indeed compliance with these rules and regulations ensure that there is a consistent and

standardized approach to security across Entebbe International Airport at all times for 24 hours and 7 days every week. So it is confirmed that much as some people cannot observe the rules and regulations in written form, but they apply, hence the fact that there is an established regulatory framework to guide security operations at the Airport. The compliance with the established security protocols help to identify and mitigate potential risks such as unauthorized access to security rooms and data, cargo processing areas, prohibited items or threats from within the aviation system. As such, airport security serves several purposes that is to protect the airport and country from any threatening events, to reassure the traveling public that they are safe and to protect the country and their people. According to the study, 62.1% agreed that regular inspections and audits help identify vulnerabilities in the prevailing security programmes and allow for timely corrective actions, so being a fact that AVSEC (Aviation Security) carries out a vulnerability assessment at the airport on a regular and reliable basis. The security leadership at the airport through Quality Assurance Section conducts quality control activities such as audits, inspections, tests, surveys, Vulnerability and Risk Assessments to evaluate compliance and implementation of the effectiveness of security measures and identify any gaps in procedures, immediately have them plugged in order to enhance security. This is effectively done by the Aviation Security leadership in order to beef up the security applications at the airport Immigration through all stages.

The study discovered that in the case of security breaches or failure to comply with regulations, there are possibilities that security breaches, potentially leading to acts of terrorism or unlawful interference can easily occur or take place. So it is right to state that aviation security leadership manages security breaches with the intention to continuously improve or boost security management. Aviation security leadership inspects and audits the security process in order to identify the areas of strengths and weaknesses in order to develop contingency measures to address or get rid of lapses. So it is true that aviation authorities conduct regular inspections and audits to assess the level of compliance by airlines, airports and other aviation stakeholders.

The aviation security (AVSEC) leadership has been instrumental in identifying respondents to safety hazards. And non-compliance can lead to safety hazards, such as inadequate security

procedures or poorly maintained security equipment. AVSEC security leadership ensures that there is continuous improvement in monitoring compliance which allows for the identification of areas needing improvement.

5.2 Conclusion

5.2.1 The relationship between screening of originating passengers and aviation security at Entebbe International Airport

The study revealed that the number of originating passengers has been rising, meaning that even their hand baggage and cargo have been increasing. Entebbe International Airport is a bustling hub of activity, serving as a gateway for thousands of passengers and their baggage daily. However, with increased air travel comes the need for robust airport security measures to keep the airport, passengers, cargo/baggage and crews' safe at all times. At Entebbe International Airport undertakes a number of screening and surveillance programmes namely passenger pre-board screening, hold baggage screening, non-passenger screening, use of Closed-circuit television (CCTV) also known as video surveillance, security bollards as well as undertaking routine and call-in or unscheduled, maintenance checks. The passengers are screened using metal detectors and X-ray equipment at various airport security checkpoints as they prepare and go through the routine checks when they are preparing to board the aircrafts. This is intended to ensure that no prohibited passengers and items make it onboard as it would jeopardize the life of the passengers and the crew as well as cause destruction of the aircraft. Pertaining to screening, the screening procedures often include pat-down procedures which are used to determine if prohibited items or other threats to aviation transportation security are concealed on the passenger who intends to board a flight. These are used during check-in where the passengers must present valid identification and boarding passes. Further still, immigration and visa verification are also conducted to confirm they can leave Uganda for another country.

The X-ray, computer tomography and explosive detection systems screening used on passenger baggage are also used on checked luggage, and a physical search is conducted where necessary. Then the modulus operandi, there is non-passenger screening which applies to all airport personnel accessing restricted areas such as pilots, flight attendants, baggage handlers, caterers, maintenance crews and other authorized staff. Non-passengers mentioned in here undergo random checks and must clear security checkpoints using the walk-through metal detectors, hand-held metal detectors, explosives trace detection devices as well as pat-downs and physical

inspections on their bodies and their luggage. The Uganda Civil Aviation Authority sets this system in place following ICAO standards and recommended practices. It is a requirement for all airlines and other aviation operators to implement the system and ensure it is being followed because in case of failure, there are consequences.

There are multilevel screenings to capture the false and true or clear rate associated with various flagged threats by the aviation security procedures. Using the human security, artificial intelligence, canine and other remote sensing technologies, these multilevel screening problems capture the false and clear rate associated with a false clear which represents an event where a passenger who represents a threat is not flagged by the aviation security procedures, but can be used as a lead to get to the root of the problem. The partial baggage screening problems address how to deploy a certain number of explosive detection systems to screen some checked baggage in order to minimize the risk associated with the unscreened bags. The findings therefore revealed that the partial baggage screening problems address how to deploy a certain number of explosive detection system to screen already checked baggage in order to minimize the risk associated with the unscreened bags. The baggage screening security devices at Entebbe International Airport provide an important defense against terrorist actions targeted at commercial aircraft as they offer real time and faster detection capacities. The for baggage screening at Entebbe International airport aviation security deployment is categorized under Uncovered Baggage Segments (UBS), Uncovered Flight Segments (UFS), and Uncovered Passenger Segments (UPS) which perform as measures to handle individual baggage screening have been effective in ensuring that baggage screening capacity is in place, screening devices operate well at the airport for each of the departing flights, the direct originating selectee bags on each flight are well screened, the connecting originating selectee bags on each flight are well screened, and a proper baggage screening security device allocation budget is in place. The airport all peak hours coincide so that any selectee bags and cargo onto a flight has to be checked thoroughly. There is significant contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security.

5.2.2 The relationship between access control and aviation security at Entebbe International Airport

The airport needs physical security barrier such as Aviation Police Officers and Constables, personnel, Information and Communications professionals and experts to manage computerized

security systems, Canine Units, fast call centers, barricades, barbered wires and other physical barriers as well as surface and air reconnaissance support to control access so that only authorized personnel can access certain parts of the Airport. Access control entails controlling admittance to certain parts of the airport, whereby some are only accessible to only authorized staff or personnel for example the security offices, while only people of certain ranks are authorize to reach certain installations like Diplomat way, the areas were weapons are stored (armory), cargo stores and warehouses, ensuring also that there is tracking of the movements of all persons throughout the airport using camera surveillance and human surveillance. According to 63.2% of the respondents who agreed that the airport users only have access to what they need to perform their job functions for example tools from the stores, information support, organizations can minimize the risk of internal threats and accidental data leaks. Here the system is kept under lock and key where only the supervisors and authorized staff are allowed to access certain points and premises. According to 71.6%, indeed access control keeps confidential information such as customer data and intellectual property from being stolen by bad actors or other unauthorized users who would use the opportunity to hack into the computer systems or steal micro chips, computers, airlines data and support data exfiltration by employees and keeps web-based threats at bay. Thus, access control keeps confidential information such as customer data for airlines and clients, and intellectual property from being stolen by bad actors or other unauthorized users.

The study revealed that airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections. This includes the use of sign in using the Biometric System by all companies for their staff, the use of Personal Tags and Identification Cards and Passes, periodic renewal of identification cards and passes and so on. Every rare and open public areas has certain access control identification and authorization such as VIP, VVIP, Cargo, aircraft and so on. Since the airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections as such. Access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry, and these include Cameras, Radar system, Radiosons for weather and climate communication, Walkie Talkies and mobile cellular phones are all used to monitor the interior

and the exterior of the Airport facilities. The airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access. For example at the VIP and VVIP, there are physical barriers erected to stop any unauthorized access to the place/area, also as one drives in into the airport, there are security check points where all movements are monitored and unauthorized accessed stopped, cargo areas is not accessed easily, and it is quite hard for civilians to access the Old Airport. All this is done to keep the airport secured at all times. Hence, it is clear that the airport has its access control system's integrity reinforced by physical barriers that impede unauthorized access. The airport has its access control system's integrity reinforced by human security barriers that impede unauthorized access. These include uniformed soldiers and police officers, plain clothed soldiers, Uniformed AVSEC (Aviation Security) Operatives and other unrecognized security officers as well as private company security like Saracen, who are all employed by the state and private organizations to secure their installations and ensure that the Airport is free from any insecurity. There is significant contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security.

5.2.3 The measure of influence of compliance on aviation security at Entebbe International Airport

The study recommends that there is an established regulatory framework to guide security operations, for example aviation security relies on a comprehensive set of laws, regulations and guidelines put in place and enforced by AVSEC (UCAA) handed down by ICAO and IATA. The compliance with the established security protocols help to identify and mitigate potential risks such as unauthorized access to security rooms and data, cargo processing areas, prohibited items or threats from within the aviation system. Regular inspections and audits help identify vulnerabilities in the prevailing security programmes and allow for timely corrective actions, so being a fact that AVSEC (Aviation Security) carries out a vulnerability assessment at the airport on a regular and reliable basis. The security leadership at the airport evaluates the effectiveness of security measures and identify any gaps in procedures, immediately have them plugged in order to enhance security. Aviation security leadership inspects and audits the security process in order to identify the areas of strengths and weaknesses in order to develop contingency measures in order to get rid of lapses. The aviation security (AVSEC) leadership has been instrumental in identifying respondents to safety hazards. And non-compliance can lead to safety hazards, such as inadequate security procedures or poorly maintained security

equipment. There is a significant and positive correlation between Airport Security Programme and aviation security.

5.3 Recommendations

Having successfully carried out the study on the contribution of Entebbe International Airport Security Programme towards guaranteeing aviation security, the following is recommended;

i. On the relationship between screening of originating passengers and aviation security at Entebbe International Airport, there should be an established and dedicated airport screening lanes to handle those passengers posing an elevated risk and for those passengers with special needs,
ii. On the relationship between access control and aviation security at Entebbe International Airport, there should be introduction of a more aggressive, visible, and unpredictable checkpoint procedures such as random pat-down and hand-wand screening,
iii. On the measure of influence of compliance on aviation security at Entebbe International Airport, there should be continued development of new technology at checkpoints to better detect concealed items.

5.4 Areas for further study

The following are the areas for further study;

1) Understanding the value of Aviation security technologies and procedures in screening passengers and baggage;
2) Passenger grouping with risk levels in an airport security system, and
3) Passenger profiling, imperfect screening and airport security

References

Adesta M. (2009) Selected to Provide Security Systems for Washington Dulles International Airport, Newswire, Retrieved 2009

AFP.gov.au: Archived from the original on July 24, 2008.

African Civil Aviation Commission (AFCAC, 2022) – Capacity Building and Training in Aviation Cyber security: Regional Update.

Agre, P. (2021). Your face is not a bar code: Arguments against automatic face recognition in public places, Whole Earth 106: 74–77.

Ahmed, A., & Nartey, J. (2019) Airport Cyber Security and Cyber Resilience Controls.

Akcay Samet; Breckon Toby P. (2017) An evaluation of region based object detection strategies within X-ray baggage security imagery, IEEE International Conference on Image Processing (ICIP). IEEE. pp. 1337–1341

Amendment of S.I. No. 92 of 2022

Amnesty International (2020) Human Rights in the Age of Biometrics. Retrieved from https://www.amnesty.org/en/latest/research/2020/11/human-rights-in-the-age-of-biometrics/

Anguyo, Innocent (2015) Entebbe airport expansion starts on Saturday, New Vision, Kampala, Archived from the original on 31 October 2015, Retrieved 16 February 2016

Appendix 11 (Aviation Security procedures) to the Fifth Edition of Entebbe International Airport Security programme (Dec 2023)

Australian Government Department of Infrastructure and Transport: Passenger Screening, 2011-07-22. Archived from the original on October 9, 2011. Retrieved October 26, 2011

Beaver, K. (2014). When Security Policies Are Bad for Business.

Bejtlich, R. (2012). The Importance of Security Awareness Threat Research Blog.

Bennie G. (2007) Thompson, Chairman, Homeland Security Committee, U.S. House of Representatives, Cover Blown: Did TSA Tip Off Airport Screeners about Covert Testing." Statement Released November 14, 2007. 18

Birger, H. & Jeppe, N. (2015).The epistemological lifeboat. (Online). Retrieved from http://www.db.dk/ (18/11/2010).

Bishop, M. (2005). Policy and Mechanism | An Overview of Computer Security | Inform IT. Bowden, J. (2003). Security Policy What it is and Why - The Basics. SANS Institute.

Bradshaw Kelsey (2020) Police ID man killed on runway; how he got there remains mystery; Austin American-Statesman. Austin, Texas

Braun, H-J. (2019). The airport as a symbol: Air transport and politics at Berlin-Temple of, 1923–1948 In. W. M. Leary (ed.)

BSI Group. (2016). [online] Available at: http://www.bsigroup.com/LocalFiles/en-GB/iso-iec-27001/resources/BSI-ISOIEC27001-Features-and-Benefits-UK-EN.

Bsigroup.com. (2016). ISO/IEC 27001 Information Security Management case studies |

Buzan, L. Hansen, (2009) The evolution of international security studies. Cambridge: Cambridge University Press, 2009.

Buzan, O. Weaver, J. de Wilde, (1998) Security: New Framework for Analysis. London: Lynne Rienner Publishers, 1998.

Buzan, B. O. Weaver, J. de Wilde, (1998) Security: New Framework for Analysis. London: Lynne Rienner Publishers

Byemboijana Muhamadi (2024) New Entebbe Airport Terminal Will Accommodate Over 3 Million Passengers Annually-UCAA, Softpower Uganda. Kampala, Uganda. Retrieved 20 April 2024

Chakrabarti and Strauss (2012) Carnival Booth: An Algorithm for Defeating the Computer-Assisted Passenger Screening System Archived 2012-02-19 at the Wayback Machine

Chapple, M. (2016). Can ISO 27002 be used as a standalone guide for security management? [Online] Search Security. Available at: http://searchsecurity.techtarget.com/answer/Can-ISO-27002-be-used-as-a-standalone-guide-for-security-management [Accessed 25 Apr. 2016].

Check-back International (2018) What is an Airside Pass? Check-back International, Retrieved 30 April 2018

Civil Aviation (Security) (Amendment) Regulations, 2024 - ULII

Civil Aviation (Security) Regulations, 2022: THE CIVIL AVIATION (SECURITY) REGULATIONS, 2022. ARRANGEMENT OF REGULATIONS

Civil Aviation Authority Act (Cap 354, 1991)

Clarke, R. (2023). Biometrics in Airports How To, and How Not To, Stop Mahommed

Cobb, M. (2016). Worst practices: Bad security incidents to avoid. Search Security.

Colson, S. (2011). Information Security: Why Policy Matters - Information Space.

Commission Regulation (EC) No 1546/2006 of 4 October 2006 amending Regulation (EC) No 622/2003 laying down measures for the implementation of the common basic standards on aviation security; Eur-lex.europa.eu. Retrieved October 26, 2011

CRS estimates based on unit costs provided in DHS TSA FY2009 congressional budget justification documents

Danchev, D. (2003). Building and Implementing a Successful Information Security Policy.

Dannatt, R. (2022), Role and Effectiveness of Government Regulation of Air Transport Safety The University of Western Australia.

David Klein (2023) Global security expert on the impact of transparent regulations in preventing accidental breaches.

Deertech.com. (2013). The Importance of IT-Security Awareness.

Delio, M. (2021). Travelling? Take Big Brother Along. Wired News. 4 April 2003. Accessed on 13th April 2014.

Deniz Gürhan (2021) Examining the Concept of Security in Abraham Maslow's Hierarchy of Needs Theory, Operations, People Management, Computer Engineer, MBA

Department of Homeland Security (2005), Office of Inspector General, Review and Audit of the Transportation Security Administration's Use of Pat-Downs in Screening Procedures (REDACTED), November 2005, OIG-06-10. 9 Ibid. 10 American Civil Liberties Union, TSA Pat-down Search Abuse, December 21, 2004, New York, NY

Department of Transportation (2021) Privacy Act of 1974; Proposed Implementation.

Dhillon, G. & Backhouse, J. (2001) "Current directions in IS security research: towards socio-organizational perspectives", Information Systems Journal, 11, pp 127-153.

Digital Uganda (2023) – Digital Transformation of the Aviation Space in Uganda.

Disterer, G. (2013). ISO/IEC 27000, 27001 and 27002 for Information Security Management. Journal of Information Security, 04(02), pp.92-100

Earl, L. (2017). Dream Machine, available from vvrww.newsday.com, accessed 1 December 2017.

Entebbe International Airport Expansion: Airport Technology, Airport-technology.com. May 2016. Archived from the original on 4 January 2018 Retrieved 19 January 2018

Eroukhmanoff Clara (2018) Securitization Theory: An Introduction

Federal Aviation Administration, FAA Aerospace Forecast: Fiscal Years 2009-2025.

Fifth Edition of Entebbe International Airport Security programme (Dec 2023)

Fulford, H. and Doherty, N. (2003). The application of information security policies in large UK-based organizations: an exploratory investigation. Info Mngmnt & Comp Security, 11(3), pp.106-114.

Furnell, S. M. & Warren, M.J. (1999) "Computer hacking and cyber terrorism: The real threats of the new millennium?", Computers and Security, 18 (1), 28-34.

Graham, S. and D. Wood (2023) Digitizing surveillance: categorization, space, inequality. Critical Social Policy, 23(2): 227-248.

Gupta, A. and Hammond, R. (2005). Information systems security issues and decisions for small businesses. Info Mngmnt & Comp Security, 13(4), pp.297-310.

Halpern, Ashlea (2022) What to Know If an SSSS Code Shows Up on Your Boarding Pass, Condé Nast Traveler, Archived from the original on March 4, 2023

Hauser Christine (2020) Southwest Flight Hits and Kills Person on Austin Airport Runway, The New York Times. New York City Retrieved 8 May 2020.

Heitz Geremy; Chechik Gal (2010) Object separation in x-ray image sets; 2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, IEEE. pp. 2093–2100

Herath, T. and Rao, H. (2009). Protection motivation and deterrence: a framework for security policy compliance in organizations. European Journal of Information Systems, 18(2), pp.106-125.

Hromada L. (2015) Security Models: In: Kosicka bezpecnostna revue, vol. 2015, no. 2, pp. 118 – 127.

https://www.e-ir.info/2018/01/14/securitisation-theory-an-introduction/

https://www.e-ir.info/2021/07/13/multidisciplinary-approaches-to-security-the-paris-school-and-ontological-security/

Huaxia (2022) China completes construction of Uganda's air cargo terminal" (News.cn Quoting Xinhua). News.cn. Beijing. Retrieved 21 March 2022

Ikonen, N; et al. (2018) Deposition of respiratory virus pathogens on frequently touched surfaces at airports; BMC Infectious Diseases, 18 (437): 437

International Air Transport Association (IATA, 2022) Security Toolkit. Retrieved from https://www.iata.org/en/programs/security/toolkit/

International Civil Aviation Organization (ICAO, 2019) Annex 17 to the Convention on International Civil Aviation: Security. Retrieved from https://www.icao.int/security/Pages/Annex17.aspx

International Civil Aviation Organization (ICAO, 2021) – Cyber security in Civil Aviation: Global Framework for Airport Resilience.

International Civil Aviation Organization (ICAO, 2022) – On liquid restrictions and aviation safety standards.

International Civil Aviation Organization (ICAO, 2023) - On collaboration and harmonization of global aviation security frameworks.

Jankowski, P. 2021 b. Presentation to the Panel on Passenger Screening. Atlantic City, New Jersey. February 8, 2021.

Jeffrey Rebecca (2022) Air cargo terminal opens at Uganda's Entebbe Airport". Aircargonews.net. London, Retrieved 21 March 2022

John Whitaker (2023) – International security analyst on legal enforcement and deterrence.

Johnson, R. (2011). Security policies and implementation issues. Sudbury, Mass.: Jones & Bartlett Learning.

Jones, A. and Lipton, R. (1978). The enforcement of security policies for computation. Journal of Computer and System Sciences, 17(1), pp.35-55.

Kamya, R. (2023) – Senior training officer at UCAA on continuous training of security personnel.

Kehaulani Sara Goo (2004) Airport Screeners Do Poorly, Panel Told; The Washington Post, April 23, p. A8.

Kisembo Didas (2015) South Korea gives boost to Entebbe airport upgrade; Daily Monitor, Kampala. Archived from the original on 6 February 2015, Retrieved 6 February 2015

Koerner Brendan (2013) Skyjacker of the Day: Excerpted from the book. The Skies Belong to Us: Love and Terror in the Golden Age of Hijacking, Slate.com. Retrieved 19 June 2013.

Kundinger, C. (2008). IBM Systems Magazine - Secure Perspective. [Online] Ibmsystemsmag.com.

Langwald Katharina (2021) ‘Multidisciplinary Approaches to Security: The Paris School and Ontological Security

Lartey, J., & Osei, S. (2021) Cyber-Security Challenges in Aviation Industry: A Review of Current and Future Trends.

Lee Sarah (2025) AI generated Llama-4-Maverick-17B-128E-Instruct-FP8, June 24, 2025

Lock, K. D., Carr, H. H. & Warkentin, M. E. (1992 "Threats to Information Systems - Today's reality, Yesterday's Understanding", MIS Quarterly, 16 (2), 173-186.

Ludek Lukas (2016) Theoretical Sources for a Theory of Safety and Security Department of Security Engineering, Tomas Bata University in Zlín, Czech Republic

Lukas L. (20150 On theory of security: In: Kosicka bezpecnostna revue, vol. 2015, no. 2, pp. 187 – 192.

Luo Daniel (2022) Why is Water Not Allowed Through Airport Security? Aviation for Aviators, Retrieved 2024-04-13

Lwanga, P. (2022) – Security training coordinator at Entebbe Airport on the importance of passenger education.

Manishimwe Wilson (2018) Entebbe new cargo center to open next year; New Vision: Kampala, Uganda; Archived from the original on 29 October 2018, Retrieved 29 October 2018

Maria Jenkins (2022) Aviation consultant on the importance of clear baggage guidelines.

McDonald M. (2008) Securitization and the Construction of Security, In European Journal of International Relations, vol. 14 no. 4563-587

McDonald M. (2008) Securitization and the Construction of Security: In: European Journal of International Relations, vol. 14 no. 4563-587. December 2008

McKay, E. (2010) Are you sure? How to write effective confirmations

Merino, Isidoro (2023) SSSS: Four letters you never want to see on your boarding pass; El País, Archived from the original on April 13, 2023

Mery Domingo (2015) Simulation in X-ray Testing, Computer Vision for X-Ray Testing, Cham: Springer International Publishing, pp. 241–266

Meserve Jeanne and Ahlers M. Mike (2008) TSA Tester Slips Mock Bomb Past Airport Security; Cable News Network (CNN), January 28, 2008

Ministry of Works and Transport Uganda (2023) – National Report on Aviation Safety Modernization Efforts.

Mortman, D. (2016). Benefits of ISO 27001 and ISO 27002 certification for your enterprise.

Mufumba Isaac (2021). "CAA gets new deputy director general". Daily Monitor. Kampala, Uganda. Retrieved 5 December 2021.

Mugalu Moses (2015) Upgraded Entebbe to handle 3 million passengers: The Observer (Uganda). Kampala. Archived from the original on 5 September 2015, Retrieved 19 January 2018

Muganga Eve (2021) Fred Bamwesigye appointed new UCAA boss". Daily Monitor. Kampala, Uganda. Retrieved 1 October 2021.

Musoke, A. (2023) Highlighted frequent training and certification of Entebbe's security personnel.

Nakato, S. (2023) – Public relations officer at UCAA on passenger awareness campaigns.

Nakitendde Hadijah (2015) NRM manifesto roots for aviation infrastructure expansion, Kampala: Sunrise.ug, Archived from the original on 24 February 2016 Retrieved 17 February 2016

Nie, X., Batta, R., Drury, C. G., & Lin, L. (2009) Passenger grouping with risk levels in an airport security system. European Journal of Operational Research 194(2): 574–84.

Nkumba University (2022) – Civil Aviation Authority and Airport Security, Safety in Uganda: A Case of Entebbe International Airport.

Nsubuga, J. (2022) Discussed the use of advanced screening technologies at Entebbe International Airport.

Pahnila, S., Siponen, M. and Mahmood, A. (2007). Employees' Behavior towards IS Security Policy Compliance.

Patalon III, W. (2005). Police probing data theft from information-security company employee. [Online] baltimoresun.com.

Rimmer David (2016) Does Heightened Airport Security Make Us Safer? Aviation.about.com. Archived from the original on January 5, 2016. Retrieved October 26, 2011

Roberts, T. (2022) – International aviation security consultant on personnel preparedness.

S&T Snapshots: Human Factors: Deception Detection, Department of Homeland Security. July 27, 2009. Retrieved October 26, 2011

Schneier Bruce (2004) An Easy Path for Terrorists; The Boston Globe, Retrieved October 26, 2011.

Sezal Mustafa (2019) Origins of Differentiation in Critical Security Schools, University of Groningen

Sloan Stephen, Bersia C. John and Hill J. B. (2006) The short-term impact of the Lod Airport massacre as a precursor to Munich, Terrorism: The Present Threat in Context; Berg Publishers, p. 50

Smith, L. (2022) Global aviation security expert on the role of technology in preventing smuggling.

SML News Uganda (2023) – UCAA Launches Safety Drill Programs at Entebbe Airport.

SML News Uganda (2024) – New Digital Communication Infrastructure Rolled Out at Entebbe Airport.

SML News Uganda (2024) – TOCC Enhances Collaboration Between Airport Security Stakeholders.

Ssebwami Javira (2018) Entebbe airport expansion works going according to plan Aviation Authority, PML Daily. Kampala, Uganda, Retrieved 16 April 2025

Staples, Edward J. (2001) The Industrial Physicist-Safeguarding ports with chemical profiling, American Institute of Physics, Archived from the original on November 3, 2011, Retrieved October 2011

Statement of Monte R. Belger, Acting Deputy Administrator of the Federal Aviation Administration, Before the Committee on the Judiciary, Subcommittee on Technology, Terrorism, and Government Information, on Security Technology, United States Senate, November 14, 2001, Archived from the original on 2013-07-05. Retrieved 2008

Swidey Neil (2020) You do not understand, Captain. He has a gun: The hijacking of Flight 1320, The Boston Globe. Retrieved March 21, 2020

Tajuba, Paul (2015). "CAA unveils master plan to create four new international airports". Daily Monitor. Kampala. Retrieved 30 January 2015.

Tentena Paul (2014) Entebbe airport set for $200m terminal; East African Business Week. Kampala, Uganda. Archived from the original on 18 January 2017

The Civil Aviation (Security) Regulations, 2022

Thirteenth Edition of ICAO Doc 8973 (Jul 2022)

Transportation Security Administration (TSA, 2022) Security Screening. Retrieved from https://www.tsa.gov/travel/security-screening

TSA: Airport Screeners Werenot Tipped Off, Air Safety Week, November 19, 2007.

Tumwine, D. (2023) Provided insight into Entebbe's adoption of high-resolution X-ray machines and chemical trace detectors.

Twelfth Edition of ICAO Annex 17 (Jul 2022)

U.S. Government Accountability Office, Transportation Security Administration (2008) Has Strengthened Planning to Guide Investments in Key Aviation and Surface Transportation Security Programs, but More Work Remains, Statement of Cathleen A. Berrick, Director, Homeland Security and Justice Issues, Before the Committee on Commerce, Science, and Transportation, U.S. Senate, May 13, 2008, GAO-08-487T.

Uganda Civil Aviation Authority (2023) – Annual Aviation Security Performance Review Report.

Uganda Civil Aviation Authority (2023) – Entebbe International Airport Hosts Inaugural Safety Week.

Uganda Civil Aviation Authority (2023) Cyber Threat Preparedness and Monitoring Initiative Report.

Uganda Civil Aviation Authority (2024) – Entebbe Airport Now Fully Automated; Security, Safety to Improve.

Uganda Civil Aviation Authority (2024) – Operational Updates on TOCC Deployment at Entebbe Airport.

Uganda Civil Aviation Authority (UCAA, 2022) On compliance audits and policy updates.

Uganda Civil Aviation Authority (UCAA, 2023) On training, public awareness, legal enforcement, and liquid regulation policies

UK Employee Checks (2018) Airside Pass Screening, Retrieved 30 April 2018

United States Government Accountability Office, Aviation Security (2007) TSA's Staffing Allocation Model Is Useful for Allocating Staff among Airports, but Its Assumptions Should Be Systematically Reassessed, GAO-07-299. February 2007

United States Government Accountability Office, Transportation Security (2008) TSA Has Developed a Risk-Based Covert Testing Program, but Could Better Mitigate Aviation Security Vulnerabilities Identified Through Covert Tests, August 2008, GAO-08-958.

United States Government Accountability Office: Aviation Security: TSA's Staffing Allocation Model.

Weed Julie (2020) Air Travelers Can't See All of It, but More Tech Is Moving Them Along, The New York Times.

Welna, J. 2017. Personal communication to the Panel on Passenger Screening. Washington, D.C. June 2, 2020.

Wesaka Anthony (2020) Justice Kavuma bounces back from retirement, appointed Aviation board chair, Daily Monitor. Kampala. Retrieved 3 June 2020.

Wowfare Travel Insights (2024) Safety Enhancements at East African Airports 2024.

Yu Roger (2010) Airport Check-in: TSA behavior screening misses suspects: USA Today. Retrieved October 26, 2011

APPENDICES
APPENDIX 1: QUESTIONNAIRE

Date: June 2025

Dear respondent,

I am Michael Manyifu, a student of Nkumba University undertaking a research titled**, "** ***COMPLIANCE WITH INTERNATIONAL AVIATION SECURITY STANDARDS ON ORIGINATING PASSENGER SECURITY IN UGANDA: A CASE STUDY OF ENTEBBE INTERNATIONAL AIPORT SECURITY PROGRAMME",*** leading to the accomplishment of the study for the Award of the degree of Master of Arts in SECURITY AND STRATEGIC STUDIES.

The data/information you provide shall be used only for academic purposes, so feel free to avail information/data in response to the questions provided in this Questionnaire.

I will be so grateful for your support in this endeavor,

Yours

…….

Researcher

Section A: Demographic characteristics of the respondents

1) Gender

   Male ( ) Female ( )

2) Age Group

   20 – 29 years ( ) 30 – 39 years ( ) 40 – 49 years ( ) 50 years +( )

3) Level of education

   Certificate ( ) Diploma ( ) Degree ( ) Masters and above ( )

4) Department of the respondents

   Management ( ) Executive ( ) Accounting and Finance ( )

   Human Resource ( ) Aviation Security ( ) Fire and rescue ( )

5) Years of experience

   0-1 year ( ) 2 - 3 years ( ) 4 - 5 years ( ) 5 years + ( )

For section B, C and D, use the scale provided to rate your response;

Strongly Disagree (1) Disagree (2) Not Sure (3) Agree (4) Strongly Agree (5)

Section B: The relationship between screening of originating passengers and aviation security at Entebbe International Airport

1) The screening devices consist of aviation security technology and/or airline personnel details

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

2) There is effective Transportation Security Administration (TSA) screening at the airport

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

3) Transportation Security Administration uses millimeter wave advanced imaging technology and walk-through metal detectors to screen passengers

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

4) Baggage screening security device deployment involves the allocation of baggage screening security devices and the assignment of selectee baggage

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

5) There is multilevel screening to capture the false and true or clear rate associated with various flagged threats by the aviation security procedures

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

6) The partial baggage screening problems address how to deploy a certain number of explosive detection system to screen already checked baggage in order to minimize the risk associated with the unscreened bags

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

7) Baggage screening security devices and operations at the airport provides an important defense against terrorist actions targeted at commercial aircraft

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

8) The baggage screening security device deployment problem are defined using the Uncovered

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

9) Baggage Segments (UBS), Uncovered Flight Segments (UFS), and Uncovered Passenger Segments (UPS) performance measures

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

10) There is much selectee baggage to screen on flights at Entebbe International Airport as it provides hub airport services

    Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

Section C: The relationship between access control and aviation security at Entebbe International Airport

1) The airport access control system requires an all-encompassing infrastructure to function effectively and efficiently

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

2) Access control entails controlling admittance to certain parts of the airport and tracking the movement of persons throughout the airport

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

3) By ensuring that users only have access to what they need to perform their job functions, organizations can minimize the risk of internal threats and accidental data leaks

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

4) Access control keeps confidential information such as customer data and intellectual property from being stolen by bad actors or other unauthorized users

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

5) The airport access control system employs an array of authentication techniques to confirm a person's identity before allowing them into restricted airport sections

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

6) Access control readers are strategically placed at different entry points throughout the airport to authenticate the identities of those seeking entry

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

7) The airport has its access control system's integrity reinforced by physical barriers that impede unauthorised access

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

8) The airport has its access control system's integrity reinforced by human security barriers that impede unauthorised access

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

Section D: The measure of influence of compliance on aviation security at Entebbe International Airport

1) There is an established regulatory framework to guide security operations at the Airport

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

2) AVSEC involves in risk identification, assessment, management and mitigation

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

3) The AVSEC carries out a vulnerability assessment at the airport

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

4) The AVSEC security leadership surveys and tests the various security applications at the airport emigration

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

5) The AVSEC security leadership allows and leads security enforcement

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

6) The AVSEC security leadership manages security breaches

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

7) The AVSEC security leadership inspects and audits the security process

   Strongly Disagree ( ) Disagree ( ) Not Sure ( ) Agree ( ) Strongly Agree ( )

End

APPENDIX 2: INTERVIEW GUIDE

Date: June 2025

Dear respondent,

I am Michael Manyifu, a student of Nkumba University undertaking a research titled**, "** ***COMPLIANCE WITH INTERNATIONAL AVIATION SECURITY STANDARDS ON ORIGINATING PASSENGER SECURITY IN UGANDA: A CASE STUDY OF ENTEBBE INTERNATIONAL AIPORT SECURITY PROGRAMME",*** leading to the accomplishment of the study for the Award of the degree of Master of Arts in SECURITY AND STRATEGIC STUDIES.

The data/information you provide shall be used only for academic purposes, so feel free to avail information/data in response to the questions provided in this Interview Guide

I will be so grateful for your support in this endeavor,

Yours

…….

Researcher

1) Describe the trends of passenger traffic through Entebbe International Airport between 1991 and 2024?
2) What are the various types of Airport Security?
3) What is passenger pre-board screening?
4) What is the significance of the security bollards?
5) What are the key elements of aviation security at the Airport?
6) What are the various components of screening devices used by AVSEC?
7) What is the significance of Transportation Security Administration (TSA) screening at the airport?
8) Describe the nature and functioning of the airport access control system?
9) What is the significance of the established regulatory framework in guiding security operations at the Airport?

Thank you

APPENDIX 3: DOCUMENT REVIEW CHECK LIST

This will include;

1) Identifying the documents for review
2) Organizing documents
3) Checking document type and format
4) Ensuring document is readable and legible
5) Verifying document content
6) Cross-checking for any outdated or irrelevant information
7) Checking for any grammatical or spelling errors
8) Ensuring document structure and formatting is consistent
9) Checking compliance with company's style guide
10) Verifying all necessary document sections is complete
11) Verifying inclusion of supporting documents or appendices if necessary
12) Checking if all required signatures are present
13) Ending document review process

End

APPENDIX 4: PARTICIPANT CONSENT FORM

Consent to take part in research

I…… voluntarily agree to participate in this research study. I further understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind. In addition, I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted. I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study. Furthermore, I understand that participation involves disclosing information while answering the questions put to me. I understand that I will not benefit directly from participating in this research, either financially or otherwise. I agree to my interview being recorded (by writing or audio-recorded).I understand that all information I provide for this study will be treated confidentially. I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about. I understand that disguised extracts from my interview may be quoted in the dissertation.

I understand that if I inform the researcher that myself or someone else is at risk of harm they may have to report this to the relevant authorities, they will discuss this with me first but may be required to report with or without my permission. I understand that signed consent forms and original audio recordings will be retained in the University reserve section until the research has been okayed and they be disposed of by burning or any other way of destroying them. I understand that under freedom of information legalization I am entitled to access the information I have provided at any time while it is in storage as specified above. I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Names, degrees, affiliations and contact details of researchers (and academic supervisors when relevant).

Signature of research participant

…….

Signed and dated by participant/respondent

Signature of researcher I believe the participant is giving informed consent to participate in this study ……..Signed and dated by researcher