UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

LEGON CENTRE FOR INTERNATIONAL AFFAIRS AND DIPLOMACY (LECIAD)

AVIATION AND INTERNATIONAL SECURITY: THE CASE OF GHANA AIRPORTS COMPANY LIMITED

BY

NANA AMO-KOREE

(10484593)

This Dissertation Is Submitted to the University of Ghana, Legon, in partial fulfillment of the Requirements for the award of **MA in INTERNATIONAL AFFAIRS Degree**

LEGON **OCTOBER 2021**

DECLARATION

I hereby solemnly declare that this dissertation is my own work produced from research carried out under the supervision of Dr. Ken Ahorsu in Legon Centre for International Affairs and Diplomacy (LECIAD). This dissertation has not been summited in any form for any degree or diploma at any university or other tertiary institution. Authors and Publishers whose work was cited in this study have been duly acknowledged in the text and list of reference.

…… ……..……..

NANA AMO-KOREE
(STUDENT)

DR. KEN AHORSU
(SUPERVISOR)

DATE: 03RD MARCH, 2022

DATE: 03RD MARCH, 2022

DEDICATION

I dedicate this work first to the almighty God for how far he has brought me and also to my family and friends for their immense support and encouragement.

ACKNOWLEDGEMENT

The product of academic excellence is not achieved through the hard work and commitment of one person but through the combined effort of some dedicated individuals. My first thanks go to the Almighty God for His protection over me throughout this period of education. I am highly indebted to my supervisor Dr. Ken Ahorsu for his invaluable contributions and professional guidance which without him, this dissertation would not have been completed.

I would like to duly appreciate the inputs of respondents from Ghana Airports Company Limited, Ghana Immigration Service, Customs Excise and Preventive Service and airline security.

Thanks also go to my family for their support and encouragement which inspired me when situations became tough. May God Richly Bless You All

LIST OF ABBREVIATIONS

ACI	-	Airports Council International
AFCAC	-	African Civil Aviation Commission
AFRAA	-	African Airlines Association
Afro-CAA	-	Afro-Civil Aviation Agency
ATC	-	Air Traffic Control
ATM	-	Air Traffic Management
AVSEC	-	Aviation Security
BOAC	-	British Overseas Warehouse Corporation
CAA	-	Civil Aviation Authorities
CCTV	-	Close Circuit Television
CEPS	-	Customs Excise Preventive Service
EDS	-	Explosion Detection Systems
ETD	-	Explosion Trace Detection
GACL	-	Ghana Airports Company Limited
GAF	-	Ghana Armed Forces
GBAD	-	Ground Based Air Defense
GCAA	-	Ghana Civil Aviation Authority
GIS	-	Ghana Immigration Service
GTD	-	Global Terrorism Database
IATA	-	International Air Traffic Association
IATA-IOSA	-	IATA Operational Safety Audit
ICAO	-	International Civil Aviation Organization
IP	-	Internet Protocol
KIA	-	Kotoka International Airport
MANPADS	-	Man Portable Air Defense Systems
MERS	-	Middle East Respiratory Syndrome
MFAs	-	Multi-Flag Airlines
NAA	-	National Aviation Authorities
PFLP	-	Popular Front for the Liberation of Palestine

PSIM	-	Physical Security Information Management
QRA	-	Quick Reaction Alert
SAATM	-	Single African Air Transport Market
SARPS	-	Standards and Recommended Practices
SARS	-	Severe Acute Respiratory Syndrome
SOP	-	Standard Operating Procedures
TCAS	-	Traffic Collision Avoidance System
TSA	-	Transportation Security Administration
UAS	-	Unmanned Aircraft Systems
UN	-	United Nation
UNSC	-	United Nation Security Council

TABLE OF CONTENT

ABSTRACT

Security is very important in the aviation industry. Aviation security is the act of preventing any unlawful interferences that can jeopardize or cause harm to the safety of passengers, aircrafts and infrastructures of an airport. The research utilized the concept of transnational security as its conceptual framework. The study adopted a qualitative research method in order to enable the researcher access the views of respondents in their most original state. The research was carried out in Ghana Airport Company Limited (Kotoka International Airport) the international airport of Ghana where respondents expressed their views primarily through interviews. Meanwhile, secondary data was collected from relevant articles and books to give more meaning to the opinions expressed. In sum, the research study revealed that the security of KIA is a joint force by major security agencies working together to keep the airport safe. Also, it was obvious that the KIA has evolved post 9/11. KIA threat being faced is the insider threat. Moreover, KIA has not experienced any form of terrorist attack. KIA implements the provision of GCAA and ICAO. Finally, KIA is making and continues to make giant strides towards achieving its main goal of becoming a Hub in West Africa. Nevertheless, the main challenge facing the attainment of this goal is the issue of insider threat, lack of screening technologies and poor monitoring of CCTV surveillance system.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 Background

The world has become a small place due to globalization, transnationalism and interconnectedness between countries and people, and in no area has this been demonstrated more than the aviation industry. Among all means of transportation, air transport has become one of the most popular in contemporary times, it has also been the fastest and the safest means of travelling around the world. With regards to the economy of states, commercial aviation is very essential and also plays a vital role in its development. "The importance of aviation to both the public and the private sectors drives concerns about how security threats, such as terrorism, could affect the utility, safety, and economic value of those sectors" (Baker, 2020, p. 2). Traditional threats such as technical faults, lack of maintenance, plane crashes and emerging threats like terrorism, civil unrest, insider threats, pandemics and epidemics however, have an economic, political and health effects on states. Terrorists according to Krull (2016), continues to attack the global aviation industry for a variety of reasons. The attack on the aviation industry by terrorists is powerful and symbolic and also provides room at the international level and widespread media coverage. "The consequences of a successful attack are significant on airlines and the government, it contributes to political embarrassment and vulnerability, and it is effective" (Krull, 2016, p. 8).

In addition, Baker (2020) posits that, the aviation system indisputably has been a terrorist attractive target across ideological and political spectrum. Terrorism "is a social phenomenon in which groups of people as well as individuals' team with one another to exert violence against innocent, defenseless victims, which results in death and damage, fear and panic,

everything in order to make another person take action leading to the achievement of the real goal set by the groups" (Glen, 2014, p. 63). However, the Global Terrorism Database has it that the aviation terrorist attacks out of 1,363 cases from 1970-2015, alongside with yet to be recorded cases have had numerous distinct attacks in the aviation industry (GTD 2016). "The distinctions include type of attack, weapons used, perpetrators, security failures, number of deaths, and indicators and warnings of the attacks or of insider threat involvement" (Krull, 2016, p. 9). Nonetheless, Baker (2020) believes terrorists have continued to try to abuse the aviation system, from hijackings in the 1970s to al-Qaeeda in the Arabian Peninsula's foiled bombing operation in May 2012, because of the visibility and impact that even semi-successful assaults have had. Aviation security has become a significant commercial, political, and social issue in the international community as a result of the threat of terrorism to aviation targets. According to Krull (2016), from 1970 to 2015 majority of recorded cases of terrorist attacks by GTD happened in the Middle East.

> *Aviation terrorism is not only a concomitant feature of the development of international civil aviation but also of political upheaval throughout the world. It is not suddenly going to cease or disappear. It is unlikely that terrorists are going to stop hijacking aircraft, although hijacking is only one of the methods by which international terrorism expresses itself. Sabotage bombing, kidnapping and armed attack are also means of aviation terrorism, and they need not depend on the presence of a commercial aircraft. The employment of violence against certain airlines, with the intention of discouraging people from using them, is undertaken frequently to attack the national interests of a state. In fact, no other industry in the world has ever been under such violent and sustained terrorist and other criminal attack as that endured by the aviation industry over the past three decades* (Choi, 1994, p. 1).

The air transport system globally was threatened after the 9/11 terrorist attack and since then, air travel has become one of the most regulated. These regulations are formulated by regulatory

bodies such as the International Civil Aviation Organization (ICAO), which is an international regulatory body under the jurisdiction of the United Nations and National Aviation Authorities (NAA) or the Civil Aviation Authorities (CAA). The CAA formulate its national protocols based on the standards of ICAO. The security protocols formulated are for the purpose of national and transnational security protection. It is for this reason that this research seeks to explore Ghana's aviation security measures since the aviation system of Ghana is potential to terrorist attack like any other international airport.

1.1 Research Problem

Ghana is a developing country and it is not an originator of technology. "One of the major trends in security failures derives from the many successes in smuggling bombs and explosives onboard aircraft. This is both a human and technological issue" (Krull, 2016, p. 18). Unlike airports in Europe and North America whose managements responded swiftly to the upsurge of terrorist attack, a lot of airports mainly located in Africa and Asia according to Forest (2007), found it difficult to implement a lot of the security measures which are deemed to be costly, leading to the presence of loopholes that could be utilized by potential terrorists. Besides, the global aviation system is weakened and plagued with inadequate security, weak governance, bribery and corruption in countries where these airports are located [Africa and Asia].

> *After the attacks on September 11, 2001, it was clear that there was urgency to protect the airplane, airport terminals and associated facilities such as car parks from terrorist attacks. Passengers and baggage are not the only sources of threats to commercial aviation security. Threats can also come from the many processes that support an airport and the passengers and aircraft it serves: catering, maintenance, cleaning, ticketing, baggage handling, air traffic control, retail, food services, parking, car rental and others. These are areas where the general public has unrestricted access to before*

> *passengers undertakes security screening and pass into secured areas prior to aircraft boarding.* (Baker, 2020, p. 3)

People having access to places they are not supposed to be and workers taking money from passengers without doing due diligence to their duty are also weaknesses which pose a threat to Ghana's aviation industry. While terrorism is expanding in the Sahel region, and threatening the littoral states of West Africa, the aviation industry appears to be spared for now. However, the threat always exists and the aviation industry of West Africa is a potential target. Nonetheless, developing countries, such as Nigeria and Ghana, "lack structured security and the finances needed to match or attempt to match" international security (Krull, 2016).

Furthermore, the recent war against aviation terrorism has been slow in terms of achievement. This in the opinion of Choi (1994) is characterized by a lackadaisical approach by political leaders and lack of collaboration between local and international organizations' as well as some states' unwillingness to ratify the recommendations of international treaties regarding aviation security breaches and also does not give the required training to their security staff. There are common structural weaknesses exhibited by West African states that are vulnerable to internal security threats (Ahorsu, 2014). Ghana is in a part of the African continent that is vulnerable to terrorism. "It is fair to conclude that Ghana's vulnerability to terrorist threats is high" (Bamba, 2014, p. 53). Yet, Ghana has not experienced any form of terrorist attack in its aviation industry, which is contradictory to the idea (attacking vulnerable and easily accessible places) that terrorists follow. However, this necessitates the question, why is it so? For this reason, this research seeks to examine whether it is the diligent security arrangements put in place by the Aviation security system of Ghana that has prevented attacks from occurring or there has been laxity on the part of security services on Ghana's aviation industry, or it is just coincidental that Ghana has not been attacked.

1.2 Research Questions

1. What are the threats to Ghana's aviation industry?
2. What security measures are put in place at Ghana Airport Company Limited?
3. How comprehensive and foolproof have Ghana's security measures been?
4. What are the loopholes and challenges of security measures at Ghana Airport Company Limited?

1.3 Research Objectives

1. To examine the threats in Ghana's aviation industry.
2. To identify the security measures that are put in place at Ghana Airport Company Limited.
3. To examine how comprehensive and foolproof Ghana's aviation security measures has been.
4. To identify the loopholes and challenges of security measures at Ghana Airport Company Limited.

1.4 Scope of the Study

This study reviewed the security measures put in place in the aviation industry of Ghana since 9/11 to prevent terrorism.

1.5 Rationale of the Study

It is heartening that Ghana has not experienced any terrorist or civil aviation crises. Security trainings and preparations in African Countries are mostly focused, and rightly so, to unconventional warfare over the years. In addition, Bamba (2014) postulates that, the rise of

security threats faced by African countries is unusual in nature. It is also important to find out if the aviation industry of Ghana is always alert to fight any act of unlawful interference.

This research study hopes to help Ghana and the rest of West African states to improve their security systems in the aviation industry. It will also contribute to existing literature in the field of international relations and security studies.

1.6 Conceptual Framework

The concept of transnational security was utilized for this research. Fafore (2020) defines transnational as the movement of people or activities of organizations across borders and such activities can be for socio-cultural, political, economic, educational, and criminal purposes. Transnational security involves issues or threats that originate from non-state actors such as terrorists groups and criminal organizations within national borders of a country and spread to other countries within and outside the region (Fafore, 2020). Transnational security encompasses cross-border activities that have impact on national and regional security. "Most of the contemporary profiles of security threats are often imperceptible non-traditional military threats whose effects can hardly be pre-determined" (Ahorsu, 2014, p. 83). The focus on transnational security addresses the growing need for a multilateral approach to security concerns that affect the whole international community. It investigates the increased requirement for international coordination when dealing with increasing global challenges (Altier, 2021). According to Sandler, Arce & Enders (2009), terrorists crossed borders and, in some cases, staged attacks in foreign cities to draw international attention to their cause or grievance during the modern period of transnational terrorism. Examples of such occurrences are;

> *…Black September's abduction of Israeli athletes during the 1972 Munich Olympics, Hezbollah's suicide bombing of the US Marine barracks in Beirut on 23 October 1983, Hindu extremists' downing of Air India flight 182 on 23 June 1985, the downing of Pan Am flight 103 on 21 December 1988, the truck bombing of the World Trade Center on 26 February 1993, and the near-simultaneous hijackings on 11 September 2001* (Sandler, Arce & Enders, 2009, p. 1).

Marie-Helen in 2015 commented on, the issue of security in the area of aviation. She assessed the issue has aggravated into a phenomenon which is transnational in nature due to globalization. To her, weapons, people and toxins easily move from one border to the other, which makes it difficult for institutions and governments all over the world to avoid transnational security threats These issues which are at the lead of the plan of security experts globally are addressed by transnational security (Marie-Helen, 2015). "Such threats are able to threaten whole regions undermining their political, socio-economic functional integrity, and the well-being of their citizenry…these threats are often diffuse and do not present a crisis central point for governments and other watchdogs to fashion solutions to" (Ahorsu, 2014, p. 83). However, Mcquaid et al. (2017) argues that, transnational challenges as a term is solely not orientated thus, other phenomenon are used to describe similar things and they are; transregional challenges, emerging threats, and non-traditional threats.

Likewise, 'transnational' security issues, according to Anggoro (1999), are cross border threats that are non-military in nature and has the tendency of threatening the social integrity, the political and the health of the residents of the nation. Mcquaid et al. (2017) also admits, the term transnational challenges are always used to differentiate between state-based adversaries and an adversary nation state's military size and strength whose threats are usually measurable.

Bergeron (2013) defines transnational organized crime as to those continuous relations of persons that function across borders with the aim of attaining authority, impact, economic and

viable gains, only or in helping, through unlawful means, while defending its actions by way of a form of exploitation and violence, or through a transnational organizational structure. In affirming the view of Bergeron, Stoica, (2016) also defines transnational organized crimes as illegal activities orientated towards profit that cross-national borders" and further posits that not all organized crime forms are transnational.

Conversely, Mcquaid et al. (2017), critique that the definition of transnational challenges is fluid thus, there is no approved definition of transnational challenges apart from the notion that the phenomena touch on institutions and occurrences which are not restricted to a state's borders. Additionally, he believes that, impact across borders is caused by so many things, including those in the physical environment and those that are not, it is debatably too broad to solely use a single idea (transnational security threats) as the sole basis for a definition. He also argues that, "the term transnational also connotes complexity and murkiness, and thus can be applied to a broad range of phenomena sometimes without precision" (p. 3). He also claims that, the words challenge and threat have been used interchangeably in the literature, and then posits that transnational challenges are distinct from transnational threats, and the latter should be viewed as a subset of the former (Mcquaid et al., 2017).

Even though the concept has been criticized by some scholars, I am of the belief that the concept is appropriate for this study. This is because the perception of transnational security helps understand the threats and vulnerabilities the aviation industry of Ghana is exposed to. It also helps to understand the existing mitigatory policies that have been put in place by GCAA. The understanding of this concept will help identify the loopholes or the gaps that are exposing airport security to these threats so as to aid in making recommendations to regulators to reduce the risk.

1.7 Literature Review

1.7.1 The Beginning and Sequence of Events of Aviation Transport Terrorism

According to Arasly (2004), the rise of aircraft as a form of transportation has nearly paralleled the increase of terrorism. The first recorded aviation terrorism is by the Peruvian insurgents who hijacked an aircraft in 1930 (Wolniak, 2019). Also, the hijacking of an airplane from "Macao by terrorists in 1948", according to the ICAO, was the first postwar hijacking. Other sources, on the other hand, relate to a Romanian plane being hijacked in 1947.

Between 1940 and 1950, hijackings of planes were uncommon. They did, however, occur seldom, primarily as part of efforts to escape communist regimes in Central and Eastern Europe (Wolniak, 2019). For example, in the initial second half of the twentieth century, dissidents in Cuba hijacked planes to flee Fidel Castro's rule to the United States (Holden, 1986). According to Wolniak (2019), in the years that followed, the situation shifted dramatically when pro-Cuban rebels, communist Americans, and regular criminals avoiding the law instigated hijacking planes flying from the United States to Cuba. The first of these incidents occurred on November 1, 1958, "when four pro-Castro Cuban citizens and supporters" hijacked an aircraft destined for Havana from Miami (Holden, 1986; Wolniak, 2019). The plane crashed in northern Cuba, presumably while looking for a rebel-controlled airstrip (Wolniak, 2019).

In addition, the hijacking of an El Al Israeli airplane destined from Rome to Tel Aviv by terrorists from the "Popular Front for the Liberation of Palestine" (PFLP) on July 22, 1968, is widely regarded as the beginning of international aviation terrorism (Arasly, 2004; Glen, 2014). The plane was flown to Algeria, which at the time was considered a "safe haven" for Arab extremists. According to Jenkins (1989), the hijackers released 26 non-Israeli hostages upon landing and demanded the release of 1,200 Arab inmates detained in Israeli jails in exchange for the other hostages. The terrorists, however, decided to release the rest of their hostages after

the release of 16 Arab inmates. It's worth noting that the 1968 event became the only "successful terrorist attack on El Al's fleet" in history, which is a remarkable accomplishment given the "number of attempted attacks on the Israeli airline" (Arasly, 2004 ; Wolniak, 2019).

The hijacking of airliner planes by Palestinian terrorist groups peaked on September 6, 1970, when four planes heading for New York were seized at the same time (Wolniak, 2019). Three planes were successfully hijacked by terrorists (Holden, 1986). "A Swiss DC-8 and a US Boeing 707 were directed to the Dawson's Field airstrip near the town of Zarka in Jordan, and a Pan Am' Boeing 747 was forced to land at the Cairo airport in Egypt due to its size" (Wolniak, 2019, p. 296).

> *Another precedential terrorist attack took place on 5 September 1972 during the Munich Olympic Games when a group of Palestinian terrorists of the Black September Organization took hostage several Israeli athletes. Sadly, all hostages were killed during an unsuccessful recapture attempt* (Wolniak, 2019, p. 297).

Soon after, a new heinous kind of aviation terrorism emerged: plane bombings. Bombs of various sizes were planted and detonated not just on-board planes, but also within airport grounds, as part of this strategy (Wolniak, 2019). On 21 February, 1970, the Swiss Air airliner which was heading to Zurich from Tel Aviv, was the first official bomb assault on an airplane and the PFLP was in charge of organizing this (Wolniak, 2019). Arab terrorist groups carried out bombs mostly against the Israeli Airline El Al in the 1970s. Terrorists began targeting US airliners in 1974, as a result of "the US's support for Israel's anti-Palestinian policy" (Wolniak, 2019).

According to Wolniak (2019), in the 1980s, there was an alarming surge in successful and unsuccessful aircraft bombings, resulting in a large number of casualties. To put it in

perspective, 42 bomb attacks killed 650 people in the 1970s, while 24 bomb assaults killed roughly 1,000 people in the 1980s (Wolniak, 2019). The episode of 23 June 1985 when "separatists from the Babbar Khalsa organization" concealed "a SEMTEX explosive device inside a Sanyo portable stereo", exemplifies the significant "increase in fatalities caused by bomb" strikes (Wolniak, 2019). The airliner in question was flown by Air India and was on its way from Montreal to New Delhi (Flight 182) (Hoffman, 1998). When the explosive burst at 08.14 a.m., the plane was flying over the Atlantic Ocean. The whole 329-person crew perished (Wolniak, 2019).

On December 21, 1988, another catastrophic aircraft bombing occurred. Pan Am Airlines operated the plane, which was on its way from London to New York (John, 1998). "This time, a SEMTEX-filled Toshiba portable stereo was put inside a suitcase marked with a stolen JFK Rush sticker" (Wolniak, 2019, p. 298). Flight 103 was flying over the Scottish town of Lockerbie at the time of the explosion. The attack took the lives of 259 passengers, crew members, and 11 local inhabitants, who were killed when the plane's wreckage hit the ground (Baker, 2020).

Terrorists used Man Portable Air Defense Systems (MANPADS) as another lethal technique of attacking civilian airplanes (Schóber, Koblen, & Szabo, 2012). Between 1979 and 2006, the Transportation Security Administration estimates that 35 terrorist MANPADS assaults on civilian airplanes occurred (Wolniak, 2019). 650 individuals died as a result of these events. According to Wolniak (2019), 40 MANPADS attacks occurred between 1975 and 1992, resulting in the deaths of 760 individuals. As can be seen, statistics on the number of MANPADS assaults and subsequent casualties is unclear, but the problem's scope remains significant.

Lastly, the September 11 attacks, often known as the 9/11 attacks, were a series of airline hijackings and suicide attacks carried out in 2001 by 19 militants affiliated with the Islamic extremist organization al-Qaeda against targets in the United States, making them the deadliest terrorist operations in US history (Krull, 2016). In New York, 2,750 people were killed, 184 at the Pentagon, and 40 in Pennsylvania; all 19 terrorists were killed (Kean & Hamilton, 2004). According to Arasly (2004), the terrorist attacks of September 11, 2001, signaled the beginning of a new era in modern history. "This period is one characterized by instability, unpredictability, and the reshaping of complex systems, including both traditional and new types of challenges and threats of particular significance in the last and most dangerous category is, beyond any doubt, the emergence of terrorism as a truly global threat" (Arasly, 2004, p. 75).

1.7.1.1 Factors that account for terrorism in the aviation industry

The ever-increasing threat of aviation terrorism has compelled international society and individual governments to take independent political, strategic, and tactical steps to counteract its impacts (Glen, 2014).

> *The global aviation industry remains a staple target for terrorists for several reasons. Aviation terrorism is powerful and symbolic, it provides an international stage and extensive media exposure, the consequences of a successful attack are significant on airlines and the government, it contributes to political embarrassment and vulnerability, and it is effective* (Krull, 2016, p. 2).

According to Wojciechowski (2017), "Ethnic, religious or ideological conflicts, poverty, negative aftermath of modernization, injustice, revolutionary sentiments among society, weak governments or an internal power struggle" are all sources of terrorism. Wojciechowski (2017) refers to a wide range of factors that fall under the "social, political, cultural, psychological and

economic categories. Aviation terrorism like any other terrorism has the same ideology and reasons for their actions (Glen, 2014). "The hijacking of modern commercial jets creates a special form of theatre in which notions of spectacle, fear, excitement and communication are all concentrated inside the hull of one aircraft" (John, 1998, p. 3). According to Jenkins (1989), terrorists were attracted to commercial airliners for political and operational reasons.

Most of the hijacks that occurred from 1930s to 1988 were politically motivated (Glen, 2014). An example is the Peruvian revolutionaries hijack in 1930. "Therein, several Peruvian revolutionaries seized an aircraft with the intention to illegally cross the border of their country" (Wolniak, 2019, p. 296). According to Arasly (2004), this aircraft hijack marked the first time where such an occurrence was used for the purpose of pressuring a political opponent by sending a propaganda message to the world by bringing a political cause using the incident and not for individual purpose or not criminally motivated. However,

> *It is no mere coincidence that late 1960s and the early 1970s were marked by explosive growth in the number of terrorist acts directed at air transport, most of which followed a typical pattern: armed seizure of an airliner; hijacking to a safe airport; and issuing demands of a political nature under the threat of execution of hostages. Later, in the 1980s, the dangerous tendency toward the further spread of aviation terrorism as a tool of political pressure and propaganda came to an end.* (Arasly, 2004, p. 77)

Beginning in 1979, several Iranian Revolution factions linked to Lebanon developed hijacking as a way of achieving political change (John, 1998). In addition, the hijacking of an El Al Israeli aircraft by the PFLP in 1968 was political and this "showed various terrorist organizations that aircraft hijacking was an effective method to achieve political goals by means of exerting pressure on state authorities" (Wolniak, 2019, p. 297).

However, the increment of bombings in the aviation industry could be traced to 1985 when "separatists planted a SEMTEX explosive device inside a Sanyo portable stereo…Although the baggage was x-rayed at the Montreal airport, the bomb was not detected" (Wolniak, 2019, p. 298). This incident occurred as a result of lack of technology at the airport.

Finally, an aircraft bombing happened on flight 103 operated by Pan Am Airlines in the year 1988. This bombing was as a result of poor infrastructure at the airport. According to Wolniak (2019),

> *…a SEMTEX-filled Toshiba portable stereo was put inside a suitcase marked with a stolen JFK Rush sticker (which indicated lost baggage to be delivered to New York's JFK Airport as quickly as possible). The baggage was loaded into the airliner with no problem and without being checked. The device was designed to explode when the aircraft climbed 31,000 feet above ground.* (p. 298)

1.7.2 International Aviation Organizations Roles in Enhancing Security

Since 1946, there has been a domination of the International Civil Aviation by two bodies which are; ICAO: the United Nations aviation wing, and IATA: the world's scheduled airlines trade association (Wallis, 2007). According to Wallis (2007), the emergence of "of the international standards and recommended practices ICAO's Annex 17 (Security) to the Chicago Convention on International Civil Air Transport, and IATA's own resolutions contained in their passenger Conference and Security Manuals," was as a result of these two organizations rising up to challenge the first threat by airborne terrorist to commercial air services.

In making rules for international aviation, ICAO and IATA is at the lead, however as IATA has been quiet on security issues in the existing decade, a lot has been perceived "of a third

body with the potential to influence the air transport industry's response to airborne terrorism" (Wallis, 2007, p. 83). "This is the Geneva-based Airports Council International (ACI), formed by the merger in 1991 of the Airport Operators Council International (a US-dominated airport group) and the International Civil Airports Association (principally a European organization)" (Wallis, 2007, p. 83). Under the previous organization of the Airports Association Coordinating Council, ICAO and IATA made important contribution at the UN agency in their decision-making processes.

1.7.2.1 International Civil Aviation Organization

The International Civil Aviation Organization is made up of 185 member states, and its mandate is derived "from the 1944 Conference on International Civil Aviation as well as IATA" (Wallis, 2007, p. 84). The act of the Canadian Parliament established the airline body officially (Wallis, 2007).When the treaty established in Chicago was ratified by a suitable number of states, ICAO was birthed and "through a tiered committee structure, ICAO develops and publishes International Standards (mandatory rules) and Recommended Practices, which its member states are urged to implement" (Wallis, 2007, p. 84).

According to Wallis (2007), the required guidelines and mandatory rules are created at the level of conceptualization "within ICAO by the Aviation Security Panel", which is made up of a professional body whose membership is drawn "from a number of states and international organizations". Fast forward, in 1985 there was an induction of a group, immediately after the Air India Boeing 747 was bombed, the panel was mandated to review and re-write the international security standards and Annex 17 to the Chicago Convention respectively (Wallis, 2007). The rule book of aviation security is Annex 17, and it is as a result of the work of the panel which in today's international security regulations serves as the basis (Wallis, 2007).

Rahman (2012) posits that, Annex 17 shows the rule, Standards and Recommended Practices (SARPS) required to bring out an effective security programme. Moreover, the document is negotiated with inputs of security specialists demanded by ICAO wide-range members which is "designed to balance the needs of civil aviation" (Wallis, 2007).

According to Rahman (2012), if contracting states find in the regulations a reason not to accept, they can opt out since arrangements are made for contracting states to do so, even though government is bonded by ICAO Annex 17. Moreover, Wallis (2007) posited that as he was developing his research;

> *ICAO's role in enhancing civil aviation security had necessarily concentrated on the development of standard rules and guidelines. If implemented, these would provide a consistent and appropriate level of security worldwide. A combination of three ICAO products - Annex 17; a Security Manual containing operating guidelines; and Training Programmes - should enable any state to develop its own efficient response to terrorism aimed against civil aviation. Three other ICAO products, the Tokyo, Hague and Montreal Conventions, provide the basis for international law in respect of acts of unlawful interference.* (p. 87)

1.7.2.2 IATA

In 1919, the International Air Traffic Association (IATA) was founded and in 1944 during the International Air Transport Chicago conference it was rebirthed (Wallis, 2007). However, the Association current charter according to Wallis (2007), was given by the Canadian Parliament in 1945 acting on behalf of the world governments. Over 200 airlines are members of IATA worldwide (Wallis, 2007). One requirement in its article of association, which is among its primary goals is;

> *to promote safe, regular and economical air transport for the benefit of the peoples of the world, to foster air commerce and to study the problems connected therewith…and*

> *also, to co-operate with the International Civil Aviation Organization and other international organizations* (Wallis, 2007, p. 88).

Wallis (2007) stated that, there have been numerous initiatives introduced by IATA in the quest to improve civil aviation security. However, the introduction of the concept of sterile lounge development has been included in a lot of major airports in the world's operations. The screening of passenger's hand luggage before entering the sterile area is required by the concept and "all other persons and items entering the area to be authorized and subjected to security control" (Wallis, 2007, p. 90).

In spite of the strategic plan of action by ICAO, Wallis (2007) posited that, "the potential for securing commercial aviation against the worst ravages of terrorism is more likely to stem from activity by the air carriers than from the efforts of governments" (p. 93).

1.7.3 Future Threats to Civil Aviation

One of the social demands in the present world is security of which aviation security is inclusive. However, Schóber, Koblen, & Szabo (2012) stated that, aviation terrorism is dispersing fear and touching passengers in all forms worldwide. Considering the interest of the media, the impact on communities psychologically and potential human victims, civil aviation is terrorists potential target (Arasly, 2004). After the 11th September, 2001 attack aviation officials of state and non-state actors have beefed up security measures in and around airports and other high rising buildings. normal way of living has changed. Even though the aviation industry has been attacked by terrorist in the past, the hijack of aircraft prior to 9/11, aircrafts were not used as ground target weapons with such effect (Baker 2020). These attacks showed the weakness in the civil aviation industry and showed that it should be an international and national importance in protecting civil aviation (Schóber et al., 2012).

According to Schóber et al. (2012), cyber-attack and Unmanned Aircraft Systems (UAS) mismanagement are potential future threats to the aviation industry. However, there are systems and large-scale computer networks as well as ground equipment which aid the aviation industry. Thus, "aviation is more than just planes" (Schóber et al., 2012). With no doubt, the aviation industry is one of the industries that experience a growing number of hacking where these hackers find cyber-attacks to be less expensive, very easy and an effective way of demonstrating their strength (Schóber et al., 2012).

Schóber et al. (2012) stated that, "every radar, every ATC/ATM system, every link, and every phone line that makes the system go is thus a potential target". Nevertheless, there is no system which is immune to cyber-attack and it has become a pandemic globally. The Traffic Collision Avoidance System (TCAS) could be removed by hackers or cyber terrorist which could lead to mid-air collision and this could also delay and bring about restrictions in air traffic when there is interference in the controllers work (Schóber et al., 2012).

In addition, there would be a huge disaster economically when the ATC is taken down, leading air transport into chaos (Schóber et al., 2012). There could be a serious threat to air transport when in combination with cyber-attack there is an electromagnetic pulse attack or jamming of radio frequency (Schóber et al., 2012). The production of highly sophisticated devices and capabilities in the aviation industry makes it extremely difficult for officials in the industry to predict or prevent cyber-terrorist from carrying out attacks on the aviation infrastructure. (Nobles, 2019), Also, Schóber et al. (2012) posits that,

> *…the cyberspace is an emerging, critical and fast-growing area of competition between both, state and particularly non-state actors like terrorist groups with their hacker`s community and many analysts are truly pessimistic about the future. To ensure an*

> *effective defense against the cyber threat is very hard, expensive and endless activity, because the attackers are always one step ahead. In contrary, the technical and economic barriers to entry into the cyber domain are much lower and significantly cheaper for any organization or subject. That is precisely the reason why almost anyone is able to develop the capabilities necessary to conduct cyberspace operations*. (p. 174)

Furthermore, the other future threat according to Schóber et al. (2012) is Unmanned Aircraft System even though there has not been any incident reported yet with regards to UAS usage by terrorist groups in the civil aviation industry. The UAS is not only needed to unravel legal and important technical challenges but serve as a guidance for potential "terrorist misuse of UAS" preparation thus, pay attention to the security challenges towards their integration into non-segregated airspace (Schóber et al., 2012). Political leaders and diplomats according to Schóber et al. (2012), can be psychologically affected through fear and also bring them under pressure when UAS is used by terrorists to attack. Adversely, terrorists gain advantage from the misuse of UAS which includes; the flexible and secrecy in take-off site selection, cheaper technology, biological or chemical weapons carriage possibility, high accuracy and easy to be assembled, increase in spreading globally and with regards to possible-caused damages, it is cost effective.

Schóber š et al. (2012) also stated that the UAS is invisible and valiant since it is a small target and also having minimal altitude coverage on the radar leading to "poor effectiveness of existing air defenses". However, with this kind of threat, the Quick Reaction Alert (QRA) units and Ground Based Air Defense (GBAD) existence are useless thus, a small UAS is impossible to be defended against and in a technical and economic viewpoint, it will also be complicated defending the airport perimeter (Schóber et al., 2012).

In conclusion, terrorists are hard and irregular to predict and they can act at any time and fear, uncertainty and violence are their core characteristics (Schóber et al., 2012). According to Schóber et al., (2012), the problem of identifying terrorists source of funding place a difficult position in combating it and the aviation security improvement process is never ending, therefore the latest technology developments and trends in the aviation industry needs to be copied. However, there should be strategy implementations which will be appropriate to manage risk in civil aviation, and also make sure aviation security systems and risk analysis are improved to identify risk levels in the aviation industry.

1.8 Research Methodology

The research used a qualitative method. Qualitative method of analysis aims to understand beliefs, motives and insights into challenges and to find solutions to them (Ritchie and Lewis 2008; Ritchie, Lewis, Nicholls, & Ormston, 2013). Qualitative analysis was employed in this study because, this form of analysis avoids pre-judgements, promotes transparency, provides in-depth understanding of the research topic and stimulates people's individual experiences (Silverman, 2016). Although this method is limited in statistical representation of data collected the choice of settling on this method is based on the fact that this study sought to explore Ghana's aviation security measures since the aviation system of Ghana is potential to terrorist attack like any other international airport.

Non-probability sampling was used as a sampling technique. The sampling methods used for the study were purposive and snowball sampling because they are less stringent and not requiring representativeness (Biernacki, & Waldorf, 1981). Snowball and purposive sampling technique aids the researcher to get the accurate information from specific characteristics of a populace (Palinkas et.al., 2015). Data was obtained by means of organized interviews.

Unlike quantitative research method, qualitative research does not give room to large sample size. It usually depends on factors like the scope, quality of data, the nature of a researcher's topic to provide deeper appreciation and more knowledge on a research topic (Dworkin, 2012). A total of 7 experts and officials from Ghana Airports Company Limited were interviewed. Phone call interviews were held to gain an in-depth understanding of Ghana's aviation security measures post 9/11 terrorist attack.

1.8.1 Sources of Data

Primary and secondary sources of data was used for this research. The primary source of data collection employed was structured interviews so that there will be consistency in the information that will be collected (Creswell, 2009; Creswell, 2013). People that were interviewed were from the heads of the Aviation Security (AVSEC) and Rescue and Fire Fighting Service (RFFS) Department of GACL, Private Security agent for international airlines, Ghana Immigration Service (GIS) and Customs Excise and Preventive Service (CEPS). This is because these security agencies work together to make sure the airport is safe. The secondary sources were explored from, internet sources, articles and other electronic and printed materials such as press releases, news articles, policy papers, reports as well as other related papers were used for the study.

1.8.2 Data analysis

The five steps of thematic analysis were employed to analyze and interpret data collected. Thematic analysis is generally used for the purposes of foundational and flexible analytic method of transforming qualitative data. It is usually applied to a collection of texts like interview transcripts, where the researcher cautiously analyses data to identify common themes that is, ideas, patterns of significance and topics that repeatedly occur in the data collected. It

is very useful in arranging collected data into themes as proposed by the founder of thematic analysis (Gerald Horton) (Braun and Clarke, 2006).

Thematic analysis was utilized in this research. Data collected from interviews were transcribed. Through a careful examination of identifying repeated ideas, topics and frequently occurring responses on Ghana's aviation security measures post 9/11. the data was structured into themes and sub-themes for a thorough discussion on findings. As inferences were made from the interview, available literature on aviation security paved way for an appropriate discussion.

1.8.3 Ethical Consideration

Informed consent: Verbal permission was sought from respondents who were associated with the study. In addition, the purpose of the study was duly clarified to respondents before data collection.

Voluntary participation: Respondents were given the opportunity to freely decide to partake, and also the right to discontinue the study.

Confidentiality: Data collected were kept on the researcher's laptop with a code to prevent people from accessing the files. Names of respondents were substituted with pseudonyms to conceal their identity.

Plagiarism: The researcher guarded against plagiarism by acknowledging authors works used in the study.

1.9 Limitation of the study

Face-to-face interviews was planned but due to the outbreak of the Coronavirus (COVID-19) pandemic, strict measures were enforced at Ghana Airports Company Limited and as part,

visitors were not allowed in their offices. This made the face-to-face interviews impossible. Therefore, phone call interviews were adopted and the calls were recorded for the purposes of transcription. Also, 15 respondents were earmarked for this research, but 7 respondents were interviewed out of the total number due to data saturation.

1.10 Arrangement of Chapters

The study will be structured in four (4) main parts,

Chapter 1-Introduction to the study

Chapter 2-An overview of contemporary aviation security.

Chapter 3- Ghana's Aviation Industry and Security.

Chapter 4-Summary of findings, Conclusion and Recommendation

CHAPTER TWO

AN OVERVIEW OF CONTEMPORARY AVIATION SECURITY

2.0 Introduction

This Chapter talks about the global aviation Industry. It also looks at the post 9/11 era, the Security arrangements, mechanisms and standards set globally in the aviation industry and Africa and Aviation Security.

2.1 Aviation Industry Globally

Events impacting international advancements in the aviation industry have frequently made news headlines over the years. Public attention is piqued not just by new innovations, but also by commercial changes and worldwide upheavals in the business (Eriksson & Steenhuis, 2015). The aviation sector is often partitioned into two categories: aerospace and aviation. Aviation refers to air transportation, which includes scheduled commercial airlines, freight operations, and non-scheduled passenger freight air transportation. The aerospace industry is defined as the manufacture of general, commercial, military aircraft, and related products such as spacecraft and missiles (Aerospace Industries Association of America, 2011; Bureau of Economic Analysis, 2011). "Aviation is a USD 2.7 trillion global industry that supports over 63 million jobs and is about 3.5 percent of the world's gross domestic product" (Krull, 2016, p. 8).

The international air transportation industry provides a key communications link that gives prosperity to many countries. Terrorism and other circumstances have put this vital link in jeopardy, but so have flaws in the aviation security system (Choi, 1994). Globalization, lower air travel costs, and rising living standards have all contributed to the aviation industry's fast

rise in recent years. According to the preliminary compilation of annual global statistics by the International Civil Aviation Organization, the total number of passengers carried on scheduled services rose to 4.5 billion in 2019, up 3.6 percent from the previous year. The number of departures reached 38.3 million, up 1.7 percent (ICAO, 2019).

Formerly, airlines in the aviation industry did not have a more interactive relationship with their customers as a result of the absence of social media platforms. They could not reach people or customers from far and wide. Presently, some airlines in the aviation industry have adopted some different ways to involve and interact with their clients through the use of social media platforms and trump cards such as "Virgin Atlantic's (VA) Looking for Linda" (World Network Service, 2021). With the pre-eminence of social media in the overall customer relationship in the aviation industry, airlines use a coalition of resources that can respond to client inquiry, complaints round the clock. Recent studies show that, today, the magnitude of social media communication for most of the world's leading airlines in the aviation industry globally "ranges between 15,000 to 200,000 tweets and between 60,000 to 100,000 Facebook fans" but this may increase in the near future (WNS, 2021)

Moreover, in the aviation industry, the offline channel in the past was of superior to the online channel. However, lately the online channel is now the most patronized. The offline channel in the aviation industry globally still exists due to the personal touch it brings. This is as a result of some technical issues passengers face when booking their flights, making online payments for flights amongst other complaints they face. The online medium in the industry through its travel agencies and websites is a very "powerful revenue generator for airlines" (World Network Service, 2021). According to the WNS (2021), about 75% of airline tickets are bought online. The online medium provides passengers in the aviation industry with ease and comfort

as they can book, make payments for their flights and channel some of their complaints to online customer service agents.

According to the WNS (2021), the analytic aspect that is the altimeter for the aviation industry serves as a useful data pool which provides very useful information on flier's profile, their choice and preferences. This pool of data is collected by analytics who "assumes importance in the form of social media analytics, contact center and speech analytics" and revenue model analytics. This goes a long way of aiding the aviation industry to improve on their services, do away with services or offers that are not appealing to passengers, and predict passengers needs in the industry (WNS, 2021).

In addition, COVID-19 has really had an impact on the civil aviation industry. Bart in 2020 enumerated some major plagues that has hit the aviation industry so hard. Bart recalls the notorious influenza pandemic in 1918, the 2003 severe acute respiratory syndrome (SARS) Outbreak, the 2014 Ebola Outbreak and the Middle East Respiratory Syndrome (MERS). In the late 1950s which marks the beginning of commercial air transportation the "COVID-19" outbreak is the first major global pandemic that has cause more harm to the aviation industry and most pandits in the industry describe it as "unprecedented". The Impact of the COVID-19 pandemic had on civil aviation extended to commercial passenger airline operations the most. The demand of air travel dropped significantly because of the social and economic cost of air travel (Bart, 2020). Passengers were grounded as a result of multiple reasons; travel restrictions, lockdown measures, self-quarantine etc. Throughout March 2020, the number of passengers passing through TSA checkpoints throughout the United States dropped precipitously (*see Figure 1.0 in Appendix I)* (Bart, 2020). However, the level of passenger air travel is expected to return to that of 2019 by 2023 at the earliest (Bart, 2020). Moreover, IATA (2021) stated that,

> *the worst point of the impact of COVID-19 on airline profitability was in the second quarter of last year, when operating losses were more than 70% of revenues. Cost cutting and a strong cargo business helped reduce losses in the second half of 2020. However, many airline costs are fixed over short periods and hard to avoid. As a result, losses were reduced only to around 50% of revenues by the last quarter of 2020.* (p. 2)

However, Mazareanu (2021) speculates that, the global airline industry in 2021 is estimated to reach $471.8 billion. Due to the COVID-19 pandemic, in 2020 the airline industry worldwide was valued at $359.3 billion, where the industry comprises of passenger transportation on scheduled and nonscheduled routes both domestically and internationally as well as cargo airlines (Mazareanu, 2021) *see figure 1.1 in Appendix I.*

COVID-19 posed a security threat to the aviation industry globally. According to an article by Ilaria (2021), "because of the global halt in international air travel, passenger numbers dropped and people became more afraid of getting on a plane, in a similar fashion to 9/11" (p. 5). In a survey conducted among more than 40 authorities managing over 100 airports globally, the findings of the survey showed that 61.5% of the respondents at the airport reported that the airports were targeted by cyber-attacks and this was as a result of budget reduction during the covid-19 recovery phase (Kesang, 2021). According to Linsell (2021),

> *…there has been an increase in reports of cyber-attacks targeting the aviation industry. Significantly, there was a 530% increase in cyber-attacks that were reported to or identified by EATM-CERT in 2020 compared to 2019, and 61% of these attacks targeted airlines…these figures represent only those reported to or identified by EATM-CERT, meaning an unknown number will have gone undetected and/or unreported* (para. 3).

Security protocols such as the patting down of passengers in some airports was replaced with handheld metal detectors. The handheld metal detector cannot detect rubber explosives posing

a security threat to airports that do not have technologies to detect such items and the aviation industry as a whole.

2.2 The Post 9/11 Era

After the September 11, 2001 attacks on the United States, it brought a new episode to aviation security with regards to threats and response (Kipp, 2014). It also brought about improvement in security through a fast development in technology. Following an article by Kipp on 2014, "the Post 9/11 aviation security environment shifted to address the specter of suicide attacks including the use of aircraft itself as an instrument of terror and destruction" (para. 10). The Aviation and Transportation Security Act (ATSA) were "signed into law on November 19, 2001" by President Bush, which according to Blalock, Vrinda, Daniel (2007) introduced a new Transportation Security Administration (TSA) consolidating the security efforts inside the Department of Transportation (DOT). Additionally,

> *the ATSA mandated several important changes in civil aviation security procedures. The two primary changes in airport security visible to passengers were the federalization of passenger security screening at all U.S. commercial airports by November 19, 2002, and the requirement to begin screening all checked baggage by December 31, 2002. The ATSA charged the TSA with overseeing security operations and implementing the mandates at all 429 commercial airports in the U.S. While these new security regulations were enacted to ensure passenger safety and restore confidence in the U.S. aviation system, the overall effect of the new regulations on passenger demand is unclear.* (Blalock, Vrinda & Daniel, 2007, p. 731)

According to Blalock, Vrinda & Daniel (2007), there was a lot of changes experienced by air travelers after the attack in airport security procedures.

> *For example, airlines instructed passengers to arrive at airports as much as two hours before takeoff for domestic flights. After passing through security checkpoints, passengers were randomly selected for additional screening, including hand-searching of their carry-on bags, in the boarding area. Following an incident in December 2001, in which a passenger attempted to light a bomb in his shoe while in flight, security screeners asked passengers to remove their shoes when passing through checkpoints.* (Blalock, Vrinda & Daniel, 2007, p. 733)

Even though there were security strategies which were more advanced, the existing system cannot be secured by relying on the technologies (EDS, ETD, X-ray screening machines, metal detectors and body scanners) used at the airport. The models of "balanced security, layered concentric security, integrated security processes with building design and technology and the establishment of situational and domain awareness" was adopted by advanced practitioners (Kipp, 2014, para. 11). The global homeland security market out of the $200 billion estimation of the global homeland security market, has devoted 10% of the total amount to the aviation industry.

Airport security officially became the responsibility of TSA in February 2002. TSA then retained screeners from private security at the initial stage (Blalock, Vrinda & Daniel, 2007). Beginning and ending from April 30, 2002 to November 19, 2002, TSA started screening passengers at Baltimore-Washington International Airport (BWI) and all commercial airports of the U.S.in an effort to efficiently improve operations of security screening, three important changes were made by TSA (Blalock, Vrinda & Daniel, 2007). These changes were: the increase in staff population to help minimize the waiting time in security lines. Private security screeners which amounted to 16,200 were employed by TSA at U.S airports and by the end of 2002, 56,000 baggage and passenger screeners had been hired by TSA (TSA, 2002). The wages of screeners were increased and they were given better benefits by TSA (General Accounting

Office, 2003). There was also an increase in the training hours for screeners by TSA from an average of twelve (12) hours to a minimum of hundred (100) hours. However, there have been problems with TSA's passenger screening operations with regards to resource allocation (Blalock, Vrinda & Daniel, 2007). Formerly, screeners were allocated by TSA with regards to screening lanes and airport passenger volumes. This according to the House Subcommittee on Aviation Security, caused "thousands standing around at major connecting airports, where most passengers do not pass-through screening, and shortages at origin and destination airports". In response to the imbalances and overstaffing concerns, by January 2004, TSA reduced the staff strength of screeners by 45,300 people (Subcommittee on Aviation, 2004). This in addition to the difficulty in hiring of extra screeners, led to understaffing at major airports bringing about flight delays, long security lines, and passengers missing their flights (Blalock, Vrinda & Daniel, 2007).

There were no baggage screening procedures at the airports before the 9/11 terrorist attack and bags that were screened were only 5% out of the total amount unlike that of passenger screening (TSA, 2002). Baggage screening was introduced by TSA which was in two stages. Since January 16, 2002, all airlines were required "to either adopt positive bag matching, in which they matched each piece of checked luggage to a passenger on board a flight, or to screen checked baggage for explosives using one of four methods: explosion detection systems (EDS), explosion trace detection (ETD) machines, bomb-sniffing dogs, or manual searching of bags" (Blalock, Vrinda & Daniel, 2007, p. 6). The EDS machines "are about the size of an SUV, process 150-200 bags per hour, and generate false positive identifications of explosives in almost 30 percent of bags" (Blalock, Vrinda & Daniel, 2007, p. 7). ETD machines are more labor-intensive and much smaller (Butler & Poole, 2004). In using the ETD machine screeners place a "swab from each bag in the machine for analysis" (Blalock, Vrinda & Daniel, 2007). It

was required for TSA by the end of 2002 to install EDS machines at all commercial airports in U.S (Blalock, Vrinda & Daniel, 2007). Alternate screening methods were used in airports who were not able to meet the deadline (TSA, 2002). EDT or EDS machines were used in airports to electronically screen not less than 90 percent of all checked baggage by January 1, 2003 (TSA, 2002). Dogs or hand searches were used to screen the checked bags remaining. The Subcommittee on Aviation Security in the United State of America revealed that, as of January 2004, TSA installed more than 1,100 EDS machines and more than 7,200 ETD machines in airports around the country. Following the 9/11 attack, TSA has been working around the world to ensure a high level of security for flights into the United States. They work cooperatively with other countries to strengthen the security in global aviation industry and conduct routine checks at airports that have direct flights to USA (TSA, 2002).

Post 9/11, according to ICAO (2002) there was an adoption of the Aviation Security Plan of Action by ICAO that calls for "regular, mandatory, systematic and harmonized audits …in order to identify and correct deficiencies in the implementation of ICAO security related standards". The estimated cost for implementing the ICAO security related standards was 17 million U.S dollars, in which 15 million U.S dollars was obtained from contributions made voluntarily (ICAO, 2002).

2.3 Global Security Arrangement, Mechanisms and Standards

The aviation industry in its obligation to protect airports and its stakeholders have improved standard operating procedures (SOP), security arrangement and mechanisms that are enforced at airports. Several measures and procedures have to be adhered to before boarding a flight to reduce the risk of a terrorist attack. Among these flags checked include; Unmanned Aircraft system, laser illumination, aerosols, explosives, cyber-attack, missile attack, insider threat,

aircraft hijack, suicide bombers, terror organizations, lone wolves and chemical attacks. (Tran, 2018). The technologies used to alleviate these threats are the CCTV surveillance system, Explosion Detection Systems (EDS) (baggage scanner/x-ray machines, metal detectors, body scan devices) and Explosion Trace Detection (ETD) machines (Tran, 2018).

Screening is one of the common processes' individuals traveling go through before boarding flight. This method is used to check passengers and their luggage to prevent them from going onboard flight with prohibited items (Tran, 2016). During screening processes, the boarding pass of the passenger is checked at the screening point. It serves as a document that allows passengers to gain access to some restricted areas such as the boarding gate. There is body screening where passengers do a full body scan, pass through a millimeter wave scanner, or a metal detector in order to help reveal concealed weapons or items on the body (Mirmina, 1998). Individuals can choose to be pat down by the security official if they are not comfortable with the metal detectors and scanners. Some passengers may involuntarily be forced to be pat down. According to Mirmina, (1998), "for passengers, other trace devices may be used. Some of these trace devices detect vapors or residues that may be left on passengers' hands or clothes, or in the air that surrounds their bodies" (p. 550). *See appendix II* for figures of body scanner/ walk through metal detector and explosive trace detector machines.

Passenger's check-in their baggage when they are about to enter the sterile areas so as to prevent them from taking explosives and other anomalies to the aircraft (TSA, 2006). They place their luggage on a conveyor belt which passes through an x-ray scanning machine monitored by security personnel who sees the image of the content of the luggage on monitor. This security agent has the right to open and search passengers' luggage when a threat item is seen. According to Mirmina (1998), for checked baggage, the CTX-5800 was used however, due to technological advancement the CTX 9800 DSi in this 21st century is the up-to-date

device used to screen as stated by Smith detection which is into threat detection and security screening technologies. This machine enhances the analysis of details and specific structures of suspected threats, allowing for efficient security decisions on all checked bags and cargo packages. There are X-ray machines which are advanced and quickly process bags but its detection capabilities are very low. There are other devices which uses electromagnetic radiation in searching for particular elements used in the manufacturing of explosives (Mirmina, 1998). Screening of carry-on baggage has a different system altogether. That is, machines used in screening carry-on bags thoroughly are not able to "detect bottles or other containers that contain liquid explosives" (Mirmina, 1998, p. 550). According to Mirmina (1998), it is unfortunate that there is no one machine that can be used to "detect all possible explosive devices in checked baggage, carry-on bags, and on passengers. For each type of baggage, there are different machines" (p. 549). For hand baggage and passengers to be effectively screened, ICAOs primary recommendation requires teams of personnel with a minimum of five persons to be present for each aircraft departure to carry out such operation such that "An airport with 20 outbound aircraft movements in an hour would need 100 persons to be on duty during the lead up period to the departure, assuming each control point was manned to the ICAO specification" (Wallis, 2007, p. 90). *See figures 2.6 to 2.12 in appendix II* for examples of baggage scanners, carry-on luggage x-ray machines and x-ray images on monitor display.

According to Elias (2018), it is a requirement for commercial airports to implement access control and credential systems so as to control entry to secured areas and surveillance Technology to monitor activities at the airport . There are differences in access control procedures from airport to airport. Big airports have layered systems put in place to allow workers access areas which are relevant to their job functioning. They are restricted from areas

which has nothing to do with their work (Elias, 2018). Moreover, video and access logs analysis help in highlighting and detection of events and activities, like accessing restricted areas which individuals do not have clearance to go to, or individuals accessing areas which is not related to their responsibilities, or accessing areas during nonworking hours. Analyzing and monitoring of access system data and surveillance also helps in detecting possible threats in some cases at the airport (Elias, 2018). *See appendix II* for figures of CCTV Surveillance and control room system.

Central screening or sterile lounge is one of the areas at the airport with a lot of restrictions. The sterile lounge or central screening perception brings about a distance barrier between the ultimate target, the aircraft and the would-be hijacker. The idea of the sterile lounge concept helps diminishes the possibility for passengers at the time of boarding aircraft to be trapped in become security checks (Wallis, 2007). "It also provides greater freedom of movement to passengers once they have passed security control points" (Wallis, 2007, p. 91). This helps in responding to incident by security forces before the goal of the criminal is achieved, this is because,

> *If screening takes place at the departure gate, it becomes a much simpler matter for the terrorist to achieve his objective. At the gate, if the terrorist believes there is a danger of his weapons being identified, he uses them at that point and in a matter of steps, reach the aircraft. 'One gate, one flight security' simplifies the terrorists' task of striking his target* (Wallis, 2007, p. 86).

Passengers at the initial stages of the departure process underutilize the staff with regards to the smaller size and time passengers arrive. Meanwhile, there is often an increase in numbers which brings about queues when the time is nearer for the aircraft to leave. This sometimes causes delay. The concept of the sterile lounge according to Wallis (2007), tries to make things

easier for the operator and the airline client to enhance the fiscal benefit and physical of security standards of passengers. With the efforts of IATA "to raise security standards essentially being covert, the sterile lounge concept, with its overt passenger and hand baggage screening check points, is probably the most visible of IATA's endeavors to enhance aviation security" (Wallis, 2007, p. 91). *See appendix II figure 2.17* for figure of general Depiction of Security Areas at the Airport.

There are regulations and recommended practices set by regulatory organizations which the civil aviation industry adheres to globally and these regulations and recommended practices are international instruments agreed upon by states. The Chicago Convention also known as the Convention on International Civil Aviation is one of the treaties guiding the aviation industry (Wallis, 2007). Its formulation was based on the development and planning of the international air transport which according to Rahman (2012), is to make sure there is safe air travel as well as airport design and aircrafts around the world. This Convention is legally binding the contracting states. There are 18 annexes to the Convention on International Civil Aviation by ICAO. These annexes to the Chicago convention are not any kind of international instruments, so they do not any legal binding on states unlike the latter. The annexes enclose the Standards and Recommended Practices (SARPs) for contracting states, where the SARPs have to be conformed to by the contracting states. These contracting states have to in accordance with the convention conform to the SARPs; in the instance where it is not possible to comply, the contracting state will have to compulsorily notify the council under Article 38 of the convention. The interpretation of Standards and Practices are not the same in every state. The interpretation is dependent on the legal system of the country (Rahman, 2012). The most important annex with regards to security is Annex 17 to the Chicago convention which deals

with "Security - Safeguarding International Civil Aviation against Acts of Unlawful Interference" in the civil aviation industry. According to the ICAO,

> *Annex 17 is primarily concerned with administrative and co-ordination aspects, as well as with technical measures for the protection of the security of international air transport, requiring each Contracting State to establish its own civil aviation security programme with such additional security measures as may be proposed by other appropriate bodies. Annex 17 also seeks to co-ordinate the activities of those involved in security programmes. It is recognized that airline operators themselves have a primary responsibility for protecting their passengers, assets and revenues… therefore States must ensure that the carriers develop and implement effective complementary security programmes compatible with those of the airports out of which they operate.*

Safety in the aviation industry is one of ICAOs fundamental objectives and that is the main focus of the standards. "ICAO standards are the minimum requirements to follow by the contracting parties of the treaty", nevertheless, states can formulate their Standard Operating Procedures but should not be contradictory to that of ICAO (Rahman, 2012).

> *The Aviation Security Manual (Doc 8973-Resrticted) in implementing. Annex 17 to the Chicago Convention assists Member States with the provision of guidance on how to apply its Standards and Recommended Practices (SARPs). The Annex 17 and Doc 8973 are constantly being reviewed and amended in light of new threats and technological developments that have a bearing on the effectiveness of measures designed to prevent acts of unlawful interference"* (ICAO, para. 1).

There are additional ICAO regulations or standards like, ICAO Assembly Resolution A40-10: Addressing Cyber security in Civil Aviation, Doc 9985 Air Traffic Management Security Manual (Restricted), Doc 10108 Global Risk Context Statement (Restricted), Aviation Cyber Security Strategy, the Tokyo, Hague and Montreal Conventions which are in force to help in the protection of the civil aviation industry.

2.4 Africa and Aviation Security

In the development of commercial aviation, the potential of Africa is very immense. Africa is 15% of the global population and also covers 20% of the world's landform (Tchouamou, 2016). Hitherto, 3% of the global market represents Africa's aviation industry. (African Development Bank Group, 2019). The aviation industry in Africa is not very lucrative like that of European American and Asian regions. Generally, the state of the aviation industry in Africa of which Ghana is not an exception fall short of best international practice hence, needs major reforms (Kapchangah, 2008). There are a lot of problems that the aviation sector of Africa encounters. Some of these problems include but not limited to the interference of government in its activities, the shortage of skills and African airlines having difficulty in procuring Air Operating Certificates (AOCs) and not complying with the international aviation security standard operating procedures (Kapchangah, 2008, p. 2). The AfDB (2019) revealed that, a lot of newly independent African states in the 1960s with the aim of declaring their position as independent nations, started their own state airlines. This was to protect the market carriers which was harmful "on liberalization, air traffic growth, aviation safety and security, as well as coordinated infrastructure development efforts" (AfDB, 2019, p. 17),

According to Amankwah-Amoah & Debrah, (2014), many newly independent African countries dedicated their limited resources and abilities to establishing joint companies and institutions to portray their image around the world in the second half of the twentieth century. These joint companies were known as multi-flag airlines (MFAs) in the civil aviation business, which were airlines jointly owned and operated as a national carrier of two or more nations (Amankwah-Amoah & Debrah, 2014). The African aviation industry, which is primarily fueled by tourism, now has the least number of passengers per year (Ciesluk, 2020). Despite the fact

that African aviation performance lags behind that of the rest of the world, air travel is critical to Africa's growth since it provides access to previously unavailable opportunities.

There were 37 airlines which were launched in Africa and 37 airlines which had failed over the last two decades (Kamara, 2012). In the case of Ghana, the state does not have a commercial flight on its own, Ghana Airways which was the only flight of Ghana is no more working. Africa has the highest accident rate despite it representing barely 2% of the world's air transport traffic in terms of passenger kilometers flown (Tchouamou, 2016). In 2010 for instance, African carriers accounted for 23% loss of the Western built jet hull (IATA, 2010), which

> *…has contributed in forcing many passengers to switch to international carriers as Ethiopian Airlines CEO stated that 80% of the African traffic is flown by non-African carriers while in Nigeria the situation is considerably worse as 98% of its traffic is carried by non- African carriers* (Heinz & Connell, 2013, p. 2).

Air transport in Africa is barely productive with regards to investment, making most of the industries capital being owned by foreigners. However, the African aviation industry according to the AfDB (2019) "has experienced high growth rates in recent years (4.8% CAGR) and has strong potential for future growth, as demonstrated by demographic trends and landmass extension" (p. 6). In terms of safety, the global air transport industry has been unimpressive with 17% of the total accidents occurring in Africa. (Kapchangah, 2008). However, in 2006, Africa was at 4.03 in terms of the major accidents per million takeoffs as compared to 0.65 of global average according to IATA.

Until recently, air safety in Africa was managed by individual countries and it seems that Africa as a continent with regards to matters of aviation does not speak with one voice. Moreover, the continent does not have a wide range benchmark in maintaining inflight and aircraft operations.

> *Currently, there is lack of harmony in issuance of airworthiness certificates for aircraft and the licensing of airliner pilots as well as experts to help national authorities implement internationally accepted levels of air transport practice. This raises questions on the capacity of oversight regulatory authorities in managing security and safety of the aviation sector. The recent initiative by African governments to create the Afro-Civil Aviation Agency (Afro-CAA), a continent-wide air safety agency modelled on the EU's Aviation Safety Agency and the U.S. Federal Aviation Agency may be a good start in the right direction.* (Kapchangah, 2008, p. 2)

African countries seem to be affected by poor security and undeveloped infrastructural problems. The air transport in the African continent is faced with major challenges, which rise as hindrances to the industry's development. The main ones are profitability as opposed to high fares, affordability of air transport, inadequate safety standards, limited access to finance, infrastructure limitations and constrained market access (AfDB, 2019). Security issues are undermined by the profitmaking nature of commercial airlines and not given the attention they deserve. In Africa, most communities are localized and their priority is commonly about surviving daily and not in air transport. Diverse security and safety levels have affected the confidence in aviation safety by customers and this have been a major problem for the aviation industry in Africa.

Although a good portion of Africa is still considered frontier territory when it comes to aviation infrastructure, the majority of the continent still has yet to be crossed (Kapchangah, 2008). Africa's progress is slow and has a fragmented market due to "the limited volume of trade between African States, the desire to protect vulnerable routes and also to preserve national airlines" (AfDB, p. 14).

> *Despite the adoption of the Yamoussoukro Decision in 1999, restrictive air service agreements continue to constrain intra-African services, impacting routing, frequency,*

> *capacity and fares. There is a discrepancy between average incomes in Africa and the cost of air travel. In Africa, the annual affordability of an air ticket is around 1.1 per capita compared to 5.4 in Latin America and 33 in North America*. (AfDB, 2019, p. 14)

The market in Africa, "has a poor comparative operating yield for African carriers". (AfDB, 2019) These costs however decrease the demand for air transport which on the other hand reduces profit. Also, the attempt of African carriers to stay the same by the increase of fares brought about the reduction of demand, poor aircraft utilization and reinforcing poor route economics with low load factors (on average 60% or less) (AfDB, 2019). There are high airfares in Africa with regards to dollar per kilometer and according to the AfDB (2019), "there is a massive gap between the average income of the population and the average intra-African flight ticket price, heavily constraining the traffic demand" (p. 15). *See figure 3.0 in appendix III* for $/km comparison of intra-regional airfares and the affordability of tickets.

According to Tchouamou (2016),

> *...in 1999 African ministers responsible for civil aviation adopted a legal framework for the liberalization of intra-African air services including the 5th Freedom for African carriers, improved safety and security standards and cross-border investment in air transport, known as Yamoussoukro Decision (YD)* (p. 3).

In January 2018, the Single African Air Transport Market (SAATM) was founded as one of the African Union (AU) Agenda 2063 flagship projects (Tchouamou, 2016). Twenty-six (26) Member States signed and showed commitment. The Single African Air Transport Market (SAATM) has six (6) pillars of implementation which are; regulatory framework, advocacy for effective operationalization, financing the aviation Industry, operationalization, infrastructure and Enhancing safety and security (AfDB, 2019).

In order to meet the Abuja Safety and the Windhoek Declaration targets in security by African States, ICAO according to the AfDB (2019) has been rendering its support. Furthermore, ICAO is dedicated under the "No country left behind" initiative, to gradually overcome the safety and security concerns of African States. African Civil Aviation Commission (AFCAC) and Member States, with the support of other organizations such as the IATA and the African Airlines Association (AFRAA), "through the IATA Operational Safety Audit (IATA-IOSA) certification, aim at ensuring that eligible African airlines achieve the required minimum safety and operational requirements" (AfDB, 2019, p. 17). See *figure 3.2 in appendix III*.

Africa Civil Aviation Commission and ICAO, in regards to Africa's need for qualified human resource and capacity building through the Human Resources Development Fund (HRDF) are providing a valuable capacity-building initiative for African aviation (AfDB, 2019). A lack of uniformity in global aviation security standards is attributable, in part, to the significant variation in aviation infrastructure development among developed and developing countries, especially Africa. Nonetheless, in order to overcome the two main challenges of SAATM, thus the improvement of connectivity and airfare reductions, IATA and AFRAA have closely been working on intra-African routes with eligible African airlines (AfDB, 2019).

2.5 Conclusion

In conclusion, the airline industry is one of the fastest and safest means of transportation which is widely patronized by people around the globe but comparing the activities in the western world and African continent, Africa is lagging behind in terms of security, policy and infrastructure, Moreover, after the 9/11 attack security measures were put in place so as to prevent any form of threats. There are standards and regulations set by ICAO and other international instruments that govern the activities of the aviation industry. Likewise, as days

go by, terrorists are finding ways to carry out their activities. However, security measures have to be strengthened, modified and new technologies have to be developed to combat new threats to the aviation industry.

CHAPTER THREE

GHANA'S AVIATION INDUSTRY AND SECURITY

3.0 Introduction

At independence in 1957, Ghana left the previous West African Corporation and established a national airline with British Overseas Warehouse Corporation (BOAC) owning 40% of the company. The country purchased the remaining of BOAC's holdings in February 1961, making the airline a wholly government-owned. According to Dr. Kwame Nkrumah, it was a source of national pride and self-confidence (Ghana Airways File, 1967). Despite the fact that Ghana currently lacks a national carrier, the aviation sector contributed $2.5 billion to the country's GDP in 2018. (Effah, 2021). This chapter talks about the history of Ghana Airports Company Limited and the role it plays. It also focuses on the security measures put in place since 9/11 and with the commissioning of Terminal Three and the cargo section. This chapter will help identify the loopholes and challenges of security measures at Kotoka International Airport. It will also examine how comprehensive and foolproof Ghana's Aviation security measures have been.

3.1 History of Ghana Airports Company Limited

The current airport, Kotoka International Airport (KIA), was built in 1946 as a "military airport" for the "Royal Air Force" of the United Kingdom. After a successful military pull-out, the facility was changed into a civilian use. In 1956, the structure was converted into a terminal building. This was due to the increase in air travel demand and development at that time (GACL, 2021). From 1958, the airport served as the base for Ghana Airways. The airport was built to handle a maximum of 500,000 people per year when it was first built and commissioned. In remembrance of the late Lt. General E.K. Kotoka, the Accra International

Airport was renamed Kotoka International Airport in 1969. To satisfy the increased demand, the airport has seen considerable infrastructural development and facility renovations.

Another phased development effort for KIA took place in 1990. The first phase lasted from 1991 to 1993. These developments included the rehabilitation of the runway and asphalting, refurbishment of the terminal buildings and control tower block, the Arrivals/Immigration Hall and Transit Hall construction, dedicated freight terminal construction, and installation of new navigational aids, as well as an update of the KIA Master Plan. The second phase, also lasted from 1997 to 2005. The developments that took place are; "the construction of a dedicated apron for freight aircraft" and the baggage/arrivals reclaim hall refurbishment and expansion. Also, the freight terminal was refurbished and expanded by 60% and the duty-free shops were remodeled to meet international standards. The extension of the runway by 550 meters, the departure check-in area expansion and refurbishment, the baggage handling and screening system installations, and the departure/immigration area improvement are also part of the development that took place in the second phase (GACL, 2021).

The Civil Aviation Act (Act 678) was adopted in November 2004. The law mandated the transfer of GCAA's airport administration operations to a new company, the GACL. The goal was for the GCAA to serve as an air transport regulative authority and provider of air navigation services. GACL was established in January 2006 in accordance with the Act, but began "operations in January 2007 with the task of planning, developing, managing, and maintaining all airports in Ghana". The third phase, which began in 2009, includes the rehabilitation of taxiways, "the main passenger apron, drainage systems, and the runway 21 touch down zone", fuel main restoration and expansion, aeronautical ground illumination systems, managing of pavement systems, and the fire station construction.

KIA had until the last quarter of 2010 only two boarding gates. To boost convenience, GACL collaborated with United Airlines and Star Alliance to build three (3) new boarding gates. Then, three (3) more gates were built, increasing the total number of boarding gates at KIA to eight (8). The arrival hall according to Acheampong (2017), was expanded in 2014 to relieve traffic congestion during peak hours. The arrival hall's existing floor size has currently been increased by 5,148m2. Also, there were "Electrical installations, fire detection and protection systems, provision and installation of two new baggage handling equipment" to bring the total number of baggage carousels in the arrival hall to four. The "provision and installation of twenty-six immigration booths, ten e-gates, a moving walkway, and new air-conditioning systems" are among the additional works. Other projects include a Data Center construction, a "transit lounge", and extra floors for GACL and other airport stakeholders to use as offices.

The Kotoka International Airport has been rehabilitated by GACL in 2018 in order to increase the airport's capacity in order to accommodate the growing passenger traffic. The development of a new Terminal three (3) as an extension of the existing Terminals one (1) and two (2) is one example of such restoration (Acheampong, 2017), Now the new terminal 3 which was completed in 2018 has additional 8 boarding gates adding to the already existing ones.

3.2 Security at The Kotoka International Airport

The security of KIA is made up of a lot of security agencies which are; Aviation Security (AVSEC), Rescue and Fire Fighting Service (RFFS), Ghana Armed Forces (GAF), Private Airline Security, Ghana Immigration Service (GIS), Customs Excise and Preventive Service (CEPS), Ghana Police Service (GPS), and the International Criminal Police Organization (INTERPOL). KIA is a coalition of a joint operation among these security agencies to tackle criminal activities.

3.2.1 Aviation Security

Aviation Security is responsible for protecting Civil Aviation from "act of unlawful interference" such as,

> *...unlawful seizure of an aircraft; destruction of an aircraft in service; hostages taking on board aircraft or on aerodromes; forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility; introduction on board flight an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes; use of an aircraft in service for the purpose of causing death, serious bodily injury, or serious damage to property or the environment; communication of false information such as to jeopardize the safety of aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.* (GCAA, 2018, p. 1)

An AVSEC Superintendent who plays significant roles in the area of supervision and has worked at Ghana Airports Company Limited for over two decades stated that, AVSEC is there to safeguard the airport against "acts of unlawful interference". The duty of AVSEC is to protect passengers, aircrafts, airport and all-important installations at the airport. He then stated that it is the responsibility of AVSEC to prevent people from entering restricted areas at the airport which was affirmed by AVSEC Training Instructor I. The primary objective of AVSEC is "to ensure the protection and safety of passengers, crew, ground personnel, the public, aircraft and facilities of an airport serving civil aviation against acts of unlawful interference" (GACL, 2017).

3.2.2 Rescue Fire Fighting Service

There is the Rescue Fire Fighting Service (RFFS) at KIA. Their duty is to ensure the protection and safety of passengers and facilities when there is an accident. In an interview with a Fire officer in charge of the Safety and Prevention unit at GACL, he said the Airport Fire Service

is supposed to ensure that the terminal building and the people within it are safe. They prevent fire and prevent the loss of life. The GACL Fire unit has an emergency plan in place. The emergency plan is for evacuation purposes. In case there is a fire "how do we make sure the people within the building are safe?" he asked. There are installations within the airport building that help achieve that goal. Anytime a flight lands or is about to take off, a fire truck stands by for fire cover. In an online article report by "Ameyaw Debrah" on 2019, July 27, *"the Rescue Fire Fighting Service (RFFS) department of the Ghana Airport Company Limited (GACL) provide firefighting services to save lives, protect properties, rescue services, casualty stabilization and evacuation at the airport"* (para. 10).

According to a report from "Graphic Online by Charles Benomi Okine" on April 17, 2015,

> *The basic functions of the RFFS among others are to safeguard human lives and property in the event of a fire outbreak at the airport; conduct fire safety inspections on airport installations and give recommendations so as to prevent fire outbreaks; carry out aircraft recovery operations of a disabled aircraft following a plane incident at the airside to pave way for normal commercial activities at the airport to resume and also; provide humanitarian services to the general public when the need arises* (para. 5).

3.2.3 Ghana Immigration Service

An Immigration Officer in charge stated that, the duty of GIS is to regulate the movement of people, check visas and passports at the airport. "*We have joint operations with other security agencies and can arrest"*, She said.

On the website of Ghana Immigration Service (2022 February, 06),

> *…the mandate of KIA command includes the processing of passengers through arrival/departure controls, ensure document security, and provide statistical data…the operational stream undertakes the core mandate of the command as provided for in the Act 573 of 2000-thus the screening and processing of all arriving and departing passengers by: examining travelers entering or leaving the country; issuing visas (entry and transit visas); collaborating with stakeholders including intelligence agencies* (para. 1)**.**

3.2.4 Custom Excise and Preventive Service

In an interview with a CEPS Officer, she stated that, their duty is to inspect imported and exported items at the airport. All goods that come into the country are inspected by CEPS, she said. Even though every security agency checks for threat items, with CEPS their main goal is to check for dutiable items. However, upon their checks, when a threat item is found, they report to the appropriate security agency in charge to handle it. Their duty is to check the amount of currency a passenger is travelling with. According to the Learning Abroad Centre of University of Minnesota, *"Customs is the authority in the respective country you enter that is responsible for controlling the flow of goods, including animals, transports, foods, personal effects, and hazardous items, into and out of a country"* (para. 6).

3.2.5 Private Airline Security

The Private airline security also plays a major role in the aviation industry. The Private Security helps in ensuring security and safety at the airport. According to a Private airline security agent, their role is to do aviation profiling. It is a criterion to ascertain the status of issues of concern. It could be baggage, passengers or anything at all going onboard an aircraft. They are also responsible for baggage makeup, catering export, tag tally, security documentation, cargo scanning of goods and check-in processes, He added.

3.3 Aviation Threats at Kotoka International Airport

Every international airport including Kotoka International Airport is a potential target to terrorist attack. "Long before the 9/11 attack, aviation was a prime target for both criminals and terrorists" (Baker, 2020, p. 8). According to the Respondents, the major threat of KIA at the moment is insider threat. "The insider is an individual presently or previously authorized to access an organization's information system, data, or network" (Krull, 2016, p. 3). NCSC (2011) also describes an insider as one who uses "her/his authorized access, wittingly or unwittingly, to do harm to the security …. This threat can include damage… through espionage, terrorism, unauthorized disclosure of national security information, or through the loss or degradation of departmental resources or capabilities" (p. 5). According to Greitzer et al. (2014), the insider threat refers to, "harmful acts that trusted individuals might carry out; for example, something that causes harm to the organization, or an unauthorized act that benefits the individual" (p.107). Greco (2017) on the topic "*Insider Threat: The Unseen Dangers Posed by Badged Airport Employees and How to Mitigate Them*" also complements the above authors.

There are threat items such as weapons (riffles, hand and short guns, martial art weapons, pistol, and revolver), Explosives (hand grenades, ammunition and bullets, C4, gunpowder, dynamite and detonators plus blasting wires), dangerous substances or goods (chisel and screw drivers, starter pistol, toy guns, knives and scissors) and dangerous articles (flammable gases, oxidizers, flammable liquids, flammable solids, toxics or infectious subs, radioactive and corrosives) which AVSEC look out for at KIA when screening passengers and workers at the access control areas (GACL, 2017).

Most Respondents stated that KIA has not encountered any form of terrorist attack. However, AVSEC Training Instructors I and II were quick to recall that, there was an incident in 2009, when Umar Farouk Abdulmutallab a Nigerian citizen (the Christmas/Underwear bomber) passed through the Kotoka International Airport with an explosive device in his underwear without security personnel detecting it. Their recollection was confirmed by an article by Justin & Ryan (2013), "*Target Hardening and Terrorist Signaling: The Case of Aviation Security, Terrorism and Political Violence"* and Krull (2016), "*The Threat Among Us: Insiders Intensify Aviation Terrorism"*.

3.4 Security Measures put in place at Ghana Airports Company Limited

3.4.1 Check-In Screening Process

The KIA has standards they follow before letting a passenger go onboard an aircraft. These measures are put in place to minimize threat and any form of terrorist activity at the airport. According to the Private security agent, when a passenger first arrives at the departure hall of the airport, the passenger first meets the airline security (Queue Control agent).

> *The Queue Control agent profiles the passenger (conduct an observer analysis) from afar to know if the passenger is sane or behaving strangely. There are passengers who may be kidnapped and monitored by someone who directs their activities at the airport. It is the duty of the Queue Control agent to foresee all these before the passenger gets to the ticketing agent. When the Queue Control Agent suspects some unusuality of a passenger, he or she approaches the passenger to know if the passenger is okay. The passenger then joins the queue for document checks.*

When the documents of the passenger are correct, the profiler makes the passenger go to the security agent making observation at the check-in area. The observer also performs the role of the Queue Comber. This is because the first security agent might have left something out. The

Queue Comber leads the passenger to the counter for him/her to go through check-in process. During check-in, the security agent checks documents such as passport, ticket and mileage of the passenger, He added.

3.4.2 Checked Baggage Screening

Passengers' baggage is checked in by the check-in agent. The check-in agent takes charge of passenger's baggage by tagging baggage and placing a claim tag at the back of the passenger's passport before checking in baggage. The baggage after check-in is being scanned and screened by AVSEC. According to Tran (2016), the screening is carried out to avoid prohibited items such as liquid bleach, flares, e-cigarettes and vaping devices, safety matches, realistic replicas of explosives chlorine and loose lithium batteries which is harmful to both passengers and the flight from going onboard the aircraft. The screening technologies used are physical search, explosives detection system (EDS), explosives trace detection (ETD), X-ray system and the Computed Tomography (CT) system.

After that the security agent takes details of the bag using the Baggage Reconciliation System (BRS) device. According to Bite (2008), the BRS is a machine that is used to check the details of the bags to their system using the bar codes to know the number of bags flying on that particular day. The BRS helps to validate "whether a piece of baggage can be positively matched to a verified boarded passenger before it is loaded onto a departing aircraft". This process is called "Anti-aircraft artillery" (triple A or AAA). The triple A is done so that no one adds foreign luggage to the checked baggage (Pietrasiński, Rodzik, Grzywiński, & Miernik, 2017). According to the Private security agent, an incident happened on Air India flight where an unattended baggage was mixed with the checked in baggage and when the aircraft took off, the baggage exploded in the aircraft and this was confirmed by Failler (2009) work titled "*Remembering the Air India disaster: Memorial and counter-memorial*". As such the agent at

the baggage makeup makes sure that the number of baggage the check-in counter agent has received is the same number. Nevertheless, if at the end of the day 200 passengers are travelling, and their baggage in total is 100 from check-in, the baggage makeup should only receive 100 luggage but if it is more, the aircraft cannot go. There would be cross matching, that is, each passenger will come for their bag or the airline security agent will go through all the baggage and identify the bag which they have not accepted and mixed up with the checked in baggage. This is what is called the triple A (AAA). After that, the security agent at the baggage makeup account for the baggage and reconciles with that of the check-in agent to make sure the baggage is up to the total number of approve baggage. The airline security agent escorts the baggage to the aircraft. This is because, they do not want anyone to put any unauthorized item in the baggage. He added. However, the main priority of the airline security is detecting explosives and other hazardous materials since it can endanger passengers and aircrafts. This was confirmed by TSA.

3.4.3 Passenger Security Screening

The Department of Aviation security at the airport is responsible for checking items that threatens passengers and the aircraft. According to GACL manual (2017), passenger security screening is performed to prevent firearms, explosives, incendiary devices or other items that could be used as weapons from being placed or carried onto an aircraft. Passengers after check-in go through immigration to authenticate their passport, verify and have them stamped. According to the Immigration officer, this process is done to prevent unauthorized individuals from going outside or entering the country. The Ghana Immigration Service also coordinate with other security agencies at the airport such as AVSEC, INTERPOL, CEPS and many others, she said. An example is when they notice someone on a wanted list is passing through their checkpoint, they notify INTERPOL and then make an arrest.

Next, AVSEC Superintendent stated that, passengers after the immigration check point, walk to the central screening security check point. At the central screening security check point, passengers and staff are subjected to body and baggage screening. AVSECs job is to make sure they know what the passengers are carrying on them. They also make sure the passengers are mentally sound, He added. Some people according to him, get to the central screening security checkpoint and it is detected that they have mental issues. Such persons are sent back even though all their documents may be correct. The state of mind is determined by talking one on one with the passenger. Sometimes the person is judged to be likely violent when he is aboard the aircraft. Example,

> *If a passenger is misbehaving and I cannot trust how the passenger will react on air once the aircraft takes off, the risk is high. However, if I cannot convince myself that the passenger's behavior is okay, I would have to deny the passenger from boarding the aircraft,* He concluded.

AVSEC Training Instructor II also stated that, during the screening processes, passengers are asked to remove their laptops and other electronic gadgets from their carry-on baggage and put it into a tray. The baggage loader places the passenger's luggage unto the belt of the x-ray screening machine. The carry-on baggage is screened to check for threat items. The passenger is then asked to pass through the walk-through metal detector. After that, the passenger is pat-down. The National Research Council. (1996) states that,

> *...commercial aviation passengers are screened in ...each day for weapons and dangerous articles prior to boarding an airplane. Passengers place their carry-on baggage on a conveyor belt for inspection by x-ray equipment, and they walk through a portal that detects the presence of metallic objects. If the metal-detecting portal sounds an alarm, passengers are searched further to determine the cause of the alarm and to ensure that they are not carrying objects that could be a threat to aviation*

> *security. These alarm-clearing search procedures employ either a hand-wand metal detector or a physical pat-down search* (p. 6).

The AVSEC Superintendent states,

> *The Pat-down came for a reason. Thus, most weapons were made of metals so if a passenger is hiding any metal on their body, the metal detector will detect it and the AVSEC officer will approach the passenger to see what it is. Currently, we have weapons which are not metallic, so if you are looking for metals, it will not detect anything. So, based on that we now do hand search so that we can feel anything which is not metallic on the body. Beyond the hand search we now use the body scanner at the screening point. So, when you get to the screening area, we scan your whole body so that anything hidden on your body will be detected.*

The Transport Security Administration posits, the "*Pat-down procedures are used to determine whether prohibited items or other threats to transportation security are concealed on the person*". After the physical pat-down, the passenger is then asked to pick up his or her items from the x-ray roller where the baggage handler is. If there is a suspected item in the passenger's luggage, the passenger is asked to remove it and shows it to the AVSEC officer. If it is a threat item, it is seized or the passenger is told to send it back. When the X-ray screening device is unable to identify items in the passenger's bag, the bag is referred to the search table. The baggage controller takes charge and searches it in the presence of the passenger. The Baggage searcher after the search removes all threat items from the bag if any and disposes it. From there the passenger is allowed to go to the boarding gate.

When it is time for boarding, the airline security agent conducts another profiling to make sure everything is okay before the passengers' board. However, before they are allowed to board some airline security agents at the boarding gate use ETDs, to check passengers' hand luggage in order to identify traces of explosives if there is any (TSA, 2006). When passengers get to

the flight, the security personnel at the access control of the aircraft then checks the boarding pass of the passengers again. This is done because, there was an issue at KIA where a passenger travelling did not pass through the security process because the passenger knew someone at the airport, He added. The passenger was smuggled through a different route and brought to the boarding gate. When they were boarding, they made the passenger join the other passengers. The passenger was denied boarding, arrested and detained together with all those involved. This is why the airline security agent does a second check of boarding pass at the access control of the aircraft and allow passengers to take their seat if everything is fine. According to Tran (2016), *"these airport checkpoints screen and process people, belongings, and cargo nonstop to prevent the entry of prohibited and dangerous items*".

3.4.4 Cabin Crew Screening

According to the Private airline security agent, before the cabin crew passes through the central screening point, there is a document named the "crew manifest" which has the flight registration number, the flight date, and the numbers of the crews on it. The crew manifest also has the demographic data of the crew on it. The crew goes through the same process as passengers to be sure they do not have any prohibited or threat item on them. When they are in the aircraft, the captain does a double check to know whether all members of his crew are onboard and also makes sure everyone is at his or her galley. The captain then takes a roll call to make sure everything is alright on the flight and makes announcement for boarding, he concluded.

3.4.5 Access Control and perimeter fencing

Access control is the process of controlling the movement of people and vehicles from landside (non-restricted) areas to Airside (restricted) areas (GACL, 2017). According to AVSEC Training Instructor II, AVSEC keeps watch at the access control point, the movement of

people, and vehicles at unrestricted areas (landside) to the restricted areas (airside). The landside is the area where the general public can access and the airside is the restricted area which AVSEC is bound not to allow the general public to access. Kapchangah, (2008) wrote that,

> *Airport perimeter fencing is the first step in securing the airport and vital installations from unauthorized access, fencing also prevents encroachment of airport land such as landing funnels thus enhancing not only safety of aircrafts but also reducing the susceptibility of unlawful interferences.* (p. 14)

According to AVSEC Superintendent, AVSEC ensures each perimeter fence is in good shape and also makes sure that people cannot scale over it, go under it, or cut it to gain access to aircrafts. As such, AVSEC Officers are stationed at gate points at all part of the airport. AVSEC conducts operations at the terminal buildings. Some of the terminal building have departure control mechanism that is automated to accept ID cards or fingerprint. However, a person cannot get into an aircraft simply because he or she has an airport ID card. AVSEC does screening of vehicles that access these secured areas in order to be sure and prevent them from carrying any dangerous item aboard aircraft.

> *There is a catering service van that goes to the airside of the airport. When they bring their items to the access control point, the AVSEC Officers inspect the goods, and match the security seal that is used on the cart with the documentation the catering security official provides them. Consequently, when the AVSEC Officers match those documents provided to them, then AVSEC knows that the items are from the right source and vice versa,* He added.

Moreover, the inspection of the seal is done to make sure nothing is added or subtracted from the items being transported to the aircraft. So, if the seal is broken, the items cannot go again, He said. The statement of AVSEC Superintendent was confirmed by another respondent.

The AVSEC Superintendent also revealed through the interview that, in order to prevent "acts of unlawful interference", there is a permit used to access restricted areas of the airport. Examples of these permits are, Permanent permit, temporary permit, boarding pass and visitor's card. These permits are meant to help AVSEC identify those who are supposed to be where at what time, that is why ID cards given are not the same. He also stated, "AVSEC gives ID cards depending on the type of job a person does at the airport". These ID cards have color codes that exhibits the place a person can be or not (GACL, 2017). An example is if a person's job is supposed to be at the arrival hall, AVSEC limits the person's ID card only to the arrival hall. If a person's job is on the ramp, AVSEC gives you an ID card that goes to the ramp. There are other people like himself whose ID card can go everywhere at the airport that is, their ID card does not have a limit.

The AVSEC officers interviewed highlighted that, there is a CCTV surveillance system that covers all perimeters of the airport. According to them those cameras helps them for play back and also use them for airside monitoring.

3.5 Code of ethics at Kotoka International Airport

The national regulatory body for Ghana Airport Company is Ghana Civil Aviation Authority (GCAA). Ghana is a signatory to ICAO. However, Ghana Airports Company Limited has been given the right to develop the airport and implement certain provisions of the National Civil Aviation act that has to deal with security. There is the Ghana Civil Aviation (Security)

Directives which is implemented by GACL to ensure safety and security at KIA (GCAA, 2018).

Furthermore, the GACL AVSEC awareness manual (2017) states, the legal authority for screening passengers/persons and their baggage is derived from:

- ICAO Annex 17 Standards 4.4 and 4.5
- Civil aviation Act 678
- The National Regulatory document-NCASP
- The Legislative Instrument (LI) 1824 Section 17
- The Airport Security Program (ASP).

3.5.1 Training and Monitoring

Every aviation related incident that happens across the globe changes security protocols in all airports. This is communicated by ICAO and also provides rules and principles which should be implemented by all signatory states. AVSEC officers are then trained based on that incident so as to be able to prevent it when it happens again. An example according to AVSEC Training Instructor I is,

> *An incident that happened at Belgium in 2016, where two people took advantage of accessing the departure hall without been screened as if they were going to travel but they were not traveling, so they placed the bags they were holding in the terminal building and left those bags unattended and within some few minutes these bags exploded. Report indicated that, over 30 people died and more than 300 were injured which caused the closure of the airport for more than a month. In addition, during the same year, active gun men entered the terminal building in turkey and started shooting indiscriminately So as part of the measures as part of the measures put in place by the aviation industry to guarantee the safety of the general public, ICAO introduced what*

> *we call pre-departure screening which was happening in a lot of airports across the globe including KIA. So, people were screened prior entry to the departure hall. However, if they were screened at the entrance, these incidents could have been prevented.*

Further checks prove there was a similar case with regards to an unattended bag on the 28th December, 2020 at KIA terminal 3 arrival hall. Fortunately for Ghana, there was no explosion as in the case of Belgium. The details pertaining to the incident was not communicated as at the time the research was conducted *See Appendix IV* for details.

There are also recurrent trainings which according to the respondents is mandatory for all AVSEC and Airline Security Agents. The training is an international exercise which is monitored by ICAO. The training according to respondents is been done to refresh their knowledge and also equip them with the technical know-how of new technologies. Every year ICAO inspects and make sure everybody participates, write exams and file results for inspection. This information by respondents is affirmed by Kulyk & Suslova (2014) through a research work titled "*Integration of the ICAO Training Institute into the international education network".*

Aside ICAO monitoring the activities of Ghana Airports Company Limited, the Transport Security Administration (TSA) of USA does a routine check at KIA which supports the notion of Blalock, Vrinda & Daniel (2007). This is because TSA is America specific, so any country that has an aircraft flying straight to USA, TSA goes there to make sure everything is fine with regards to security. This according to AVSEC Training Officers, is an attempt to protect her citizens.

3.6 Loopholes and challenges of security measures at Ghana Airport Company Limited

In all sphere of life, challenges are unavoidable and so is the aviation industry. According to the AVSEC Superintendent, the metal detectors, x-ray scanners, and body scanners used at KIA are old technologies. Besides, what KIA uses at the moment is not enough, which causes long queues and waiting time during screening processes which stresses passengers. He also added that, due to the long hours of work daily (12 hours) causes fatigue among the staff which sometimes lead to functional anomalies.

In an interview with some of the respondents, Insider threat or risk is one of the challenges facing the airport. They alleged, there are some unknown insiders who leak sensitive information to outsiders. Again, there are people working within the industry that have their loyalty to people in government who helped them gain employment, they added. The political affiliation by workers also informs the decisions of these insiders for their personal or political gain. These assertions by respondents are supported by Greitzer et al. (2014) stating that, a lot of crimes and abuses in the aviation industry includes bribery and corruption, extortion unauthorized access to sensitive information, and illicit communications with unauthorized recipients. According to Krull (2016),

> *...there are several factors that contribute to insider threats, including human, social, political, cultural, organizational, and economical influences. Human level factors include personal events and stressors, such as a recent divorce or the death of a loved one. Social, political, and cultural elements are often displayed in the workplace, especially within the government. At the organizational level, influences can include poor workplace performance and the passing of a promotion to another employee. These contributing factors, in conjunction with capabilities (access), motive – such as revenge, self-benefit, espionage, and intellectual property theft – intent, and*

> *opportunity, create the ideal circumstances for malicious or intentional insiders to act. Elements that influence the threat from unintentional or accidental insiders include workplace negligence, failure to follow policy, and a lack of training and awareness for employees throughout different departments in a company.* (p. 5)

The Private security agent also stated, they always live in fear because, AVSEC can take money and grant access to individuals who ordinarily should not have access to the access control areas. He later gave a more pictorial representation of his fear. In an illustration he said, due to the negative influence of money at the KIA, terrorist might attempt sending explosives or any other threat item on board an aircraft or any part of the airport either by person or through third parties. Some officials of AVSEC might not take them through thorough screening because money has exchanged hands.

With regards to CCTV Footage, when there is an issue, AVSEC do not monitor strange activities of people using the airport. But they only resort to playbacks when there is an incident at the airport, He added.

3.7 Conclusion

From the above literature and findings, it can be observed that, Kotoka International Airport is made up of various security agencies who work together to prevent acts of unlawful interferences that can jeopardize the safety of passengers the airport as a whole. Also, the roles of these security agencies and the security processes individuals passes through has been highlighted in this chapter. The activities of KIA are in conjunction to the standards and recommendation practices of ICAO. Moreover, it is indicated that, GCAA serves as the regulatory body for GACL and enact the ICAO provisions into its National regulatory Acts.

Additionally, the threats faced by KIA are stated in the chapter. The prospects and challenges faced by Kotoka International Airport have been outlined accordingly.

CHAPTER FOUR

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

4.0 Introduction

This chapter comprise of the summary of findings of the study, conclusion and recommendations are also made based on the findings of the research.

4.1 Summary of Findings

The study examined whether it is the diligent security arrangements put in place by the Aviation security system of Ghana that has prevented attacks from occurring or there has been laxity on the part of security services on Ghana's aviation industry, or it is just coincidental that Ghana has not been attacked. The study revealed that historically, Kotoka International Airport (KIA), was built in 1946 as a "military airport" and after a successful military pull-out, the facility was changed into a civilian use. In 1956, the structure was converted into a terminal building. There have been phased developmental project that took place from 1990. The first phased lasted from 1991 to 1993, the second lasted from 1997 to 2005 and the third began in 2009 to date. The Civil Aviation Act (Act 678) was adopted in November 2004. The law mandated the transfer of GCAA's airport administration operations to a new company, the GACL. GACL was officially decoupled from GCAA in 2006 and started operations in January 2007.

The findings of the study, showed that there are a lot of security agencies working together at KIA. such agencies include; AVSEC, GAF, POLICE, GIS, CEPS RFFS and Private airline security agencies. These security agencies main aim is to avoid any act of unlawful interferences which can jeopardize or cause harm to passengers, aircrafts and infrastructures of the airport.

The study found that, the threat faced by KIA is the insider threat. These findings agree with Krull (2016), NCSC (2011) and Greitzer et al. (2014) who highlighted the features and problems encountered as a result of insider threats in an organization. Aside insider threats, there are threats such as; weapons, Explosives, dangerous substances or goods and dangerous articles which are prohibited from going aboard an aircraft and other sterile areas at KIA. the 9/11 attack thought the world to make aviation security a topmost priority. From available literature almost every country has invested one way or the other in the security of the aviation industry. Aside the heavy investment in the area of aviation security by various countries, some airports have unfortunately suffered terrorist attacks. Examples are the incident of the Brussels terror attacks on 2016 that resulted in the death of 32 people and several injuries and that of Istanbul Ataturk airport attack in 2016, that also caused the death of 41 people and more than 230 people injuries just to mention but few.

In terms of the security measures put in place at KIA to prevent terrorist attack, the study further revealed that there are strict measures and procedures passengers and staffs adhere to, in order to prevent any harmful occurrences. The perimeter of the airport thus unrestricted area (landside) to the restricted area (airside) of the airport are patrolled and monitored by AVSEC officers to prevent any act of unlawful interference. Moreover, passengers before checked-in are profiled by the airline security and have their documents (passport and ticket) checked. Checked baggage are screened before going onboard an aircraft. CEPS on the other hand screen cargo items for threats and dutiable items. Immigration also checks passports and visas of passengers before proceeding to the central screening point. At the central screening point passengers, cabin crew and their carryon baggage are screened for threat items using technologies such as the EDS and ETD machines. Moreover, passengers, cabin crew and staffs are pat-down to detect nonmetallic objects which can be used to cause harm onboard an aircraft.

After that, travelers go to the boarding gate and wait for boarding. Some airline security also screens passengers at the boarding gate before boarding the aircraft. These security protocols observed at KIA is an international practice according to Mirmina (1998), Tran (2016), TSA (2006) and Wallis (2007).

In identifying the challenges, the research revealed that, there are not enough and modern technologies (body scanner, metal detectors, x-ray machines and many others) for screening purposes. One other challenge found during the study is that, the CCTV Surveillance system is not adequately utilized. It is evident the threat faced by KIA currently is the insider threat. Another observation is, the private airline security agent lives under the fear that, their colleagues from AVSEC might be victims of monetary or political influence that might lead to breach in security protocols which may go against the image of KIA. This practice is not peculiar to KIA, Greitzer et al. (2014) also confirms it. Some practices in the industry which justify the fear of the Private security agent could be traced to the following incidents: the security threat at Orland International Airport in 2014 where a Comair Airlines employee used his SIDA badge to smuggle guns and drugs aboard several Delta Airlines flights to Puerto Rico. Also, the 2014 Atlanta incident where, an FAA aviation safety inspector used his SIDA badge to bypass the TSA checkpoint and board a flight from Atlanta to New York with a loaded handgun in his carry-on baggage.

The study showed that GCAA is the national authority for GACL. Its national policies are derived from ICAO since it is a signatory. GACL has been clothed with the authority to develop the airport and implement certain provisions of the National Civil Aviation Act that has to deal with security. There is the Ghana Civil Aviation (Security) Directives implemented by GACL for safety and security purposes. Other legal authorities for screening found during the research include; ICAO Annex 17 Standards 4.4 and 4.5, Civil aviation Act 678, the National

Regulatory document-NCASP, the Legislative Instrument (LI) 1824 Section 17 and the Airport Security Program (ASP).

In addition, the study revealed that there are recurrent trainings organized for security officers at the airport. Some of these trainings are done when there is aviation crisis in anywhere else. These trainings are meant to refresh staff and also have the technical know-how of new technologies. However, aside ICAO there is the TSA which is American specific who annually inspects KIA due to the direct flight from Ghana to USA. Their main aim is to ensure that aircrafts leaving KIA to USA observes best practices in the aviation industry.

One of the leading objectives of the research is to examine how comprehensive and foolproof Ghana's aviation security measures has been. Ghana's security measures are comprehensive because, from the departure hall to the aircraft, security measures put in place at KIA from the research is very robust and always aimed at ensuring safety for passengers. From the interviews and researchers' observation, the type of screening passengers goes through before going onboard the aircraft is very thorough and makes it uneasy for criminals or terrorist to sneak any threat item through, *see (page 50-57*). This however cannot be said about its "foolproof" though KIA is doing its best to provide safety for users of their facility. Inadequate modern technologies, long hours of work (AVSEC) and insider threat still are the issues that needs urgent attention to make KIA one of the best not only in Africa but the world at large, *see (page 59-61).*

4.2 Conclusion

In conclusion, the study disclosed that, it is the diligent security arrangements put in place by the Aviation security system of Ghana that has prevented attacks from occurring. This is due

to the fact that, their Standard Operating Procedures (SOP) are in line with ICAOs standard. So far, there is no existing records of terrorist attack at KIA. Though the research has enumerated the mirage of technological predicaments challenging KIA, the staff under the leadership of management always do all they could to make KIA one of the best airports in Africa and a preferable destination to thousands of travelers Based on that they have model airports in other countries they look up to. These airports are People's airport of Amsterdam and Singapore's Changi airport due to how extremely busy the airport is and the type of technology they use and also their exceptional customer service they provide to the passengers to make sure they are happy. However, there is limited data on the phenomena in Ghana and Africa as a whole. Hence, this research can be used for broader quantitative research using the identified relevant variables.

4.3 Recommendations

From the findings of the study, therefore, offer the following recommendations to enhance the security at KIA.

- Throughout my interview with the respondents, one challenge that was crystal clear was the type of devices used at KIA most especially for screening purposes. From almost all of them, devices such as the metal detectors, x-ray scanners, and body scanners used at KIA are old technologies as such does not match up to modern devices. In this modern age of terrorism and other security threats in the aviation industry where criminals and terrorists are becoming more sophisticated, it should be remarkable for KIA to procure and train staff as to how to use modern technological devices which can in a way make KIA prepared anytime there is an attempt of attack. This procurement if done will go a long way to reduce the number of hours passengers spend at the various screening points and also alleviate the stress passengers go through before getting

onboard an aircraft. Finally, the availability of these modern technologies will make KIA a safe and preferred destination for travelers and one must not underestimate the financial benefit this will bring to KIA.

- From the interview conducted, the information gathered points to the fact that, the CCTV facility is mostly resort to only when there is an incidence. This must not be the case, rather the staff in charge of CCTV monitoring must always be tasked to give daily reports of occurrences after work. This will make persons in charge of CCTV monitoring active and prompt on their responsibilities. Aside for administrative purposes such reports could be used as evidence for GACL when necessary. Also, workers must be sensitized through trainings, seminars and workshops to be aware of the fact that, the CCTV cameras are not used to monitor the movement and activities of passengers only but employees as well. From the above it is highly recommendable for GACL to engage a third-party (another security institution) that will aid them in the CCTV monitoring. This is because, anytime there is an issue against or for the company, the results of the internal investigations which are likely to favor the position of GACL always put doubt on the minds of the general public or the individuals involved. It is just a basic knowledge that one must not act as a prosecutor, a lawyer and a judge in his or her own court. The establishment of a third-party in the monitoring of the CCTV will help clear all doubts since they will also contribute to any investigations called upon and make GACL more credible.
- Long hours of work continuously with no specific break time is the reality among the Aviation Security field officers. This practice may result in psychological and physical stress leading to low productivity. Since KIA is Ghana's biggest international airport and one of the best in Africa, it is very necessary the management recruits more AVSEC officers. This will contribute to the reduction in working hours from 12 to at least

6hours daily which in turn will increase productivity and make work easier and better at GACL.

- The services of an industrial and organizational psychologist should be employed so that he or she studies and access the workers to identify problems and suggest possible solutions to the management that will help improve the well-being and performance of employees. through regular in-service trainings. This should be aimed at reducing the concerns of negative financial influence and insider threat.

REFERENCES

Acheampong, A. A. (2017). Exploring Customer Retail Preferences in the Proposed Kotoka International Airport Terminal 3.

Aerospace Industries Association of America. (2011). *Aerospace industry report 2011*. Arlington, VA: Author.

African Development Bank Group (2019). Framework and Guidelines to Support the Aviation Sector.

Ahorsu K. (2014). Contemporary Transnational Security Threat to West Africa: A Peace Education Approach. *Lejiad* Vol 7, 75-101.

Altier M. B. (December 9, 2021). Transnational Security. Retrieved from https://www.sps.nyu.edu/content/sps/homepage/academics/masters-degrees/ms-in-global-affairs/transnational-security.html

Amankwah-Amoah, J., & Debrah, Y. A. (2014). Air Afrique: The demise of a continental icon. *Business History*, 56(4), 517-546.

Ameyaw Debrah (2019 July, 27). People & lifestyle; *Recruits with the Rescue Fire Fighting Service Department of Kotoka International Airport Cry Over Unfair Treatment*. Accessed on 2022 February 06 from https://www.google.ccom/amp/s/ameyawdebrah.com/update-recruits--with-the-rescue-fire-fighting-service-department-of-kotoka-international-airport-cry-over-unfair-treatment/amp/

Anggoro, K. (1999). Transnational Security Concerns, Defence Modernization and Security Cooperation in Southeast Asia. 25–28.

Arasly, J. (2004). Terrorism and Civil Aviation Security: Problems and Trends. *The Quarterly Journal*, *February*, 75–102.

Baker, D. M. (2020). Tourism and Terrorism: Terrorists' Threats to Commercial Aviation Safety and Security. In *Tourism, Terrorism and Security*. Emerald Publishing Limited.

Bamba R. (2014). The Emerging Threats of Terrorism in West Africa: An Analysis of Ghana's Response.

Bart E. (2020). Addressing COVID-19 Pandemic Impacts on Civil Aviation Operations. *Congressional research service*. https://crsreports.congress.gov/

Bergeron, J. (2013). Transnational Organised Crime and International Security. The RUSI Journal, 158:2, 6–9. https://doi.org/10.1080/03071847.2013.787728

Biernacki, P., & Waldorf, D. (1981). Snowball sampling: Problems and techniques of chain referral sampling. Sociological methods & research, 10(2), 141-163.

Bite, K. E. (2008). Minimizing the baggage loss at airports. *Periodica Polytechnica Transportation Engineering*, *36*(1-2), 29-32.

Blalock, G., Vrinda K., & Daniel H. S. (2007). "The Impact of Post-9/11 Airport Security Measures on the Demand for Air Travel". *The Journal of Law and Economics*. 50 (4): 731–755.doi:10.1086/519816 (https://doi.org/10.1086%2F519816). ISSN 0022-2186 (https://www.worldcat.org/issn/0022-2186) .

Braun, V. & Clarke, V. (2006). *Using thematic analysis in psychology*. Qualitative Research in Psychology, 3, 77-101.

Bureau of Economic Analysis. (2011). *Industry economic accounts information guide.* http://www.bea.gov/industry/iedguide.htm#bioa/

Butler, Viggo, and Robert W. Poole (2004): "Rethinking Checked-Baggage Screening," Policy Study 297, Reason Public Policy Institute, Los Angeles, CA, July. 7

Charles Benomi Okine (2015 April, 17). Graphic Online. Aircraft Rescue; The Case of KIA Accessed on February 6 2022 from https://www.graphic.com.gh/features/features/aircraft-rescue-the-case-of-kia.html

Choi, J. T. (1994). Aviation Terrorism. Historical Survey, Perspectives and Responses, New York: St.

Creswell, J. (2009). Research Design. Qualitative, Quantitative and Mix Methods Approaches. Los Angelese: Sage.

Creswell, J. W. (2013). Research Design. Qualitative, Quantitative and Mix Methods Approaches. Sage publications.

Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews.

Effah, E. (2021, January 20). Ghana's Aviation Industry from an appendage to mainstream. Retrieved from https://www.pulse.com.gh/business/ghanas-aviation-sector-from-an-appendage-to-mainstream/j14ls01

Elias, B. (2018). *Strange Occurrences Highlight Insider Threat to Aviation Security*.

Eriksson, S., & Steenhuis, H. J. (2015). *The global commercial aviation industry*. Routledge.

Fafore, O. (2020). Radical Islam and Transnational Security in West Africa Radical Islam and Transnational Security in West Africa Olumide Adetokunbo Fafore. August 2019. https://doi.org/10.31920/2050-4306/2019/8n2a6

Failler, A. (2009). Remembering the Air India disaster: Memorial and counter-memorial. *The Review of Education, Pedagogy, and Cultural Studies*, *31*(2-3), 150-176.

Forest, J. J. (2007). The modern terrorist threat to aviation security. *Perspectives on Terrorism*, *1*(6), 10-13

General Accounting Office (2003). "Aviation Security: Improvement Still Needed in Federal Aviation Security Efforts," Testimony Before the Subcommittee on Aviation, Committee on Commerce, Science and Transportation, United States Senate GAO-04-592T, Washington, D.C., March 30, Statement of Norman J. Rabkin, Managing Director, Homeland Security and Justice Issues. 6

Ghana Airports Company Limited (2021, December 07). Retrieved from http://www.gacl.com.gh/index.php.

Ghana Airports Company Limited (GACL) (2017). Threats to aviation security (AVSEC Awareness) Manuscript.

Ghana Airways Timetable, 1967.Ghana Airways File, Herskovits Library of African Studies.

Ghana Civil Aviation Authority. (2018). *Ghana Civil Aviation (Security) Directives*. *November*.

Ghana Immigration Service (2022 February, 06). Kotoka International Airport (KIA) Command. Retrieved from https://www.gis.gov.gh/border_control.html

Glen, A. (2014). Aviation terrorism. The essence of the phenomenon, systematics, typology. *Security and Defence Quarterly*, *2*(1), 59-75.

Global Terrorism Database. 2016. "Transportation Incidents over Time." The National Consortium for the Study of Terrorism and Responses to Terrorism. University of Maryland, College Park, Maryland. Accessed December 07, 2021 at https://www.start.umd.edu/gtd/search/Results.aspx?search=transportation&sa.x=0&sa.y=0&sa=Search

Greco J. P. (2017). *Insider Threat: The Unseen Dangers Posed by Badged Airport Employees and How to Mitigate Them*,82 J. Air L. & COM. 717.

Greitzer FL, LJ Kangas, CF Noonan, CR Brown, and T Ferryman. (2014). "Psychosocial Modeling of Insider Threat Risk Based on Behavioral and Word Use Analysis." e-Service Journal, pp. 106-138. Indiana University Press, Indiana University, Bloomington, Indiana.

Heinz, S., & Connell, J. F. O. (2013). Air Transport in Africa : Toward Sustainable Business Models for African Airlines. *Journal of Transport Geography*, *31*, 72–83.

Hoffman, B. (1998). Aviation Security and Terrorism: An analysis of the potential threat to air cargo integrators. *Terrorism and Political Violence*, *10*(3), 54-69.

Holden, R. T. (1986). The contagiousness of aircraft hijacking. *American Journal of Sociology*, *91*(4), 874-904.

IATA (2010). Air Transport Market Analysis. IATA.

IATA (2021). Outlook for the global airline industry from https://www.iata.org/en/iata-repository/publications/economic-reports/airline-industry-economic-performance---april-2021---report/

ICAO (2002). "Aviation Security Plan of Action." Available at (http://www.icao.org/applications/search/Results.cfm)

ICAO (2019). The world of air transport in 2019 & 2018.

Ilaria G. M. (2021, April 13). Has Covid-19 knocked terrorism off aviation's most feared threat list? Retrieved from https://www.airport-technology.com/features/has-covid19-knocked-terrorism-off-aviation-most-feared-list/

International Civil Aviation Organization. Security and Facilitation; Aviation Security Manual (Doc 8973) — Restricted accessed from https://www.icao.int/Security/SFP/Pages/SecurityManual.aspx

Interview with a Customs Officer on 28th January, 2021

Interview with a Former Private Airline Security Agent Bright on 14th December, 2021

Interview with a GACL Fire Officer on 14th December, 2021

Interview with an AVSEC Superintendent on 14th December, 2021.

Interview with an AVSEC Training Instructor I on 14th December, 2021

Interview with an Immigration Officer on 28th January, 2021

Interview with AVSEC Training Instructor II on 14th December, 2021

Jenkins, B. M. (1989). *The terrorist threat to commercial aviation*. RAND CORP SANTA MONICA CA.

Justin V. Hastings & Ryan J. Chan (2013. Target Hardening and Terrorist Signaling: The Case of Aviation Security, Terrorism and Political Violence, 25:5, 777-797, DOI: 10.1080/09546553.2012.699906

Kamara, D. (2012). Inaugural speech at ECOWAS transport conference, Mali

Kapchangah, M. K. S. (2008). *Situation Report on Africa Aviation Security: Implications for Peace and Security*.

Kean, T. H., & Hamilton, L. H. (2004). *The 9/11 Commission Report: Executive Summary*. National Commission on Terrorist Attacks upon the United States.

Kesang U., (2021, January 6). Airport cybersecurity in a COVID-19 world. Retrieved from https://blog.aci.aero/airport-cybersecurity-in-a-covid-19-world/

Kipp D. (2014, July 22). *A brief and moveable history of aviation security*. Retrieved from https://www.rossbar.com/a-brief-and-moveable-history-of-aviation-security/

Kolo, Z. I. (2017). Terrorism and the Challenges of Food Security. University of Maiduguri.

Krull, K. E. (2016). *The Threat Among Us: Insiders Intensify Aviation Terrorism* (No. PNNL-25689). Pacific Northwest National Lab. (PNNL), Richland, WA (United States).

Kulyk, M., & Suslova, G. (2014). Integration of the ICAO Training Institute into the international education network. *Aviation, 18(2), 104-108.*

Learning Abroad Center (2022, February 14). Immigration & customs. Retrieved from https://umabroad.umn.edu/resources/travel/immigration-customs

Linsell I. (2021, August 11) Aviation, cyber security and COVID-19: What has driven the rise in attacks? Retrieved from https://www.ospreyflightsolutions.com/aviation-cyber-security-and-covid-19-what-has-driven-the-rise-in-attacks/

Marie-helen, M. (2015). *Transnational Security*. CRC Press Taylor & Francis Group. http://www.crcpress.com

Mazareanu E. (2021). Global Airline Industry Market Size 2018-2021. Accessed on November 12 2021 from https://www.statista.com/statistics/1110342/market-size-airline-industry-worldwide/#:~:text=The%20global%20airline%20industry%20was%20valued%20at%20686,domestically%20and%20internationally%20as%20well%20as%20cargo%20airlines.

Mcquaid, J., Faber, P. G., & Gold, Z. (2017). Transnational Challenges and U. S. National Security: *Defining and Prioritizing Borderless Threats*. September.

Mirmina, S. A. (1998). Aviation Safety and Security - Legal Developments. *Journal of Air Law and Commerce*, *63*(3). https://scholar.smu.edu/jalc/vol63/iss3/3

National Counterintelligence and Security Center (NCSC). 2011. National Insider Threat Program. Accessed November 18, 2021 at https://www.ncsc.gov/nittf/docs/National_Insider_Threat_Policy.pdf

National Research Council. (1996). *Airline Passenger Security Screening: New Technologies and Implementation Issues* (Vol. 482, No. 1). National Academies Press.

Nobles, C. (2019). Cyber threats in civil aviation. In *Emergency and Disaster Management: Concepts, Methodologies, Tools, and Applications* (pp. 119-141). IGI Global.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*, *42*(5), 533-544.

Pietrasiński, J. F., Rodzik, D., Grzywiński, S. A., & Miernik, J. M. (2017). Proving Ground Testing of an Anti-Aircraft Artillery Evaluation System. *Problemy Mechatroniki. Uzbrojenie, lotnictwo, inżynieria bezpieczeństwa*, *8*(3).

Rahman M. (2012). ICAO International Standards and Recommended Practices for international civil aviation: an evaluation of the effectiveness of the adoption of those standards and procedures in Bangladesh.

Ritchie, J., Lewis, J., & Elam, G. (2008). Designing and Selecting Sample. In Ritchie, J., Lewis, J. (Eds.), Qualitative Research Practice: A guide for Social Science Students and Researcher (77-108).

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). Qualitative Research Practice: *A guide for Social Science Students and Researchers.* Sage.

Schóber, T., Koblen, I., & Szabo, S. (2012). Present and potential security threats posed to civil aviation. *Incas Bulletin*, *4*(2), 169–175. https://doi.org/10.13111/2066-8201.2012.4.2.17

Seidenstat, P. (2004). "Terrorism, Airport Security, and the Private Sector," Review of Policy Research, 21(3), 275–292. 9, 22, 27

Silverman, D. (Ed.). (2016). *Qualitative research*. London: Sage.

St. John, P. (1998). The politics of aviation terrorism. *Terrorism and Political Violence*, *10*(3), 27-49.

Stoica, I. (2016). Transnational Organized Crime. An (Inter) National Security Perspective. *Journal of Defense Resources Management*, 7(2(13)), 13–30.

Subcommittee on Aviation (2004): "Hearing on Aviation Security: Progress and Problems in Passenger and Baggage Screening," Hearing transcript, United States House of Representatives, Washington, D.C., February 12. 6, 8, 27

Szyliowicz J. S. (2004) Aviation Security: Promise or Reality? Studies in Conflict & Terrorism, 27:1, 47-63, DOI: 10.1080/10576100490262160

Tchouamou N. E. (2016) Africa's single aviation market: The progress so far. Journal of Transport Geography, 50. pp. 4 11. ISSN 0966 6923

Tran, V. (2018, February 6). *Security Threats With The Most Impact on Aviation*. Retreived from https://blog.safe-passage.com/security-threats-with-the-most-impact-on-aviation

Transport Security Administration (2006) Recommended security guidelines for airport planning, design and construction. Revised.

Transportation Security Administration (2002). "TSA Meeting December 31 Deadline for Screening All Checked Baggage," Press Release 147-02, Washington, D.C., December 30. 6, 7

Wallis, R. (2007). The Role of the International Aviation Organizations in Enhancing Security. Terrorism and Political Violence, 6553, 83–100. https://doi.org/10.1080/09546559808427471 3rd ed. London, Oxford University Press, p. 96.

Wojciechowski, S. (2017). Reasons of Contemporary Terrorism. An Analysis of Main Determinants. *Radicalism and Terrorism in the 21st Century*, 49.

Wolniak, R. (2019). Aviation terrorism and its impact on the aviation industry. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*.

World Network Service (2013). Five Trends for the Global Airline Industry, A WNS Perspective, accessed on 11 November 2021, https://www.wns.com/Portals/0/Documents/Articles/PDFFiles/600/62/5-Trends-for-the-Global-Airlines-Industry.pdf.

APPENDICES

Appendix I

Daily Passengers Passing Through TSA Screening Checkpoints Maarch-July 2020 Vs. 2019

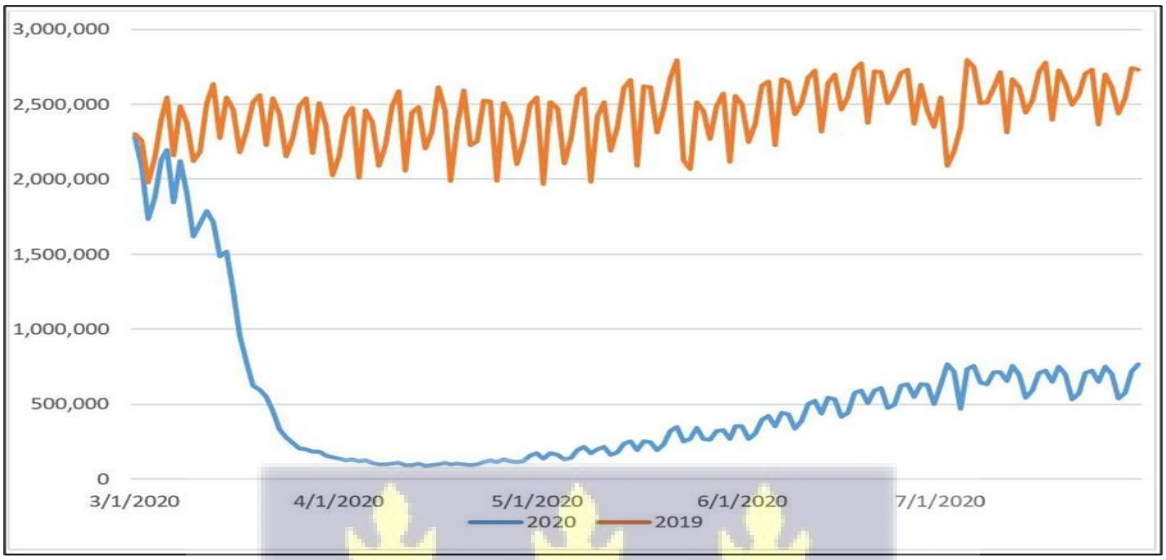

Figure 1.0 (Source: Bart Elias, 2020).

Notes: 2020 dates are provided. 2019 data are matching with the 2020 weekday date

Airline industry market size worldwide from 2018-2021

(In billion U.S dollars)

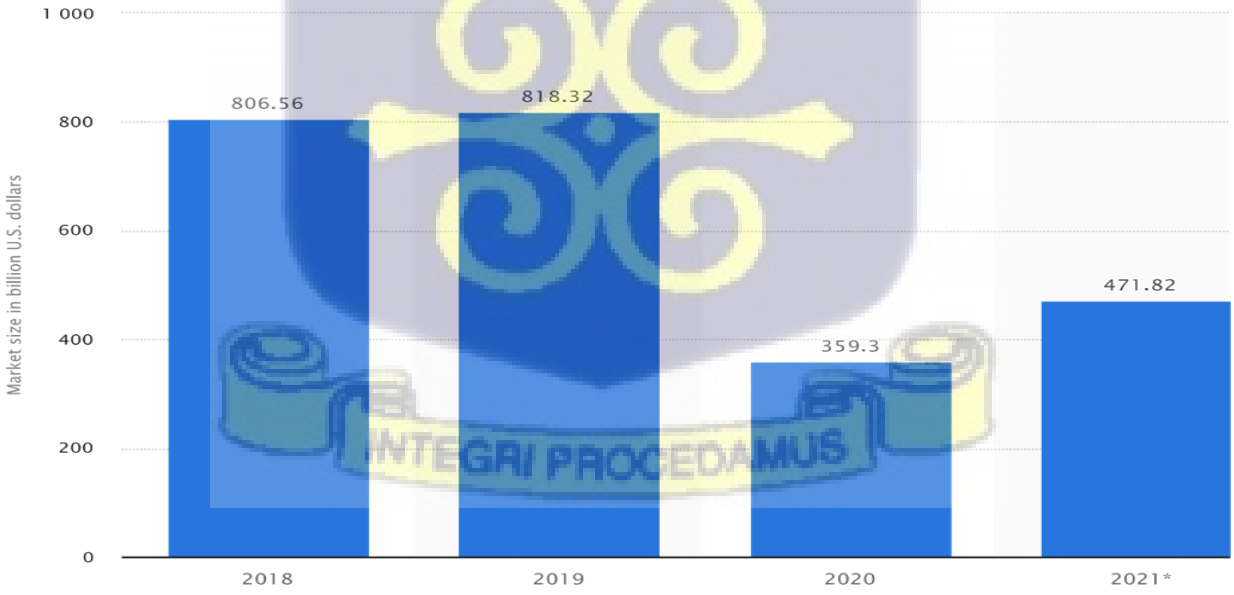

Figure 1.1. (Source: Mazareanu, 2021)

Appendix II

Examples of Body Scanner and walk-Through Metal Detectors

Figure 2.0

Figure 2.1

Figure 2.2

Examples of Explosxive Trace Detector/Explosive Detector Itemasiser Machines

Figure 2.3

Figure 2.4

Figure 2.5

Examples of. Baggage Scanners

Figure 2.6

Figure 2.7

Figure 2.8

Examples of Carry-on luggage Xray scanner

Figure 2.9

Figure 2.10

Example of X-ray images on monitor of screening device

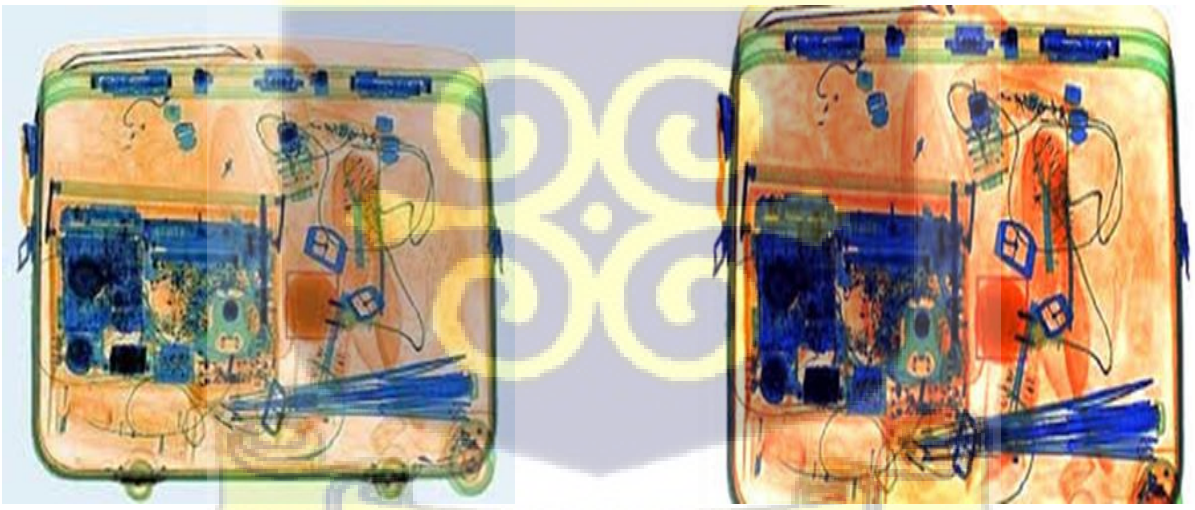

Figure 2.11

Figure 2.12

Examples of CCTV Surveillance and Control Room System

Figure 2.13

Figure 2.14

Figure 2.15

Figure 2.16

Example Of General Depiction Of Security Areas At The Airport

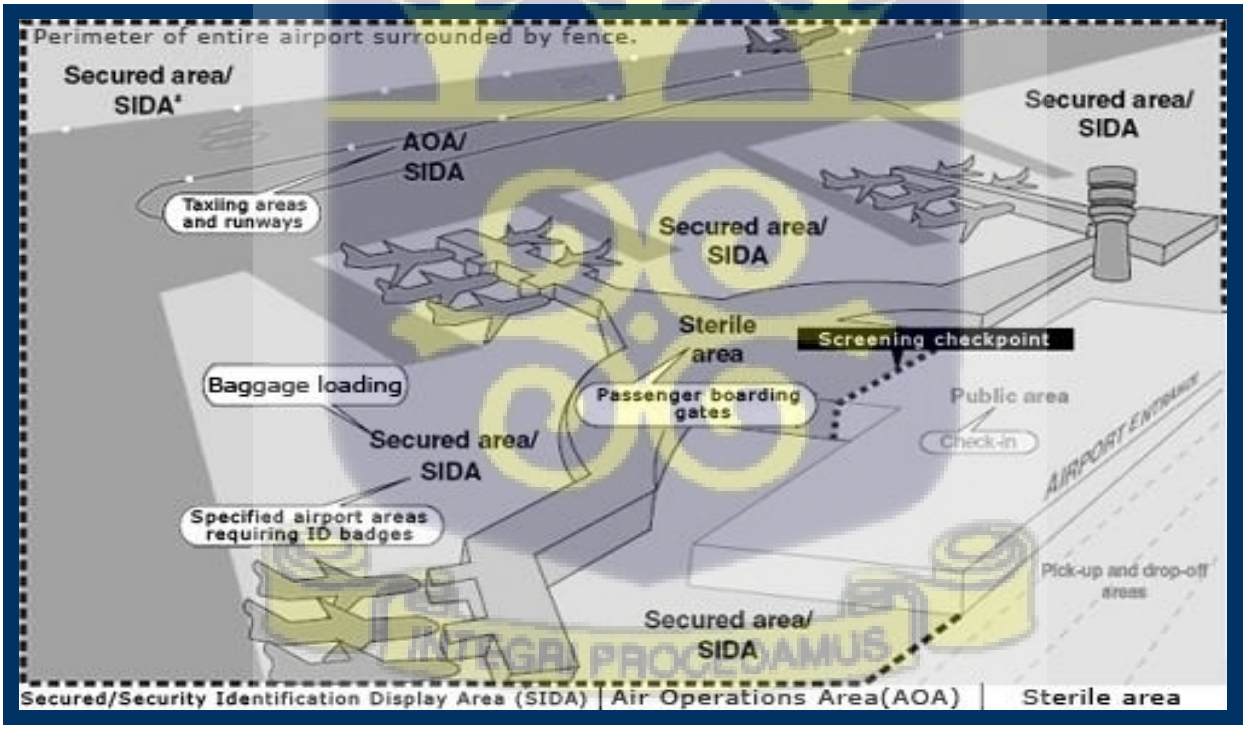

Figure 2.17 (Source: Wallis, 2007).

Appendix III

Affordability Of Tickets And $/Km Comparison Of Intra Regional Airfares

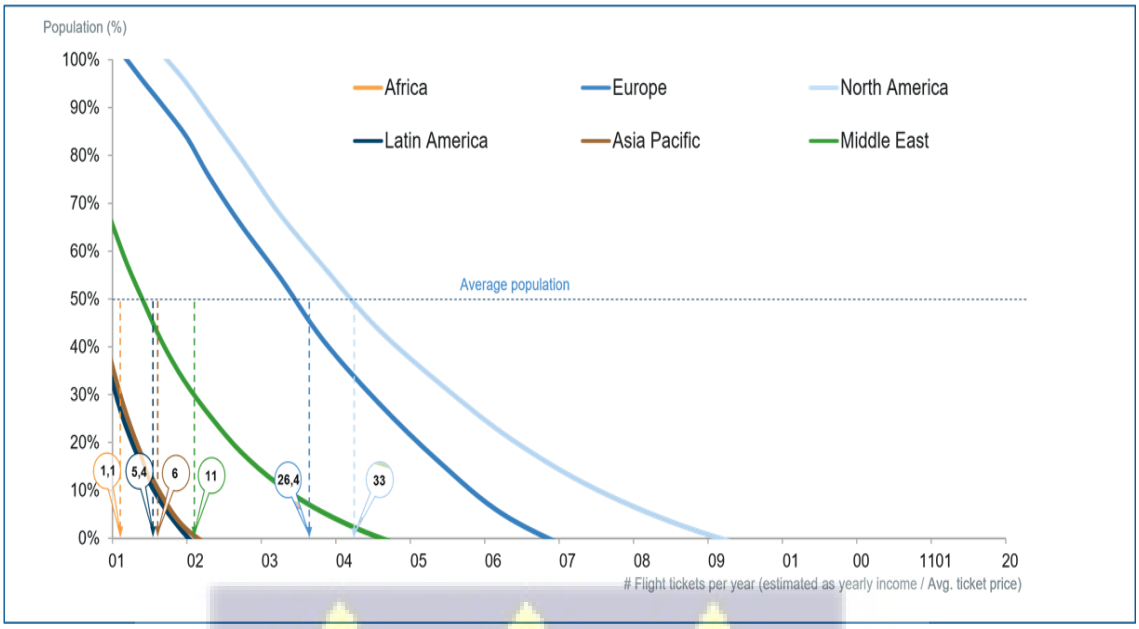

Figure 3.1. (Source: African Development Bank Group, 2019)

Level of effective implementation of ICAO safety related SARPs in Africa

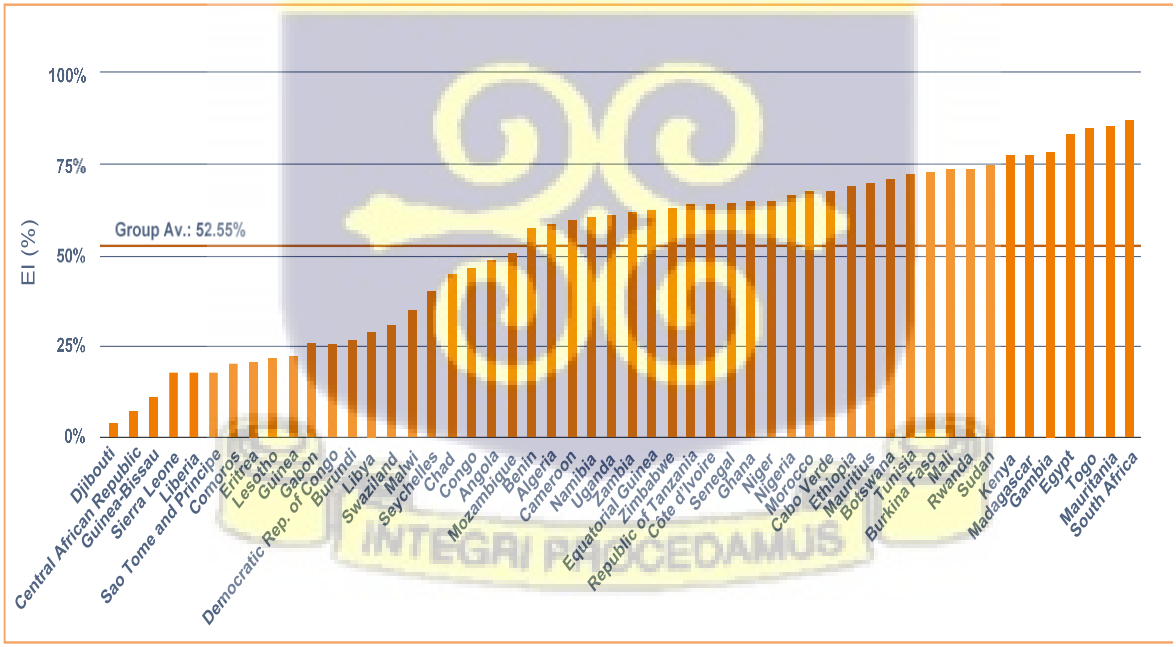

Figure 3.2 (Source: African Development Bank Group, 2019)

Appendix IV

ghana airports
COMPANY LIMITED

Postal Address
KA PMB 36
KIA ACCRA
GHANA
Digital Address: GL – 125 - 6946

Tel# 030 255 0612
Fax# 030 276 0981
E-mail: info@gacl.com.gh
website: www.gacl.com.gh

DATE: DECEMBER 29, 2021

STATEMENT

INCIDENT AT ARRIVAL HALL, KOTOKA INTERNATIONAL AIRPORT

Management of Ghana Airports Company Limited (GACL) can confirm that on Tuesday, December 28, 2021 at around 9pm, an unattended bag was sighted at the arrival hall of Terminal 3, Kotoka International Airport.

The Base Ammunition Depot Unit of the Ghana Armed Forces was immediately brought in to conduct preliminary assessment of the bag and its contents. The bag was subsequently taken away for further investigations, the outcome of which will be made public.

Management of GACL wishes to apologize for the disruption in the arrival facilitation process during the period and assures the travelling public of its commitment to ensure their safety and security at our airports.

MANAGEMENT

INTEGRI PROCEDAMUS

Figure 4.0