

TERRORISM: THE CHALLENGE OF AVIATION SECURITY

R.-C. NICOLAS

Radu-Chiru Nicolas

Politehnica Bucharest National University of Science and Technology, Romania

<https://orcid.org/0009-0005-8665-1414>, E-mail: nicolas.radu@stud.aero.upb.ro

***Abstract:** The paper explores a chronological account of major aviation-related terrorist incidents, including the hijacking of aircraft and attacks such as those on September 11, 2001. These events underscore the vulnerabilities within civil aviation security and highlight the psychological impact of such attacks. This study emphasizes the need for advanced technologies and stringent national and international regulations to combat aviation terrorism. It discusses the evolution of aviation security measures, the importance of a holistic approach involving airlines, airport authorities, security forces, and governmental bodies, and the necessity of information sharing and best practices adoption. Additionally, the paper addresses the economic implications of aviation security, advocating for better data collection and analysis to optimize resource allocation and enhance overall safety. The ongoing development of aviation security strategies, driven by evolving threats and technological advancements, is critical for safeguarding passengers and ensuring the resilience of the global aviation industry against terrorist threats.*

***Keywords:** terrorism, aviation, security, aircraft, hijacking, attacks.*

Introduction

As Gerard Chaliand (2018) highlights in "The History of Terrorism from Antiquity to Daesh", the concept of terrorism has ancient roots, with various groups throughout history employing terror tactics to achieve political aims. The term terror (from the Latin *terrere* - to make to tremble), with the meaning we attribute to terrorism today, was used for the first time during the French Revolution (1789 - 1799), although actions that can be defined as terrorist acts date back from much more distant times.

In Antiquity, the first known empire, the Akkadian, founded by King Sargon of Akkad, used terror to keep subject populations under control, respectively to eliminate revolts.

The term "terrorism," originating from the Latin "terrere" (to cause to tremble), first appeared during the French Revolution, though acts of terrorism date back much further. Ancient civilizations, such as the Akkadian Empire and the Roman Empire, employed terror to control populations and suppress revolts. Over the centuries, various groups, from the Sicarii in Judea to the Nizari Assassins in the medieval Islamic world, have utilized terror tactics to achieve political aims. The evolution of terrorism continued through significant historical events, including the Gunpowder Plot in England and the revolutionary terror in France. In the contemporary era, aviation has become a primary target for terrorist activities due to its potential to cause widespread fear and significant human and material damage.

The ancient terrorists

In the Greek and Roman civilizations, terrorism took the form of tyrannicide (from fr. tyrannicide - killing a tyrant). For example, assassination by stabbing of the dictator Julius Caesar (44 \.Hr.) was considered by the majority of Romans a tyrannicide.

The Roman Empire also faced another type of terrorism, the most known and invoked in Antiquity, practiced by the Sicari, a radical faction of the Zealots (from the Greek zelotes - ardent follower). The Zealots were a sect that accepted no other lord but God and used terrorist tactics against the Roman rule, including the Jews considered collaborators of the Romans. In the first revolt against Rome (AD 66-70), Zeolites took control. In the year 73, they preferred to commit suicide rather than surrender the Masada fortress and be killed by the Romans. The Zealots continued to remain a formidable force well into the first part of the following century. A faction of the Zloty, the Sicari killed their enemies in crowded public places (such as the markets), using a double-edged dagger ("sica"). They also distinguished themselves by kidnapping figures from the Jewish community, demanding in return the release of the Sicari prisoners from the Roman prisons, but also by attacking the buildings where the Romans kept records of the taxes collected from the population, thus trying to win the sympathy of the common people.

Sect of Assassins

Representative in the East, during the Middle Ages, was the Nizari sect, whose members executed on command political assassinations or selective crimes, without hesitating to sacrifice their own lives. Soon they were named sect of the Assassins/"Hashhashin" (hasasiyya -consumer of hashish). The assassins were also considered the first suicide terrorists in the world because they killed their victims in public, in crowded places (eg mosques), and they were most often captured and executed. It should be mentioned that there are notes that attest that they still tried to flee the scene, but their chances were minimal or even non-existent. Therefore, the use of the term "suicide terrorists" can be slightly forced.

Moving on to Europe, an example of the use of terrorist means to achieve political goals was the Gunpowder Plot (Wounded Treason), which attempted to blow up the House of Lords in the British Parliament. The attack was prepared by a group of Catholics, as a result of the measures of persecution directed against them, and had as their target King James I. They rented a cellar in the basement of the edifice and stored there a considerable number of barrels of gunpowder. The plot was discovered by an English parliamentarian, who received a letter by which he was warned not to move to the seat of the Legislature. Most of those involved were sentenced to death.

Revolutionary treason

The mentioned examples demonstrate the existence of terrorism in society, in different forms, since ancient times. The French Revolution at the end of the 18th century was a key moment in the evolution of terrorism. At this historical stage the phenomenon acquired the connotations that are frequently associated with it nowadays. The revolutionary terror was manifested by the execution of tens of thousands of people to make the French accept the principles of the Revolution and the new leadership of the state.

A phenomenon that has never been completely eradicated, terrorism has accompanied humanity throughout its evolution, each time managing to transform and adapt to survive. The evidence is the weapons used to spread terror, from the double-edged dagger of the snipers to the materials broadcast in the virtual environment, which manage to induce an individual to commit the ultimate sacrifice. Regardless of the period in which it made its presence felt, terrorism knew how to exploit the lack of adaptability and frustrations of individuals.

Threats to aviation security are constantly evolving, subjecting overall safety to risks that can produce significant human and material damage in all public and governmental sectors, including at the economic level, affecting the safety climate globally. According to Elias B. and Cohn M. (2017) in 'Aviation and Airport Security: Terrorism and Safety Concerns,' the vulnerabilities in civil aviation security have been a significant concern, especially in the wake of high-profile terrorist incidents.

We can review a short chronology of the main attacks:

Aircraft hijacking (also known as hijacking airplane hijacking, skyjacking, airplane hijacking, plane jacking, air robbery, air piracy, or aircraft piracy, the latter term being used in special aircraft jurisdiction in the United States), or simply hijacking, is the illegal seizure of an aircraft by a person or a group. Dating back to the first hijackings, most cases involve a pilot being forced to fly according to the pirate's demands. However, in rare cases, pirates have flown them themselves and used them in suicide attacks – note the 9/11 attacks, in other cases, planes have been hijacked by the official pilot or co-pilot; for example the Lubitz Case.

Unlike automobiles or marine vessels, an aircraft hijacking is not usually committed for robbery or theft. Individuals driven by personal gain often divert planes to destinations where they have no intention of going alone. Some pirates intend to use passengers or crew as hostages, either for monetary ransom or for some political or administrative concessions from the authorities.

Various reasons led to such events, such as the request for the release of certain high-profile individuals or for the right to political asylum (especially flight ET 961), but sometimes the decision to carry out a hijacking can be influenced by a failed private life or financial distress, as in the case of Aarno Lamminparras of Oulu Aircraft Hijacking. In the case of Lufthansa Flight 181, and Air France Flight 139, the hijackers were not satisfied and showed no inclination to surrender, resulting in attempts by special forces to rescue the passengers.

In most jurisdictions around the world, hijacking aircraft is punishable by life imprisonment or a lengthy prison term. In most jurisdictions where the death penalty is a legal penalty, aircraft hijacking is a capital offense, including China, India, and the United States of Georgia and Mississippi. International civil aviation is vulnerable to the manifestation of security risks, as the psychological impact in the event of an attack is major, therefore civil aviation was a first option in the illicit operations of various extremist groups precisely through the lens of this major psychological impact.

In recent years, processes have been initiated at the international level to develop strategies and standards in security applied to civil aviation, generating obligations to adapt the regulations and national institutions/organizations accordingly. Recent European regulations create the obligation to establish concrete institutional responsibilities and impose financing and development decisions (in infrastructure, technology, human resource training, standardization and regulation), to align national civil aviation with community security

requirements. Threats against airports, airlines, aircraft and aviation personnel highlight the fact that terrorist groups view the air transport business as a favorable target for causing destruction and creating fear among the population. The negative effect of hijackings, sabotage and attacks on airport infrastructure was far more profound than any type of attack used against civilians. Air terrorism is a complex phenomenon, which is a concomitant feature of the development of international civil aviation, but also of political unrest around the world.

The article is based on understanding the causes invoked by terrorist groups for committing attacks and the consequences generated after their occurrence. The cases of attacks presented in a chronological order clearly exemplify the evolution of the phenomenon. Thus, the need to develop new technologies, as well as national and international regulations, can be justified to win the fight against these illegal actions. It is important to note that preventing and combating terrorism requires a holistic approach and close collaboration between different actors involved, such as airlines, airport authorities, security forces and government authorities. These actors must share relevant information and adopt security best practices in order to identify and counter terrorist threats before they become operational. During the last decades, the state of affairs in the management of security on board aircraft and the prevention of terrorism has undergone a significant evolution. This development has been driven by a number of factors that have heightened security concerns in the aviation industry.

One of the main reasons that have led to increased concern in this area is represented by the evolution of terrorist threats at the global level. In recent decades, we have witnessed numerous terrorist incidents targeting commercial aircraft, such as the September 11, 2001 attacks on the World Trade Center and the Pentagon, as well as other notable incidents such as the mid-air bombing of Pan Am Flight 103 over the city of Lockerbie in 1988. These incidents showed the vulnerabilities in civil aviation security and generated global concern about the protection of passengers and aircraft against terrorist threats.

In addition to these tragic events, the continued evolution of technology and the increasing accessibility of information have provided terrorists with the tools and resources to plan and execute attacks on aircraft. For example, in recent years, the threat of cyber-attacks on civil aviation systems has arisen, raising additional security concerns.

In response to these threats, the international community has acted quickly and firmly to strengthen security on board aircraft. Strict rules and regulations have been developed and implemented globally under the auspices of organizations such as IATA, ICAO through Annex No. 17 to the Chicago Convention stipulates international standards and recommended practices for safeguarding civil aviation against acts of unlawful interference, EASA (Regulation (EC) No. 300/2008 established a comprehensive framework for civil aviation security, addressing the need for standardized security measures across member states), for example

The National Aeronautical Security Program (PNSA), approved by H.G. No. 1193/2012, outlines essential strategies and protocols to enhance aviation security at a national level. These rules imposed mandatory requirements and standards regarding civil aviation security and laid the foundations for a coherent and unified approach to the prevention of terrorism on board aircraft. Another important factor that has led to increased concern in this area is the growing awareness of the importance of aviation security.

Terrorist incidents and attacks on civil aviation have had a significant impact on public opinion and authorities, drawing attention to the need to develop and implement robust strategies to prevent and combat terrorism in the aviation industry. In this regard, the pressure exerted by passengers, non-governmental organizations and the media has led governments and authorities to pay more attention to this aspect and allocate resources and efforts to ensure an adequate level of security.

The Economic Perspective of Aeronautical Security

We have argued that aviation security is not immune to fundamental resource allocation problems. This means that decisions must be made about how to allocate scarce resources efficiently and how to generate the maximum net social welfare. Making such decisions requires data, and despite our best attempts to find and analyze relevant data, we were struck by the lack of available data – and, where data exists, by the lack of consistency and transparency. Future research on aviation security issues could make significant contributions if international standards for the publication, reporting and delineation of aviation security data were developed at both international, national and individual airport analysis levels. We see the potential for more research on measuring outcomes in aviation security (how safe are we?) and for more extensive use of benefit-cost analysis to determine the performance of security measures or programs (groups of measures). But again, data is needed. With more and better data, analysis can help us better understand the cost relationships and economic consequences of different funding mechanisms. Regarding the effectiveness of aviation security, it should be noted that efficiency differs by "effort" and efficiency matters because a more efficient aviation security system can reduce indirect economic costs to society while improving the benefits and overall safety of travelers and of the public. With access to data, I estimate that screening service levels relate to technology investment, human capital investment, and time costs imposed on passengers, airlines, and airports. In terms of financing aviation security, the trend towards increased reliance on security fees levied on air travelers is worrying and unjustified on economic grounds. The reasoning appears to have been, we can fund aviation security with a user charge because air travelers can and will pay; however, this approach does not take into account the external economic costs imposed on aviation and the wider economy.

There appears to be little doubt that the current standard implementation of aviation security at airports around the world will need to change given the projected growth in air travel and the increasing number of passengers passing through airports. Specifically, we cannot continue to operate under the assumption that every passenger is an equal threat to aviation. The shift to risk-based systems is an inevitable consequence of economic pressures exacerbated by current institutions that evolved from hasty decisions following the 9/11 attacks. International industry associations (notably IATA and ACI) have developed and promoted a coordinated movement towards "next generation" aviation security. Working independently until recently, IATA called its vision for aviation security "checkpoint of the future", while ACI developed a concept it called "better security". This year, at the ICAO meetings in Montreal, IATA and ACI announced a memorandum of understanding to harmonize their work and jointly advance the next generation of aviation security, with a focus on "the airline-airport interface, the ability to airport transfer and efficiency".

Conclusions

The challenge is to create a coordinated international evolution of risk-based aviation security. Many of the problems faced at the individual jurisdiction level are compounded by the coordination problems of moving to an international standard model for risk management and adopting new technologies. Such coordination creates incentives like the prisoners' dilemma at the international level. There is an incentive for each nation or jurisdiction to delay the implementation of the new measures to wait and see the outcome of other countries adopting the new model. If all countries follow this incentive, then delay is the result.

A central problem with plans as envisioned by IATA and ACI is the lack of data and analysis with which to measure expected outcomes and net benefits, along with costs and net efficiency changes. IATA and ACI have begun the process of pilot studies, but there are no published results at the time of writing. Another issue concerns the issue of adding new layers of security to existing ones. Future risk-based systems will be a hybrid of new security layers and existing security layers, which involves a reallocation of resources as new layers replace some existing layers while other existing layers remain or are augmented. The degree of complementarity and substitutability between layers will play an important role in determining security efficiency, transfer efficiency and the quality of the passenger experience. Differences in how individual nations choose to design, organize, and implement the security systems of the future will give rise to differences in effectiveness, efficiency, and cost. Thus, we need more data and analysis to better understand exactly how the different layers of security relate to each other and how adding, removing, increasing or decreasing layers would affect the entire system. As argued, the danger is that in the absence of compelling analysis and data, political incentives will push us to add new layers of security with minimal adjustments and without removing existing layers.

REFERENCES

1. Annex No:17 to the Chicago Convention
2. Elias, B., & Cohn, M: (Eds:): (2017): *Aviation and Airport Security: Terrorism and Safety Concerns* (Second Edition): CRC Press:
3. Law no: 535/2004, regarding the prevention and combating of terrorism;
4. National Aeronautical Security Program (PNSA) approved by H:G: no:1193/2012 –
5. Regulation (EC) no: 300/2008 of the European Parliament and of the Council of 11 March 2008, regarding common rules in the field of civil aviation security and repealing Regulation (EC) no: 2320/2002, with subsequent amendments and additions;
6. Regulation (EU) no: 1998/2015 of the Commission of November 5, 2015, establishing detailed measures for the implementation of common basic standards in the field of aviation security
7. *The history of terrorism from Antiquity to Daesh*, Gerard Chaliand, 2018