

MANPADS – THREAT FOR AVIATION SECURITY

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ABSTRAKT

Článek se zabývá hrozbou pro leteckou dopravu, kterou představují přenosné protiletadlové řízené střely (tzv. MANPADS). V posledních letech se událo několik teroristických útoků s použitím MANPADS. Civilní letadla mohou používat speciální protiraketové systémy, ale tyto technologie jsou velmi drahé. Existují i bezpečnostní systémy pro letiště. Odhad ekonomických dopadů teroristického útoku může poskytnu vodítko pro alokaci zdrojů na bezpečnostní opatření.

Klíčová slova: letecká bezpečnost, přenosné protiletadlové řízené střely (MANPADS), bezpečnostní opatření, terorismus

ABSTRACT

The paper deals with the threat for aviation security which is posed by shoulder-fired missiles also known as man-portable air defence systems (MANPADS). There were several terrorist attacks using MANPADS in a few last decades. Commercial aircrafts can use special countermeasures against MANPADS, but these technologies are very expensive. There have been also developed security systems for airports. Estimation of the economic impact of an attack can provide guidance for the allocation of resources to countermeasures.

Keywords: aviation security, man-portable air defence systems (MANPADS), security measures, terrorism

INTRODUCTION

Aviation transportation is one of the most important kinds of transportation and it is essential part of modern society. Aircrafts transfer millions of people and millions tons of cargo every year. Terrorists understand this and have made commercial aviation one of their main targets. Terrorist attack against commercial aircraft, which

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causes tens or hundreds victims, attracts attention of media and public as one of terrorists' goals.

Airports use diverse kinds of security measures to prevent terrorist attacks against aircrafts or people in the airports. Using new technologies, modern scanners and security procedures force terrorists to look for new ways of attack. It is very probable that shoulder-fired missiles also known as man-portable air defence systems (MANPADS) will become more attractive for terrorists in near future. The proliferation of MANPADS has for long time led to fear that terrorists could use them to shoot down a commercial aircrafts. Several attacks have been performed and MANPADS are one of the most serious threats for contemporary aviation transportation.

MANPADS are ranked among light weapons according to the United Nations classification. They are technologically advanced person-portable weapons and their size enables them to be easily hidden and transported. MANPADS are compound from a missile, which is launched from a missile launcher. According to their guidance can be divided into three categories: passive infrared seekers, laser-beam riders and command line-of-sight system [1]. Most MANPADS missiles home on infrared light generated by target aircraft's heat. These can be confused by flares, the most common MANPADS countermeasure. Confusing of the other types is much more complicated.

The progression in development of MANPADS means that contemporary they can be operated from more positions, to greater ranges, and with bigger chance of success in catching crucial parts of an aircraft, because big passenger aircrafts have multiple engines. Older MANPADS were designed to destroy single-engine fighter. There is a quite high probability that big passenger aircraft will survive an attack by missile with older system. New types of MANPADS are more able to aim the body of an aircraft and destroy it that the older types [2].

1 MISUSE OF MANPADS BY TERRORISTS

Terrorists and other non-state actors began misuse MANPADS closely after the weapon was initially deployed in the late 1960's. Since the early 1970's terrorist and insurgent groups have acquired MANPADS from diverse sources, including state sponsors, private arms dealers, lowly secured weapon depots, and illegal groups. These missiles have been used to shoot down military and commercial aircraft [1]. Also nowadays it is not exceedingly difficult to acquire MANPADS for terrorists. It is estimated there are approximately 100,000 MANPADS selling for about \$5,000 on the black market [3].

The United States of America transferred approximately 750 Stinger missiles to the Mujahideen in Afghanistan, in support of their struggle against the Soviet Union in 1980's. Some of these missiles remain in Afghanistan and are suspected to be now owned by Al Qaeda [4].

Research conducted by Hillel Avihai shows that there were 198 cases of pure aviation terrorism attacks that took place in 1968-2004. Among these 198 incidents, 22 MANPADS attacks were counted, causing the deaths of 658 persons [4].

The first attack by non-state actors on a commercial aircraft, which was reportedly organized by the Popular Front for the Liberation of Palestine, was plotted

in 1973 and thwarted by Italian authorities. Terrorists planned to use two SA-7 missiles to shoot down an Israeli plane after take-off.

The first successful MANPADS attack on a commercial airliner occurred on September 3, 1978, Air Rhodesia Vickers Viscount was shot down by members of Joshua Nkomo's Patriotic Front using SA-7 Strela-2. Six months after the crash, Rhodesian rebels shot down another aircraft, Air Rhodesia Flight 827, and killed all 59 people on board.

In September 1993, three commercial aircrafts belonging to Transair Georgia were hit by missiles fired by rebels in Sukhumi, Abkhazia, and Georgia. The first two aircrafts were shot down with MANPADS.

On October 7, 1998, Lionair Flight 602 which took off from Kankasanturai Airport was shot down by Liberation Tigers of Tamil Eelam using MANPADS.

On November 28, 2002, two SA-7 were fired at Israeli Boeing 757 which took off from Moi International Airport in Mombasa. The missiles missed the aircraft and it continued safely to Tel Aviv. Speculations came up that Israeli plane was equipped with an infrared countermeasure system. SA-7 was used also for attack against DHL's Airbus A300B4-203F cargo plane in Iraq on 22 November, 2003. Damaged aircraft safely landed back on Baghdad airport. TransAVIAexport Airlines aircraft with humanitarian aid was supposedly hit by a surface-to-air missile on March 23, 2007 in Mogadishu, but Somali authorities denied that the aircraft was shot down.

2 POSSIBLE COUNTERMEASURES AGAINST MANPADS

There are three major categories of countermeasures to MANPADS which suit civilian application: flares, laser jammers, and high-energy lasers (HELs). The first two aim to confuse the infrared seeker of an infrared missile, HELs, which are in development, aim to destroy the missile [5].

After terrorist attempt to shoot down Israeli plane in Kenya in 2002 Israel's largest airline El Al installed anti-missiles systems Flight Guard on its passenger aircrafts. Israel's Ministry of Transportation has provided a budget of approximately \$1.4 million to Israel Aircraft Industries' Elta Systems' to perform flight tests [6]. Installation began in 2004. The system was developed by Israel Military Industries and the Elta defence firm, unit of state owned Israel Aircraft Industries, and costs around \$1 million per unit [7].

Saab Avitronics created Civil Aircraft Missile Protection System (CAMPS), the only European protection system for civil aircrafts [3].

Raytheon has been involved with the U.S. Department of Defence in the developing of ground-based counter-MANPADS protection for large airports. Microwave-based airfield defence Vigilant Eagle uses illuminating the missile with electromagnetic energy tailored to divert it [8].

American Department of Homeland Security has launched Project Chloe. It consists in flying unmanned aerial vehicle above an airport to scan the area below, identify a MANPADS, and remotely divert the missile from the threaten aircraft [9].

3 ECONOMIC CONSEQUENCES OF TERRORISM

American RAND Corporation divides economic losses from attack against aviation transportation into three categories: *“immediate, tangible losses from the attack; losses to travellers and airlines during a subsequent air-travel shutdown, and losses to travellers and airlines from reduced demand”* [5].

According to RAND Corporation initial damages from an attack with MANPADS would likely approach \$1 billion per aircraft destroyed. These are straightforwardly estimated. Larger commercial aircraft costs \$200–250 million and carries around 300 passengers each. Monetary expression the value of passengers’ lives is impossible, but to make the tradeoffs compensation policies and other economic treatments typically approximate a value of \$2–2.5 million per life [5].

Research of the economic impact of realized attacks and estimation of economic impact of possible attacks provide guidance for the allocation of resources to countermeasures.

CONCLUSION

MANPADS are serious threat for commercial aviation transportation. Their size enables them to be easily hidden and transported and their price on the black market makes possible for terrorists to buy them. Terrorists have used MANPADS for decades and there have been over twenty terrorist attacks with MANPADS. The most common measure against MANPADS is anti-missiles system mounted on an aircraft. These systems are quite expensive, approximately \$1 million per aircraft. Armament industry in conjunction with security authorities has been developing ground-based systems or countermeasures using unmanned aerial vehicle above an airport able to identify a MANPADS and remotely divert it from its heading. When sufficient number of airports decides for using ground-based system or unmanned aerial vehicle in long-term perspective it will be cheaper than using anti-missiles systems for separate aircrafts. It will also probably be preferred countermeasure by airlines, but anti-missile system mounted on aircraft protects the aircraft on each airport in the world while ground-based system or unmanned aerial vehicle protects a relatively small area and aircrafts only on the airport where they operate.

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