

## **Terrorist and sabotage attacks on selected critical infrastructure systems – a historical perspective**

KRZYSZTOF IZAK

Independent author

 <https://orcid.org/0000-0001-9815-6035>

### Abstract

The article describes terrorist and sabotage attacks carried out worldwide against two major critical infrastructure (CI) systems: energy supply and public transport. The selection of the events described in the article was subjective. In the section on attacks on the energy sector, the author adopted a geographical division – Middle East, Africa and South America. In the section on attacks on public transport, the division includes land transport and air transport. In the case of terrorist attacks on rail infrastructure, the author mainly used Anneli Botha's study covering data from 2000 to 2017 and the work of Brian M. Jenkins and Bruce R. Butterworth, and for air transport, the work of Jacques Duchesneau. Not all data on attacks on CI systems has been updated due to the fact that the information contained in the sources is partial. The author draws the conclusion that with the development of modern technology and the escalation of tensions in international relations, the level of threat to CI will increase.

### Keywords

terrorist attacks, energy, critical infrastructure, transport, sabotage

## Introduction

Terrorist and sabotage attacks on critical infrastructure (CI) facilities are one of the most serious threats to state security. They often have far-reaching consequences, as the destruction or damage to one CI facility can negatively affect the functioning of others. The development of CI is an essential component of a modern economy. The driving force behind this economy is, among other things, the dynamic development of modern information and communications technology (ICT). The challenge is to ensure the security of systems based on these technologies, including CI systems.

Frequent attacks on oil pipelines, power lines, telecommunications networks and other CI facilities prompted the UN Security Council in 2017 to adopt Resolution 2341 on protecting CI from terrorist attacks<sup>1</sup>. The following year, the United Nations Office of Counter-Terrorism (UNOCT) and the United Nations Counter-Terrorism Committee Executive Directorate (UNCTED) produced the first compendium of good practices for protecting CI from terrorist attacks<sup>2</sup>. In 2008, the European Union adopted Directive 2008/114/EC, which established an EU-wide procedure for the identification and designation of European Critical Infrastructures, and identified actions to improve their protection<sup>3</sup>. This document was repealed by Directive 2022/2557 of the EU Parliament and of the Council, adopted in December 2022, introducing additional measures to protect CI<sup>4</sup>. The directive entered into force on 16 January 2023. On 25 July 2023, the European Commission approved a list of 11 sectors covered by the Critical Entities Resilience (CER) Directive. These are CI sectors that provide essential services in maintaining important elements of the social system, supporting the economy, ensuring public health and safety as well

<sup>1</sup> United Nations, *Security Council resolution 2341 (2017) [on protection of critical infrastructure against terrorist acts]*.

<sup>2</sup> UNOCT, UNCTED, Interpol, *The protection of critical infrastructure against terrorist attacks. Compendium of good practices*, [https://www.un.org/securitycouncil/ctc/sites/www.un.org/securitycouncil.ctc/files/documents/2021/Jan/compendium\\_of\\_good\\_practices\\_eng.pdf](https://www.un.org/securitycouncil/ctc/sites/www.un.org/securitycouncil.ctc/files/documents/2021/Jan/compendium_of_good_practices_eng.pdf) [accessed: 12.12.2024].

<sup>3</sup> Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.

<sup>4</sup> Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC.

as protecting the environment<sup>5</sup>. Such legislative measures are likely to have real benefits in terms of reducing the level of terrorist and sabotage threats only within a few years after their provisions have been implemented by CI operators.

Currently, few areas of human life and high-tech civilisation remain outside CI systems. These are primarily tourism, culture, spirituality, domestic commerce and related infrastructure (large shopping malls do not count as CI). Bazaars, temples, tourists in hotels, on beaches and in museums continue to be excellent targets for terrorists, mainly in Africa and Asia. The attacks they perpetrate have sometimes caused many deaths, but with few exceptions have not affected the economy of the country. In Egypt, these exceptions were the terrorist campaign by Muslim extremists in the 1990s and the ISIS attacks in the 21<sup>st</sup> century. As a result of these, the number of tourists visiting the country decreased significantly, which translated into a decrease in national income and the need to increase the number of police officers needed to protect tourists. For these reasons, tourism infrastructure in Egypt is treated as CI.

The purpose of this article was to analyse statistical data on terrorist and sabotage attacks worldwide targeting two CI systems – the energy sector and public transport – together with a brief description of selected incidents. The selection was subjective in nature. The author has refrained from citing definitions of CI due to the limitations of the volume of the text and the analysis of this issue in many other publications. In the case of terrorist attacks on railway infrastructure, the article mainly uses data from the work of Anneli Botha<sup>6</sup> and the publications of Brian M. Jenkins and Bruce R. Butterworth<sup>7</sup>, and with regard to air transport, from the work of Jacques Duchesneau<sup>8</sup>. As the statistics presented in the first and second

<sup>5</sup> European Commission, *Enhancing EU resilience: A step forward to identify critical entities for key sectors*, [https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip\\_23\\_3992/IP\\_23\\_3992\\_EN.pdf](https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_23_3992/IP_23_3992_EN.pdf) [accessed: 12.12.2024].

<sup>6</sup> A. Botha, *Prevention of Terrorist Attacks on Critical Infrastructure*, in: *Handbook of Terrorism Prevention and Preparedness*, A.P. Schmid (ed.), [https://icct.nl/sites/default/files/2023-01/Handbook\\_Schmid\\_2020.pdf](https://icct.nl/sites/default/files/2023-01/Handbook_Schmid_2020.pdf), pp. 841–870 [accessed: 20.11.2024].

<sup>7</sup> B.M. Jenkins, B.R. Butterworth, *Train Wrecks and Track Attacks: An Analysis of Attempts by Terrorists and Other Extremists to Derail Trains or Disrupt Rail Transportation*, [https://transweb.sjsu.edu/sites/default/files/1794\\_Jenkins\\_Train-Wrecks-Train-Attacks.pdf](https://transweb.sjsu.edu/sites/default/files/1794_Jenkins_Train-Wrecks-Train-Attacks.pdf) [accessed: 3.12.2024].

<sup>8</sup> J. Duchesneau, *Aviation Terrorism. Thwarting High-Impact Low-Probability Attacks*, Royal Military College of Canada 2015, <https://espace.rmc.ca/jspui/bitstream/11264/741/1/>

publications end with 2017 and in the third with 2011, the author attempted to update them on the basis of other sources. However, the information they contained was partial. In the section on attacks on the energy sector, the author adopted a geographical division – Middle East, Africa and South America – and in the section on public transport, a division between land and air transport. For air transport, incidents were grouped as follows: hijackings, bombings, suicide terrorism, attacks on airports and grounded aircraft, as well as attacks from the ground on aircraft in the air.

## Energy sector

In every country, the energy sector is the main link of CI, as without energy the other sectors cannot function efficiently. Between 2000 and 2009, there were 565 terrorist attacks on energy, energy commodity and fuel supply facilities worldwide, and as many as 1745 between 2010 and 2017, a threefold increase in the number of such incidents. Explosives were used in 88% of cases, and arson in 9%. The highest number of attacks was recorded in two years: in 2014 – 347 and in 2015 – 390<sup>9</sup>. In 2003, attacks on power plants, gas and oil network facilities accounted for 25% of all terrorist attacks worldwide. By 2005, this had risen to 35%. In 2016, terrorist attacks targeting the oil and gas industry increased by 14% from the previous year and accounted for almost 42% of the total number of such incidents. These figures also include other criminal activities, including the theft of oil or gas from pipelines, extortion or the sale of raw materials to finance terrorist groups, among others<sup>10</sup>.

The energy sector is particularly at risk in areas of insurgency or warfare. An example is Ukraine, whose energy infrastructure is constantly under attack. The war taking place in the country resulted in the sabotage action of blowing up the Nord Stream 1 and Nord Stream 2 gas pipelines

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Duchesneau%20PhD%20Thesis%2020150726%20Final%20e-Space%20RMC.pdf [accessed: 6.12.2024].

<sup>9</sup> A. Botha, *Prevention of Terrorist Attacks...*, pp. 855–856.

<sup>10</sup> A. Olech, *Terrorist Threats to the Energy Sector in Africa and the Middle East*, in: S.J. Lohman et al., *Countering Terrorism on Tomorrow's Battlefield: Critical Infrastructure Security and Resiliency (NATO COE-DAT Handbook 2)*, <https://press.armywarcollege.edu/cgi/viewcontent.cgi?article=1953&context=monographs>, p. 166 [accessed: 15.12.2024].

carrying gas from northern Russia to Germany on 26 September 2022<sup>11</sup>. This event was a symbolic end to Europe's access to cheap energy. The existing strategy of sourcing it from oil, coal and gas deposits in Russia and other countries in the region cannot be continued for political and economic reasons. On the other hand, the continuity of supply from the Gulf countries via the Red Sea and the Suez Canal is threatened by the Shiite rebellion of the Yemeni Houthi movement, also known as the Supporters of Allah (Arabic: Ansar Allah), and earlier by acts of piracy in the Gulf of Aden and the Indian Ocean by Somali bandits supported by the Young Mujahideen Movement (Arabic: Harakat al-Shabab al-Mujahidin).

The energy sector, like other CI systems, is also at risk from cyber attacks. One of the most devastating was carried out in August 2012 using the Shamoon virus. The target was the Saudi oil and chemical company Saudi Aramco. The virus infected 10 000 computers at the company and shut down all important internal networks for almost a month. It was recognised that the attackers were not looking to take over data, but to eliminate as many systems as possible. After the incident, the corporation isolated its electronic systems from the outside world. Five years later, Aramco was attacked again, this time using a new version of malware – Shamoon 2.0 – with the aim of deleting data and causing explosions and fatalities. These cyber attacks, demonstrating how serious the effects of hackers can be, heightened concerns about the security of energy facilities around the world<sup>12</sup>. The hacking attack in May 2021 on the computer system controlling the operation of the Colonial Pipeline oil pipeline in the US had severe consequences. There was a six-day disruption in oil supply, which triggered public panic and a massive buyout of propellants<sup>13</sup>. In November 2023, the internal computer network of Canadian company Trans-Northern Pipelines Inc., whose pipeline network connects, among other things, refineries to airports, was attacked. This caused delays in the exchange

<sup>11</sup> P. Oltermann, P. Beaumont, D. Sabbagh, *European leaders blame sabotage as gas pours into Baltic from Nord Stream pipelines*, The Guardian, 28.09.2022, <https://www.theguardian.com/business/2022/sep/27/nord-stream-1-2-pipelines-leak-baltic-sabotage-fears> [accessed: 28.12.2024].

<sup>12</sup> A. Olech, *Terrorist Threats...*, p. 168.

<sup>13</sup> Ł. Kielban, *Zagrożenia Infrastruktury Krytycznej – podstawy dla urzędników i przedsiębiorców* (Eng. Critical Infrastructure Threats – basics for officials and businesses), Polska Platforma Bezpieczeństwa Wewnętrznego, 13.06.2024, <https://ppbw.pl/zagrozenia-infrastruktury-krytycznej-podstawy/> [accessed: 13.12.2024].

of files and the generation of reports on engineering assessments of pipelines and related facilities, but without material damage<sup>14</sup>.

Power plants and the lines that feed them are also targets of diversionary-terrorist attacks. In the North Caucasus, this phenomenon has emerged relatively recently. In 2009, one of the jamaats of the Caucasus Emirate took responsibility for a malfunction at the Sayano-Shushenskaya hydroelectric power station in Siberia (an official investigation ruled out a terrorist attack). Earlier, the leader of the Caucasus Emirate, Doku Umarov, had threatened a diversionary war directed against the energy infrastructure deep inside Russia. In the republic of Kabardino-Balkaria, terrorists blew up structures supporting power lines on 22 October 2008. In Ingushetia, high-voltage power lines were attacked three times in September 2009. The first attack, which involved blowing up a high-voltage pole, caused losses of more than 5 million roubles<sup>15</sup>. The first successful attack on a strategically important target occurred in the North Caucasus on 21 July 2010. A group of militants sabotaged the Baksan Hydroelectric Power Station in Kabardino-Balkaria. Guards were killed, civilian workers were tortured and explosives were planted. The explosions destroyed 2 of the 3 generators and caused a fire. Losses were estimated at 800 million roubles. On 7 September 2010, a fire broke out at the Irganay Hydroelectric Power Plant in Dagestan. During its extinguishment, explosive charges and a booby-trapped mine were discovered. Dagestan's Jamaat Guraba claimed responsibility for the sabotage and reported that a total of 9 charges had been planted at the power station. Two bombs consisting of TNT cubes, plastic and aluminium dust were found during the refurbishment in February 2011. There is no information on the location of the other charges<sup>16</sup>.

There have been a number of airspace violations over nuclear sites in France in the second decade of the 21<sup>st</sup> century, but the link between these incidents and terrorist activity has not been confirmed. French law prohibits flights within 5 km of a nuclear site and at altitudes below

<sup>14</sup> A. Ribeiro, *Cyber attacks continue to hit critical infrastructure, exposing vulnerabilities in oil, water, healthcare sectors*, Industrial Cyber, 14.02.2024, <https://industrialcyber.co/critical-infrastructure/cyber-attacks-continue-to-hit-critical-infrastructure-exposing-vulnerabilities-in-oil-water-healthcare-sectors/> [accessed: 14.12.2024].

<sup>15</sup> T.W. Grabowski, *Terroryzm północnokaukaski. Źródła, przejawy i przeciwdziałanie zjawisku* (Eng. North Caucasus terrorism. Sources, manifestations and countering the phenomenon), Kraków 2017, p. 272.

<sup>16</sup> Ibid., pp. 272–273.

1000 m. Breach of this ban is punishable by a EUR 75 000 fine and 1 year's imprisonment. In October and November 2014, almost 30 unmanned aerial vehicles (UAVs) were reported flying over 15 nuclear power plants in France. The aim of the provocation was to disrupt the control and security system of these facilities. Initially, it was suspected that the perpetrators were opponents of nuclear power, who were trying to draw attention in this way to the inadequate – in their view – level of security of such plants. Greenpeace denied any connection to the incidents and called them very worrying. In early January 2015, 2 drones appeared over a nuclear power plant in Nogent-sur-Seine in northern France<sup>17</sup>. Despite the introduction of systems to detect UAVs, there have been further incidents involving them. In November 2021, Greenpeace members crashed a Superman-shaped drone into the concrete cover of the reactor of the Bugey nuclear power plant in France. The incident did not jeopardise the safety of the reactor, but showed that UAVs can have very unusual shapes, making them difficult to detect<sup>18</sup>. In October 2023, drones flew over 7 nuclear power plants in France, and on 1 August 2024, they flew over 6 such facilities<sup>19</sup>.

### Middle East

Between 1918 and 1939, the first cases of attacks on oil pipelines in the Middle East were recorded. During the anti-Jewish and anti-British uprising in Palestine between 1936 and 1939, the pipeline that carried oil from Iraq to Haifa became the target of sabotage actions<sup>20</sup>. In 1970, Palestinian organisations with bases in Jordan demanded that King Hussein dismantle

<sup>17</sup> *Au total, 17 sites nucléaires ont été survolés par des drones depuis octobre*, Le Monde, 29.01.2015, [https://www.lemonde.fr/planete/article/2015/01/29/dix-sept-sites-nucleaires-ont-ete-survoles-par-des-drones-depuis-octobre\\_4565967\\_3244.html](https://www.lemonde.fr/planete/article/2015/01/29/dix-sept-sites-nucleaires-ont-ete-survoles-par-des-drones-depuis-octobre_4565967_3244.html) [accessed: 29.01.2025]; AFP, *Deux drones ont survolé la centrale nucléaire de Nogent-sur-Seine*, BFMTV, 4.01.2015, [https://www.bfmtv.com/police-justice/deux-drones-ont-survole-la-centrale-nucleaire-de-nogent-sur-seine\\_AN-201501040009.html](https://www.bfmtv.com/police-justice/deux-drones-ont-survole-la-centrale-nucleaire-de-nogent-sur-seine_AN-201501040009.html) [accessed: 4.01.2025].

<sup>18</sup> J. Łukasiewicz, *Unmanned aerial vehicles as a source of threats to the states' electricity supply infrastructure and the proposed methods of protecting this infrastructure*, "Terrorism – Studies, Analyses, Prevention" 2022, no. 1. <https://doi.org/10.4467/27204383TER.22.012.15428>.

<sup>19</sup> *De nouvelles centrales nucléaires survolées par de présumés drones*, TF1Info, 2.08.2024, <https://www.tf1info.fr/societe/de-nouvelles-centrales-nucleaires-survoles-par-de-presumes-drones-1562592.html> [accessed: 2.08.2024].

<sup>20</sup> K. Gebert, *Pokój z widokiem na wojnę. Historia Izraela* (Eng. Peace with a view to war. Israel's history), Warszawa 2023, p. 122.



the Jordanian part of this pipeline. When he refused, the Palestinians tried to blow up the facility<sup>21</sup>.

After US forces entered Iraq in 2003, the oil pipelines were repeatedly targeted by the rebels and later by ISIS. In 2014 in Syria, ISIS gained control of the pipeline and sold the seized oil to Turkey<sup>22</sup>. In the same year, ISIS took control of the Iraqi city of Baiji, where the country's largest oil refinery is located. This caused the most powerful crisis in Iraq since the Americans left in December 2011 and local elites took over. The refinery in Baiji, to which pipelines from all Iraqi oil fields lead, supplied 11 of Iraq's 18 provinces with refined products. The jihadists failed to get it up and running. In November 2014, the facility was recaptured by the Iraqi military with US air support. On 13 June 2015, jihadists carried out a suicide bombing at the site. The perpetrators drove a car filled with explosives into the refinery. At the time, 11 people were killed and 27 injured<sup>23</sup>.

Gas and oil pipelines are also being targeted by Arab separatists in the south-west of Iran. In February 2024, two gas pipelines were targeted for sabotage. Tehran indirectly accused Israel of this<sup>24</sup>. A number of terrorist attacks have targeted the gas pipeline that runs through the northern part of the Sinai Peninsula, through which Egypt supplies gas to Israel. In July 2010, Bedouins attempted to blow it up as part of a protest against the government in Cairo. Another attack occurred in February 2011. As a result of the Arab Spring in Egypt, the organisation Supporters of Jerusalem (Arabic: Ansar Bait al-Maqdis) was formed. By the end of 2013, it had attacked this pipeline 13 times<sup>25</sup>. In November 2014, the Supporters of Jerusalem assumed ISIS authority and continued attacks as the Sinai Province (Wilayat Sinai). It became a target dozens of times

<sup>21</sup> A. Chiczkina, *Jordania: zamach stanu w odwrotnej kolejności* (Eng. Jordan: coup d'état in reverse), TopWar, 12.04.2021, <https://pl.topwar.ru/181817-iordaniya-perevorot-naoborot.html> [accessed: 12.12.2024].

<sup>22</sup> D. Butter, *Does Turkey really get its oil from Islamic State?*, BBC, 1.12.2015, <https://www.bbc.com/news/world-europe-34973181> [accessed: 1.12.2025].

<sup>23</sup> O. Wasiuta, S. Wasiuta, P. Mazur, *Państwo Islamskie ISIS. Nowa twarz ekstremizmu* (Eng. Islamic State ISIS. The new face of extremism), Warszawa 2018, p. 205.

<sup>24</sup> *Iran condemns 'terrorist' attack on gas pipelines*, AlJazeera, 14.02.2024, <https://www.aljazeera.com/news/2024/2/14/iranian-gas-pipeline-blasts-due-to-terrorism-and-sabotage-official-says> [accessed: 14.12.2024].

<sup>25</sup> D. Barnett, *Ansar Jerusalem claims responsibility for recent Sinai gas pipeline attack*, FDD's Long War Journal, 19.01.2014, [https://www.longwarjournal.org/archives/2014/01/ansar-jerusalem-claims\\_respons.php](https://www.longwarjournal.org/archives/2014/01/ansar-jerusalem-claims_respons.php) [accessed: 19.01.2025].



between 2011 and the end of 2015. Terrorists blew up its small sections, resulting in disruptions to Israel's gas supply and significant material damage<sup>26</sup>.

For the first time, an oil industry hub in Saudi Arabia was attacked on 1 May 2004. The attack on the refinery in Yanbu on the Red Sea was carried out by 4 attackers. At the time, 6 people were killed in the attack – 5 Western employees of the company and a Saudi security officer<sup>27</sup>. On 29 May 2004, Al-Qaeda attacked oil installations and a settlement for foreigners working on them in Al-Khobar, in eastern Saudi Arabia. As a result, 22 people were killed, including 19 foreigners<sup>28</sup>.

For several years, petrochemical industry installations in Saudi Arabia have been targeted by the aforementioned Houthi movement. In July 2017, the rebels first attacked oil installations in the port of Yanbu with a missile. The missile did not reach its target<sup>29</sup>. In the years that followed, the Houthis continued to shell Saudi airports and petrochemical facilities using missiles and drones. A precision attack by more than 20 drones and cruise missiles damaged Aramco's Abqaiq and Khurais oil facilities on 14 September 2019. As a result of the damage, Saudi Arabia's oil production was halved, causing a brief 20% jump in oil prices. The Houthi movement took responsibility for the attack and cited Arab intervention in Yemen as the cause. Saudi Arabia, on the other hand, accused Iran of the attack. Tehran rejected the allegations, supported the Houthi version and threatened US forces in the Gulf. The US was seen as the guarantor of uninterrupted oil exports from the Gulf. The US Navy guarded the shipping lanes not only in this body of water, but also in the rest of the Arabian Sea. However, the share of oil from this region in US imports has declined to 16%. Most of the oil produced (80%) flowed to Asia (as of 2019)<sup>30</sup>. Between January 2018 and the end of 2021, the Houthis

<sup>26</sup> AFP, *Des djihadistes revendiquent l'attaque d'un gazoduc*, 20 Minutes, 8.01.2016, <https://www.20min.ch/fr/story/des-djihadistes-revendiquent-l-attaque-d-un-gazoduc-826827705429> [accessed: 9.01.2025].

<sup>27</sup> M. Scheuer, S. Ulph, J.C.K. Daly, *Saudi Arabian Oil Facilities: The Achilles Heel of the Western Economy*, The Jamestown Foundation 2006, <https://jamestown.org/wp-content/uploads/2006/05/Jamestown-SaudiOil.pdf>, p. 43 [accessed: 24.02.2025].

<sup>28</sup> K. Izak, *Leksykon organizacji i ruchów islamistycznych* (Eng. Lexicon of Islamist organisations and movements), Warszawa 2014, p. 322.

<sup>29</sup> *Atak rakietowy na Rijad* (Eng. Rocket attack on Riyadh), Defence24, 5.11.2017, <https://defence24.pl/atak-rakietowy-na-rijad> [accessed: 5.11.2024].

<sup>30</sup> M.A. Piotrowski, *Taktyka oraz konsekwencje strategiczne ataku na instalacje naftowe Arabii Saudyjskiej* (Eng. The tactics and strategic consequences of the attack on oil installations

launched 430 ballistic missiles and 850 drones towards Saudi Arabia. In 2021, they carried out an average of 78 attacks targeting the country per month, compared to an average of 38 in 2020<sup>31</sup>. In 2023, the Houthis began to intensively attack ships passing off the Yemeni coast with rockets and drones. In January 2024, major ship owners stopped shipping through the Red Sea. Oil companies BP and Shell also did so. The situation became so serious that China began to put pressure on Iran to stop Houthi attacks<sup>32</sup>.

## Africa

More than 30 armed terrorists belonging to the organisation Signed-in-Blood Battalion (Arabic: Muwakaum bi ad-Dima), also known as the Masked Men Brigade (Arabic: Katibat al-Mulassamin), attacked an Algerian gas liquefaction base in Tiguentourine, near the Saharan town of In Amenas, on 16 January 2013. The facility belonged to a consortium including the UK's BP, Norway's Statoil and the Algerian state-owned company Sonatrach. There were more than 800 workers at the site, including 137 foreigners. After 4 days of siege and an assault by an Algerian special unit, the hostages were freed. The attack left 38 dead and 29 terrorists were also killed<sup>33</sup>.

In the 1990s, in south-eastern Nigeria, armed gangs carried out uncoordinated attacks on oil company workers and property, and on security force officers protecting oil infrastructure. Some of these groups united to form the Movement for the Emancipation of the Niger Delta (MEND). MEND extorted oil companies and carried out oil theft and smuggling. The companies estimated that losses amounted to 9 million

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in Saudi Arabia), „Biuletyn PISM” 2019, no. 137, [https://www.pism.pl/publications/The\\_Tactics\\_and\\_Strategic\\_Consequences\\_of\\_the\\_Attack\\_on\\_Oil\\_Installations\\_in\\_Saudi\\_Arabia](https://www.pism.pl/publications/The_Tactics_and_Strategic_Consequences_of_the_Attack_on_Oil_Installations_in_Saudi_Arabia) [accessed: 4.12.2024].

<sup>31</sup> *Atak raketowy na Arabię Saudyjską i naloty w Jemenie* (Eng. Missile attack on Saudi Arabia and airstrikes in Yemen), Defence24, 27.12.2024, <https://defence24.pl/geopolityka/arabia-saudyjska-przeprowadza-naloty-huti-w-jemenie-za-atak-na-miasto-jazan> [accessed: 27.12.2024].

<sup>32</sup> J. Losik, *Wiadomo, co przewoził zaatakowany statek. Powód do niepokoju dla Moskwy* (Eng. It is known what the attacked ship was carrying. A cause for concern for Moscow), Money.pl, 27.01.2024, <https://www.money.pl/gospodarka/nieoczekiwany-cios-w-handel-rosyjskim-paliwem-zaplona-tankowiec-6989192670440384a.html> [accessed: 27.01.2025].

<sup>33</sup> T. Kijewski, *Atak terrorystyczny na kompleks gazowy Tiguentourine w In Amenas w Algierii w styczniu 2013 r. jako przykład nowych zagrożeń dla energetycznej infrastruktury krytycznej i bezpieczeństwa wewnętrznego państwa* (Eng. Terrorist attack on the gas system in Tiguentourine, Amenas, Algeria, in January 2013, as an example of new threats to critical energy infrastructure and the internal security of the state), „Przegląd Bezpieczeństwa Wewnętrznego” 2013, no. 9, pp. 202–224.

barrels of oil per year. In January 2006, dozens of armed members of the organisation overran one of Shell's facilities and abducted 4 foreign specialists employed by the British-Dutch company. MEND spokesman, Jomo Gbomo, announced at the time that this was only the beginning of his organisation's operations. *Our aim is to totally destroy the capacity of the Nigerian government to export oil*<sup>34</sup>.

In March 2016, the Niger Delta Avengers (NDA) armed group officially announced its existence. Two months later, it attacked a Chevron oil rig and then oil and gas installations in the Niger Delta. More than 30 attacks were carried out during the three-month operation. They continued to occur in the following months of 2016, but were significantly reduced in intensity. They resulted in a 36 – per cent drop in oil production, which translated into a halving of state revenue. The organisation issued a statement demanding a greater share of oil sales and threatened to disrupt Nigeria's economy if its demands were not met. The NDA are seeking the creation of a sovereign state in the Niger Delta<sup>35</sup>. The region of the country remains unsettled. Pirates pose a threat in Nigerian waters and Niger Delta residents are stealing oil directly from pipelines<sup>36</sup>.

In September 2022, the Nigerian authorities announced that the country's oil imports were at their lowest in 25 years and its production had fallen below 1.18 million barrels per day, which, according to OPEC (Organisation of the Petroleum Exporting Countries), ranked the country second only to Angola. According to then President Muhammadu Buhari, this was the fault of massive theft of the commodity in the south-east of the country. The situation strongly affected the state's finances. In August 2022, the scale of oil theft in Nigeria was estimated at 700 000 barrels per day. Some companies claimed that up to more than 80% of the oil that enters the pipelines is stolen as it flows<sup>37</sup>. In another part

<sup>34</sup> D. Howden, *Shell may pull out of Niger Delta after 17 die in boat raid*, The Independent, 17.01.2006, <https://web.archive.org/web/20170527010950/http://www.corpwatch.org/article.php?id=13121> [accessed: 17.01.2025].

<sup>35</sup> A. Olech, *Terrorist Threats...*, pp. 173–174.

<sup>36</sup> F. Mbah, *In Nigeria's crude capital, a plan to win the war against oil theft*, Al Jazeera, 19.12.2024, <https://www.aljazeera.com/news/2024/12/19/in-nigerias-crude-capital-a-plan-to-win-the-war-against-oil-theft> [accessed: 19.12.2024].

<sup>37</sup> *Nigerian oil exports at lowest level in 25 years due to oil theft*, Al Jazeera, 9.09.2022, <https://www.aljazeera.com/news/2022/9/9/nigerian-oil-exports-at-lowest-level-in-25-years-due-to-oil-theft> [accessed: 9.01.2025].

of Africa, in Mozambique, a terrorist attack carried out by the Supporters of the Tradition (Arabic: Ansar al-Sunna) organisation caused huge losses. Its militants seized the port city of Palma in the north-east of the country on 24 March 2021 and occupied it until 8 April. During this time they inflicted severe damage, killed many residents and 12 Western engineers working on a USD 60 billion gas project<sup>38</sup>.

### South America

Colombia is the country with the highest number of terrorist attacks and sabotage operations on pipelines and power lines feeding oil production facilities in the world. Since the mid-1960s, the country's authorities have been fighting groups that are the remnants of Marxist guerrillas. These include the National Liberation Army (Spanish: Ejército de Liberación Nacional, ELN) and the Revolutionary Armed Forces of Colombia (Spanish: Fuerzas Armadas Revolucionarias de Colombia, FARC). Currently, the splinter groups of the FARC are fighting both among themselves (they did not agree to the 2016 peace agreement) and with the ELN and various paramilitary groups for control of lucrative coca crops, illegal gold mining and smuggling routes, and attacking oil pipelines. For Colombia, oil accounts for about 1/3 of export revenues, meaning that even small disruptions in the extraction and transport of this resource have an impact on state revenues<sup>39</sup>. Attacks on oil infrastructure, owned by national and foreign oil companies, remain one of the primary methods of fighting the government. Between 1987 and 1991, the ELN carried out 141 acts of sabotage on key sections of oil pipelines running through central Colombia. The financial losses incurred during these 4 years were estimated at USD 634 million<sup>40</sup>. From 1986 to 2002, the ELN also carried out 950 bomb attacks (an average of 40 to 50 attacks per year) on an 800-kilometre stretch of pipeline carrying oil from the Caño Limón field in western Colombia. Its shareholder was Occidental Petroleum Corp.

<sup>38</sup> T. Mandrup, *The attack on Palma in Mozambique: An insurgency getting out of hand?*, Risk Intelligence, 8.04.2021, <https://www.riskintelligence.eu/analyst-briefings/the-attack-on-palma-in-mozambique-an-insurgency-getting-out-of-hand> [accessed: 8.01.2025].

<sup>39</sup> D. Czyżewski, *Ropa pod uprawami koki, czyli problemy Kolumbii* (Eng. Oil under coca crops – Colombia's problems), Energetyka24, 2.10.2021, <https://energetyka24.com/ropa/ropa-pod-uprawami-koki-czyli-problemy-kolumbii-komentarz> [accessed: 2.12.2024].

<sup>40</sup> *Encyklopedia terroryzmu* (Eng. Encyclopedia of world terrorism), M. Crenshaw, J. Pimlott (eds.) Warszawa 2004, p. 428.

of Los Angeles. Losses were estimated at USD 2.5 billion<sup>41</sup>. These activities also resulted in environmental pollution on a massive scale. For example, oil spilled from a pipeline blown up in June 1990 contaminated a large section of the Catatumbo River, along which several thousand people lived. Other attacks have caused, among other things, the destruction of more than 3 000 ha of farmland<sup>42</sup>. Sabotage campaigns forced foreign oil companies to create private armies and fund the training of government forces to protect pipelines. In the 1990s, British Petroleum incurred costs running into tens of millions of dollars for this purpose<sup>43</sup>. In turn, the US sent a group of military advisers to provide training to Colombian soldiers related to the protection of the pipeline, of which the Los Angeles-based company was a shareholder<sup>44</sup>. Despite this, the sabotage actions continued undeterred and the terrorists made themselves pay to stop them. In 2001, 170 bomb attacks were recorded against the Caño Limón-Coveñas pipeline. An attack carried out in February 2005, in which explosives were used, shut down the pipeline for several weeks as the network supplying the energy needed to exploit the Caño Limón deposit was also destroyed<sup>45</sup>.

The FARC intensified attacks on pipelines following the death of their leader Raul Reyes, who was killed on 1 March 2008 in an operation by government forces. A few days later, a section of an oil pipeline transporting 100 000 barrels of oil per day was blown up. Its repair took several days<sup>46</sup>. In the first half of 2012, FARC armed groups carried out more than 40 attacks on oil pipelines. Kidnappings and murders of engineers working in the oil industry were common. Soldiers protecting the pipelines were also attacked. In July 2013, a squad of soldiers was ambushed by

<sup>41</sup> G. Marx, *Oleoducto en peligro recibe tropas estadounidenses en Colombia*, Amazon Watch, 12.11.2002, <https://amazonwatch.org/es/news/2002/1112-imperiled-pipeline-gets-us-troops-in-colombia> [accessed: 12.11.2024].

<sup>42</sup> *Encyklopedia terroryzmu...*, p. 428.

<sup>43</sup> J. McEvoy, *La Financiación de BP a los militares asesinos de Colombia*, Declassified UK, 18.07.2023, <https://www.declassifieduk.org/es/la-financiacion-de-bp-a-los-militares-asesinos-de-colombia/> [accessed: 18.12.2024].

<sup>44</sup> K. Wang, D. Kashi, *Major U.S. military operations/actions to protect oil*, <https://nationalsecurityzone.medill.northwestern.edu/archives/oilchangeproject/how-do-we-protect-the-flow-of-oil/index.html> [accessed: 12.12.2024].

<sup>45</sup> Library of Congress, Federal Research Division, *Country Profile: Colombia*, 2007, <https://maint.loc.gov/rr,/frd/cs/profiles/Colombia.pdf>, p. 19 [accessed: 15.12.2024].

<sup>46</sup> Reuters, *Terroryści z FARC biorą na cel rurociągi* (Eng. FARC terrorists take aim at pipelines), „Dziennik”, 7.03.2008.

the FARC. Fifteen of them were killed. The incident occurred in sparsely populated areas of Arauca province<sup>47</sup>. In August 2014, near the border with Venezuela, the Bicentenario pipeline was attacked. This caused a massive fire in the region. In May 2019, after another attack, the pipeline was shut down for a while. Attacks with greater or lesser intensity occurred until mid-2023, then ceased for more than a year. On 26 August 2024, the oil company Ecopetrol authorities reported a series of attacks on the country's most important pipelines – Bicentenario was attacked twice, Caño Limón-Coveñas three times. Between 26 August and 9 September 2024, there were 9 attacks on other pipelines. These occurred after the collapse of talks between the guerrilla group ELN and the Colombian government. The ELN believes that foreign oil companies have obtained contracts that are highly beneficial to themselves but detrimental to the country. According to the ELN leadership, Colombia should have full control over its natural resources, like Venezuela. Until this happens, the energy infrastructure is still to be targeted by this group<sup>48</sup>.

## Public transport sector – land transport

An analysis of the statistical data shows that public transport is the CI system most vulnerable to terrorism and sabotage<sup>49</sup>. The number of attacks on this sector increased from 1165 between 2000 and 2009 to 1966 between 2010 and 2017. The largest increase was in the number of attacks on trains: from 366 to 647. Between 1970 and 2009, bus transport infrastructure worldwide was the target of 1497 attacks. Most were carried out in Israel and the Occupied Palestinian Territory (142), India (88), the Philippines (72), Pakistan (70), Colombia (38), the Russian Federation (37) and Sri Lanka (36). Almost 60%

<sup>47</sup> PAP, *Kolumbia: 15 żołnierzy zginęło w zasadzce FARC* (Eng. 15 soldiers killed in FARC ambush), *Wirtualna Polska Wiadomości*, 21.07.2013, <https://wiadomosci.wp.pl/kolumbia-15-zolnierzy-zginelo-w-zasadzce-farc-6079340922217089a> [accessed: 21.12.2024].

<sup>48</sup> K. Byzdra, *Partyzanci mieli zaatakować rurociągi w Kolumbii. Na miejsce wysłano wojsko* (Eng. Guerrillas were to attack pipelines in Colombia. The military was sent to the site), *Energetyka24*, 27.08.2024, <https://energetyka24.com/ropa/wiadomosci/partyzanci-mieli-zaatakowac-rurociagi-w-kolumbii-na-miejsce-wyslano-wojsko> [accessed: 27.08.2024]; Ch. Kennedy, *Guerrilla Attacks on Pipelines Threaten Colombia's Oil Production*, *Oil Price*, 10.09.2024, <https://oilprice.com/Energy/Crude-Oil/Guerrilla-Attacks-on-Pipelines-Threaten-Colombias-Oil-Production.html> [accessed: 10.12.2024].

<sup>49</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 849.

of the targets were attacked using explosives. The perpetrators of attacks in these countries were separatist, far-left and Muslim organisations<sup>50</sup>. Between 2010 and 2017, the number of attacks targeting buses increased from 476 to 740. There was also an increase in the number of attacks and sabotage actions against other facilities, including bus stations and bus stops – from 138 to 179, bridges and tunnels – from 116 to 249 and roads – from 38 to 52<sup>51</sup>. They were conducted using mostly firearms (1450 incidents) and arsons (216 incidents)<sup>52</sup>.

The driving force behind the industrial revolution in Europe, European colonial expansion and an effective tool for warfare was the steam railway. It is one of the first CI elements to be targeted by terrorists. In Britain between 1881 and 1885, the Fenians (forerunners of the Irish Republican Army) fought the so-called ‘Dynamite War’. There were 13 attacks in London at the time, including several on railway stations<sup>53</sup>. The first attack on the London Underground was carried out on 30 October 1883. In the evening, an explosive device exploded in the tunnel between Charing Cross and Westminster stations and another in front of Praed Street station. A total of 72 passengers were injured, many of them seriously. Six carriages were seriously damaged<sup>54</sup>. In January 1885, 2 bombs exploded: one at Gower Street station and the other on a Metropolitan Line train. The depot was damaged and several passengers were injured<sup>55</sup>.

Europe’s dense rail network was crucial to military operations during World War I. The railways enabled the great powers to mobilise armies on a unprecedented scale and keep them in the field, despite growing and

<sup>50</sup> B.M. Jenkins, B.R. Butterworth, K.S. Shrum, *Terrorist Attacks on Public Bus Transportation: A Preliminary Empirical Analysis*, Mineta Transportation Institute 2010, <https://transweb.sjsu.edu/sites/default/files/2982-Terrorist-Attacks-On-Public-Bus-Transportation.pdf>, pp. 3, 23, 27 [accessed: 3.12.2024].

<sup>51</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 855.

<sup>52</sup> Ibid., p. 850.

<sup>53</sup> R. Kirkland, ‘A secret, melodramatic sort of conspiracy’: *The disreputable legacies of Fenian violence in nineteenth-century London*, King’s Research Portal, [https://kclpure.kcl.ac.uk/ws/portalfiles/portal/114850253/A\\_secret\\_melodramatic\\_sort\\_KIRKLAND\\_Accepted25July2017Published12August2019\\_GREEN\\_AAM.pdf](https://kclpure.kcl.ac.uk/ws/portalfiles/portal/114850253/A_secret_melodramatic_sort_KIRKLAND_Accepted25July2017Published12August2019_GREEN_AAM.pdf), pp. 6–7 [accessed: 3.12.2024].

<sup>54</sup> I. Mansfield, *The first terrorist attack on the London Underground*, IanVisits, 30.10.2013, <https://www.ianvisits.co.uk/articles/130th-anniversary-of-the-first-terrorist-attack-on-the-london-underground-9335/> [accessed: 30.10.2024].

<sup>55</sup> *List of terrorist incidents in London*, Wikipedia, [https://en.wikipedia.org/wiki/List\\_of\\_terrorist\\_incidents\\_in\\_London](https://en.wikipedia.org/wiki/List_of_terrorist_incidents_in_London) [accessed: 19.12.2024].



increasingly complex logistical needs. Railway infrastructure was therefore the target of attacks and sabotage actions by the opposing side's armies. Attacks organised by the Arabs led by Thomas E. Lawrence on the Hejaz Railway from Damascus to Medina, a line of strategic importance to the Turkish forces. During the Palestinian campaign of 1917–1918, it was one of the main targets of the British offensive and attacks by Arab rebels. Parts of the line were blown up and numerous stations destroyed<sup>56</sup>. The target of German attacks was, in turn, the British Uganda Railway, running from Port Florence (now Kisumu) on Lake Victoria to Mombasa in what was then British East Africa (now Kenya). German diversionary groups set out from Tanganyika (now Tanzania) to blow up the tracks and attack British trains<sup>57</sup>.

In the interwar period, the railway and its infrastructure were used to organise mass murder. On 13 September 1931, Szilveszter Matuska planted a bomb under the railway tracks on the viaduct at Biatorbágy on the outskirts of Budapest. The powerful explosion led to the derailment of the Vienna Express. Twenty-four people were killed and 120 injured, 14 of them seriously. Matuska also made two unsuccessful attempts to derail trains in Austria and detonated a bomb near Berlin. His high-profile trial pointed the way forward for terrorist activity. In the following years, terrorists attacked the entire railway infrastructure, including stations, ticket halls, waiting rooms, station restaurants, bridges, tracks, signals, trains, sidings and steam locomotives. Their aim was to cause as much loss of life and property as possible, thus gaining media publicity<sup>58</sup>.

On 28 August 1939, a German agent, Antoni Guzy, left two suitcases filled with explosives in a luggage room at a railway station in a Polish town. The explosion left 20 people dead and 35 injured. The Tarnów assassination attempt was one of the sabotage actions of the German fifth column, which paralysed the defence activities of the Polish state before the outbreak of World War II<sup>59</sup>. During this conflict, rail sabotage was one of the most

<sup>56</sup> T.E. Lawrence, *Siedem filarów mądrości* (Eng. Seven pillars of wisdom), Warszawa 1971, pp. 198–203.

<sup>57</sup> R. Farnworth, *The Uganda Railway during the First World War*, <https://rogerfarnworth.com/2020/12/28/the-uganda-railway-during-the-first-world-war/> [accessed: 28.12.2024].

<sup>58</sup> *Tragically Explosive – Szilvestre Matuschka: A Fetish For Disaster (Part Three)*, Europe Between East And West, 7.03.2020, <https://europebetweeneastandwest.wordpress.com/tag/hungarian-serial-killers/> [accessed: 7.12.2024].

<sup>59</sup> M. Biedroń, *Zamach bombowy na tarnowskim dworcu kolejowym* (Eng. Bomb attack at Tarnów railway station), Tarnowskie Centrum Informacji, <https://www.it.tarnow.pl/>

common guerrilla activities in all theatres of the war. Its scale was so large that guerrilla actions in occupied Europe targeting German-controlled railway infrastructure were dubbed the Battle of the Rails or the War of the Rails. The partisans carried out most sabotage actions on the railways in the USSR<sup>60</sup>. Poland was the second country in terms of the number of attacks on railway infrastructure. From 1 January 1941 to 30 June 1944, the Union of Armed Struggle and the Home Army carried out some 29 000 rail sabotage actions. As a result of these actions, 6930 locomotives and 19 058 wagons were damaged, 732 transports were derailed and 443 were set on fire, 1167 tank cars were destroyed and 38 bridges were blown up<sup>61</sup>.

On the terrorist attacks carried out worldwide between 1950 and 1970 targeting transport infrastructure, information is contradictory and statistics incomplete. A problem is the assessment of incidents that occurred during decolonisation processes in Asia and Africa. National liberation and nationalist groups called the attacks militant operations against colonialists, while the administration in the colonies, its security forces and the authorities in the metropolises considered them acts of terrorism and the organisations carrying them out as terrorist. Such attacks were organised in Palestine in the 1940s, in French Indochina in the 1940s and 1950s, in Algeria in the 1950s, and in Angola and Mozambique in the 1970s. Incidents that qualified as 'ordinary' train crashes rather than acts of sabotage were questionable. This was the case when the perpetrators remained silent about the incident in question<sup>62</sup>.

Relatively accurate statistics on attacks worldwide targeting public transport infrastructure have been available since the early 1970s thanks to the US-based Mineta Transportation Institute (MTI), established in 1991. It publishes periodic reports on the subject. Public transport facilities are targeted by separatist, far-left, far-right and religious organisations, primarily Muslim extremists (jihadists), and bandit groups. According

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atrakcje/tarnow/ciekawostki/taka-jest-historia/zamach-bombowy-na-tarnowskim-dworcu-kolejowym [accessed: 3.12.2024].

<sup>60</sup> P.W. Blood, *Hitler's Bandit Hunters: The SS and the Nazi Occupation of Europe*, Washington 2006, [https://books.google.pl/books?id=jR49G7eyxBUC&pg=PA101&redir\\_esc=y#v=onepage&q&f=false](https://books.google.pl/books?id=jR49G7eyxBUC&pg=PA101&redir_esc=y#v=onepage&q&f=false), p. 101 [accessed: 3.12.2024].

<sup>61</sup> M. Ney-Krwawicz, *Armia Krajowa: siła zbrojna Polskiego Państwa Podziemnego* (Eng. Home Army: the armed forces of the Polish Underground State), Warszawa 1993, p. 214.

<sup>62</sup> M. Tomczak, *Ewolucja terroryzmu, sprawcy – metody – finanse* (Eng. Evolution of terrorism, perpetrators – methods – finance), Poznań 2010, pp. 40–47.

to MTI data, between 1970 and 2019 there were approx. 5800 attacks on railway infrastructure, with passenger trains being targeted in 346 cases. These resulted in 676 deaths and more than 9720 injuries. The remaining incidents involved goods trains and other railway infrastructure. These figures are from OECD countries, excluding Turkey. In that country, there were 33 attacks on railway infrastructure between 1970 and 2010, resulting in 17 fatalities<sup>63</sup>.

In developed countries (the MTI report lists 27 countries), terrorist attacks on passenger railways are a statistically rare occurrence. Over the half-century period (1970–2019), there was an average of 7 incidents per year, with attacks carried out in the UK, Spain, France, Germany and Italy accounting for 67% of the total number of attacks. The UK was ranked first because of its long IRA (Irish Republican Army) terrorist campaign. Spain was second because of ETA (Basque: Euskadi Ta Askatasuna) activity. In the United States, the companies that own the passenger railways recorded 27 attacks between 1970 and 2019. In addition, 7 cases of preparations for attacks were detected. In terms of the number of victims, South Korea leads the statistics, where 198 people were killed in a fire started on an underground train in the city of Daegu on 18 February 2003. Spain is in second place. Coordinated attacks on commuter trains carried out in Madrid on 11 March 2004 killed 192 people. Italy comes in third place. The bombing of the Bologna train station on 2 August 1980 killed 85 people<sup>64</sup>.

Analysis of the available data shows that the most common *modus operandi* of the perpetrators was bomb attacks. Of these 346 attacks on passenger trains, as many as 216 (62%) were carried out using explosives placed on trains, railway tracks and cars. In 33 attacks (10%), the perpetrators' actions consisted of mechanically damaging or destroying railway equipment, in 32 (9%) – starting a fire using flammable materials, in 29 (8%) – using a knife, and in 19 (6%) – using firearms. In 17 cases (5%) other methods of attack were used. One attack was carried out using a weapon of mass destruction – chemical weapons. In March 1995, sarin

<sup>63</sup> B.M. Jenkins, B.R. Butterworth, *How Sophisticated are Terrorist Attacks on Passenger Rail Transportation*, San José 2020, <https://transweb.sjsu.edu/sites/default/files/SP0520-Jenkins-Terrorist-Attacks-Passenger-Rail-Transportation.pdf>, p. 8 [accessed: 3.12.2024].

<sup>64</sup> *Ibid.*, p. 11.

was used in the Tokyo underground. It caused the death of 12 people and more than 5000 had symptoms of poisoning<sup>65</sup>.

Another MTI report looked at attacks on passenger railways carried out worldwide between 1970 and 2017, listing train derailments: mechanical (64%) and using explosives (31%). In 39 countries, these methods were used in 282 attacks. The highest number was in: India – 82, Pakistan – 66, Russia – 22, Turkey – 11, Bangladesh – 10, Thailand – 10, Algeria – 7, Italy – 7, UK – 7, Germany – 6 and France – 5. These incidents resulted in 1068 deaths and more than 3040 injuries. The highest number of casualties was in India with 485, Angola, where 278 people were killed in two attacks, followed by Pakistan with 67 and Mozambique, where 58 people were killed in one attack<sup>66</sup>. Most train derailments (37 incidents) were caused by Indian Maoists (Naxalites). These resulted in 199 deaths. However, the highest number of casualties resulted from attacks organised by various jihadist groups. In 10 attacks carried out by them, 208 people were killed<sup>67</sup>.

A separate category of incidents consists of attacks on railway infrastructure, the main purpose of which is to disrupt the functioning of railway communication rather than to kill people. There were 817 such incidents recorded between 1970 and 2017. In 721 incidents (88%), the targets were railway tracks, bridges and tunnels, in 59 (7%) – railway signalling, communications and power systems, in 29 (4%) – personnel and their intended facilities. The means of attack were most often explosive devices, dynamite, mines and grenades – 702 incidents (86%). In other cases it was sabotage involving mechanical damage and arson. The highest number of such incidents was recorded in South Asia – 482 (59%) and Western Europe – 126 (15%), with 48 people killed and 268 injured<sup>68</sup>.

Cyber attacks on the rail network also fall into this category of incidents. The first known case of successful physical sabotage via the internet was recorded in Poland. In January 2008, a 14-year-old boy, a talented electronics engineer, used a self-built transmitter to hack into the city's tram system in Łódź, took control of tram traffic and caused 4 of them to derail. Twelve

<sup>65</sup> Ibid., pp. 13–14.

<sup>66</sup> B.M. Jenkins, B.R. Butterworth, *Train Wrecks and Track Attacks...*, pp. 8–9.

<sup>67</sup> Ibid., p. 26.

<sup>68</sup> Ibid., pp. 16–17.

people were injured<sup>69</sup>. Between 2014 and 2024, cyber incidents affecting railway systems were reported in countries such as Belgium, Belarus, the Czech Republic, Denmark, France, India, Germany, the United States, Ukraine and Poland. A very large increase in the number of cyber attacks on railways (by 220%) occurred between 2020 and 2024. This has become a global problem<sup>70</sup>. In 2023, unauthorised activation of the 'radio-stop' signal repeatedly immobilised trains in Poland. The repeated incidents had the character of well-organised sabotage actions<sup>71</sup>.

Hijackings of trains with passengers in order to force certain actions on the authorities are rare. In 1975 and 1977 in the Netherlands, militants of the Front for the Republic of the South Moluccas (Dutch: Front Republik Maluku Selatan) hijacked a train and demanded that the Netherlands create a state independent of Indonesia, a former Dutch colony. In 2006, 2009, 2012, Naxalites hijacked passenger trains in eastern India<sup>72</sup>. In Nigeria in 2022, bandits detonated an explosive device placed on the tracks just ahead of an oncoming Abuja-Kaduna train, fired machine guns at the depot and abducted more than 150 of the approx. 1000 passengers. Eight people were killed and many others injured. The incident has prompted the Nigerian authorities to treat all bandit groups as terrorist organisations<sup>73</sup>.

<sup>69</sup> 14-latek przestawiał zwrotnice (Eng. 14-year-old switched railway crossovers), Policja.pl, 9.01.2008, <https://www.policja.pl/pol/aktualnosci/13278,14-latek-przestawial-zwrotnice.html> [accessed: 9.01.2025].

<sup>70</sup> C. Sivesind, *Cyber Attacks on Railway Systems Increase by 220%*, SecureWorld, 20.08.2024, <https://www.secureworld.io/industry-news/railway-cyber-attacks> [accessed: 20.08.2024].

<sup>71</sup> M. Olanicki, *Tajemnicze awarie polskich pociągów. O sabotaż podejrzewany producent* (Eng. Mysterious failures of Polish trains. Manufacturer suspected of sabotage), Biznes Info, 6.12.2023, <https://www.biznesinfo.pl/tajemnicze-awarie-polskich-pociagow-o-sabotaz-podejrzewany-producent-mo-wak-061223> [accessed: 6.12.2024].

<sup>72</sup> N. Shukla, *Maoists briefly hijack Indian train*, Reuters, 22.04.2009, <https://www.reuters.com/article/world/maoists-briefly-hijack-indian-train-idUSTRE53L102/> [accessed: 22.12.2024]; M. Saqib, *Recent Trends of Naxal Violence in India: Need for Comprehensive Approach from the Government*, "International Journal of Research in Social Sciences" 2018, vol. 8, [https://www.ijmra.us/project%20doc/2018/IJRSS\\_NOVEMBER2018/IJMRA-14770.pdf](https://www.ijmra.us/project%20doc/2018/IJRSS_NOVEMBER2018/IJMRA-14770.pdf), p. 878 [accessed: 3.12.2024].

<sup>73</sup> *Nigeria train resumes operations eight months after major attack*, Al Jazeera, 5.12.2022, <https://www.aljazeera.com/news/2022/12/5/nigeria-train-resumes-eight-months-after-deadly-attack> [accessed: 5.12.2024].

## Public transport sector - air transport

For many decades, air transport was a target of choice for various terrorist organisations and individual perpetrators alike. In 1967, there were 15 aircraft hijacked, in 1968 – 30, and in 1969 – 80, and 5 sabotages were carried out on aircraft belonging to 37 countries. These incidents resulted in 6 deaths and 34 injuries. From 1 January to 16 June 1970, 32 aircraft were hijacked and 8 sabotages were carried out on machines belonging to 23 countries. As a result, 90 passengers were killed and 23 injured<sup>74</sup>. The large number of hijackings of civilian aircraft in the late 1960s and early 1970s contributed to attempts to classify them. Terrorist incidents do not include aircraft hijackings carried out for the purpose of escape, media publicity or material gain. They should be considered air banditry, also known as air piracy. These are criminal acts undertaken for the purpose of seizing an aircraft, regardless of the motives, reasons and objectives of the perpetrator(s)<sup>75</sup>. In order to separately collect data on aviation terrorism incidents and those on incidents that cannot be so classified, two databases were created: Aviation Terrorism Sub-Database (ATSD) and Global Aviation Criminal Incidents Database (GACID)<sup>76</sup>.

### Hijackings

The first attempted plane hijacking was recorded in 1931. Peruvian revolutionaries captured an American pilot making a flight from Lima to Arequipa. They wanted to use his plane to spread leaflets. The pilot adamantly refused and the hijackers' plan failed. After 10 days, the American was freed and returned safely to Lima. According to the International Civil Aviation Organisation (ICAO), the first aeroplane hijacking after the end of World War II took place in 1948. A Cathay Pacific flight from Macao to Hongkong was hijacked for ransom. The machine plummeted into the Pacific Ocean and 25 people died. In 1958, the first case of hijacking in the US was reported. Four Cubans hijacked a plane flying from Miami

<sup>74</sup> J. Laskowski, *Terroryzm lotniczy – charakterystyka zjawiska* (Eng. Air terrorism – characteristics of the phenomenon), „Studia Humanistyczno-Społeczne” 2013, vol. 7, p. 146.

<sup>75</sup> K. Jałoszyński, *Współczesne zagrożenie terroryzmem powietrznym, kierunki przedsięwzięć w zakresie przeciwdziałania mu oraz walka z tym zjawiskiem* (Eng. The contemporary threat of air terrorism, the directions of countermeasures and the fight against this phenomenon), in: „Bezpieczne niebo”. *Materials from the AON (National Defence University in Warsaw) Scientific Conference*, J. Gotowała (ed.), Warszawa 2002, p. 116.

<sup>76</sup> J. Duchesneau, *Aviation Terrorism...*, p. 5.

to Havana. It crashed while attempting to land in territory controlled by Fidel Castro's rebels. In the early 1960s in Cuba, planes were hijacked by dissidents. They wanted to escape the Castro regime to the USA in this way. Then the situation was reversed. Members of various far-left organisations and criminals fleeing justice were hijacking planes from the United States to reach Cuba. In 1969, aeroplane hijackings between the US and Cuba became so frequent and troublesome that the two governments signed a bilateral agreement to combat it, which essentially solved the problem<sup>77</sup>.

Aircraft terrorism was the *modus operandi* of Palestinian organisations, mostly of a left-wing, Marxist nature, which turned the Palestinian-Israeli conflict into international terrorism. The series of aeroplane hijackings by Palestinians was initiated on 22 July 1968 by three members of the Popular Front for the Liberation of Palestine (PFLP, Arabic: Al-Jabha ash-Shaabiyya li-Tahrir Filastin). They seized an Israeli El Al airline plane flying from Rome to Tel Aviv and forced the crew to land in Algiers. Following negotiations that lasted some 40 days, the terrorists agreed to release the hostages in exchange for the release of a group of Palestinians from Israeli prisons<sup>78</sup>. The incident set a precedent because it showed that hijacking planes are very effective in achieving the terrorists' main objectives, i.e. to put political pressure on the authorities and to focus the attention of world public opinion. George Habash, one of the leaders of the PFLP, pointed out that before the terrorist activities began in 1968, the Palestinian cause was unknown to the world: *Probably less than half of Americans even knew that such a thing existed. We wanted to do something that would make people ask: Why are they doing this? (...) We achieved our goal. The Palestinian cause became instantly known throughout the world. (...) The hijacking of a large plane has a greater propaganda, media effect than killing a hundred Israelis in battle. For decades, world opinion was neither for nor against the Palestinians. Now at least the world is talking about us*<sup>79</sup>.

There were 151 aircraft hijacked between 1968 and 1970<sup>80</sup>. The hijacking on 6 September 1970 of 3 passenger planes taking off from European

<sup>77</sup> J. Laskowski, *Terroryzm lotniczy...*, pp. 145–146.

<sup>78</sup> *Encyklopedia terroryzmu...*, p. 295.

<sup>79</sup> T.R. Aleksandrowicz, K. Liedel, *Zwalczanie terroryzmu lotniczego. Wybrane zagadnienia i źródła prawa międzynarodowego* (Eng. Combating air terrorism. Selected issues and sources of international law), Szczytno 2010, p. 13.

<sup>80</sup> B.M. Jenkins, *The Terrorist Threat to Commercial Aviation*, Santa Monica 1989, <https://www.rand.org/content/dam/rand/pubs/papers/2008/P7540.pdf>, p. 4 [accessed: 25.02.2025].



airports by members of the PFLP was unprecedented. One of them landed in Cairo and was destroyed after the passengers disembarked. Two were diverted to Dawson's Field airport near Zarqa in Jordan. Three days later, the terrorists hijacked another plane and diverted it to this airport. All 3 planes were blown up on 12 September. Most of the passengers were released, with only American Jews and Israeli citizens remaining in captivity. They were set free in exchange for the release of Palestinians from European prisons<sup>81</sup>. In the years that followed, Palestinian militants carried out dozens of terrorist attacks in the Middle East and Europe, including 52 attacks on Israeli airline El Al planes<sup>82</sup>.

Aircraft hijackings often occurred in Eastern Bloc countries, but the propaganda of the time tried to ignore these incidents with silence. The motives of the perpetrators were most often personal. Between 1960 and 1980, around 100 cases of aircraft hijacking were recorded, including for the purpose of escaping from Eastern Bloc countries to West Germany, West Berlin and Denmark<sup>83</sup>. During the 1970s and 1980s, the number of aircraft hijackings in Poland increased. They were mainly directed to West Berlin. There were more than 20 such incidents. The largest number of planes, as many as 10, were hijacked from Katowice-Pyrzowice airport. Machines performing domestic flights were hijacked on the grounds that it was easier to board them. This was due to the lack of passport control and border checks and the simplified security procedure for such flights<sup>84</sup>. In 1990, the daily *Izvestia* reported that 69 machines were hijacked in the USSR between 1958 and 1990. The perpetrators killed 120 hostages and wounded another 200<sup>85</sup>. A total of 218 incidents of terrorist hijacking (279 victims) and 1067 incidents of criminal hijacking (530 victims) occurred worldwide between 1931 and 2011<sup>86</sup>. According to other data, 553 aircraft hijackings

<sup>81</sup> *Encyklopedia terroryzmu...*, p. 300.

<sup>82</sup> Ł. Szymankiewicz, *Terroryzm lotniczy wobec Izraela* (Eng. Air terrorism against Israel), Warszawa 2019, p. 7.

<sup>83</sup> E. Ciborowska, *Wybrane przypadki piractwa powietrznego w Polsce w latach 80.* (Eng. Selected cases of air piracy in Poland in the 1980s), „Terroryzm” 2008, no. 1, p. 6.

<sup>84</sup> M. Desler, *Seven five – man with knife, lotnictwo, a terroryzm* (Eng. Seven five – man with knife, aviation, and terrorism), dlapilota.pl, 9.04.2014, <https://dlapilota.pl/wiadomosci/monika-desler/seven-five-man-knife-lotnictwo-terroryzm> [accessed: 9.12.2024].

<sup>85</sup> *Ibid.*

<sup>86</sup> J. Duchesneau, *Aviation Terrorism...*, p. 139.

were recorded between 1980 and 2022. The fewest (18) were in the decade 2011–2022<sup>87</sup>.

### Bombings

According to the ICAO, these involve placing explosives on board aircraft and detonating them while the aircraft is on the ground or in the air. The cargo may be in checked baggage or may be dropped off by a passenger<sup>88</sup>. From 1931 to 2024, 73 terrorist bombings (1644 dead) and 119 criminal attacks (1184 victims) were carried out on aircraft worldwide<sup>89</sup>. There were 48 attacks between 2000 and 2009, 27 of which were hijacking and 14 used explosives. Between 2010 and 2017, there were 26 attacks, of which 5 were hijacking and 10 were attacks using explosives<sup>90</sup>. According to other data, there were 64 aeroplane bombings between 1970 and 2022, killing 2097 people. The fewest (2 bombings) of this kind were in the decade 2011–2022, with 225 deaths<sup>91</sup>.

The first aeroplane bombing was carried out on 21 February 1970. PFLP was the perpetrator and the target was a Swissair Convair aircraft flying from Zurich to Tel Aviv. A bomb placed in the baggage hold exploded 9 minutes after take-off. The pilots attempted to return to Zurich airport, but due to loss of controllability the aircraft plummeted to the ground and 47 people were killed<sup>92</sup>. On the same day, an explosive device exploded on an Austrian Airlines Caravelle flight from Frankfurt am Main to Tel Aviv. The bomb had been placed between thick bundles of newspapers, which significantly weakened the force of the explosion. The pilot landed safely. In the early 1970s, bombings by Palestinian terrorist groups mainly targeted El Al airline planes. Due to the US government's support of Israel's anti-Palestinian policy, US carriers' machines also became targets.

<sup>87</sup> O. Čokorilo, S. Čokorilo, L. Tomic, *A framework for aviation security*, AIIT 4th International Conference on Transport Infrastructure and Systems (TIS ROMA 2024), [https://www.researchgate.net/publication/381768379\\_A\\_framework\\_for\\_aviation\\_security](https://www.researchgate.net/publication/381768379_A_framework_for_aviation_security), p. 5 [accessed: 28.02.2025].

<sup>88</sup> J. Duchesneau, *Aviation Terrorism...*, p. 118.

<sup>89</sup> Ibid., p. 139; A. Botha, *Prevention of Terrorist Attacks...*, p. 851; *Timeline of airliner bombing attacks*, Wikipedia, [https://en.wikipedia.org/wiki/Timeline\\_of\\_airliner\\_bombing\\_attacks](https://en.wikipedia.org/wiki/Timeline_of_airliner_bombing_attacks) [accessed: 26.02.2025].

<sup>90</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 851.

<sup>91</sup> O. Čokorilo, S. Čokorilo, L. Tomic, *A framework for aviation security...*, p. 3.

<sup>92</sup> J. Laskowski, *Terroryzm lotniczy...*, p. 149.

In September 1974, a bomb explosion on a TWA Boeing, flying from Tel Aviv via Athens to New York, caused the plane to crash over the Ionian Sea and killed 88 people. The attack was claimed by the PFLP. In the 1970s, a total of 42 bombings were recorded, killing more than 650 people. In the following decade, the number of bombings dropped to 24, but the number of victims increased – to around 1000 people<sup>93</sup>. The most tragic in terms of casualties were 2 terrorist attacks. Members of the separatist Sikh organisation Babbar Khalsa placed a bomb on board an Air India Boeing 747 flying from Montreal to New Delhi on 22 June 1985. The cargo exploded while the machine was over the Atlantic Ocean off the coast of Ireland. There were 329 casualties, the most in the history of such attacks. The second attack occurred on 21 December 1988 by agents of Libyan intelligence who managed to place an explosive device in the baggage checked in on flight 103 of a Pan Am Boeing 727 flying from London to New York. The plane exploded over Lockerbie. It killed 259 people on board and 11 residents of the Scottish town<sup>94</sup>. One of the most recent attacks, which used the same pattern of operations, occurred on 31 October 2015. Terrorists belonging to the ISIS-linked Sinai Province group planted an explosive device on an Airbus A321 aircraft of Russian airline Metrojet, flying from Sharm el-Sheikh to St Petersburg. The explosion occurred around 23 minutes after take-off. The plane crashed in the Sinai Peninsula and 224 people were killed<sup>95</sup>.

### Suicide terrorism

Another method of attacking aircraft is through acts of suicide terrorism, in which the aircraft is used as an instrument of attack. From 1989 to 2011, a total of 17 such attacks and failed and foiled attempts were recorded. A total of 3143 people were killed in these attacks<sup>96</sup>. The first suicide incident was recorded in November 1989. A Saudi attempted to detonate a bomb on board a Saudi Arabian Airlines flight. The explosion did not occur due to a design flaw in the detonator. Little is known about the incident, other

<sup>93</sup> Ibid., pp. 149–150.

<sup>94</sup> *Encyklopedia terroryzmu...*, p. 369.

<sup>95</sup> PAP, *Egipt: katastrofa samolotu Airbus A321 na Półwyspie Synaj (aktualizacja)* (Eng. Egypt: Airbus A321 plane crashes in the Sinai Peninsula (update)), *dlapilota.pl*, 17.11.2015, <https://dlapilota.pl/wiadomosci/pap/egipt-katastrofa-samolotu-airbus-a321-na-polwyspie-synaj> [accessed: 17.12.2024].

<sup>96</sup> J. Duchesneau, *Aviation Terrorism...*, p. 139.

than that 10 people were arrested<sup>97</sup>. The 11 September 2001 attacks on the World Trade Center and the Pentagon in the USA fall into this category of terrorist acts. This event is considered the apogee of aviation terrorism and the largest successful terrorist operation in history. It claimed the lives of 2996 people. The number of victims of this attack surpassed those killed by terrorist hijacking (279 people) and terrorist bombings (1418 people)<sup>98</sup>. The 9/11 attacks also caused huge material damage. Very large costs were incurred by insurance and reinsurance companies, airlines and aircraft manufacturers, as well as the travel industry. Swiss reinsurance company Swiss Re estimated that the insurance sector's losses related to the September attack amounted to USD 90 billion, of which 19 billion were direct costs. Total airline losses were estimated at USD 12–13 billion<sup>99</sup>. These events plunged air communications into the deepest crisis since World War II. In the following years, there were several incidents demonstrating the potential for aircraft to be used as a tool of terror. Among them, on 5 January 2002, a flying school student hijacked a small Cessna-type aircraft and crashed it into a high-rise building in Tampa, Florida. The pilot died on the spot and the structure of the building was slightly damaged<sup>100</sup>.

Between 1989 and 2011, there were 32 suicide attacks that were classified as criminal. The death toll in these attacks was 691<sup>101</sup>. Such an event may have been, according to some opinions, the disappearance of a Malaysia Airlines plane in March 2014. A Boeing 777 flying from Kuala Lumpur to Beijing re-routed its flight and disappeared from radar. The plane's captain, Zaharie Ahmad Shah, was killed along with 238 passengers and crew members. There were reports that the captain may have deliberately caused the plane to crash into the waters of the Indian Ocean. His religious radicalism and difficult personal experiences were cited as motives<sup>102</sup>. In February

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<sup>97</sup> Ibid., p. 123.

<sup>98</sup> Ibid., p. 126.

<sup>99</sup> K. Izak, *Twentieth anniversary of September 11. The plot, the events and the aftermath of the terrorist attack on the USA*, "Internal Security Review" 2021, no. 25. <https://doi.org/10.4467/20801335PBW.21.033.14310>.

<sup>100</sup> M.L. Wald, *Student Pilot, 15, Crashes Plane Into Tower in Florida*, New York Times, 6.01.2002, <https://www.nytimes.com/2002/01/06/us/student-pilot-15-crashes-plane-into-tower-in-florida.html> [accessed: 6.01.2025].

<sup>101</sup> J. Duchesneau, *Aviation Terrorism...*, p. 139.

<sup>102</sup> Daily Mail, *New report explores the pilot of MH370 troubled personal life, likely scenario of what happened on flight*, New Zealand Herald, 18.06.2019, <https://www.nzherald.co.nz/world/>

2025, the search for the remains of this aircraft began again<sup>103</sup>. The most recent incident took place on 24 March 2015. A Germanwings Airbus A320 aircraft flying from Barcelona to Düsseldorf crashed in the French Alps. All passengers and crew members were killed – 150 people in total. The crash was deliberately caused by the co-pilot, Andreas Lubitz<sup>104</sup>.

In the air transport sector, suicide missions are the least used modus operandi (3% of incidents). However, due to the number of victims of the 11 September 2001 attack, they proved to be the most deadly (51% of victims)<sup>105</sup>. Only 8 out of the 17 suicide attacks in preparation were successful and resulted in fatalities. Two of these were attacks by Chechen women, so-called black widows, on Russian aircraft<sup>106</sup>. Three attacks were unsuccessful, including that of Briton Richard Reid, known as the shoe bomber. With an explosive charge placed in his shoes, he attempted to board a flight from Paris to Miami<sup>107</sup>. Six attacks were foiled, including Operation “Bojinka”, detected in Manila in January 1995, in which terrorists intended to hijack 11 aircraft and use them for suicide attacks on US facilities (along the lines of the 9/11 attack)<sup>108</sup>. Another terrorist operation was foiled in London in August 2006. The aim of the suicide terrorists was to cause explosions on planes flying from the UK capital to New York, Washington DC, Chicago, San Francisco, Toronto and Montreal<sup>109</sup>. Nigerian Umar Farouk Abdulmutallab intended to blow up a US NorthWest Airlines plane with 289 people on board, flying from Amsterdam to Detroit on

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new-report-explores-the-pilot-of-mh370-troubled-personal-life-likely-scenario-of-what-happened-on-flight/TOQ557EGUHWQDXG5DU47E7JOVE/ [accessed: 18.12.2024].

<sup>103</sup> T. Jones, *MH370: Search resumes to find missing plane 11 years on*, Deutsche Welle, 25.02.2025, <https://www.dw.com/en/mh370-search-resumes-to-find-missing-plane-11-years-on/a-71739469> [accessed: 25.02.2025].

<sup>104</sup> M. Zafimehy, G. Chieze, *Crash de la Germanwings: à quoi ont ressemblé les dernières minutes avant la catastrophe?*, RTL, 26.03.2023, <https://www.rtl.fr/actu/justice-faits-divers/crash-de-la-germanwings-a-quoi-ont-ressemble-les-dernieres-minutes-avant-la-catastrophe-7900246615> [accessed: 26.01.2025].

<sup>105</sup> J. Duchesneau, *Aviation Terrorism...*, p. 123.

<sup>106</sup> *Ibid.*, p. 205.

<sup>107</sup> *Ibid.*

<sup>108</sup> K. Izak, *Leksykon organizacji i ruchów...*, pp. 164–165.

<sup>109</sup> *Ibid.*, p. 411.

25 December 2009. However, he was overpowered by passengers and crew while attempting to detonate a load of pentrite hidden in his underwear<sup>110</sup>.

### Attacks on airports and grounded aircraft and attacks from the ground on airborne aircraft

The final category of incidents consists of attacks at airports and attacks carried out against aircraft on the ground and in the air. This is the most numerous category of incidents. By 2017, a total of 624 such terrorist incidents had been recorded<sup>111</sup>. Between 2010 and 2017, the number of terrorist incidents at airports increased from 83 to 164<sup>112</sup>. In contrast, 31 terrorist attacks were recorded at ports and aircraft in 2019, 10 more than in the previous year<sup>113</sup>. The first recorded terrorist attack at a passenger airport was carried out on 10 February 1970. Three PFLP terrorists at Munich Airport threw grenades at and shot at passengers travelling on an Israeli El Al airline flight. One person was killed and 11 injured<sup>114</sup>. In the 1970s and 1980s, Palestinian terrorists attacked Italy's Rome-Fiumicino and Leonardo da Vinci airports on several occasions<sup>115</sup>. In December 1999, an Algerian man, Ahmed Ressay, was arrested at a border crossing between Canada and the US while attempting to enter the US. Explosives and weapons were found in his car. Ressay's aim was to carry out a bomb attack at Los Angeles airport on New Year's Eve 1999<sup>116</sup>. Civilian airports in Saudi Arabia have also been targeted by the aforementioned Houthi movement in recent years. Militants of this organisation fired a Burkan H-2 missile towards Riyadh's King Khalid International Airport on 4 November 2017. The missile was shot down by a Patriot anti-missile system<sup>117</sup>. Between 2000 and 2009, there were 83 attacks on airports carried out with firearms,

<sup>110</sup> Ibid., p. 478.

<sup>111</sup> J. Duchesneau, *Aviation Terrorism...*, p. 139.

<sup>112</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 854.

<sup>113</sup> START, *Global Terrorism Overview: Terrorism in 2019*, [https://www.start.umd.edu/pubs/START\\_GTD\\_GlobalTerrorismOverview2019\\_July2020.pdf](https://www.start.umd.edu/pubs/START_GTD_GlobalTerrorismOverview2019_July2020.pdf), p. 11 [accessed: 30.07.2024].

<sup>114</sup> J. Laskowski, *Terroryzm lotniczy...*, p. 151.

<sup>115</sup> M. Zimmerman, „Cud, że tyle osób przeżyło”. Mija 50 lat od zamachu na lotnisku Fiumicino (Eng. 'A miracle that so many people survived'. It's 50 years since the attack at Fiumicino Airport), Onet, 17.12.2023, <https://wiadomosci.onet.pl/swiat/50-lat-od-ataku-na-lotnisku-fiumicino-najbardziej-krwawy-z-tamtych-zamachow/mpd5nm4> [accessed: 17.12.2024].

<sup>116</sup> K. Izak, *Leksykon organizacji i ruchów...*, p. 186.

<sup>117</sup> *Atak rakietowy na Rijad...*

explosives and incendiary devices. Between 2010 and 2017, there were 169 such attacks<sup>118</sup>. The last one occurred on 5 August 2024, using a Katyusha missile and targeting the Ain al-Assad airbase in Iraq. Five US soldiers were wounded<sup>119</sup>.

In recent years, UAVs have become an increasing threat to airports and aircraft taking off and landing. 2013 was the last year in which no such incidents were recorded. In December 2018, traffic was halted at London Gatwick Airport due to numerous drone overflights. In July the previous year, there was a near collision between a UAV and a passenger aircraft there. According to the British Airline Pilots Association, the number of drone incidents has risen sharply. There were 93 in 2017 and 117 between January and November 2018<sup>120</sup>. Similar cases have also been reported in Poland. In March 2014, a drone dropped a small explosive on the runway at the military part of Balice airport. In July 2015, a UAV posed a serious threat to a Lufthansa aircraft approaching from Munich to Warsaw. A similar incident was reported at Balice in June 2022 and at Okęcie and Pyrzowice in May 2023<sup>121</sup>. All of these incidents were criminal in nature.

In recent years, there has been a significant increase in the number of cyber attacks on airports and airlines. These are mainly of a criminal nature. There were 178 cyber attacks on airports and 775 cyber attacks on airlines recorded in Europe in 2020. This represents a 530 per cent increase compared to 2019. Cyber attacks on airlines accounted for as much as 61% of all cyber attacks carried out in Europe in 2020. Most of these (735) were financially motivated<sup>122</sup>. It is important to note that in 2023, global CI was the target of more than 420 million cyber attacks, which equates to

<sup>118</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 854.

<sup>119</sup> *At least five US personnel injured in rocket attack on Iraq military base*, Al Jazeera, 6.08.2024, <https://www.aljazeera.com/news/2024/8/6/at-least-five-us-personnel-injured-in-attack-on-iraq-military-base> [accessed: 6.08.2024].

<sup>120</sup> A. Botha, *Prevention of Terrorist Attacks...*, p. 853.

<sup>121</sup> M. Walków, *Coraz więcej incydentów z dronami. Lotnisko Chopina przetestuje rozwiązanie* (Eng. More and more drone incidents. Chopin Airport will test a solution), Money.pl, 30.05.2023, <https://www.money.pl/gospodarka/lotnisko-chopina-sie-zbroi-drony-to-coraz-powazniejsze-zagrozenie-dla-samolotow-6903403450051296a.html> [accessed: 30.12.2024].

<sup>122</sup> EUROCONTROL, *Aviation under attack from a wave of cybercrime*, <https://www.eurocontrol.int/sites/default/files/2021-07/eurocontrol-think-paper-12-aviation-under-cyber-attack.pdf> [accessed: 5.07.2024].



approx. 13 attacks per second. Most of these were in the US. These attacks are often attributed to hackers linked to China, Russia and Iran<sup>123</sup>.

The first act of terrorism involving the downing of a passenger plane took place on 21 December 1948. Greek insurgents shot down a Czechoslovak airliner flying from Rome to Athens, killing 24 people. In the 1970s, this type of attack became widespread with the availability of man portable air defence system (MANPADS) missiles. MANPADS were first used by terrorists on 5 September 1973 at Rome-Fiumicino airport. Palestinians attempted to fire an SA-7 missile at a taxiing El Al airline plane, but the attempt failed. The first successful attack of this type was carried out on 12 February 1979 near the town of Kariba in Zimbabwe. Shortly after take-off, an Air Rhodesia airliner was hit by an SA-7 missile, with the loss of 59 lives<sup>124</sup>. MANPADS were widely used by the Afghan Mujahideen against Soviet military aircraft and helicopters, and later by the Taliban. They were also used by insurgent groups in Somalia, Iraq, Syria, Chechen fighters, Tamil fighters from the Liberation Tigers of Tamil Eelam (LTTE) and Colombian fighters from the FARC<sup>125</sup>. The tactic of attacking civilian aircraft with missile systems is regularly used by various terrorist groups, warring armed groups (Sudan) and, in recent years, states. For example, on 17 July 2014 a Malaysia Airlines Boeing 777, flying from Amsterdam to Kuala Lumpur, was shot down in the Donetsk region in eastern Ukraine using a Buk surface-to-air guided missile. The perpetrators were separatists from Russia. Casualties totalled 283 passengers and 15 crew members<sup>126</sup>. On 8 January 2020, Iranian forces shot down a Ukraine International Airlines Boeing 737 flying from Tehran to Kyiv with 176 people on board<sup>127</sup>.

<sup>123</sup> B. Candan, *Top 5 critical infrastructure cyberattacks*, Anapaya, 17.10.2024, <https://www.anapaya.net/blog/top-5-critical-infrastructure-cyberattacks> [accessed: 17.10.2024].

<sup>124</sup> J. Laskowski, *Terroryzm lotniczy...*, pp. 151–152.

<sup>125</sup> A. Radomyski, D. Michalski, *Managing the Threat of Manpads Use Against Civil Aviation*, „Rocznik Bezpieczeństwa Morskiego” 2023, vol. 17, pp. 569–571. <https://doi.org/10.5604/01.3001.0054.1602>.

<sup>126</sup> A. Pawluszek, *Malezyjski Boeing 777 zestrzelony przez Rosjan w 2014 r. Sąd w Hadze przedstawił stanowisko* (Eng. Malaysian Boeing 777 shot down by Russians in 2014. The Hague-based court outlined the position), *Gazeta Prawna*, 17.11.2022, <https://www.gazetaprawna.pl/wiadomosci/swiat/artykuly/8590126,holandia-sad-zestrzelenie-2014-malezyjski-boeing-777-ukraina.html> [accessed: 17.11.2024].

<sup>127</sup> Reuters, *Teheran proponuje odszkodowania rodzinom ofiar zestrzelonego boeinga. Kijów krytykuje* (Eng. Tehran offers compensation to families of victims of downed boeing. Kyiv criticises), *TVN24*, 30.12.2020, <https://tvn24.pl/swiat/ukrainski-samolot-zestrzelony-nad->

One of the most recent attacks on aircraft occurred on 11 November 2024. Two passenger airbuses, belonging to a US airline, were fired upon by gangs in Port-au-Prince, the capital of Haiti. A flight attendant on one of the planes was slightly injured. Following the incident, US airlines suspended flights to the country. In October 2024, on the other hand, a UN helicopter flying over Port-au-Prince was fired upon and had to turn back to the airport<sup>128</sup>.

## Conclusions

Critical infrastructure, due to its multi-sectoral nature, its vastness and the consequent difficulty in providing it with sufficient security, has for many years been a prime target of both terrorist organisations and individual perpetrators. The attacks carried out against it, particularly in the transport sector, cause mass casualties and become fuel for the media. In many cases, thanks to international cooperation, the strengthening of anti-terrorist controls, security measures and intelligence activities, attacks on CI facilities have been successfully prevented. However, this does not ensure a sufficient level of security for CI as a whole. Dynamic scientific and technological advances and civilisational development are accompanied by new outbreaks of tension and armed conflicts around the world, which make use of the latest technological advances. These advances have also been and will continue to be used by terrorists, insurgents and “guerrillas” to carry out attacks and acts of sabotage in hybrid operations. It can therefore be assumed that the threat level to CI worldwide will increase.

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<sup>128</sup> *Horror w przestworzach, gangi ostrzelały dwa samoloty. Ranna stewardessa* (Eng. Horror in the skies, gangs fire on two planes. Injured stewardess), Polskie Radio 24, 12.11.2024, <https://polskieradio24.pl/artypul/3445609,horrer-w-przestworzach-gangi-ostrelaly-dwa-samoloty-ranna-stewardessa> [accessed: 21.12.2024].

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## Legal acts

*Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC* (Official Journal of the EU L 333/164 of 27.12.2022).

*Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection* (Official Journal of the EU L 345/75 of 23.12.2008).

### Other documents

United Nations, *Security Council resolution 2341 (2017) [on protection of critical infrastructure against terrorist acts]*.

Krzysztof Izak

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Retired officer of the Internal Security Agency, who served, inter alia, in divisions carrying out tasks in the field of counteracting terrorist threats. Author of more than 20 articles on terrorism, which were published in many scientific journals. Creator of *Lexicon of Islamist organisations and movements* published by the Internal Security Agency.

**Contact:** lizior3@wp.pl