

Unsafe Skies

How Geopolitics and Technology Affect the Civil Aviation Industry

Jahangir E. Arasli

The sources affecting civil aviation performance can be categorized into three broad areas: the natural environment, the technology domain, and human activity. The latter category divides into two subgroups: unintended harmful activity (such as professional deficiency, human error, negligence, etc.) and deliberate actions determined by malicious intent. A line of distinction between these two subgroups delimits aviation safety from aviation security and brings us to the matter of aviation terrorism.

Soon after its advent and rapid progress, commercial aviation became a priority target for violent non-state actors, e.g., terrorist groups, in the context of their goals and objectives. Since the 1960s, non-state terrorism has remained a major security threat in the civil aviation milieu. Even if some rogue states clandestinely sustained terror groups, the mainstream body of states combated that menace and observed internationally accepted rules and regulations pertinent to aviation operations.

However, today the nature and structure of threats and risks in the aviation realm have evolved. The mounting antagonism between major powers fractures world order and its security architecture. Its byproducts are, among others, hybrid and shooting wars and the related phenomenon of states' militarized international behavior. At the same time, threats projected by violent non-state actors (VNSA) and sub-state actors (SSA) persist; moreover, they tend to intensify due to the potential access to destructive technologies and probable state support driven by a logic of strategic competition.

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Against this background, this IDD Analytical Policy Brief begins by providing a brief history of the evolution of threats and risks to civil aviation. Then, it analyzes new vectors and impacts emerging at geopolitical and technological layers, particularly in the parallel context of strategic competition between state powers and the cumulative sophistication of VNSA. In support of its arguments, the paper examines several events related to the aviation security domain that occurred in May 2025.

Threats' Evolutionary Trajectories

Since the 1960s, security threats to commercial aviation and countermeasures against them evolved within the “challenge/response” loop. Once terrorist actors began to apply innovative, unconventional tactics or game-changing technical solutions, states introduced procedures, protocols, and technologies to counter and mitigate them.

The start of terrorist hijacking campaigns of passenger planes and hostage-taking in July 1968 by the Popular Front for the Liberation of Palestine against an Israeli passenger jet led to mandatory airport security checks of boarding passengers and cabin luggage, in addition to the deployment of armed air marshals on flights. Onboard bombing incidents met a response in the form of air cargo inspections. The threat of using man-portable air defense systems (MANPADS) against airliners prompted states to take collective counter-proliferation efforts and develop technical countermeasures instruments (I examined this issue in my paper “[Unholy Grail: Small Device, Big Hassle – Patterns of MANPADS Threat Projection by Non-State Actors](#)”). Terrorist attacks against airports and service facilities compelled aviation authorities to strengthen perimeters' protection. The risk of sympathetic or planted insiders assisting terrorists and cyber threats also met correspondent answers.

Generally, in these competition cycles, states operated reactively against threats induced by proactive VNSA. Still, the measures taken helped to reduce, if not eliminate, these threats. Furthermore, during the Cold War, states' behavior was relatively moderate, self-restrained, and essentially rules-observing. Even so, some tragic incidents occurred at the peak of the East-West tensions, such as the shooting down of the [Korean Airlines flight 007](#) by a Soviet jet fighter in 1983.

However, in the current context of rolling geopolitical competition, certain state powers tend to prioritize their zero-sum-game strategic logic and immediate operational considerations over other concerns, including the maintenance of relatively risk-free international civil air travel. This condition adds another hazardous dimension to the threat matrix.

Recent disastrous events illustrate this proposition. In July 2014, a surface-to-air missile system, [operated by a Russian crew](#), shot down [Malaysia Airlines flight 17](#) over East Ukraine, killing all 298 people onboard. Iran's air defense, placed on high alert to

beat off an expected U.S. attack, accidentally destroyed [Ukraine International Airlines flight 752](#) near Tehran in January 2020, killing 176 people. In December 2024, Russian air defense forces reacting to a Ukrainian drone attack on Grozny accidentally hit [Azerbaijani Airlines \(AZAL\) flight 8243](#), which eventually had to make a crash landing that resulted in the death of 38 of 67 people onboard.

The emergence of threats and risks generated by states' belligerent behavior and the proliferation of armed conflict settings presents a new challenge that the civil aviation industry has to recognize, understand, and rapidly adapt to. The events that unfolded in just one week in May 2025 demonstrate that the combination of non-state actor-generated threats and state-produced precarious conduct is placing increasing stress on the global civil aviation industry.

The Seven Days of May

The following set of events, which took place between 4 and 10 May 2025 in four flashpoint zones on three continents, illuminates the scope and nature of the transforming danger.

Vignette 1. On 6 May 2025, Ukraine launched an unprecedented three-day-long unmanned aerial blitz with small groups of one-way attack (OWA) drones and single drones that forayed into, and packed the airspace over, the central part of Russia. Although Russian air defense capabilities and electronic warfare assets disabled the majority of these Ukrainian aerial vehicles, their mission was successful, nonetheless.

This swarming operation did not target specific facilities in order to deliver kinetic effects; rather, its objective was disruption. The Russian authorities had to declare the "Carpet" condition (an emergency closure of airspace) and cancel flights or divert them to secondary airports. Then, in seven regions of the European part of Russia, all the way up to the Volga River and the White Sea, the air traffic had all but [collapsed](#). In four days, [21 airports](#) had to cease their operations a total of 43 times. Over [60,000 passengers](#) were stranded, more than 400 flights were canceled, and almost 180 flights were diverted to other destinations. Definitely, the impact of such disorganization is substantial, counting the financial cost, collateral damage (such as the shutdown of mobile internet), and politico-reputational and psychological effects. On 21-22 May 2025, Ukraine conducted a follow-up attack, which affected [over 160 flights](#) and led to the temporary closure of all four of Moscow's airports.

In total, 37 airports in Russia ceased operations 217 times in the first [four months and ten days of 2025](#) (or approximately twice a day on average) due to Ukrainian offensive actions. There were only 58 such instances in 2023 and 91 in 2024. Apparently, the harassing campaign against air traffic has become a sustained trend in this war.

Vignette 2. In the context of the war in Gaza and the Red Sea crisis, the Yemen-based militant movement Ansarallah (a.k.a. the Houthis) has sporadically launched Iran-made ballistic missiles against Israel. On 4 May 2025, one such missile traveled over 2,000 km, penetrated a missile defense layer, and detonated very close to [Ben Gurion International Airport](#) in Tel Aviv—the country’s main international airport. The damage caused was minimal; yet, the airport had to shut down its operations and divert inbound flights immediately.

Upon this attack, [18 air carriers](#) suspended their flights to Israel. As of [29 May](#), at least 10 airlines, including major companies and lowcosters, did not resume their routine; some of them have prolonged temporary deferral until September 2025. The fear is that a disaster caused by hostilities would result in the loss of life and produce multi-billion compensation claims. The disruption caused by the Houthis has increased insurance rates and impacted business travel, tourism, and the upcoming summer holiday period. It places additional distress on Israel’s commercial aviation segment, already troubled by the impact of the Gaza War (its financial loss in the first nine months of 2024 amounted to [\\$28.8 million](#)).

The Houthis appreciate the strategic impact of their strikes and have vowed to escalate: they aim to impose a “[comprehensive aerial blockade](#)” on Israel. Accordingly, they have issued a warning to foreign airlines to cease their Israel-bound air traffic. Although the Houthis claim “success” each time they strike (over 40 missiles have been launched since March 2025), this is largely incorrect: their projectiles either break apart in the midcourse or are intercepted during the terminal phase. However, the psychological impact of these attacks outweighs the absence of physical destruction, for it yields direct negative economic effects. In other words, the shadow of a threat is more effective than the threat’s practical implementation.

Vignette 3. The 2025 Indo-Pakistani crisis included a visible commercial aviation aspect. Both belligerents [closed their airspace](#) in order to affect their adversary’s economy and avoid collateral damage from the anticipated hostilities. Pakistan sealed its airspace on [April 24](#) for India-bound and outbound flights, causing Indian and third-country air carriers (including the Lufthansa Group, Air France, British Airways, and Emirates) to reroute their air travel by effectuating a bypass “hook” over the Arabian Sea.

When the crisis peaked in its escalatory phase on 7-10 May, the kinetic action between the belligerents involved an exchange of OWA drones and ballistic missiles, during which some civilian and dual-use airports became targets. Subsequently, Pakistan introduced a blanket closure of its airspace due to intensive drone activity, while India [followed suit](#), shutting down 32 international and domestic airports and restricting the use of airspace in its western regions. It is worth noting, however, that both sides acted conscientiously and declared designated no-fly zones, in contrast

to what Russia has done for more than three years, namely keeping its airspace open despite the war with Ukraine.

Overall, alterations and restrictions temporarily grounded hundreds of jetliners and other civilian aircraft, canceled hundreds of flights, produced extra operational costs due to increased fuel consumption (because of longer flight paths), and deprived both India and Pakistan of the overflight fees paid by international airlines flying over their respective air spaces for routes between the European continent and the Indo-Pacific theater. The ensuing [economic impact](#) of the hostilities on both sides is evident.

Vignette 4. The Rapid Support Force (RSF), an empowered SSA militia involved in Sudan's civil war, launched [six massive OWA drone strikes](#) on the government-controlled city of Port Sudan on 4-9 May 2025. These serial attacks, particularly those targeting and damaging the city's international airport, were especially notable. The major consequence was the suspension of humanitarian supplies delivered by flights chartered by the United Nations and non-governmental organizations. This disruptive condition puts millions of refugees and internally displaced people—who depend on the international aid pipeline—at potential risk of starvation and other destitutions.

Electronic Warfare and Omnipresent Drones

As illustrated by the above cases, ongoing wars, crises, and tensions produce a negative impact on civil aviation worldwide. It is essential to discern two arising trajectories in this regard.

The first trajectory is the extensive routine use of electronic warfare (EW) and electronic countermeasures (ECM) tools, which is one of the main fears associated with irresponsible state military activities in flashpoint zones. These toolkits, designed to protect their own forces and military installations from precision-guided munition strikes or provide camouflage, interfere with the global navigation satellite system (GNSS), weakening or distorting its signal (i.e., displaying an airplane's location inaccurately) or lost. Subsequently, their indiscriminate use can affect a pilot's ability to control his aircraft, distress crews' awareness and orientation, and compel pilots to follow visual flight rules instead of instrumental ones, which would complicate landings, especially in conditions of adverse weather and low visibility.

Russia, which reportedly implements its anti-access/area denial (A2/AD) concept, is by all accounts unparalleled in jamming or spoofing GPS signals with its powerful EW and ECM systems. The primary areas of concern are the Nordic-Baltic region, the Black Sea, and the Eastern Mediterranean (where the Russian military bases in Syria are still operational), but they are not limited to them. The aforementioned episode involving the downing of the AZAL passenger jet over Chechnya in December 2024 involved the use of [EW signal jamming](#) that contributed into the plane's eventual crash landing. .

The Baltic Sea area is particularly vulnerable to this practice, with Finland, Poland, and the three Baltic States being the most affected. In the period between August 2023 and March 2024, some [46,000 air flights](#) reported signal interference over that zone, which in some cases “blinded” pilots. [Dangerous maneuvering](#) of Russian warplanes, which fly with their transponders off near international flight corridors, further imperils air traffic conditions and increases the risk of incidents and even catastrophic events.

Generally, the trend of GPS interference is increasing worldwide. [Statistics](#) illustrate that there were 200 incidents of such a sort each day on average in the first quarter of 2024 while this number rose to 900 in the second quarter of the same year. On some days, there were over 1,350 crews’ reports on the subject matter. In addition to the aforementioned regions, the Gulf, where Iran spoils the GPS signal to deter an anticipated Israeli attack, is another risky area.

The second trajectory is the proliferation and circulation of hitherto niche technologies available to VNSA and SSA. The biggest concern is a selection of unmanned aerial systems (UAS), commonly referred to as drones. Not too long ago, the mentioned actors were using fairly primitive commercially available drones (mostly quadcopters) for reconnaissance, surveillance, and limited-effect harassment attacks in places like Myanmar or Iraqi Kurdistan. At the current stage, the amount and quality of the UAS arsenal, especially their increased range, endurance, precision, payload, and lethality, are transforming that resource into a significant non-state actors’ force multiplier (especially if they rely on states’ technical support, which is the case for the Houthi-Iran interaction). The empowered VNSA and SSA operating in the armed conflict zones are steadily developing swarming drone attack capabilities based on sophisticated aerodynamic system designs, which are now likely enabled and enhanced by AI. The “flood of drones” disrupting air traffic in broad areas is no longer a so-distant future possibility.

At the same time, clandestine homegrown terrorist cells, which have limited resources, can use modified simple drones bought in around-the-corner shops to conduct improvised attacks against airliners and airport facilities. The kinetic impact of a quadcopter (particularly one fitted with an explosive charge) on a passenger plane can cause serious damage and even a crash. As such, drones targeting airplanes on takeoff or landing represent a cheap and accessible substitute for MANPADS, whose circulation in the global arms “black market” has shrunk in the past years.

Synopsis

- The system of threats to civil aviation evolves due to the combinatory impact of geopolitical and technological factors.
- Hazards projected by VNSA and SSA are increasingly merging with challenges posed by risky and reckless military or militarized activities by states.

- Such dualism was not a mainstream trend until recently and introduces an emergent reality.
- Interstate armed conflicts, such as the ongoing war in Ukraine, the 2024 missile exchange between Iran and Israel, and the 2025 India-Pakistan crisis, are causing massive pressure on the aviation industry.
- GPS jamming represents a deliberate yet deniable grey-zone strategy, which exposes airliners to a direct vulnerability; subsequently, this state-related criterion requires its integration into threat metrics and taking into consideration in airlines' business strategies.
- At the non-state level, the cost-benefit calculus of targeting the aviation sector favors malicious actors, who can utilize relatively inexpensive tools to inflict disproportionate economic damage and fiscal loss on states and commercial airlines. Therefore, the drift of cutting-edge technologies into the hands of "bad guys" equally requires attention and specific countermeasures.
- The collusion of revisionist states and malicious non-state/sub-state actors, in which the latter could emerge outsourced for proxy terrorist attacks against civil aviation, looks like a quite probable development in the context of the return to geopolitical competition.
- The disrupting pressure on the aviation domain contributes to the process of de-globalization, which is already intensified by regionalization, tariff wars, and other factors.
- Strategic competition, the bifurcation of the West, and the erosion of norms and rules all complicate international cooperation against terrorism and the implementation of multilateral frameworks and treaties in the aviation security sector.
- Overall, the above-defined operational environment presents a significant challenge for the industry. In these conditions, air carriers face a major challenge: staying ahead, or at least keeping pace, with the rapidly changing security paradigms.
- Particularly, they require the monitoring of security trends and situations constantly, especially in regions of concern, and the ability to become "red-alerted" instantly to cope with potential penalties.
- Subsequently, the mission of airlines' security and analytical divisions in delivering proactive and timely forecasting of threats and risks grows in relevance even more.

A final observation is philosophical in nature. The American journalist Alexander B. Chase once termed air travel a midpoint between the illusion of immortality and the fact of

death. It is difficult to imagine the recent history of human progress without aviation. The departure from the earth into the air was one of its greatest triumphs. Aviation “shrunk” time and space, made it possible to reach the limits of the oecumene, and became the first step of human civilization into the universe beyond *terra firma*. It is hard to fathom existing without aviation, which is so deeply ingrained in our economies, societies, cultures, and everyday lives. Hence, the current turbulence experienced by civil aviation would be an encounter that pushes humankind closer to regression and disarray. The hope is that this historical period will pass with the least possible harm, eventually.