



ALLIANZ COMMERCIAL

Aviation risk, claims and insurance outlook

2024

Trends to watch



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Introduction

To say that the aviation industry, and its insurers, have had to face significant challenges in recent years is an understatement.

The sudden halt imposed by the Covid-19 pandemic hit the industry faster and harder than most others. Then, just as the industry was about to take off again and recover from pandemic pains such as staff shortages or supply chain bottlenecks, it encountered further turbulence from high inflation, the energy crisis, Russia's invasion of Ukraine and potentially the largest single loss ever to hit the sector due to Russian confiscation of several hundred aircraft owned by Western aircraft lessors. All at a time when it was already facing the not insignificant challenge of the Net Zero transition.

The aviation sector has rebounded well from these difficulties. Although the geopolitical environment remains uncertain, and airlines continue to face capacity constraints, supply chain disruptions and safety incidents, there are many reasons for optimism. Several 2023 parameters showed "best ever" safety results, according to the International Air Transport Association (IATA)¹.



Tom Fadden,
Global Head of Aviation,
Allianz Commercial

In addition, while global GDP grew by only 3.2% in 2023, 1.3bn people traveled internationally, a year-on-year increase of +33%. According to UN Tourism², during Q1 2024, international tourism reached more than 285mn travelers, 20% more than a year earlier and 97% of pre-pandemic levels. This suggests that travel is increasingly being considered a 'staple' in many household budgets, with consumers willing to pay a higher price for the experience, according to our colleagues at [Allianz Research](#)³. In 2024, the volume of global air passengers, is expected to hit an all-time high (+10.4% year-on-year), with Asia-Pacific and North America in the lead (see page 5). At the same time, the lack of a silver bullet solution for decarbonization should not take away from the exciting opportunities currently underway with developments in Sustainable Aviation Fuels (SAF) and Advanced Air Mobility (AAM), to name just a couple of examples.

In this report, our aviation insurance team highlights some of the most important trends and challenges we see impacting the industry, from the rising number of runway incursions on the ground to growing GPS interference in our skies. Our experts also explore the impact of technological innovations such as AAM and electric vertical takeoff and landing (eVTOL) aircraft in particular, which offer the potential to revolutionize aviation, fostering sustainability, efficiency, and enhanced passenger experiences. They also examine how artificial intelligence can make aviation safer, more sustainable, and more satisfying for customers, while also shining the spotlight on some of the associated risks that must be considered.

Such innovations may steal the headlines when it comes to the sector’s flight path to a greener future but elsewhere, we also explain how one unheralded development may have the greatest impact on decarbonization overall – compliance.

Meanwhile, our team of claims practitioners identify the top causes of aviation claims we see around the world, while also keeping an eye on developing areas of interest, ranging from rising repair costs to a shortage of mechanics to the growing number of helicopter sightseeing experiences. From the insurer’s perspective, we also look at some of the ways in which today’s risk landscape is impacting the market, such as demonstrating the need for effective accumulation management or a growing interest in multinational insurance.

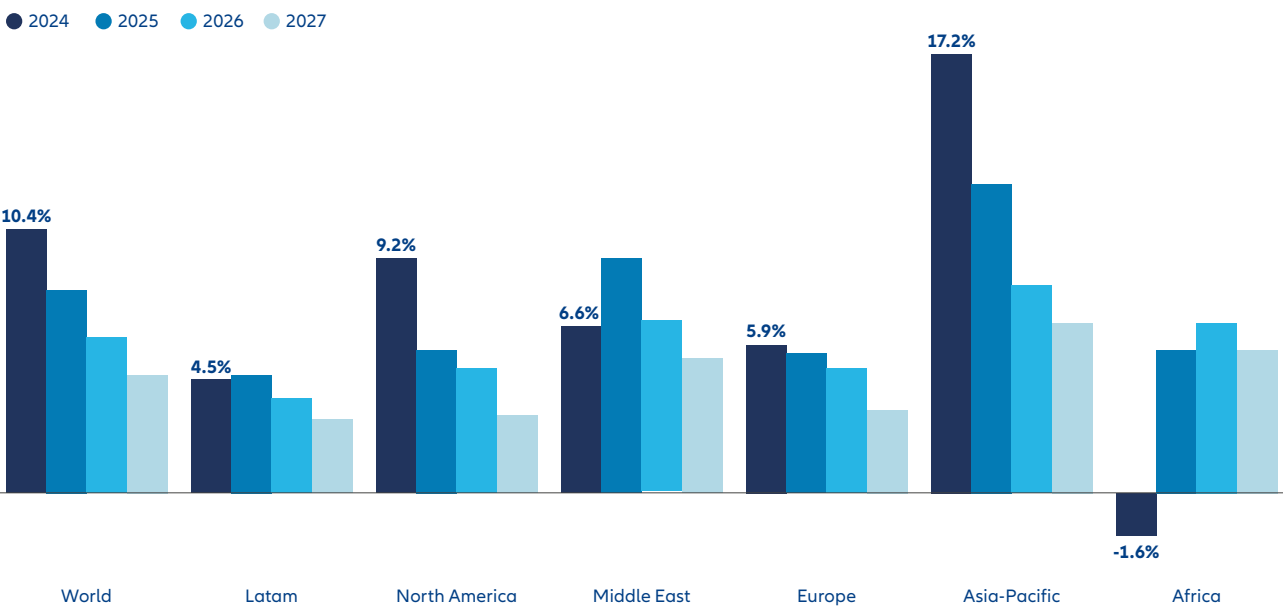
Of course, as the oldest continuously trading aviation insurer in the world, Allianz has always been at the forefront of pioneering developments, harking back to our very first aviation insurance policies issued in 1915. As the latest innovations and advancements sweep through the industry we look forward to this continuing.

Whether it is actively supporting eVTOL aircraft manufacturers through our solutions or playing a key role in the decarbonization transition by supporting companies via provision of stable capacity, sharing of best practices, or advising on the risk impact of technological advances or potential environmental exposures, Allianz Commercial has a crucial role to play in working with our trusted clients and partners to help de-risk businesses.

➤ [We examine the outlook for the aviation insurance market on page 29](#)

Regional and global year-on-year growth rates for air passengers

In 2024, the volume of global air passengers, is expected to hit an all-time high (+10.4% year-on-year), with Asia-Pacific and North America in the lead.



Source: Allianz Research, *What to watch: ECB easing begins, taking stock of NGEU, no turbulence for the airline industry's bottom line*, June 6, 2024

Executive summary

Claims trends and developments: [▶ page 11](#)

Impact of a shift in attritional claims: Hard landings; bird strikes; runway and ground handling incidents; supply chain challenges; labor challenges; increased repair costs; and Constructive Total Loss (CTL) thresholds being reached sooner are all driving claims costs upwards.

Collision / crash incidents account for over half the value of all aviation insurance claims (63%) by value and one-third (33%) by number, according to analysis of more than 30,000 industry claims with a value of €14bn (US\$15.1bn) over the past five years. Such incidents do not just include major crashes. They also incorporate events like hard landings, bird strikes and runway incidents.

Faulty workmanship / defective product is the second top cause of claims by value and by frequency while natural catastrophes (including turbulence) rank third by value of claims. Travel issues (including property damage, personal injury, baggage claims, lost/stolen goods etc.) rank third by number. Other top causes of claims include fire and slip and fall incidents.

There has been **a significant increase in aircraft repair costs** in recent years, driven by higher labor rates and the cost of aircraft parts, among other factors, such as inflation. The shift to next generation aircraft continues to impact claims, especially when it comes to engine disassembly and repair costs. Claims costs related to certain aircraft spare parts have increased by 10% to 15% over the last few years, which has resulted in a greater number of aircraft being deemed Constructive Total Losses (CTLs) than in the past.

Supply chain challenges continue. Delivery times for mechanical and avionic components are challenging and unpredictable for all involved: insured clients, maintenance, repair and overhaul operations, and insurers, driving up the cost of claims. Maintenance and repair capacity resources are dwindling across the UK, Europe, and the US.

Runway excursions are trending higher than 2023, with at least 23 incidents reported globally from January through May 2024. The causes are varied, including weather issues and technical problems. Most incidents primarily involve aircraft hull damage.



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There has also been **a noticeable rise in ground handling claims at large airports worldwide**, including towing, fueling, catering and wheelchair services related to commercial aircraft operations, as well as vehicle collisions on the tarmac. Pandemic-related layoffs have resulted in new hires and less experienced employees in some cases, contributing to these claims.

Over the past year or so Allianz Commercial has also witnessed **a shift in certain types of 'everyday' claims being lodged by commercial airline passengers**. For example, claims that were once prevalent and in the news, such as 'air rage' claims after the pandemic, and claims involving animals on board aircraft, have now dwindled.

The growing shortage of aircraft mechanics may impact future claims activity. An obvious concern is that the shortfall ultimately leads to an accident, despite the systems of checks and balances in place in the industry. It may take longer to complete repairs if vendors lack manpower, or efficiency. Further, if a mechanic does not have the ability to repair a part, it will need to be replaced with a new one, which typically is more costly.

A growing demand for helicopter sightseeing trips and getaways, including 'heli-skiing', 'heli-fishing,' or 'heli-hiking' trips, is also impacting claims activity, primarily in North America but there have also been cases in Europe and Asia. Examples includes crashes, hull damage and injury.

manowar1973 / Adobe Stock



Runway incursions on the rise [▶ page 17](#)

Runway incursion incidents, such as taking off or landing without clearance, are among the most persistent threats to aviation safety, given the consequences of a collision. In the US, over the last decade the rate per one million takeoffs and landings rose from 25 to over 30. With airports becoming even busier – global air passenger volume is expected to hit an all-time high in 2024 (+10.4% year-on-year) – there is increasing scrutiny on what is being done to manage the risks.

Contributing factors include weather-related factors such as low visibility; airport-related factors such as congestion; Air Traffic Control (ATC)-related factors such as incorrect or inadequate clearance; or crew-related factors such as improper knowledge of signals and signs. Ensuring good communication between crew and ATC during taxi is crucial to reduce the chances of an incident occurring. Crews also need to ensure they have a proper knowledge of airport surface markings, lights, and signs. Technology also has an important role to play in supporting crews and ATC.

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GPS jamming and spoofing incidents cause concern [▶ page 20](#)

Aviation has suffered a significant increase in Global Positioning System (GPS) spoofing and jamming incidents as geopolitical tensions have heightened around the world, with the average number of events 40% higher than in Q1, 2023. Examples include false GPS signals which have tricked aircraft flight management systems into indicating that the aircraft is many miles off-track.

To date, most reported spoofing attacks have come from Eastern Europe and the Middle East, as well as up through the Black Sea region. Incidents have escalated since the onset of Russia's invasion of Ukraine. However, operators should be cognizant of the potential for spoofing anywhere.

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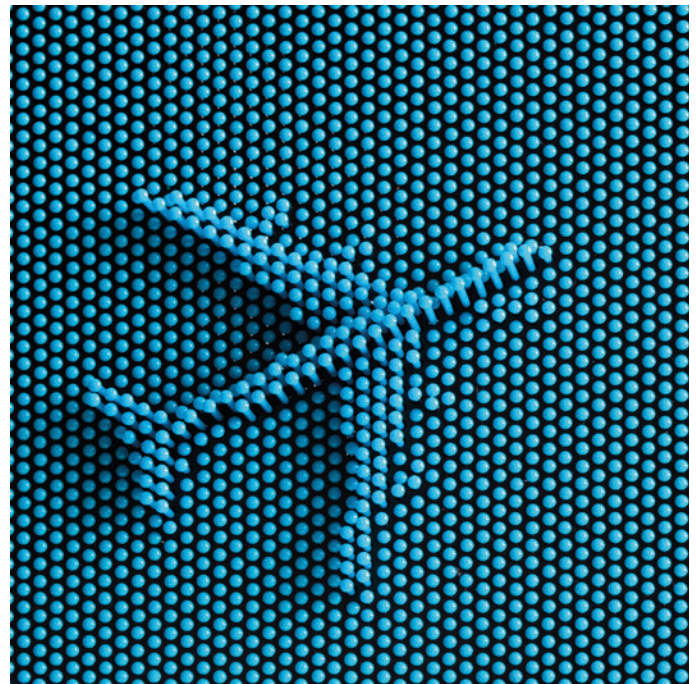
eVTOLs take flight [↘ page 23](#)

The aviation sector is excited about the prospect of exponential growth for Advanced Air Mobility (AAM) and electric vertical takeoff and landing (eVTOL) aircraft in future, which offer the potential to revolutionize aviation, fostering sustainability, efficiency, and enhancing passenger experiences.

eVTOL aircraft operate by integrating electric propulsion, vertical lift capabilities, and flight control systems, eliminating the need for traditional runways, and performing a variety of tasks including passenger and cargo transportation, medical evacuation, firefighting, and offshore operations. Revenues are projected to surge from US\$1bn in 2030 to US\$90bn by 2050.

Insurance is already being provided to eVTOL manufacturers for test flights. As with every development of new technology, there will always exist uncertainty, however. For now, the expectation is that operational risks will remain the same as currently seen in general aviation operations, such as loss of power, mid-air collisions, or foreign object damage. However due to the sensitive nature of aircraft movements in dense urban areas and its implication for liability claims, underwriters will deeply scrutinize the safety management systems of operators to ensure that full regulatory compliance is achieved.

shexp880 / Adobe Stock



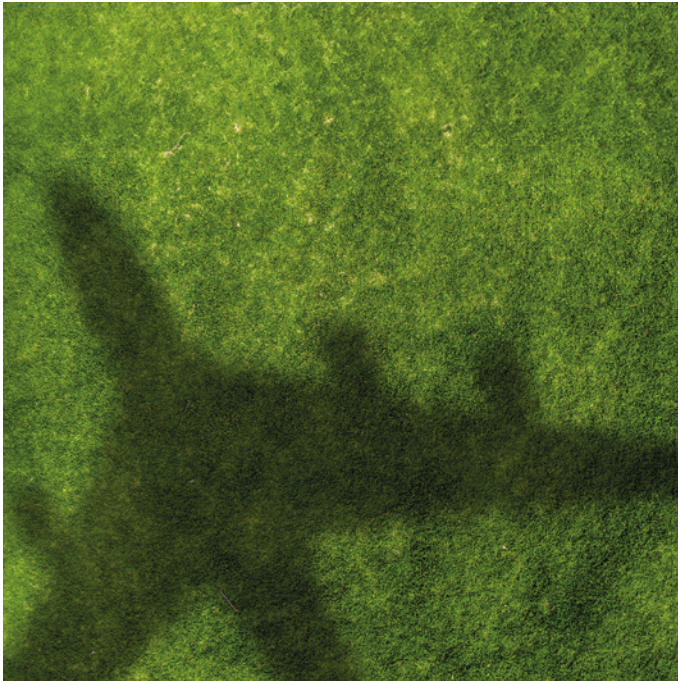
Artificial intelligence takes off [↘ page 25](#)

As with every facet of life, the aviation sector is primed for a significant transformation with the integration of Artificial Intelligence (AI). It has already been using AI for many years, and the current speed of development means it is revolutionizing the industry in many ways, from enhancing flight safety and improving maintenance procedures to personalizing the passenger experience and optimizing route management.

AI algorithms can analyze data from flight recorders and sensors along with historic data to predict potential system failures before they occur, allowing for preventative maintenance and reducing the risk of accidents. AI-driven simulations and predictive analytics can be used for training pilots, providing them with realistic scenarios and helping them make better decisions in critical situations. AI can even improve security at airports via biometric identification and evaluation.

However, with benefits comes risk and there are challenges to consider, such as ensuring data privacy and maintaining rigorous safety standards as AI systems become more autonomous. The focus on data security also sits alongside the greater focus on cyber threats, which rank as the second top risk for the aviation industry in the [Allianz Risk Barometer 2024](#).

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Aditya / Adobe Stock



Sustainability standards drive aviation accountability [↘ page 27](#)

Aviation contributes around 2% of global emissions and is focused on its sustainability efforts, pledging to reach Net Zero by 2050. The lack of a silver bullet solution for decarbonization should not take away from the exciting developments underway. Sustainable Aviation Fuel (SAF) continues to attract a lot of attention with mandatory targets starting to be implemented. The world's first transatlantic flight fueled entirely by SAF occurred at the end of 2023, demonstrating its feasibility as a power source, while innovations such as eVTOL aircraft continue to advance apace, as do improvements on existing technology, such as enhanced engine efficiency or aerodynamic design, and operational developments, such as better and more efficient route planning or mission tailoring.

One unheralded development that could force greater accountability is the development and subsequent implications of the European Union's Corporate Sustainability Reporting Directive (CSRD), and similar regulations worldwide. They require companies to disclose comprehensive information on their environmental, social, and governance (ESG) performance and impact.

Companies in the aviation sector will have to familiarize themselves with the CSRD and determine whether they are required to report. However, when companies look beyond the cost implications, there are some potential benefits to standardized reporting. It may foster investor and stakeholder confidence in the industry and the best performing companies, even enhancing reputation and brand image for, say, airlines that perform well and improve their metrics against standardized KPIs, demonstrating industry leadership in decarbonization. Most importantly, it should improve sustainability practices across the sector.

Insurance market outlook [↘ page 29](#)

The continual growth of the aviation sector will see gross written insurance premiums (GWP) hit a 20-year high in 2024 of more than US\$8bn. The standalone war market is also experiencing significant growth. Multinational insurance and international insurance placements are becoming more common due to geopolitical and regulatory concerns and a desire for a highly-managed insurance structure.

The push for Net Zero means the first operational eVTOL aircraft risk will likely be placed into the insurance market this year.



Industry trends

Claims trends and developments

Allianz Commercial's team of aviation claims experts worldwide highlight the top causes of aviation claims globally and discuss the impact of other developing areas of interest.

The aviation sector produces some of the highest value and high-profile claims across the corporate insurance sector around the world, driven by such factors as the ever-increasing cost of aircraft repairs to the general public's continuing hyperfocus on aviation news, and, understandably, safety.

Below are some of the interesting claims trends **Allianz Commercial's** aviation team are currently witnessing – both on-board aircraft and behind the scenes.

"While Covid-19-related concerns are largely in the rearview mirror of the industry, some issues related to the pandemic persist, while others have given way to other noteworthy trends," explains **Cristina Schoen, Global Head of Aviation Claims, Allianz Commercial.**



Aircraft repair costs continue to rise

Over the past two years, there has been a significant increase in aircraft repair costs, driven by rises in labor rates and the cost of aircraft parts, among other factors, such as inflation.

“Labor shortages in many areas have resulted in the retention of external contractors, whose rates are higher than in-house staff,” says **Mike Nicholls, Senior Aviation Claims Expert, UK, Allianz Commercial.**

Moreover, and as reported in previous editions of **Allianz Commercial aviation reviews**, the shift to next generation aircraft continues to have an impact on the cost of aviation claims especially when it comes to engine disassembly and repair costs, which are on the rise.

For example, a comparison of claims involving PW1100G and CFMI LEAP engines shows that costs have noticeably increased against previous engine types on the same airframe designation. Likewise, repairs on the composite Boeing 787 aircraft, which have weeks-long timescales for repair development are now roughly four times more expensive than the same repairs would have been on metal aircraft, according to **Mike Nicholls.**

Similarly, **Gemma Spicer, Senior Aviation Claims Adjuster, UK, Allianz Commercial,** adds that claims costs related to certain aircraft spare parts have increased by 10% to 15% over the last few years which has resulted in a greater number of aircraft being deemed Constructive Total Losses (CTLs) than in the past.

Finally, the significant shortage of spare parts is also driving up claim costs and duration from the time of claim notification to closure of the file, according to **John Nowicki, Regional Head of Aviation Claims, US, Allianz Commercial.**

Related to this, **Roland Wehner, Complex Aviation Claims Manager, Aviation Claims Germany and Switzerland, Allianz Commercial,** adds that in both the general aviation and airline sectors, supply chains are still an issue.

“Delivery times on mechanical and avionics components are still very challenging and oftentimes unpredictable for all involved: insured clients, maintenance, repair and overhaul (MRO) operations, and insurers alike,” says **Roland Wehner.** *“This drives up claims cost. Moreover, in the European market we are seeing MRO capacity and other resources dwindling, just as in the UK and US.”*



General aviation and airline claims trends

In the commercial air transport sector, and from a potential developing trend perspective, runway excursions are trending higher in 2024 than in 2023, says **Roland Wehner**.

“In 2024, there have been at least 23 excursions reported globally from January through May,” says **Roland Wehner**, such as a Boeing 737-300 aircraft which skidded off a runway in Senegal, injuring at least 10 people⁴. According to industry sources, there were only 38 runway excursions reported worldwide in 2023.⁵ The causes of such excursions are varied and include weather issues and technical problems, with most incidents primarily involving aircraft hull damage.

Another observation is the noticeable rise in ground handling claims at large airports worldwide. Such claims arose from, for example, the towing, fueling, catering and wheelchair services related to commercial aircraft operations, as well as the collision of vehicles on the tarmac. *“This can be attributed to pandemic layoffs, which now has resulted in new hires and less experienced employees at ground handling companies,”* says **Roland Wehner**.

In general aviation, **Gemma Spicer** observes a marked uptick in certain pilot error claims. *“Since the Covid-19 lockdown four years ago, and the UK regulator, the Civil Aviation Authority, subsequently authorising owners to carry out aircraft check flights, we see a greater number of high-hour commercial pilots now having free time to fly light aircraft for pleasure when, in the past, their schedules did not permit them to do so,”* **Gemma Spicer** explains. *“With this change has come a spike in pilot error claims, primarily involving the takeoff and landing phases. These pilots often have high hours on commercial aircraft but low hours on light aircraft.”*

Contributing to this increase in claims is the pilots’ lack of experience in light aircraft and the fact they are manoeuvring on grass strips instead of the asphalt runways to which they are accustomed, **Gemma Spicer** believes.

In the past year or so, **Allianz Commercial** has also witnessed a shift in certain types of ‘everyday’ claims being lodged by commercial airline passengers.

Prior to the Covid-19 pandemic there was often no more than 150 reports a year of serious onboard disruption on aircrafts in the US. During 2021 that number jumped to around 3,000 in the first six months of the year alone⁶, including well over 2,000 incidents involving passengers who refused to comply with the federal mandate to wear a mask while traveling. Since then, with mask requirements gone across the board, so called ‘air rage’ or ‘mask rage’ claims have also plummeted with the number of new claims in this category dropping to near zero, according to **Carmen Paul, Manager, Airline Claims, US, Allianz Commercial**.

When asked about the increased claim volume **Allianz Commercial** saw with the proliferation of animals – both large and small, exotic and conventional – passengers sought to carry onboard aircraft, **Carmen Paul** explains: *“Airline policies have become stricter when it comes to the type of animals allowed on the aircraft. More stringent policies regarding the breed and size of animals permitted in the cabin, as well as the type of carry-on bag required, have certainly translated into a noticeable drop in claims.”*

In fact, some airlines now limit carry-on pets to cats and dogs that meet certain size, age and destination requirements and may require that the pet stays in a carrier and under a seat the entire flight. Likewise, some airlines have developed more robust definitions of ‘service animal,’ such that, for example, only dogs with specific training to assist qualified individuals with disabilities may fit the definition. Prior to such changes, **Allianz Commercial** saw a host of animals on board, including monkeys, snakes, miniature horses and peacocks, as well as untrained dogs – with fellow passengers lodging claims ranging from discomfort or inconvenience from sitting near such animals to allergic reactions to bodily injury from being scratched or bitten.

While the volume of the above-mentioned claims has tapered off, as **Till Kürschner, Regional Head of Aviation Claims, Germany and Switzerland, Allianz Commercial**, observes: *“We do see a rise in other types of claims against airlines, particularly discrimination claims of all nature, being lodged.”*

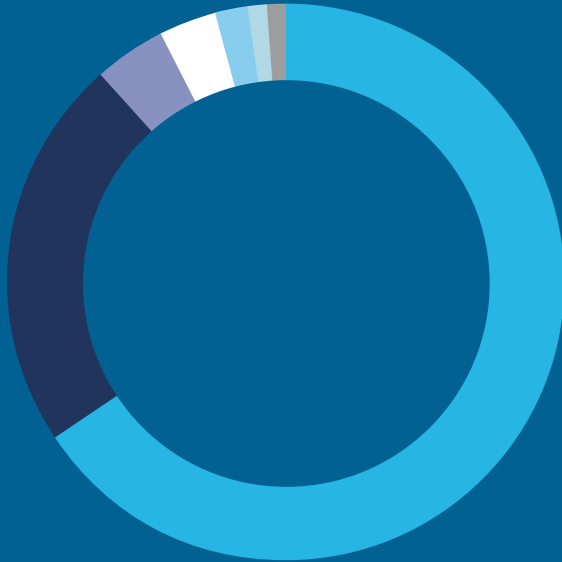
Regrettably, of late there has also been a marked uptick in claims alleging sexual assault onboard commercial airliners. This may be due in part to the return to pre-pandemic passenger loads, especially on longer, overnight flights. As one might expect, such claims and suits often garner substantial press attention and, of late, have replaced ‘air rage’ claims in terms of social media visibility.



From January through May 2024, there were at least 23 excursions reported globally

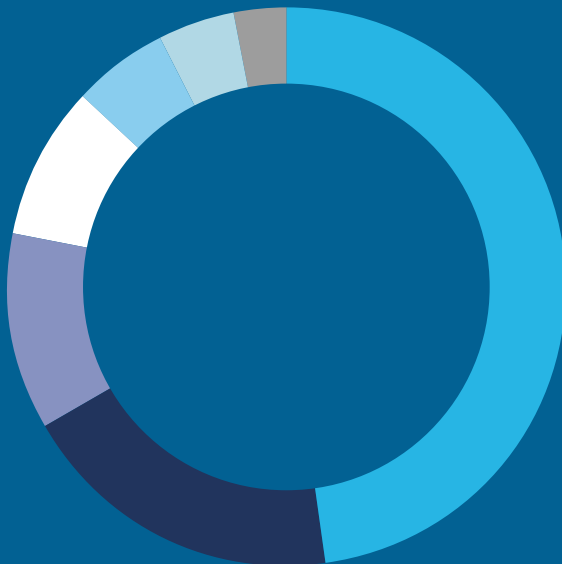
What are the top causes of aviation claims globally?

By value:



● Collision / crash	63%
● Faulty workmanship / defective product	22%
● Natural catastrophes	4%
● Machinery breakdown (including engine failure)	3%
● Travel issues (including property damage, personal injury, baggage claims, lost/stolen goods etc.)	2%
● Fire	1%
● Slips and falls	1%

By number of claims:



● Collision / crash	33%
● Faulty workmanship / defective product	13%
● Travel issues (including property damage, personal injury, baggage claims, lost/stolen goods etc.)	8%
● Slips and falls	6%
● Natural catastrophes	4%
● Damaged goods (including handling / storage)	3%
● Environmental liability / pollution	2%

Based on analysis of 32,114 aviation insurance industry claims worth more than €14bn over the past five years. Top seven causes of loss only. Unsurprisingly, collision / crash incidents account for over half the value of all claims (63%) by value and one-third (33%) by number. Such incidents do not just include major crashes, however. They also incorporate events like hard landings, bird strikes and runway incidents such as incursions and excursions.

Source: Allianz Commercial.

Claims between the period January 2019 and April 2024 were analyzed. Claims total includes share of other insurers in addition to Allianz Commercial.

'Cabin air quality' claims

Aircraft 'cabin air quality' claims, which had pre-pandemic beginnings, persist and, hence, is an area **Allianz Commercial** continues to watch, according to **Cristina Schoen**.

These claims allege that due to an onboard event and/or defect with the aircraft, bleed air has caused the cabin air to become contaminated, 'toxic', or otherwise unhealthy to inhale. Such claims and suits are primarily filed by pilots and flight attendants against aircraft manufacturers, rather than by passengers.

As **Stephan Fisher, Senior Manager, Aviation Claims, Allianz Commercial**, says: *"In our experience, it's relatively rare to see a cabin air claim filed by a passenger against an airline. Moreover, any such US-based claim filed by a crew member against an airline, which is the crew member's employer, would likely be barred by workers' compensation laws."*

Kevin Murphy, Director, Products and Major Case Unit, Allianz Commercial, agrees: *"The majority of cabin air suits we see are filed by the same one or two firms against the major aircraft manufacturers on both sides of the Atlantic. In fact, it seems these firms have created a cottage industry in the space. Aviation aerospace insurers worldwide continue to keep a close eye on developments around this subject matter, as interest in it by the plaintiffs' bar has not seemed to wane."*

Despite such interest by the plaintiffs' bar, however, and as **Guillaume Cadillat, Claims Practice Leader Aviation, Mediterranean Region, Allianz Commercial**, notes: *"To date, neither international or national studies⁷ by official bodies on cabin air quality, including the most recent ones, nor any reliable scientific or medical evidence, have demonstrated any potential harm to cabin occupants. These studies do not support the allegation of toxic fumes. These claims come from one or two individuals within the crews and never the whole crew."*

Shortage of mechanics

Previous **Allianz Commercial** aviation sector reviews such as **Aviation trends post Covid-19** focused on the pilot shortage that plagued the commercial airline industry, particularly during the wave of pandemic-related early retirements and reductions-in-force.

Today, the extent of the pilot shortage seems to have eased⁸ or even plateaued, observes **Carmen Paul**, *"(In North America), the major airlines have now filled their ranks, many times by hiring pilots from the regional airlines. Likewise, the regional airlines have scaled back hiring, as there is no longer an immediate need for them to have pilots waiting in the wings should their crews decamp for the majors."*

The rapidly growing shortage of aircraft mechanics has now supplanted the pilot shortage in terms of concerns that are foremost in the minds of industry leaders as well as the traveling public. In 2022, industry analysts Oliver Wyman⁹ remarked, *"Behind the scenes yet another labor shortage looms – not enough aircraft mechanics".* At that time, it predicted that while there were *"just enough"* mechanics to handle the maintenance, repair, and overhaul workload on the North American fleet in 2022, in 2023 there would be a shortfall of roughly 12,000 to 18,000 mechanics depending on economic and fleet growth. This gap, it concluded *"represents about 14% of the total mechanic workforce."* Moreover, it posited, *"that imbalance between supply and demand – including licensed and unlicensed labor working on aircraft and in the backshops – will persist through the rest of the decade ..."*

By all accounts, these predictions have rung true and, in 2024, the mechanic shortage is squarely on the radar of **Allianz Commercial's** claims practitioners.

"First and foremost, and from a risk management perspective, there is no escaping the fact that this shortage has resulted in less experienced mechanics being on the line," says **John Nowicki**. *"Of course, the obvious concern is that the mechanic shortfall ultimately leads to an aviation accident, despite the systems of checks and balances in place in the industry."*

As for claims of a more attritional nature, the mechanic shortage could result in longer claim cycle times, as it may take longer to complete repairs if vendors lack manpower, or if the new generation of mechanics is not as efficient as the previous one, with its decades of experience. Further, claim cost could be driven up if new mechanics do not acquire or maintain the same skillsets as veteran mechanics. That is, if a mechanic does not have the ability to repair a part, the part will need to be replaced with a new one, which typically is more costly.

Helicopter excursion claims

In the aftermath of the Covid-19 pandemic, where lives were largely confined to the four walls of one's home, it is only natural for the public to wish to travel more frequently and to more exotic and remote places in search of 'once-in-a-lifetime' experiences. This may account for the growing demand **Allianz Commercial** sees for helicopter sightseeing excursions and extended getaways, including 'heli-skiing', 'heli-fishing,' or 'heli-hiking' trips.

"As a society, and with the return of tourism in full swing, we are becoming a more adventurous population," says **Doug Wicks, Director, Aviation Claims, Allianz Commercial**. *"The traveling public is not afraid to fill their downtime with experiences that, in the past, may have been considered rather risky."*

In fact, in its previous [aviation review](#), Allianz Commercial remarked that leisure flights over spectacular landscapes in tourist destinations were growing in popularity. It also noted, however, that the problem with such landscapes is that they can also be the most demanding and unforgiving. Post-pandemic there are potential questions about the skills of some pilots flying over such locations, particularly if they are unfamiliar with the territory.

Insurance professionals are trained to be on the lookout for a correlation between a certain activity or trend (such as an uptick in 'heli' trips) and increased claim counts and/or severity. **Till Kürschner** explains that the demand for sightseeing, 'heli' and other adventure helicopter flights brings into focus the myriad factors that influence these types of excursions – and, hence, the insured risk – including specialized pilot training, rough weather conditions, remote locations, seasonal swings in passenger demand and economic pressures on flight operators.

Not surprisingly, third-party claims in this area can be quite significant and include allegations of severe bodily injury and, sadly, death as a result of a crash. Depending on the insured, first-party hull coverage may also be owed. **Till Kürschner** adds that the majority of the 'heli' claims **Allianz Commercial** sees are in North America, although there have also been cases in Norway, Nepal and Switzerland.

Doug Wicks, who is based in Canada where 'heli' excursion opportunities are abundant, adds that from a claims and litigation management perspective, one thing to keep in mind when dealing with insureds operating in this general aviation sector is the strength and enforceability of the liability waivers the helicopter passengers will undoubtedly be required to sign.

"Are the waivers written in the passengers' native tongue? Do the passengers fully understand what they are signing?" says **Doug Wicks**, adding that in some jurisdictions tort law holds that waivers of liability – especially those involving physical harm – may be found void as against public policy or otherwise unenforceable. Canadian courts, however, find the opposite. There, well-written and properly executed waivers are generally upheld by the courts. From a risk management and claims perspective, it is important to know the content of the waivers being used by an insured and be familiar with the law of the jurisdiction in which the waiver is sought to be enforced.



Runway incursions on the rise

They are among the most persistent threats to aviation safety, given the potential consequences of a collision incident. With airports expected to become even busier in future, what can be done to reduce the risks?

On January 2, 2024, an Airbus A350 suffered a serious accident during landing at Tokyo’s Haneda airport¹⁰. A Dash 8 aircraft of the Japanese Coast Guard entered the active runway and collided with the landing airplane. Although the Japan Airlines crew was able to bring the heavily damaged airplane to a halt and safely evacuate the 379 people on board, tragically all crew members in the Coast Guard airplane died and both aircraft were destroyed in this runway incursion.

Such incidents rank among the five highest-risk categories of events that must be addressed to mitigate the risk of aviation fatalities, according to the International Civil Aviation Organization (ICAO)¹¹.

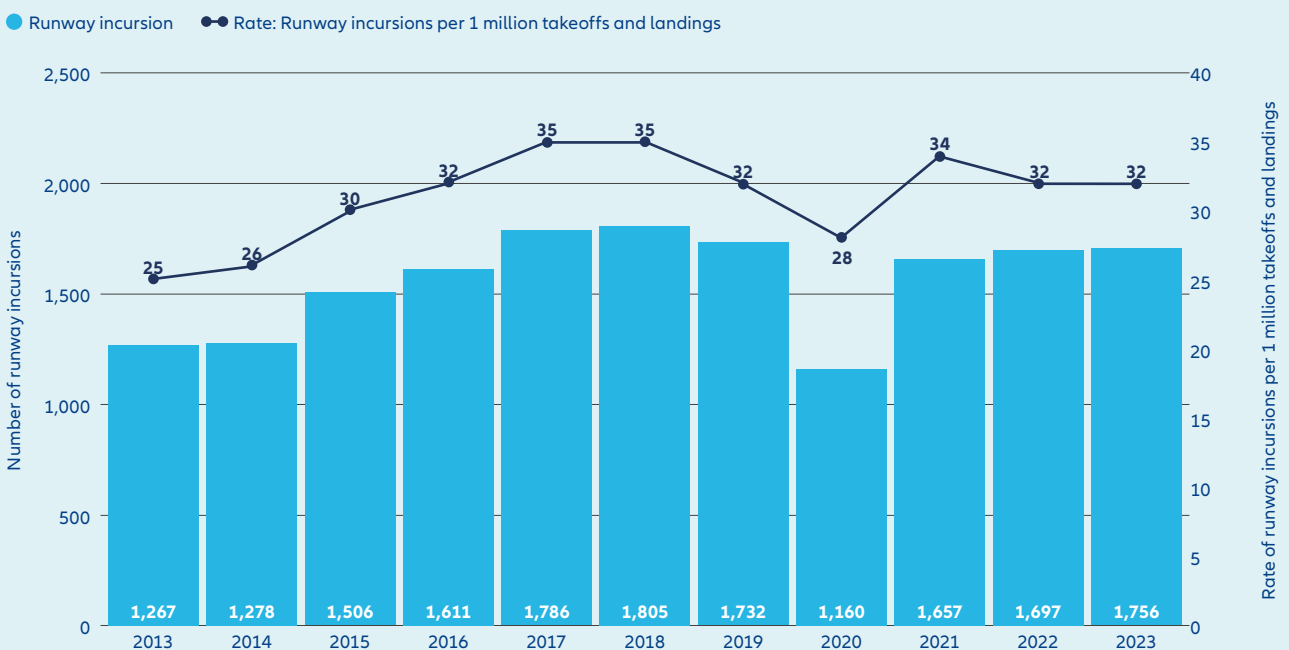
In the US, over the last 10 years (since 2013) the rate of runway incursions (per 1 million takeoffs and landings) rose from 25 to 35 in 2018. It dropped to 28 in 2020 (influenced by the Covid-19 pandemic) before rising again to over 30 in subsequent years.

What can be done to reduce the risks?

There are three main areas which the aviation industry needs to continue to focus on in order to reduce the chances of a runway incursion occurring, according to **Dave Warfel, Head of Aviation, North America, Allianz Commercial**.

Number of runway incursions in the US, the world’s largest aviation market

per calendar year



Sources: Federal Aviation Administration, Close Calls and the New York Times: What you need to know; US Department of Transportation, Addressing Close Calls to Improve Aviation Safety, November 9, 2023

Firstly, ensuring good communication between the crew and Air Traffic Control (ATC) during taxi is crucial. The use of aviation English, as well as a sound language proficiency, needs to be established and adhered to. Standard International Civil Aviation Organization (ICAO) phraseologies need to be used to keep situational awareness for all participants associated with runway operations. Pilots need to acknowledge and read back all clearances and instructions, including the call sign and runway designator, and, particularly, full read back of any holding position instructions. If clearances are not clearly understood, the cockpit crew should not hesitate to request clarification.

The sterile cockpit rule needs to be strictly adhered to as well. This regulation specifically prohibits crew member performance of non-essential duties or activities while the aircraft is involved in taxi, takeoff, landing, and all other flight operations conducted below 10,000 feet mean sea level (MSL), except cruise flight.

Secondly, cockpit crews need to ensure they have a proper knowledge of airport surface markings, lights and signs. Thirdly, technology has a crucial role to play in supporting flight crews and ATC. Examples include:

- the Airport Movement Area Safety System (AMASS), a software package that takes data from the ASDE-3 airport surface movement detection radar (installed at major US airports) and processes it to provide controllers with aural and visual warnings of potential collision risks
- Airport Surface Movement radar, known as ASDE-X, a system designed to receive and process automatic dependent surveillance – broadcast signals from aircraft
- Airport moving map with aircraft location on Head Down Display
- New generation of Head Up Display to aid with ground operation as a tactical tool to taxi the aircraft in low visibility conditions depending on the availability of certain new technologies such as: Surface Guidance System (SGS), Enhanced Vision System (EVS) based on forward looking infrared sensors and Synthetic Vision System (SVS) to provide the display of conformal images assembled from a database.

Defining a runway incursion

A runway incursion describes “any occurrence at an airport involving an aircraft, vehicle, person or object on the ground that creates a collision hazard or results in the loss of separation with an aircraft taking off, intending to take off, landing or intending to land”, according to US aviation regulator, the Federal Aviation Administration (FAA). In short, an aircraft, vehicle, or a person on the runway without clearance.

Examples include inadvertent crossing of a hold-line and / or entry onto an active runway (with or without loss of separation with an aircraft, vehicle or pedestrian); takeoff / landing without clearance; simultaneous takeoff and landing from the same or from intersecting runways; or takeoff / landing from / onto the wrong runway.

Major contributing factors

Contributing factors that lead to runway incursions can be divided into four major areas. These include:

1. Weather-related factors such as:

- Low visibility conditions
- Snow covered airport surface markings
- Night time operations

2. Airport-related factors such as:

- Congested airports
- Closely spaced parallel runways
- Complex and confusing intersections

3. Air Traffic Control-related factors such as:

- Incorrect or inadequate clearance
- Use of non-standard phraseology
- Pilot readback errors not detected by controller

4. Crew technique-related factors such as:

- Improper knowledge of airport surface markings, lights and signs
- Inadequate pre-flight or approach preparation
- Distraction of the crew (violation of the sterile cockpit rule).



Action plans and looking to the future

Of course, given the headlines runway incursions make around the world, and the potentially serious consequences of an incident, particularly if an incursion ends in a collision, airlines, multinational organizations, and aviation authorities have already started various initiatives such as GAPPRI (Global Action Plan for the Prevention of Runway Incursions) to overcome the threat to aviation safety.

Driven by EUROCONTROL, a pan-European civil-military organization dedicated to supporting European aviation, and supported by leading aviation companies and organizations, the action plan is split in two volumes. The first volume¹² addresses agreed recommendations to civil aviation organizations such as aerodrome operators, air navigation service providers, aircraft operators, manufacturers, and regulators. Furthermore, research and development recommendations to states, international organizations and the industry are provided. The second volume will provide explanatory and guidance material and best practices.

*“Runway incursions are a perennial topic of concern which will become even more pressing as airports are predicted to become more crowded in the future, making it challenging for flight crews to navigate their way to the runway or choose the right taxiway,” says **Dave Warfel**. “The workload for flight crews and Air Traffic Control is increasing considerably and the likelihood of mistakes or oversights leading to runway incursions will likely grow. We strongly support the advancement and implementation of technical solutions which are crucial to counter this development.”*

GPS jamming and spoofing incidents cause concern

The phenomenon is on the rise, posing several challenges for flight crews and a serious threat to the safety of air navigation

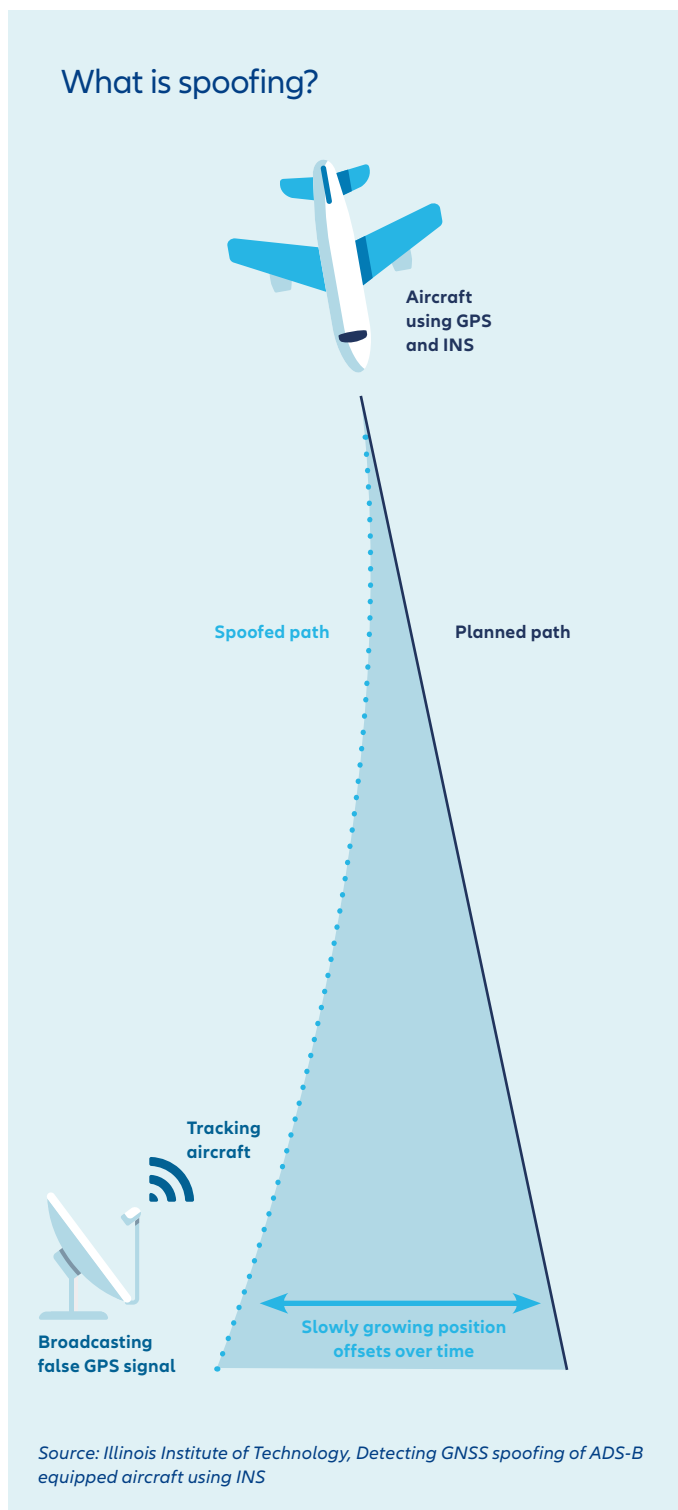
Global Positioning System (GPS) jamming uses a frequency transmitting service to block or interfere with radio communications, usually by broadcasting signals from the ground that are stronger than satellite-based signals. The result is that an aircraft is unable to receive standard GPS signals and its navigation system must therefore rely on other inputs to determine its position. Although flight crews know how to respond to a jamming attack on a GPS system, nevertheless, it can catch those who are unprepared off-guard, leading to potentially dangerous situations.

GPS spoofing, also known as simulation, refers to the practice of manipulating or tricking a GPS receiver by broadcasting false signals. Essentially, it misleads the GPS receiver into believing it is located somewhere it is not, resulting in the device providing inaccurate location data. Compared to jamming, spoofing represents a much more sophisticated attack which actively exploits weaknesses in the aircraft's navigation system, according to **Bernhard Koessler, Global Airlines Underwriting Practice Leader, Allianz Commercial.**

To date, most reported spoofing attacks have come from Eastern Europe and the Middle East (see *graphic on page 21*), as well as the Black Sea region. Incidents have escalated since the onset of Russia's invasion of Ukraine. However, operators should be cognizant of the potential for spoofing anywhere.

Examples of incidents have included false GPS signals which have tricked aircrafts' flight management systems into indicating that the aircraft is many nautical miles off-track. The potential consequences in the event of a serious prolonged incident are obvious.

"Aviation has suffered a significant increase in GPS spoofing and jamming incidents as geopolitical tensions have heightened around the world," says **Bernhard Koessler.** *"While there is no simple way or a 'silver bullet' to prevent this trend continuing, particularly when it comes to GPS spoofing, there are a number of things that companies are doing or can do to raise awareness of these situations and potentially mitigate the impact of them."*



GPS jamming awareness

When it comes to GPS jamming, creating awareness and introducing specific training of flight crews to help them detect these errors, especially for flight crews transiting high-risk flight regions, is key, as well as providing recommendations to resolve these in-flight.

In addition, avoiding areas where jamming might be active, if it is possible to do so, is important. Fly-by-wire (FBW) aircraft have extensively integrated GPS into their designs to such an extent that the US aviation regulator, the Federal Aviation Administration, has issued warnings to these aircraft to avoid areas where GPS jamming may be active¹³.

GPS spoofing awareness

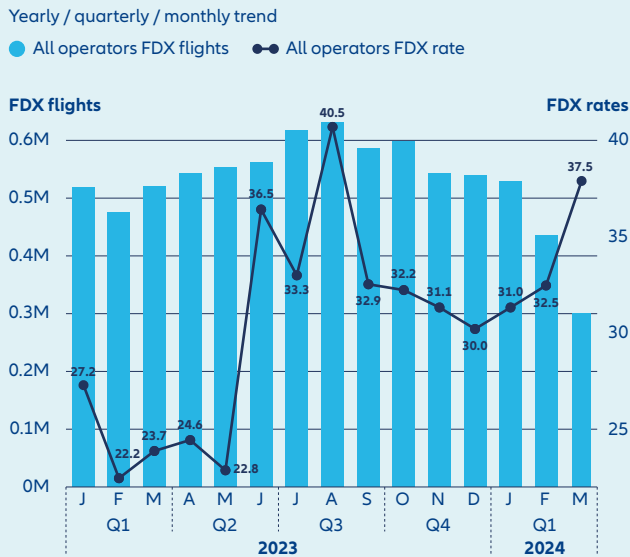
As with combatting GPS jamming, creating awareness and introducing specific training of flight crews to help them detect spoofing is key, especially for those transiting high-risk flight regions, as well as providing recommendations to resolve these in-flight. Similarly, avoiding areas where spoofing may be active, if it is possible to do so, is also important.

To counter disruptions, maintaining traditional navigation aids and systems is essential. They provide a reliable backup, ensuring ongoing operation and safety.

Creating a 'firewall' that attempts to block or eliminate anomalous GPS signals is also a potential mitigation.

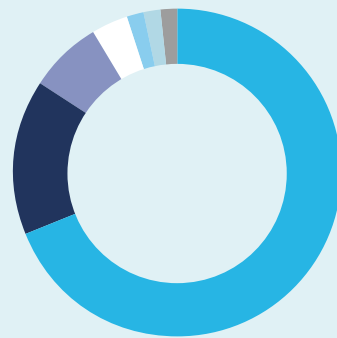
"The concern for the aviation industry is technical solutions have to be constantly updated to keep up with the hackers," says Bernhard Koessler.

Global Navigation Satellite Systems interference



68% increase in GPS signal loss events from the baseline* to the peak in August 2023.
 The current average number of events is still 40% higher than the baseline*.
 *Baseline set as Q1 2023

Distribution of GPS Signal Loss Incidents by Region (Jan 2023 – Mar 2024)



Europe*	68.9%
Middle East and North Africa	15.4%
Commonwealth of Independent States	7.2%
Asia-Pacific	3.6%
Africa	<1%
North Asia	<1%
North America	<1%

*Incidents in Europe are predominantly occurring in Eastern Europe; these have escalated since the onset of the Russia Ukraine conflict.

Source: International Air Transport Association (IATA), 80th AGM and World Air Transport Summit Dubai, UAE, Operations and Safety Update, June 2-4, 2024
 FDX - Flight Data Exchange

Pressing security topic

Obviously, the rapidly evolving topic of GPS jamming and spoofing is already high on the agenda of authorities and multinational organizations. The European Union Aviation Safety Agency (EASA) and the International Air Transport Association (IATA) held a workshop in January 2024 to share incident information and potential remedies given that *“interference with satellite-based services that provide information on the precise position of an aircraft can pose significant challenges to aviation safety”*¹⁴.

Workshop participants agreed on some measures to make navigation services provided by Global Navigation Satellite Systems (GNSS) more resilient, including reporting events, eventually to a common database; sharing aircraft manufacturers’ guidance to operators; sharing EASA alerts about attacks with relevant stakeholders; and ensuring a backup system with the minimum operational network of traditional ground-based navigation aids, including Very High Frequency Omnidirectional Range Stations (VOR), Distance Measuring Equipment (DME) and Non-Directional Beacons (NDB).

EASA has also issued a Safety Information Bulletin (SIB No 2022.02R3) which tackles the topic of “Global Navigation Satellite System Outages and Alterations Leading to Communication / Navigation / Surveillance Degradation”.



eVTOLs take flight

Electric vertical takeoff and landing aircraft will soon be in our skies, transforming modern day flight with several different uses. How will they impact sustainability, safety, and insurance in the aviation sector?

Aviation is one of the leading drivers of economic growth and with governments all around the world setting targets for achieving Net Zero emissions in future, the aviation industry is undergoing a transformation to pave the way for a more sustainable future. One significant development is the introduction of Advanced Air Mobility (AAM), an air transport system concept that integrates new aircraft designs and flight into existing and modified airspace operations. The main objective of AAM is to ensure safety and efficiency when moving both people and cargo across regional and urban spaces. One such exciting example is electric vertical takeoff and landing aircraft (eVTOL).

The components of the ecosystem encompass eVTOL aircraft, Maintenance, Repair and Operations (MRO) services, flight operations, and both physical and digital infrastructure. As with any new technology, adaptation is essential, yet these changes will undoubtedly attract an abundance of new customers.

Exponential growth expected

“The aviation sector is excited about the prospect of eVTOL aircraft entering the industry in the near future (with some eVTOL aircraft slated to be certified later this year),” says Ben Cannon, Underwriting Manager, General Aviation, at Allianz Commercial. “More than a thousand concepts have already been published, all of which are designed to serve different types of objectives, such as passenger or cargo transportation, medical evacuation, firefighting, offshore operations and many others.”

Urban Air Mobility (UAM) is predicted to experience exponential growth, with revenues projected to surge from US\$1bn in 2030 to US\$90bn by 2050, according to consultant Roland Berger¹⁵, accompanied by an anticipated deployment of 160,000 passenger drones worldwide. This distribution is divided among city taxis (36%), airport shuttles (35%), and intercity services (29%).

This represents one of the most significant transformations the aviation industry has witnessed. Currently in the testing phase, the eVTOL aircraft proposes short-term plans for piloted flights, with the overarching objective of transitioning to remote operations. This initiative aims to showcase new technologies and advancements in autonomous flight capabilities. The proposed plans envision the eVTOL aircraft operations managed from specialized control centers.

Functionality and benefits

So, how does an eVTOL aircraft function? It operates by integrating electric propulsion, vertical lift capabilities, and sophisticated flight control systems and this innovative aircraft enables vertical takeoff and landing, eliminating the necessity for traditional runways. Multiple rotors and fans within the aircraft generate thrust, facilitating vertical ascent, descent, and hovering. The flight control center oversees stability and autonomous flight operations, ensuring the safety of both the aircraft and its occupants. Advanced onboard technology optimizes battery health, facilitates safe navigation, obstacle avoidance, and provides real-time data on the aircraft's whereabouts.

The eVTOL aircraft offers a range of benefits that promise to revolutionize UAM. Firstly, its electric propulsion systems enable zero-emission flights, which significantly reduces air pollution and greenhouse gas emissions, contributing to a cleaner environment. Secondly, due to its vertical takeoff and landing capabilities, only small vertiports or landing pads are needed, which can be located within urban areas, ideal for densely populated cities. Additionally, eVTOLs minimize noise emissions as the flight control systems ensure quieter and safer operations with a significant benefit for urban commuters with the reduced commute time. Lastly, the potential autonomous flight capabilities and advanced technologies of the aircraft pledge to enhance safety, reliability, and affordability, making UAM a viable and sustainable mode of transportation for the future.

Sustainability and safety

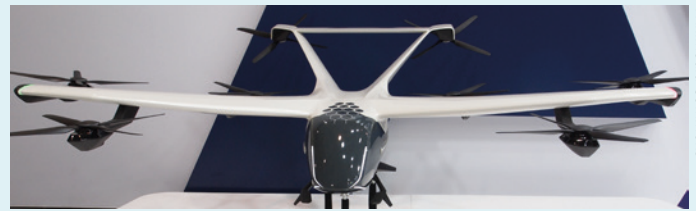
While recognized as a hard to abate sector, decarbonization is a priority for the aviation sector, as is protection of the environment (including wildlife and noise pollution). AAM poses an opportunity to eliminate seven million tons of CO2 globally if aircraft are powered entirely by renewable energy, according to EY¹⁶. The aviation industry is renowned for its commitment to safety, and authorities are actively embracing regulatory frameworks that facilitate the operation of AAM aircraft while harnessing the commercial potential of the market. Important regulators such as the European Union Aviation Safety Agency (EASA), the Federal Aviation Administration (FAA) in the US and the Civil Aviation Authority (CAA) in the UK are developing the frameworks that will ensure safe operations of AAM. The International Civil Aviation Organization (ICAO) is heading efforts to harmonize certification systems globally. The inaugural Advanced Air Mobility Symposium, scheduled for September 2024 and led by the ICAO working group, marks a significant milestone in these endeavors. These developments signal a promising outlook for the establishment of cohesive global regulations soon.

The insurance perspective

From an insurance perspective, this innovative technology is exciting, and its introduction necessitates updates to policy wordings, the development of unique programs, changing regulatory environments, and the disruption of established sectors by start-up operators and manufacturers.

Insurance is already being provided to eVTOL manufacturers for their test flights. The next stage of development will require insurance for operational use. This will look like standard aviation aircraft cover with hull and liability insurance under the same policy with ancillary coverages such as personal accident and hull war as options. Terms and conditions for these policies remain to be fully established until certification by the competent authorities.

“As with every development of new technologies, there will always exist uncertainty,” says Ben Cannon. “For now, the expectation is that the operational risks will remain the same, as currently seen in general aviation operations, such as loss of power, mid-air collisions, or foreign object damage. Most eVTOL prototypes are valued lower than equivalent sized fossil-fuel powered aircrafts of the latest generation, hence limiting the hull exposure of insurers.”



Top to bottom:
CityAirbus NextGen, Volocopter 2X, Wingcopter 178 HL

However, due to the sensitive nature of aircraft movements in dense urban areas and its implication for liability claims, underwriters will deeply scrutinize the safety management systems of operators to ensure that full regulatory compliance is achieved. Representatives from the general aviation, airlines, and aerospace sectors of **Allianz Commercial** are already participating in working groups and the International Underwriting Association to discuss developments in this market. Indeed, **Allianz Commercial** is already actively supporting a major eVTOL aircraft manufacturer through its coverage solutions.

“In summary, eVTOL aircraft and AAM offer the potential to revolutionize aviation, fostering sustainability, efficiency, and enhanced passenger experiences,” says Ben Cannon. “As this technology advances, it is poised to unlock unprecedented opportunities and fuel innovation within the aviation sector. With eVTOL aircraft at its forefront, the aviation industry is poised for remarkable growth and transformation and insurers will also play a pivotal role in supporting companies on this exciting journey.”

Artificial Intelligence takes off

AI brings significant benefits for the aviation sector but there are challenges to consider.

As with seemingly every facet of life, the aviation sector is primed for a significant transformation with the integration of Artificial Intelligence (AI). In fact, this transformation is already underway – aviation has been using AI for many years, and the current speed of developments means it is revolutionizing the industry in various ways, from enhancing flight safety and improving maintenance procedures to personalizing the passenger experience and optimizing route management.

AI can help optimize flight paths for fuel efficiency and on-time performance. By analyzing weather patterns, air traffic, and other factors, it can suggest the most efficient routes, saving time and reducing fuel consumption. While incorporating such systems involves investment, it should also improve the bottom line with an added benefit of potentially reducing emissions and contributing to airlines' sustainability goals.

AI can also have a direct impact on customer interactions. AI-powered chatbots can provide anything from instant customer service to personalized recommendations for in-flight entertainment and services. The end result should be increased customer satisfaction as well as long-term cost savings.

Potential efficiency improvements can also be extended to the wider aviation ecosystem including Air Traffic Control, where AI is being implemented in systems to manage the complex flow of air traffic more efficiently. By processing vast amounts of data, AI can help controllers make more informed decisions and maintain safety in increasingly crowded skies.

*"Perhaps the most interesting area for AI development for the sector (and its insurers) lies in improvements to flight safety, maintenance and repairs," says **Adam Tozzi, Head of Underwriting Global Tasks and Processes, Aviation, at Allianz Commercial.** "AI algorithms can analyze data from flight recorders and sensors along with historic data to predict potential system failures before they occur, allowing for preventative maintenance and reducing the risk of accidents. AI-driven simulations and predictive analytics can be used for training pilots, providing them with realistic scenarios and helping them make better decisions in critical situations. AI can even improve security at airports, in particular via biometric identification and evaluation."*

Further into the future, we may even see AI introduced into cockpits to assist with the all-important business of flying the plane. An important part of this will be the certification process. AI could achieve a good result but in a completely different way to a human. This is a big challenge for manufacturers with the operational liability that may transfer to them with autonomous aircraft.

Challenges on the radar

And with reward comes other risks. While AI offers numerous benefits, there are challenges to consider, such as ensuring data privacy and maintaining rigorous safety standards as AI systems become more autonomous.

*“Data in particular presents a challenge. An AI program is only as good as the data it consumes. Poor quality data could lead to incorrect outputs and unconscious bias, affecting safety, efficiency, and passenger experience,” says **Adam Tozzi**. “Users of AI systems must be sure the inputted data is correct to avoid negative outcomes – particularly around safety. A human-centric and monitored approach remains essential to ensure aviation maintains its superb reputation for safety.”*

That said, the more delicate human capital element cannot be ignored. AI might increase efficiencies, but it might also reduce jobs and opportunities, particularly for younger people starting out in the sector. The industry has a responsibility to continue to retain and train the best individuals to ensure knowledge is passed down the generations rather than lost through reliance on AI systems.

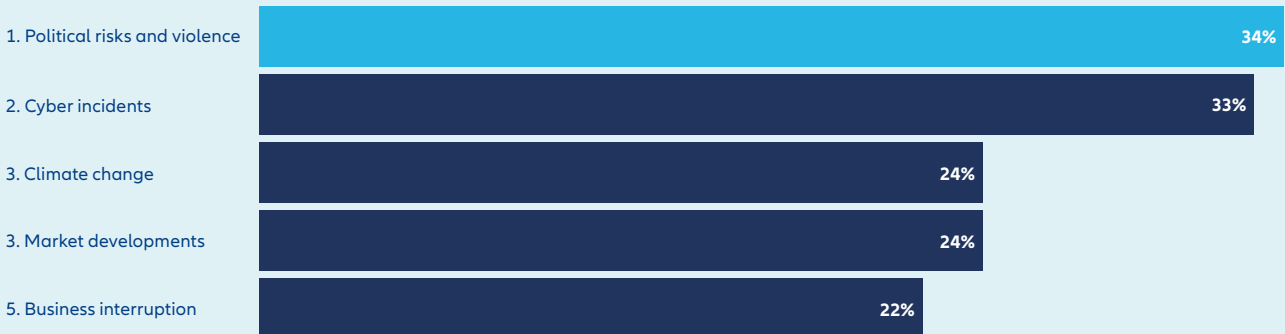
Finally, there are also legal issues around data – data protection laws; intellectual property considerations and confidentiality requirements – with the regulatory environment likely to change to keep pace with such a fast-moving sector.

Focus on cyber

The focus on data security also sits alongside the greater focus on cyber threats, which was the top risk in the most recent [Allianz Risk Barometer](#) and the second top risk as voted for by aviation respondents. The increasing concern is not a surprise given certain high profile cyber incidents in the aviation sector in recent years. During 2023 alone, cyber incidents impacted the likes of Air Canada, Kenya Airways, Boeing, Manchester Airport, Copenhagen Airport, among many others. While business interruption cyber events are not covered under traditional aviation insurance, standalone cyber insurance offers solutions that can help protect companies against these risks.

In conclusion, AI holds the promise of making aviation safer, more efficient, and more enjoyable for passengers. As the technology continues to evolve, it will undoubtedly unlock new possibilities and drive innovation in the aerospace sector. The aviation industry is poised to soar to new heights with AI as a fundamental part of its journey into the future. Aviation insurers have a crucial role to play in helping the sector on this exciting journey.

Allianz Risk Barometer 2024: Top 5 risks for the aviation and aerospace sector



Source: Allianz Commercial

Figures represent how often a risk was selected as a percentage of all responses for that industry sector. Respondents: 58. Figures don't add up to 100% as up to three risks could be selected

Sustainability standards drive aviation accountability

Developments in Sustainable Aviation Fuel and innovations such as eVTOLs steal the headlines, but compliance may have the greatest impact on decarbonization overall.

While aviation is a relatively small contributor to global emissions, (around 2% in 2022, according to the International Energy Agency), it is regarded as a potentially hard to abate industry in the push for decarbonization. Notwithstanding this, the sector has pledged to reach Net Zero by 2050.

The lack of a silver bullet solution for decarbonization should not take away from the exciting developments currently underway. Sustainable Aviation Fuel (SAF) continues to attract a lot of attention with mandatory targets starting to be implemented and global airlines increasingly vocal about their commitments (when not falling foul of advertising standards agencies – a number have also been censured for making misleading claims about their environmental impact). Excitingly, Virgin Atlantic completed the world's first transatlantic flight fueled entirely by SAF at the end of 2023¹⁷, demonstrating its feasibility as a power source.

Elsewhere, electric vertical takeoff and landing (eVTOL) aircraft (see page 23) continue to advance apace, as do improvements on existing technology, such as enhanced engine efficiency or aerodynamic design, and operational developments, such as better and more efficient route planning or mission tailoring, which could potentially have a big impact on the sector's emissions. The future is both bright and is already reducing emissions.

"On a more prosaic level, one unheralded development that could force greater accountability in larger aviation companies is the development and subsequent implications of the European Union's Corporate Sustainability Reporting Directive (CSRD), as well as other similar regulations worldwide," says Adam Tozzi, Head of Underwriting Global Tasks and Processes, Aviation, at Allianz Commercial.

Standardizing and harmonizing sustainability

The CSRD is an EU regulatory framework that aims to standardize and harmonize sustainability reporting practices across industries, including the aviation sector. It requires companies to disclose comprehensive information on their environmental, social, and governance (ESG) performance and impact. It builds on the scope but is a significant widening of the previous Non-Financial Reporting Directive (NFRD).

In particular, the CSRD introduces new mandatory reporting standards which have been developed by the European Financial Reporting Advisory Group (in conjunction with the European Commission) called the European Sustainability Reporting Standards (ESRS). Currently one sector-agnostic ESRS exists (adopted in June 2023). There are plans for transportation specific standards, but the EU Commission recently delayed the adoption of sector specific standards for two years to allow companies to focus on the first set of standards.

The ESRS operate on a “double materiality” perspective – that is to say, they oblige companies to report both on their impacts on people and the environment, and on how social and environmental issues create financial risks and opportunities for the company.

As a minimum, reporting will include a description of companies’ business model and strategy as well as opportunity and resilience to sustainability risks and transition plans; sustainability targets and their progress status; sustainability governance; sustainability policies; incentives schemes linked to sustainability matters; due diligence of sustainability matters; principal adverse impacts and those of its value chain; and principal sustainability risks and their management.

Further, pursuant to the EU Taxonomy Regulation and as part of their non-financial reporting, those entities will be required to disclose: the proportion of their turnover derived from products or services associated with economic activities that qualify as environmentally sustainable; and the proportion of their capital expenditure and the proportion of their operating expenditure, in each case related to assets or processes associated with economic activities that qualify as environmentally sustainable.

The CSRD applies to a broad range of entities, such as listed companies, large companies, and non-EU companies that operate within the EU market or have significant EU subsidiaries or branches. It also covers small and medium enterprises (SMEs) listed on EU regulated markets, with some exceptions and transitional periods. This will of course include a number of aviation companies from airlines and original equipment manufacturers (OEMs) to aircraft lessors and, of course, aviation insurers.

Where Europe has led, the US has followed with the Securities and Exchange Commission (SEC) adopting rules in March 2024 to enhance and standardize climate-related disclosures by public companies and in public offerings (albeit implementation is currently frozen as a result of ongoing litigation). Among the things the final rules require a registrant to disclose are: material climate-related risks; activities to mitigate or adapt to such risks; information about the registrant’s board of directors’ oversight of climate-related risks and management’s role in managing material climate-related risks; and information on any climate-related targets or goals that are material to the registrant’s business, results of operations, or financial condition.

Costs and benefits

What will this look like in practice? First and foremost, there are likely to be significant cost consequences for companies caught by the reporting rules via the implementation of reporting systems, the human capital requirements and auditing the reporting. Companies in the aviation sector will have to familiarize themselves with the CSRD and determine whether they are required to report. Those that are will need to assess current practices and identify any reporting gaps. Data collection and monitoring will need to be improved to ensure all sustainability data is captured accurately and reliably.

*“However, when companies look beyond the costs, there are some real potential benefits to the standardized reporting. If done right, it may foster investor and stakeholder confidence in the industry and the best performing companies,” says **Adam Tozzi**. “It may even enhance reputation and brand image for, say, airlines that perform well and improve their metrics against standardized KPIs, demonstrating industry leadership in decarbonization. Most importantly, by improving reporting standards and improving stakeholder engagement, such reporting should improve sustainability practices across the sector. Companies will be forced into engaging with the topic (if they aren’t already) by such accountability. Investment will surely follow engagement.”*



Insurers have a key role to play in de-risking the transition.
Find out more in [The journey to sustainable aviation | AGCS](#) (allianz.com)



Insurance outlook

Seatbelt sign on: turbulence ahead

The continual growth of the aviation sector will see gross written insurance premiums (GWP) hit a 20-year high in 2024 of more than US\$8bn. The standalone war market is also experiencing significant growth.

The drivers of market pricing are a delta over the past two renewal cycles between the direct aviation market pricing and the reinsurance market, very large reserves on some parts of the manufacturing portfolio and inflation (repair and supply chain costs as well as social inflation, US awards being of particular note).

The underlying fundamentals could result in a quicker turnaround than in previous cycles. The direction of reinsurance market pricing more accurately reflects the bigger picture of recent aviation overall market profitability (total premium inflows versus claims outflows). This is before any Russian/Ukraine impacts – legal fees alone for some market players are considerable.

Capital preservation / cost of capital, actuarial technical adequacy, increased input costs (in the form of reinsurance), claims trends, volatility management and the ever-present potential for large loss in the class which sits below the statistical norm all under-pins potential future direct market capacity deployed and rating considerations.

A staggering increase

Total GWP in 2024 is anticipated to be more than US\$8bn – at a 20-year high, driven by the continual growth of the aviation sector. General Aviation will supply the lion's share, generating approximately 47% of the total; Airlines will provide approximately 35%, Aerospace 14% and Contingent around 4%. Within these figures, the standalone war market accounts for roughly 13% of this anticipated premium (US\$1.1bn), a staggering increase from 2021 when it accounted for just 4% of global GWP.

*"Yet dark clouds continue to hover for insurers, with well publicized losses and social inflation pressurizing bottom lines," says **Tom Fadden, Global Head of Aviation at Allianz Commercial.** "An increased focus on the cost of capital if the market softens could result in a quicker turnaround than in previous cycles. The role of regulators may be important here. They continue to actively monitor the insurance market to ensure satisfactory capitalization.*

"From the customer side, we are seeing a growing interest in multinational insurance and more enquiries for international insurance placements for clients' entire programs across lines of business. These enquiries are driven by increasing geopolitical and regulatory concerns and a desire from clients for a highly-managed insurance structure."

Insurers (and their clients) also stand on the precipice of the next data revolution and the uses (and complexities) of Generative Artificial Intelligence (GenAI). These are challenging times, but full of opportunity. There is also the exciting push for Net Zero, with remarkable and wide-ranging effects across the sector.

*"We anticipate the first operational electric vertical takeoff and landing (eVTOL) aircraft risk will be placed into the market this year," says **Tom Fadden.** "In a market predicted to grow exponentially in the next 25 years, this is an exciting development. The aviation insurance industry can play an important role in supporting this revolution of air travel."*



The need for effective accumulation management

The accumulation potential of aviation policies needs to be properly understood, evaluated, and monitored to protect insurers' balance sheets.

In the world of insurance, accumulation management has largely been seen as a discipline related to natural catastrophe prone classes, such as property or energy.

Risks covered under those lines of business are mostly static, so when underwriters evaluate a risk, they know where it is located and it is almost certain that it can still be found at the same place one year later, at the time of renewal. Usually, based on their location, risks are allocated to hazard zones for which insurers have pre-defined appetites/ limits against which, depending on the specific hazard, the actual value, or Probable Maximum Loss (PML) value, is run.

All this information gets entered ideally into one system that is owned by the respective insurance company and used to produce reports and analysis across the different classes of business based on scenarios that could potentially happen, so called Realistic Disaster Scenarios (RDS).

All of this is quite a sophisticated process that has been in place for a long time.

Changing risk profile

Within aviation, the Covid-19 pandemic showed that airplanes can be static exposures, parked for months in locations expected to have stable weather conditions, although the odds of an ever-changing climate proved the opposite. With rising weather extremes around the globe, airports are not immune to natural catastrophes, such as hail, tornados or floodings, at the same time as other perils such as political tensions and instability are heightened.



The world of aviation insurance might face the largest accumulated loss in its history

The world of aviation insurance might face the largest accumulated loss in all of its history from the Russian confiscation of several hundred aircrafts owned by big Western aircraft lessors, in the wake of its invasion of Ukraine¹⁸. So called contingent lessor policies insure aircraft lessors against their financial interest in the aircrafts that they lease out to airlines. Many markets, which were writing these policies, now find themselves in a difficult situation which may have been avoided with a proper accumulation management tool and effective steering framework in place.

Allianz exited this segment in 2019 after it concluded that accumulation could not be controlled effectively: *“The more we looked into this segment, the less convinced we were that we had the tools to control the accumulation we would face through these policies,”* says **Tom Fadden, Global Head of Aviation at Allianz Commercial**. *“The most complex risks require best in class accumulation steering. Since then, Allianz has been developing and utilizing best in aviation class accumulation management and steering tools.”*

Hull war developments

However, as a result of Russia’s war in Ukraine, and re-emphasized by events such as the civil war in Sudan, which resulted in aircraft being destroyed at Khartoum airport¹⁹, as well as looming tensions in the Middle East and elsewhere in the world, some specialized war markets and larger insurance carriers decided not to write hull war policies any longer. This has left some companies struggling to find enough capacity to insure their hull values against war perils including strikes, riots and terrorism. Allianz stepped in and has offered hull war policies since September 2023. However, the key to this decision was the ability to actively track and steer accumulations across the portfolio, says Fadden.

Russia’s invasion of Ukraine has also had a significant impact on the aviation insurance market.

*“Allianz has partnered with a leading provider of insurance of aviation war perils to steer accumulations of all airline fleets we insure based on live data, which gives an exact view of our exposures at any place at any given time,” says **Tom Fadden**. “With this live information, which relies on satellite transponder data, Allianz is able to track its portfolio against aggregates per country.”*

These aggregates are defined based on individual risk profiles per country and the composition of the hull war portfolio is linked to these aggregates. RDS, considering latest developments and political conflicts, stress test the portfolio, the consumption of country aggregates and inform the reinsurance strategy.

*“These effective accumulation management capabilities enable Allianz to be a long-term partner for our clients, also in more challenging classes,” says **Tom Fadden**.*



Dealing with global risks in the aerospace business

In today’s fast changing world aviation companies face risks that span borders and regulatory regimes, which is resulting in a growing interest in multinational insurance. How does it work?

Aerospace is an international business – many companies in the sector have a multinational footprint and subsidiaries worldwide, be it production lines in other countries or companies providing support (maintenance, repair, etc.) to local firms that use their products. Original Equipment Manufacturers (OEMs) of aircraft or engines and manufacturers of aircraft parts establish units in other countries in order to be close to their own customers or to use cost-efficient workforces and infrastructures.

Therefore, risk managers – in cooperation with the lead insurer of their aviation insurance policy (master policy) – need to do an assessment of the risks of each subsidiary, which can range from the product liability out of the sale of aircraft parts to operating their own helicopters, and establish whether local insurance coverage is needed or not. This depends on the location of risk.

In aerospace, insurers such as **Allianz Commercial** mainly deal with liability risks such as:

- **Product liability risks** – linked to the company that is either producing or selling products, or providing services to third parties. For example, the subsidiary manufactures parts for aircraft and needs insurance coverage if a product is defective and causes damage to a third party.
- **So-called “Hangarkeepers” liability risks (meaning damages to third party aircraft)** – linked to the company having the aircraft under care, custody, and control. For example, the subsidiary undertakes maintenance of third party aircraft and damages the aircraft during the activity.
- **Aircraft third party liability risks** – linked to the owner or operator of the aircraft. For example, the subsidiary has a helicopter to conduct demonstration flights for potential customers and causes damage to a third party during its operation.

Type of risk	Location of risk
Product liability	Country of domicile of the company
Hangarkeepers liability	Country of domicile of the company
Aircraft third party liability	Country of registration of the aircraft

*“Risk managers need to harmonize their insurance strategy with a multitude of regulatory, statutory, fiscal and compliance issues in all countries where their company is active,” explains **Susanne Grillenberger, Regional Practice Leader Aerospace Germany and Switzerland, Allianz Commercial.** “Many favor centralized decision-making and harmonized local covers and wish to implement common risk management and risk quality standards within their entities.”*

How to cover local activities

Direct (“non-admitted”) insurance by the insurers of the parent company insurance policy is forbidden in many jurisdictions in the world, therefore it is necessary to place insurance policies in the country, provided by an insurer that is locally admitted. It should be mentioned that there are in some countries exceptions to the prohibition of non-admitted insurance, for example, self-procurement (a company directly obtaining insurance coverage without the involvement of a local insurance broker) or when local insurers do not want to underwrite the risk.

Admitted	Non-Admitted
An admitted policy is a policy issued or coverage provided by an insurer for a risk located in a territory where that insurer is licensed	A non-admitted policy is a policy or coverage provided by an insurer for a risk located in a territory where that insurer is not licensed

Different concepts of IIPs

In recent years, so-called multinational insurance or international insurance programs (IIPs) have increased in popularity among risk managers as an effective way of managing the cross border exposures of their organizations. Different concepts of these include:

Stand-alone local policies: These can be appropriate for companies that have elected to adopt less financial integration or less central control of the cost of risk and of risk management. Locally admitted policies are issued preferably by the offices of an insurer or one of its network partners. There is no pooling of risks via reinsurance to the master policy.

Difference in Conditions/Difference in Limits (DIC/DIL): The DIC/DIL coverage as part of the master insurance policy is supposed to only cover deviations in master and local policies in scope of coverage and unexpected severity issues. However, it needs to be considered that direct claims payments via the master policy into strictly non-admitted countries might violate local laws and regulations and therefore might be problematic.

DIC (Difference in Conditions): In case the scope of coverage of the master policy is wider than the local policy, the master policy can apply.

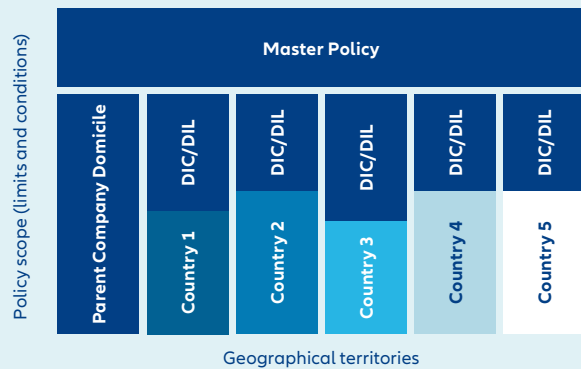
DIL (Difference in Limits): In case of events where the local limit or sublimits are exhausted, the master policy can provide coverage up to the agreed limits.

Integrated IIP: This type of coverage combines local insurance policies where mandatory or where reasonable, reinsured into the master policy, and an umbrella DIC/DIL coverage as a complement in the master policy. The global master cover is then structured to absorb or leverage coverage gaps at the local level, with due deference to local regulations. The worldwide scope of coverage as well as the detailed structure is always jointly developed with the customer.

The local policies follow best market standards and adequately reflect and cover the customer’s local risks including mandatory local coverage and clauses. They take local supervisory aspects into consideration, for example minimum local retention or tariffs. Local taxes can also be administered.

*“For many of our aerospace customers, an integrated international insurance program is now the most appropriate option,” explains **Susanne Grillenberger**. “Offering international insurance solutions is one of the core pillars of our value proposition to our customers. We have many IIP specialists in our aerospace teams and our underwriters provide support and knowledge to both the global customer and the local insurers for aviation and customer specific issues.”*

Example of an integrated International Insurance Program (IIP)



Benefits of an integrated IIP

An integrated IIP allows companies to do the following:

- To centrally coordinate and control premiums and scope of coverage
- To consolidate their buying power at a corporate level (negotiation of one premium amount for all aviation risks worldwide)
- To support a uniform risk management and claims handling philosophy
- To receive local service (for example, issuance of certificates in local languages and according to local requirements)
- To be compliant with local requirements such as local tax regulations
- To receive centralized claims management – claims handling is done by the insurer’s claims experts for the respective customer. Local claims service can be provided where necessary.

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About Allianz Commercial

Allianz Commercial is the center of expertise and global line of Allianz Group for insuring mid-sized businesses, large enterprises and specialist risks. Among our customers are the world's largest consumer brands, financial institutions and industry players, the global aviation and shipping industry as well as family-owned and medium enterprises which are the backbone of the economy. We also cover unique risks such as offshore wind parks, infrastructure projects or film productions.

Powered by the employees, financial strength, and network of the world's #1 insurance brand, [as ranked by Interbrand](#), we work together to help our customers prepare for what's ahead: They trust us to provide a wide range of traditional and alternative risk transfer solutions, outstanding risk consulting and multinational services as well as seamless claims handling.

The trade name Allianz Commercial brings together the large corporate insurance business of Allianz Global Corporate & Specialty (AGCS) and the commercial insurance business of national Allianz Property & Casualty entities serving mid-sized companies. We are present in over 200 countries and territories either through our own teams or the Allianz Group network and partners. In 2023, the integrated business of Allianz Commercial generated around €18 billion in gross premium globally.

Further information and contacts

For more detailed information on aviation insurance, please contact your regional Allianz Commercial contacts.

commercial.allianz.com

Email: az.commercial.communications@allianz.com

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Allianz Global Corporate & Specialty SE, Königinstraße 28, 80802 Munich, Germany.

Commercial Register: Munich, HRB 208312

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