



Aviation Insurance

What is Aviation Industry ?

- The term “aviation” is most commonly used to describe mechanical air transportation, which is carried out using aircraft .
- The two main types of aircraft are aeroplanes and helicopters , but most modern definition of the word “aviation” extend beyond this to include the use of unmanned aircraft, such as drones

With this in mind, the aviation industry can be described as all industry that surround these activities .

why is the Aviation Industry important ?

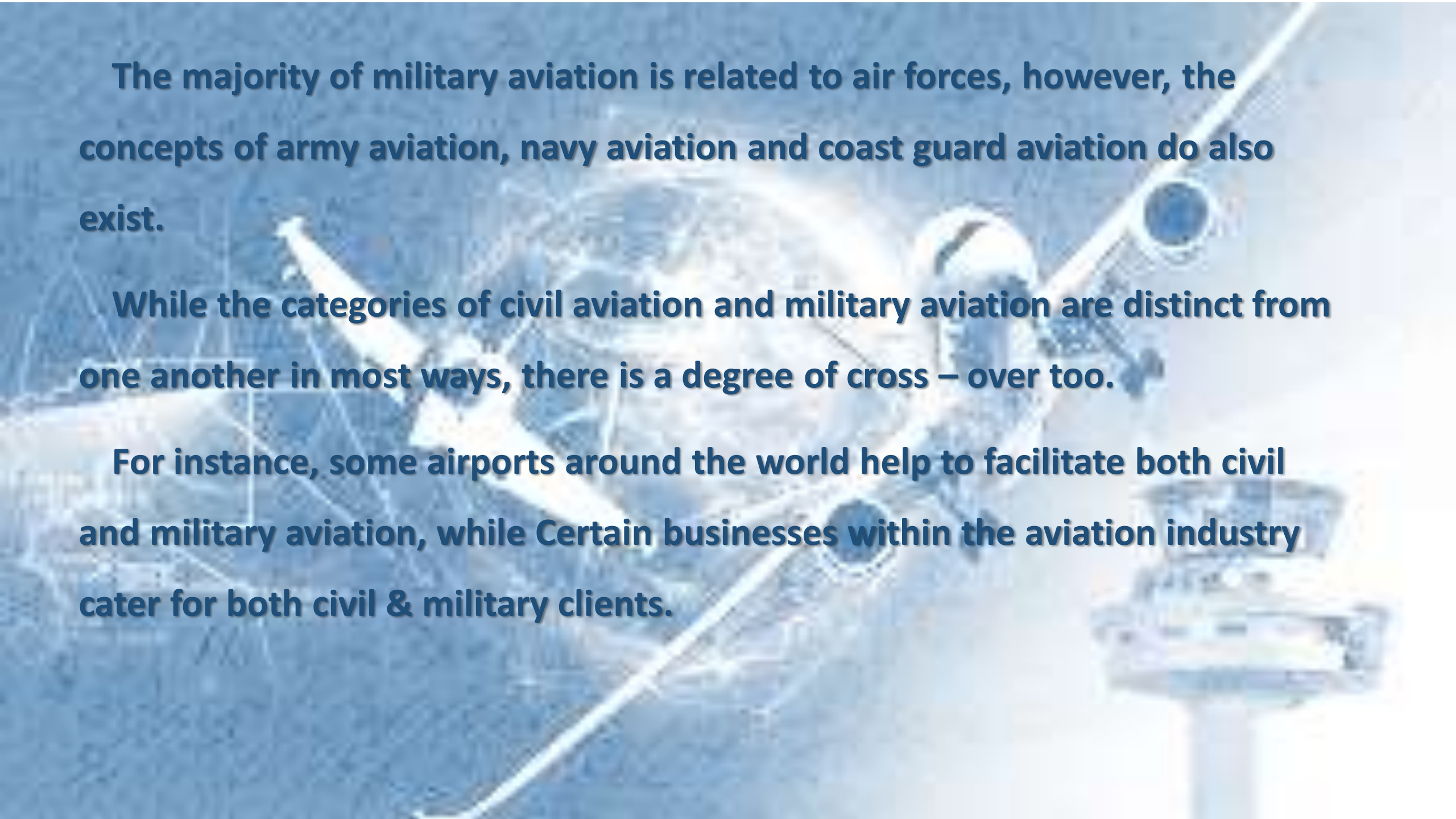
- The globalized nature of the industry, helping to connect different continents, countries, and cultures .
 - As a result, global aviation has been key in facilitating the efficient travel to distant places, enriching many lives in the process.
 - The aviation industry have also been a key contributor for global economic prosperity, not only as a result of tourism industry boosting local economies but also it has allowed for improvement to global trade.
 - Meanwhile, the aviation industry also directly provides millions of jobs for people around the world, with examples including, everything from pilots and cabin crew , through to air traffic controllers and aerospace engineers .
- on the top of this , the aviation industry has helped to create many jobs in the wider travel and tourism industry too .

Civil & Military Aviation

With the aviation sector, there are two main categories of flight civil and military.

In Simple terms, civil aviation refers to all aviation that is not connected to military, includes both private and commercial air travel regardless of whether flights are carrying passenger's cargo or a combination of two.

By contrast, military aviation refers to the use of aircraft within military settings. Typically this kind of air transportation is designed to enable aerial war, or perform surveillance operations.



The majority of military aviation is related to air forces, however, the concepts of army aviation, navy aviation and coast guard aviation do also exist.

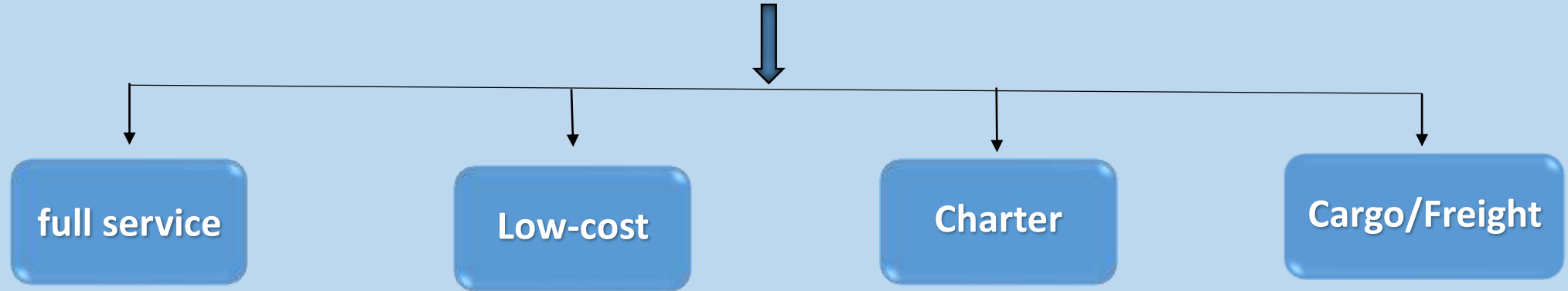
While the categories of civil aviation and military aviation are distinct from one another in most ways, there is a degree of cross – over too.

For instance, some airports around the world help to facilitate both civil and military aviation, while Certain businesses within the aviation industry cater for both civil & military clients.

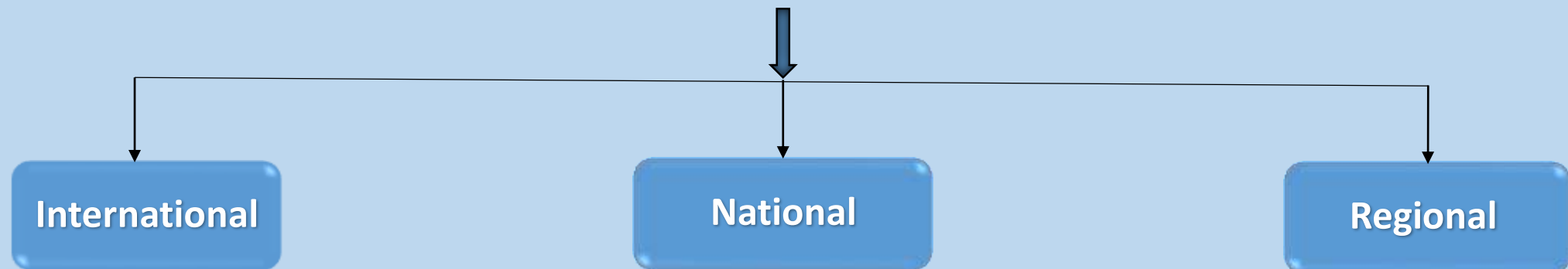
The difference between the aviation industry and airline industry

Airline industry	Aviation industry
<p>An airline is a business offering air transportation services for people or cargo</p>	<p>Airline industry forms just one part of the wider aviation industry In addition to airlines, the aviation industry also includes aircraft manufactures, researchers, air safety specialists, business involved with military aviation, increasingly, companies that design, produce and or make use of drones</p>

Main Business Models for Airlines



What are the types of Airlines



Large Aircraft manufacturing companies within the aviation Industry (among the largest)

AIR BUS

Large European aircraft manufacturing company which produces aircraft for both civilian and military aviation markets.

- Most of the production facilities are located in France, Germany and Spain.

The Airbus A380, used by airlines like Emirates and Lufthansa, is recognized as the world's largest passenger airliner.

Boeing



Based in the United States, Boeing is generally classed as the second-largest airline manufacturer, as well as being one of the largest defense contractors in the world.

In addition to producing commercial and military jets, Boeing is also heavily involved in the manufacture of spacecraft.

Some of its best known commercial aero-plane models include the Boeing 737, the Boeing 747, and the Boeing 777

LOCKHEED MARTIN

Its headquarters in Maryland, in the United States.

LOCKHEED MARTIN is recognized as the world's largest defense contractor, specializing in military aviation and the production of fighter aircraft for air forces around the world (F-16 Fighting Falcon and F35)

LOCKHEED MARTIN



Aviation Insurance market



CORONAVIRUS PANDEMIC

GLOBALLY

TOTAL CASES

7,934,277

DEATHS

433,919

IN THE UNITED STATES

TOTAL CASES

2,094,069

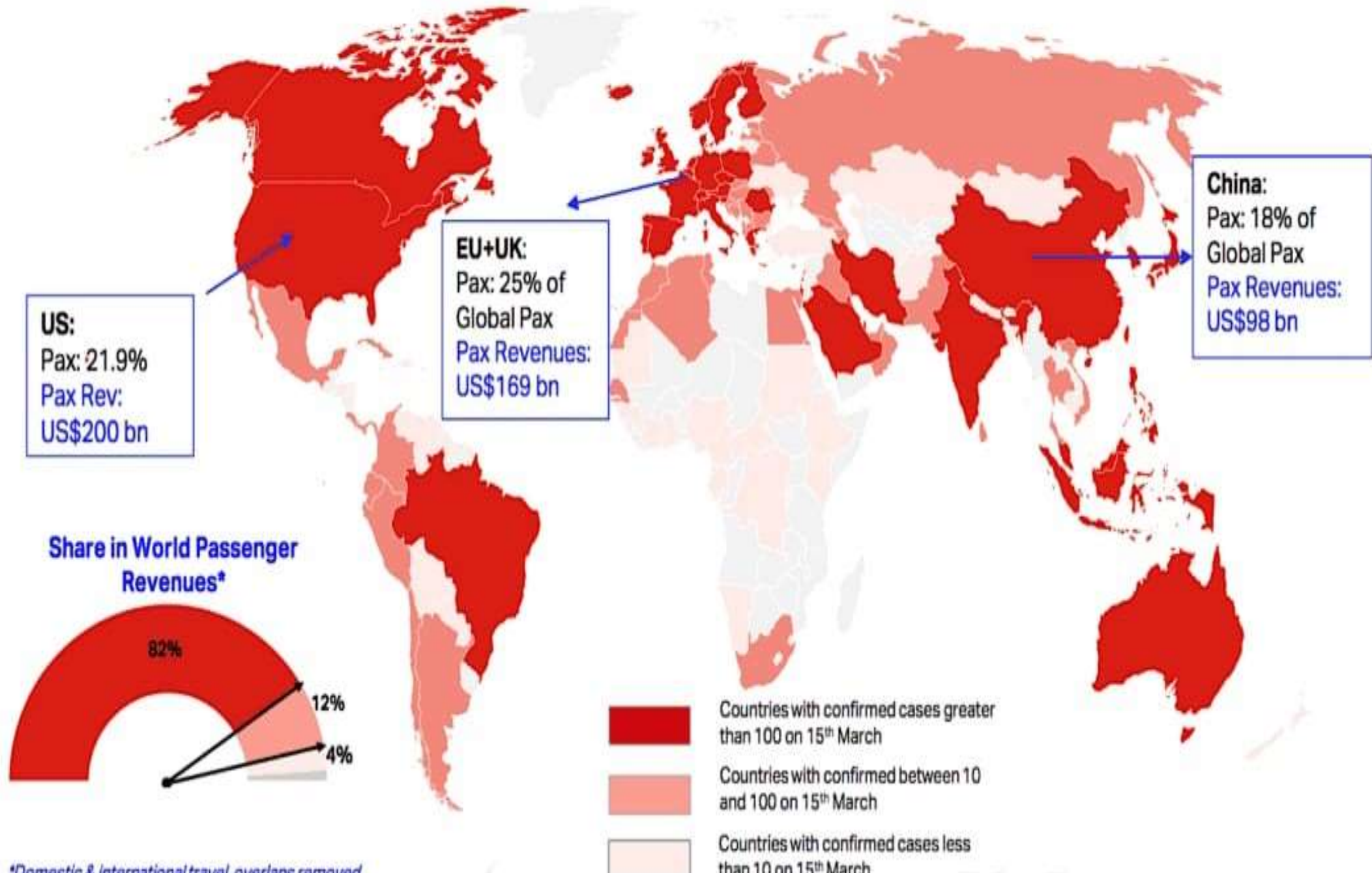
DEATHS

115,732

SOURCE: JOHN HOPKINS UNIVERSITY

بالعربية

COVID-19 and Air Passenger Traffic



Aviation Insurance market

- Since late 2017 the aviation insurance market has been hardening
- How have insurers reacted during the challenging period and has their underwriting focus changes ?

The undeniable fact is that the vast Liability Limits required by clients and huge fleet value at risk (all with unlimited reinstatements) require substantial capital

Commitments and reinsurance

programs that added to normal business costs.

Make minimum income level vital for insurers

- The 2020 renewal season was focused on finding a balance which reflect the revised outlook\circumstances of each client against the insurer's determination for core rate increases into double digits.

These rate increases were much higher than it would have been expected with the impact of COVID-19 and were combined with overlying minimum premium requirements that pushed dollars premiums close to pre - COVID- 19 levels despite an average 30 % to 40 % reduction in exposure forecasts

- These have been some of the toughest and most impassioned negotiations that the market and client have experienced for decades





Aviation and Aerospace losses were substantial in 2019, but 2020 losses are expected to be notably lower, what impact if any, has this had?

- There is no doubt that losses have been lower than in a typical year. Still, unfortunately, we continued to observe claims throughout 2020 with some significant fatal losses and ground incidents seen across the airline, aerospace and general aviation segments.
- It is early to say just how the overall losses compare to recent years, particularly the attrition type losses as these figures take time to correlate.
- Insurers were also mindful of the heightened ground accumulation risks and their exposure to increased numbers of aircraft on the ground that the pandemic presented

what happened in 2020 in respect of capacity?

- unfortunately covid-19 has seemingly little direct impact on aviation insurance capacity levels
- we did see a handful of market withdrawals, some entirely from the aviation class and others only from certain lines of business, but this was primarily due to long term profitability issues rather than the pandemic itself.
- Like wise, there were ratings downgrades which impacted some renewal as well as reduced capacity deployment from a handful of market but largely these were minor expectations.



Positively, we did observe several new market entrants in 2020 and capacity actually grew slightly in certain lines of business.

some carriers are clearly positioning themselves for growth having raised fresh equity for expansion, and enthusiasm for market share actually increased among some insurers that may be significant for the future outlook.



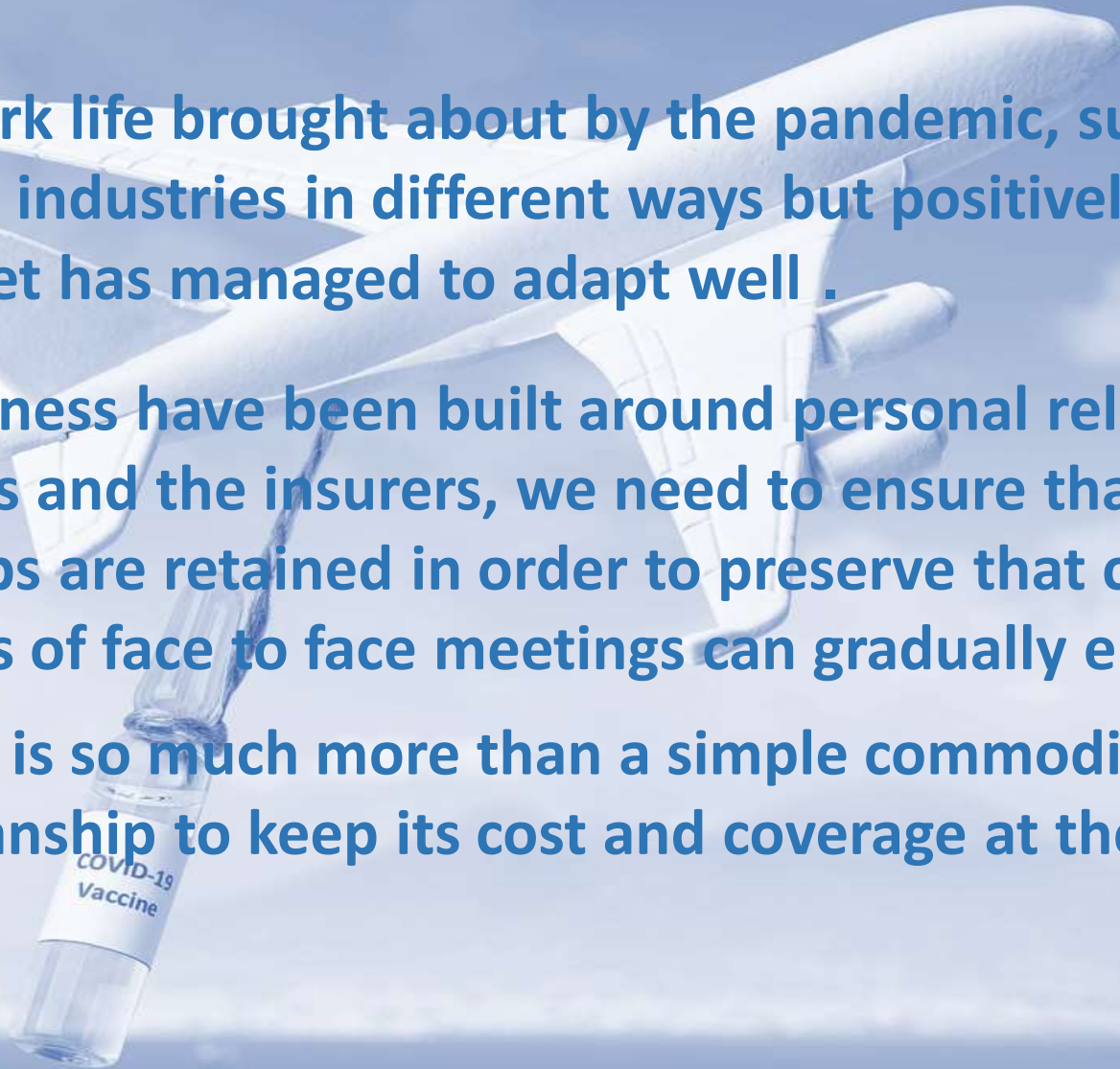
Did anything else of note happen in the aviation insurance market ?

- Aside from pandemic related factors, the aviation insurance sector continued to make headlines.
- The announcement of the pending AON / WILLIS towers Watson "WTW" merger and the emergence of several new broking start-ups caused some major personnel moves in the sector with large numbers of key aviation staff leaving established brokers to join new entities.



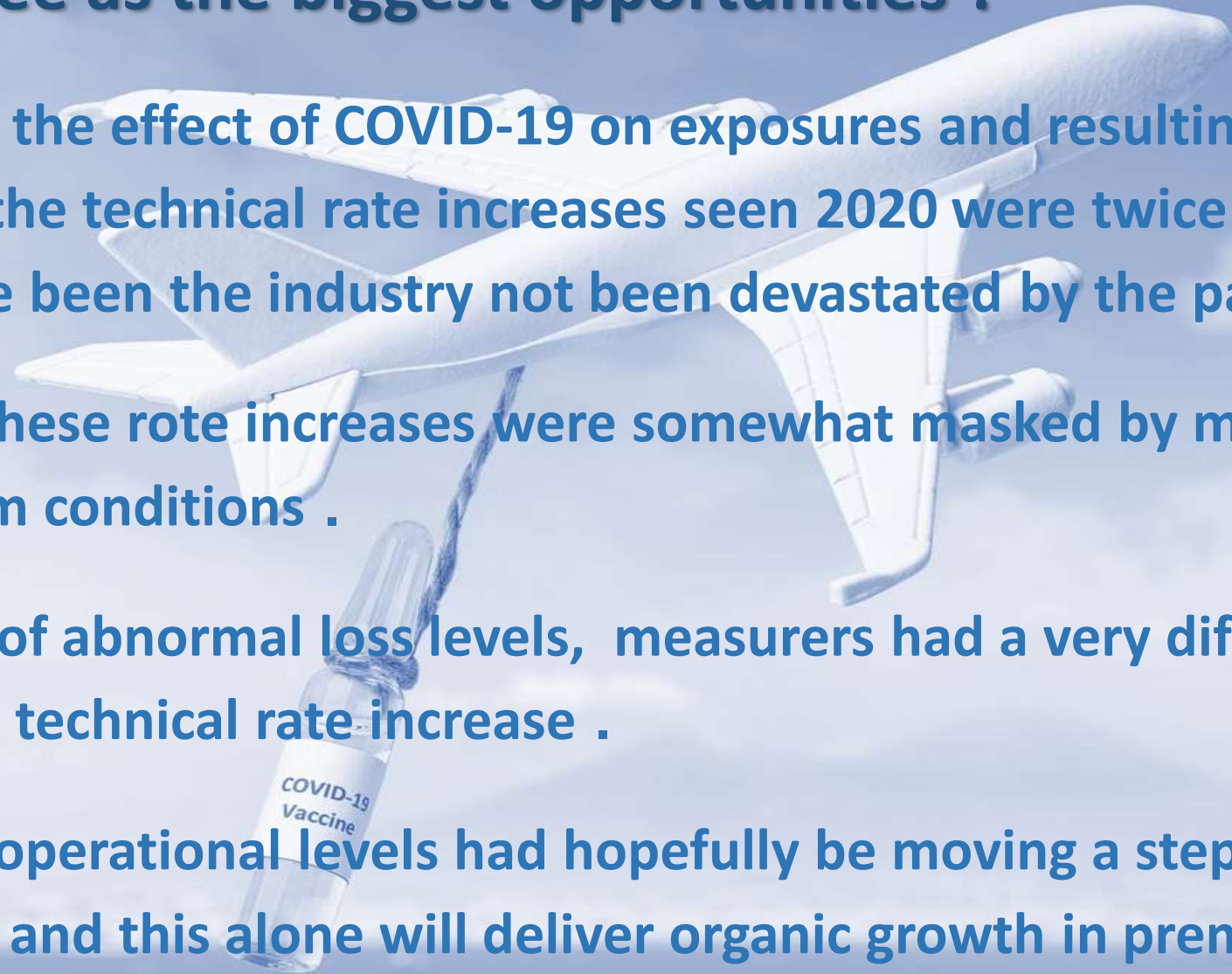
what is the biggest threat to the aviation insurance market?

- Change in day to day work life brought about by the pandemic, such a remote working, has affected all industries in different ways but positively the aviation insurance market has managed to adapt well .
- However, insurance business have been built around personal relationship between, clients, brokers and the insurers, we need to ensure that in this new world, these relationships are retained in order to preserve that continuity of partnership that the loos of face to face meetings can gradually erode.
- Insurance of this nature is so much more than a simple commodity and its demands careful guardianship to keep its cost and coverage at the optimal level.



what we can see as the biggest opportunities ?

- In my opinion, the effect of COVID-19 on exposures and resulting rating levels was that the technical rate increases seen 2020 were twice as big as they would have been the industry not been devastated by the pandemic .
- The impact of these rate increases were somewhat masked by minimum and deposit premium conditions .
- In 2021, absent of abnormal loss levels, measurers had a very difficult time securing further technical rate increase .
- Exposures and operational levels had hopefully be moving a step towards pre COVID-19 levels and this alone will deliver organic growth in premium .



An eye view of Aviation Insurance

Aviation insurance is one of the most modern type of insurance in general, as it began to appear in Britain in 1914 when insurance companies and Lloyds began to accept coverage for some Aviation risks on hull aircraft and various liabilities too.

Aviation insurance is characterized by set of special features that take it out of the scope of other types of insurance because:

- * The magnitude of its operations.**
- * The magnitude of the insurance amounts due to the high division of assets that are insured.**
- * Air accidents are characterized by their rarity, magnitude, and the large side of the material damage that result from, and it often difficult to determine the main culprit that led to risks occurrence.**

Therefore, this type of insurance requires special experience in inspecting and evaluating material damages.

Aviation insurance needs constant communication with the insured and with the reinsurers, as the reinsurer is referred to in every small and large area related to Aviation insurance, unlike other types of insurance.

The geographical scope of the Aviation insurance contract include all parts of the world due to the fact that the countries in whose field the aircraft pass are exposed to any accident or claim.

Risks covered by aviation insurance:

1- Natural hazards, including:

- **Storms, hurricanes, thunderbolts.**
 - **Freezing snow and unusual objects that enter into the plane's engines, such as floating birds.**
 - **Air bumps or hypotension.**
 - **Poor vision conditions.**
- 

2- The Risk of the plane itself:

- **Due to technical defect in the plane or during its operation, and one of its causes may be:**

- # Flying at less than the minimum speed required in the different stage of the flight, whether while on the aisle, takeoff or landing**

- # The modern design of the aircraft and what is causes in case of plane explosion for example , the presence of engines under the wings of the plane, as well as in the case of delay in putting down wheels.**

- # The use of highly flammable fuel and the fire risk it caused**

- # The effect of cosmic radiation on passengers in the case of supersonic aircraft**

3-Personal Risks:

Due to personal error, and one of the causes may be:

- **pilots errors due to omission by lowering the wheels while landing or overshooting (bypassing)the landing place.**
- **Errors of omission of a cabin crew member, such as warning to fasten belts.**
- **Actual hijacking or hijacking attempts.**
- **One or more crew members contracting a sudden illness while on duty.**

4-Airport Risk

Risks due to a technical defect at the airport or its malfunction, and one of its causes may be the following:

- the risk of non- conformity of the corridors with the accepted technical specifications**
- Risk to hit the aircraft on the airport grounds as a result of collision, storms, or otherwise, the risk of deficient information or the severity of the implementation of adequate care for pilotage of aircraft.**

5- Risk of war and unlawful seizure, which is a group of risks affecting air traffic as a result of open and undeclared warfare, whether internal or external.

Aviation insurance policies in general:

1- Hull insurance policy

2- liability insurance: are divided into:

- **Insuring liability of the air carrier towards passengers and luggage**
- **Physical damage and third party liability insurance**
- **Liability for parcels and goods**
- **civil liability insurance whether for the air carriers or for others**

3- insurance policies that guarantee full insurance protection for carrier and example thereof:

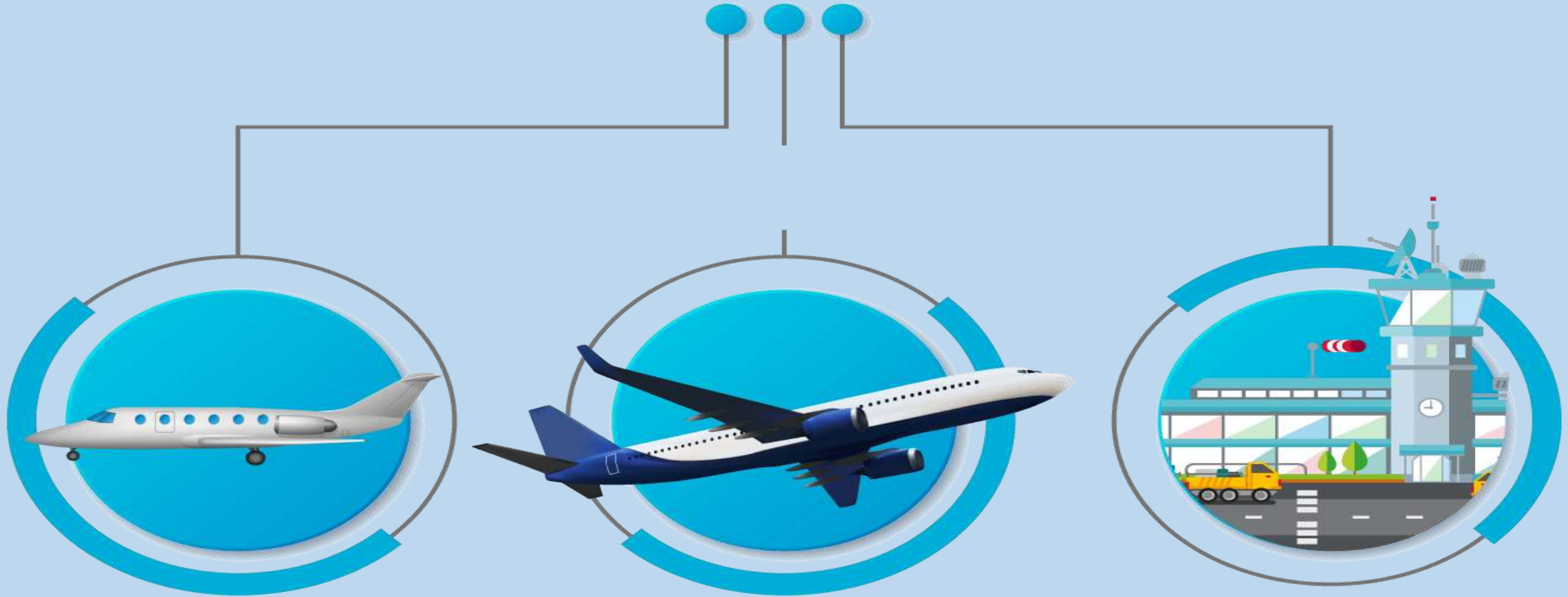
- **Total losses only policies**
- **limited losses in order to benefit of deductible**
- **loss of profit**
- **civil liability policy**

4- Insurance policies that cover unusual purposes and increase risk degree:

- **policy covers the use of civil aviation in celebrations of global aviation .**
- **policy that covers new pilots training**
- **Policy covers civil aircraft used for military purposes**



what can you cover under Aviation Insurance?




Private Aircrafts

Corporate Aircrafts

Liabilities for
Ground Operation

The different types of Aviation insurance

what is the aviation insurance ?

- **Aviation insurance covers a suite of property and liability policies that provide coverage for aerospace, airlines, aircraft and other components of the Aviation network .**
 - **Aviation insurance Covers losses resulting from poor maintenance, property damage, loss of cargo , or injury to travelers .**
 - **All in all, this line of insurance is designed to protect aircraft owners, operators and passengers**
- 
- A small, white propeller airplane is shown in flight, banking to the right. The aircraft is positioned in the upper right quadrant of the slide, flying against a background of a bright blue sky filled with soft, white clouds. The overall aesthetic is clean and professional, typical of a corporate or educational presentation.

The different types of Aviation Insurance

There are four different types of aviation Insurance, each offer protection against wide spectrums of risk associated with commercial and personal aircraft .

1- Aerospace Insurance

**For : manufacturers, suppliers, airports ,airfields ,refuels ,
Other service providers.**


Coverage : general and product liability .



2- Airlines Insurance

For : private or government owned airlines

Coverage : physical damage to aircraft, passenger and Third-party liability, baggage and cargo liability, Workers compensation, employer's liability and General liability to cover the full range of operation
From single aircraft to major international carriers .

A small white propeller airplane is shown flying through a sky filled with soft, white clouds. The plane is viewed from a low angle, showing its wings and tail. The overall scene is bright and airy.

3- General Aviation insurance

For : privately owned aircraft, base operators, flying Schools, flight clubs

Coverage : physical damage and liability Coverage for smaller aircraft .



4- Drones Insurance

For : commercial and recreational unmanned avail vehicles


**Coverage : physical damage and liability protection against flight Accidents,
theft or damage to additional equipment .**



Unpredictable Risks in Aviation



Tips for purchasing Aviation insurance

- ➔ Ensure you will have access to A-rated insurance carriers, not Just one
 - ➔ Choose a broker with experience in every type of Aviation
 - ➔ Inquiry about any available risk management product.
 - ➔ Check their claims management track record.
 - Choosing the right agent will ultimately result in you getting the most comprehensive plan at the most competitive rates available on the market.
 - More importantly, the right agent will provide fair and seamless claims payouts and help you avoid out-of-pocket losses that can threaten your financial stability.
- 

What is Hull Insurance in Aviation ?

Hull insurance typically covers all parts that would normally be affixed to the aircraft and the labor to repair the aircraft after incident. It may also include portable equipment (e.g., hand held radios and headsets).

On what basis is airline Hull insurance usually rated ?

Hull coverage is normally written in a valued basis, with the value of the **aircraft** determined at policy inception and the amount listed in the declarations. If aircraft incurs a total loss, the insurer pays the scheduled value less the applicable deductible.

What is not covered by aviation physical damage insurance?

Those exclusions are wear and tear, deterioration, Freezing, mechanical or electrical breakdown.

Five types of insurance coverage in particular to Aviation

➔ That are taken out individually or in combination

- Public liability insurance
- Passenger liability insurance
- Ground risk hull insurance, not in motion
- Ground risk hull insurance, in motion
- In-flight insurance



Which type of Aviation insurance is more expensive ?

- in-flight insurance provides coverage for damages that an aircraft may sustain when it is in motion this is the most expensive aviation insurance and most accidents are likely to occur when the aircraft in motion .

What is Aviation liability insurance?

➔ Aviation liability insurance insures the owner of aircraft against losses caused by having to pay damages for injuries to persons or property inflicted by or in the operation of the aircraft.

- Passengers liabilities.
- Premises and Ground liabilities.
- Cargo Risks
- Third party and passenger war liability

What are aviation liability insurance?

- Premiums are reasonably priced
- Cost of damages and legal defense are covered
- Conditional requirements vary by country



Cost of insurance depends on experience and record:

➔ **Deductible amount:**

Higher deductible will lower the cost of the premiums

➔ **Pilot experience:**

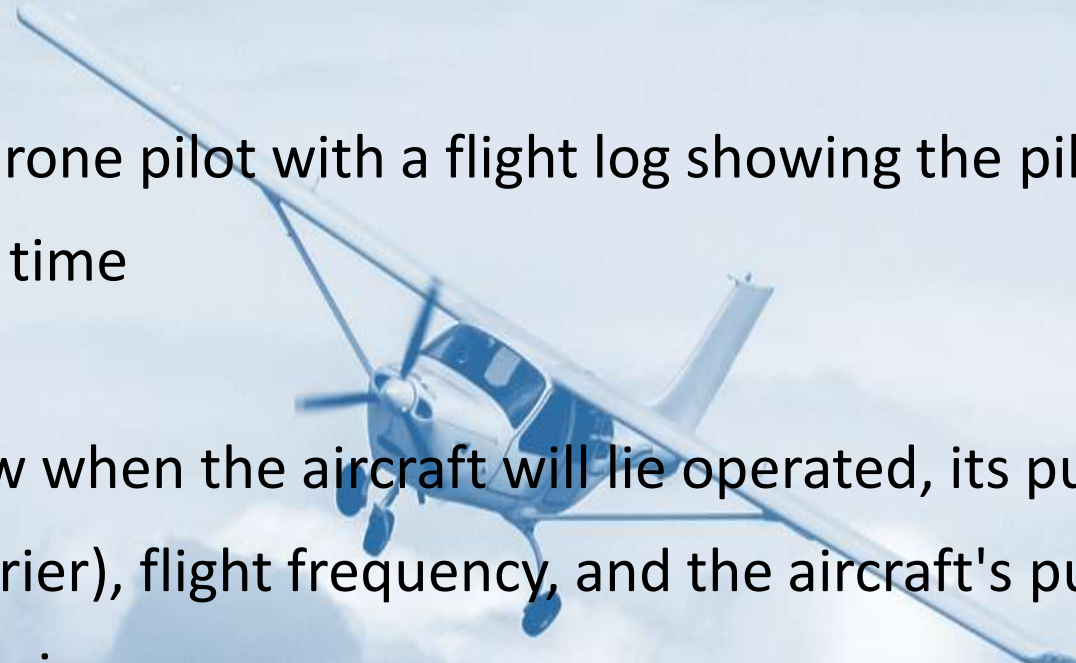
Pilot should be a licensed drone pilot with a flight log showing the pilot an at least 50 hours flying time

➔ **The aircraft:**

The insurer will want to know when the aircraft will be operated, its purpose (cargo and/or passenger courier), flight frequency, and the aircraft's purchase price, current value, age and size

➔ **Passenger and cargo capacity :**

What aircraft is carrying, the number of passengers, and the value of any cargo will affect the cost of your coverage.

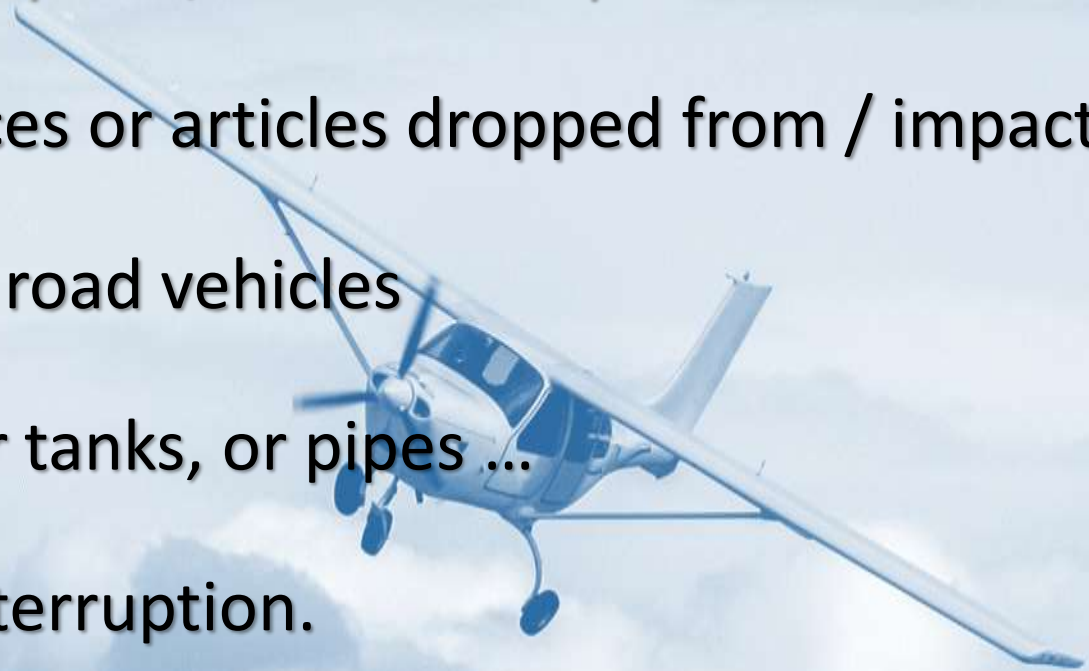


Aviation Hull “war and Allied perils”

- ➔ Covers loss or damage to the aircraft which is specifically excluded under the hull all risks policy by virtue of the war risks exclusion clause
- ➔ Risks covered include war, invasions, acts of foreign enemies, hostilities (whether war lie declared or not), war, civil war , revolution, material law , military, or usurped war or attempts at usurpation of power , strikes, riot, civil commotion or labor disturbances, political or terrorist acts, malicious acts, sabotage, confiscation, nationalization, seizure, restaurants, detention, appropriation, requisition for title or use by or under the order of any government (whether civil military or de fact) or public or local authority and hi-Jacking
- ➔ Furthermore, the war Risks policy extended to include the coverage suspended under the hull all Risks policy, arising whilst the aircraft is outside the control of the insured by reason of any of the above perils.

What is allied perils?

- ➔ Storm, tempest and flood, Earthquake, volcanic eruptions.
- ➔ Aircraft or any other aerial devices or articles dropped from / impact damage by or any third party to road vehicles
- ➔ Bursting or overflowing of water tanks, or pipes ...
- ➔ Loss of profits or the business interruption.



Miscellaneous Aviation coverage

- ➔ Boiler and machinery insurance.
- ➔ Glass insurance
- ➔ Credit insurance will be **covered** separately from the others because there are some unusual features not found in other insurance contracts



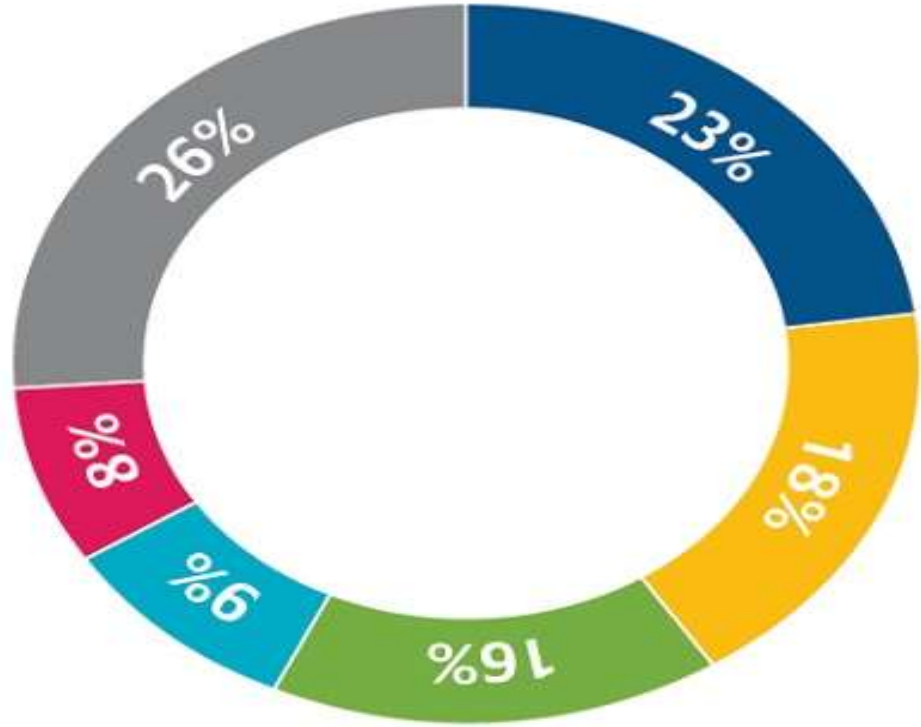


Aviation losses and claims trends

Improved safety is resulting in fewer major catastrophic claims for insurers overall, despite the activity of the past year. However, the cost of everyday losses is rising.

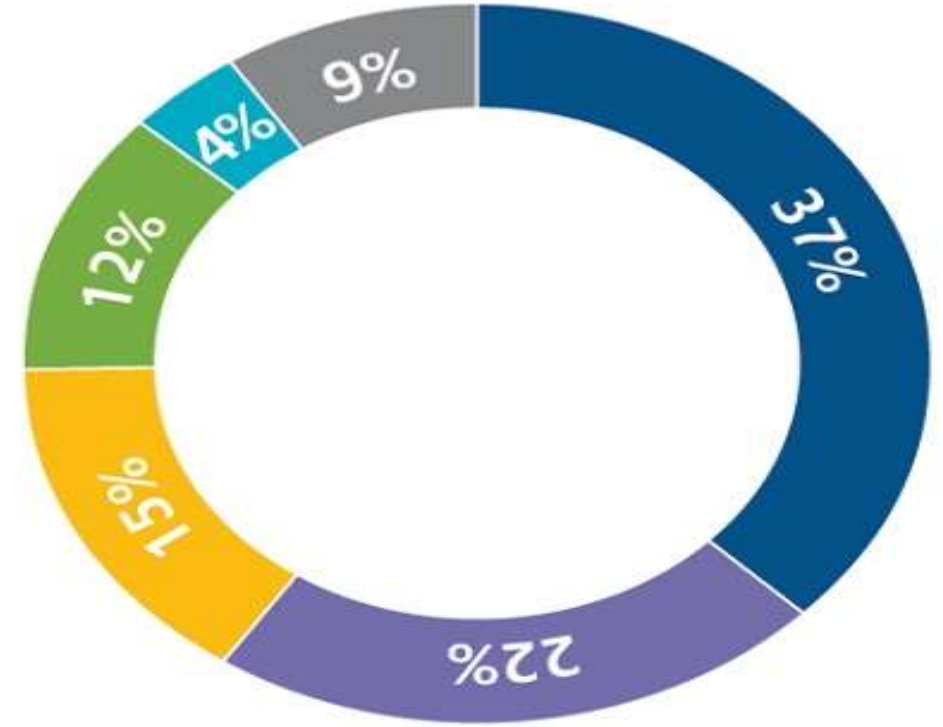
The much-improved safety environment of recent years has contributed to the fact that premiums for aviation insurance, which helps to protect the sector against a number of risks, were at their lowest level for many years, prior to 2014's, and this year's, loss activity. And premiums are still at their lowest ever when compared with exposures.

Top Causes of Loss: Aviation Claims



No. of Claims

Plane crash	23%
Ground handling	18%
Mechanical failure	16%
Hard landing	9%
Damage by foreign object	8%



By value

Plane crash	37%
Over/undershot runway/taxiway	22%
Ground handling	15%
Mechanical failure	12%
Hard landing	4%

IATA: Global airlines face \$48 billion in losses in 2021

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A large commercial airplane is parked on a grassy airfield. The sky is overcast with grey clouds. The text is overlaid on the image in a dark blue, bold font.

There has been a 50%+ increase in exposure since the turn of the century, driven by increasing fleet values and an increase in passenger numbers. Exposures have risen from \$576bn in 2000 to \$896bn in 2013 – if exposure growth continues at the same rate, it will top \$1trn by 2021.

“Rate reductions over the past decade reflect improvements in the underlying exposure. However, reductions in the airline and aviation market in the past two years have not been driven by risk management improvements, but by overcapacity in the insurance market,”

Rising costs

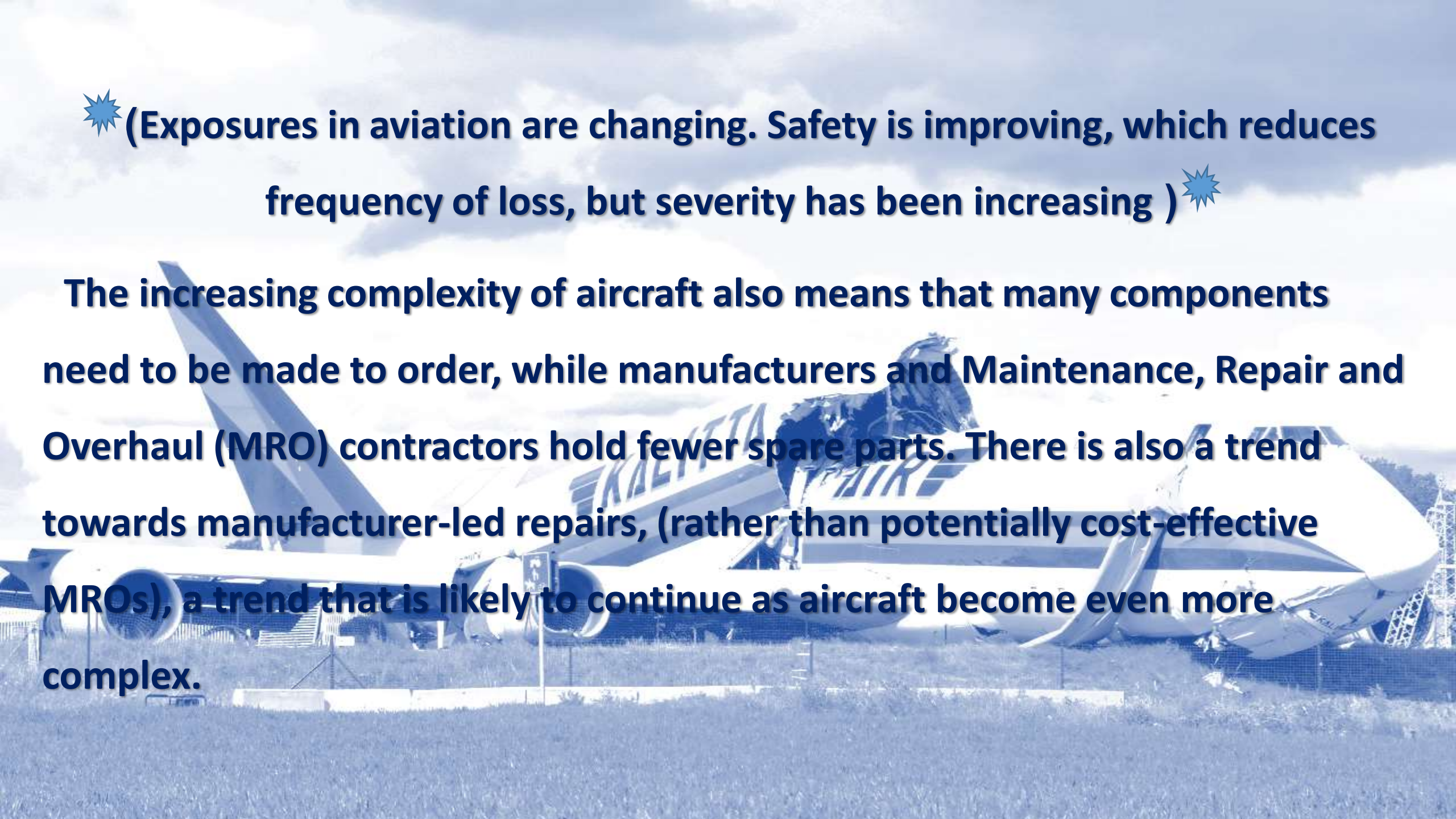
While improved safety has resulted in fewer catastrophic claims for insurers, the costs of everyday claims has been rising. Aviation claims are generally becoming more complex to handle and more expensive, reflecting higher values, increasing repair costs, rising compensation payouts and more stringent litigation.

“Exposures in aviation are changing. Safety is improving, which reduces frequency of loss, but severity has been increasing. Today we are seeing a significant change in the underlying risk,”



★ (Exposures in aviation are changing. Safety is improving, which reduces frequency of loss, but severity has been increasing) ★

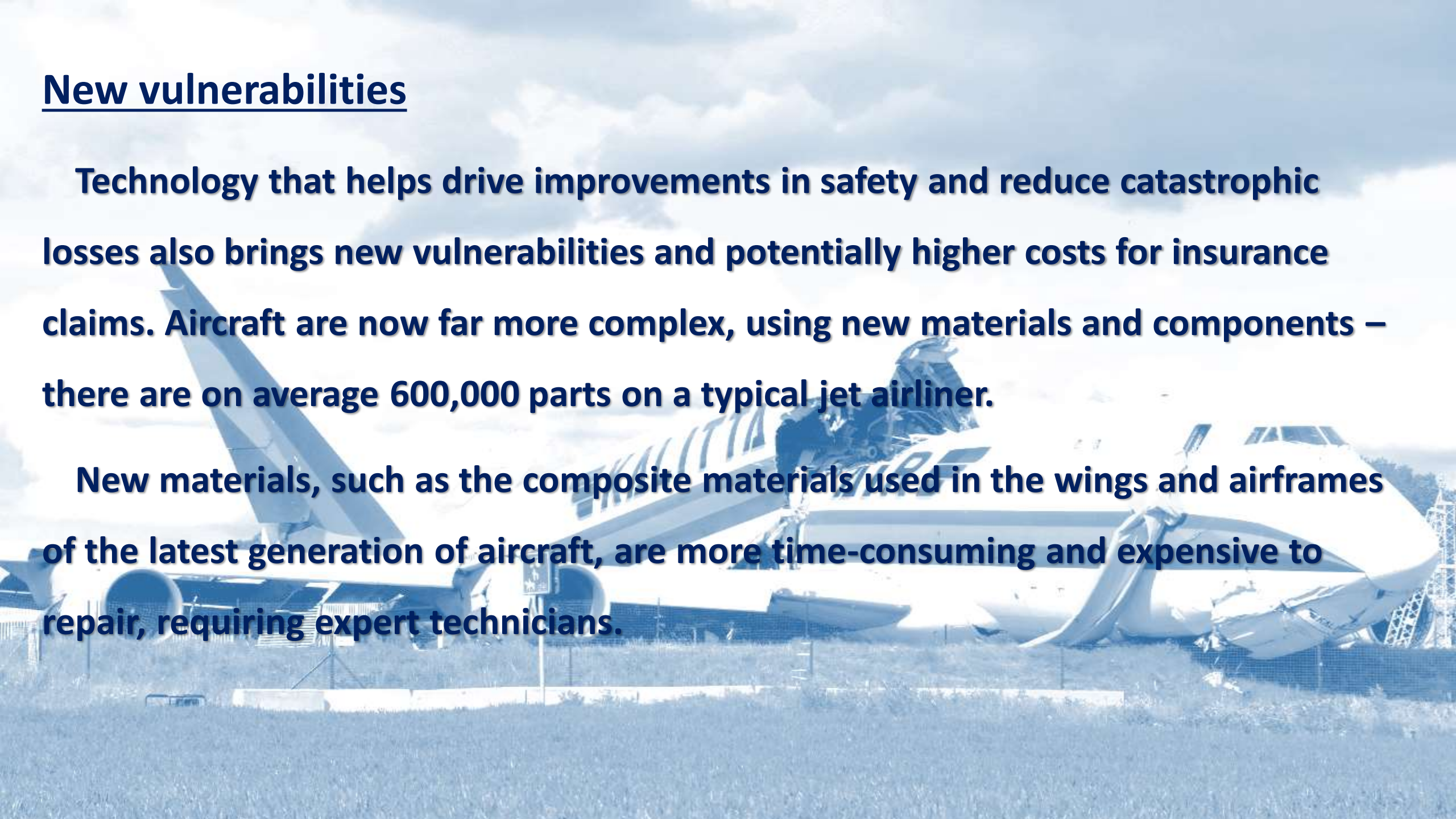
The increasing complexity of aircraft also means that many components need to be made to order, while manufacturers and Maintenance, Repair and Overhaul (MRO) contractors hold fewer spare parts. There is also a trend towards manufacturer-led repairs, (rather than potentially cost-effective MROs), a trend that is likely to continue as aircraft become even more complex.



New vulnerabilities

Technology that helps drive improvements in safety and reduce catastrophic losses also brings new vulnerabilities and potentially higher costs for insurance claims. Aircraft are now far more complex, using new materials and components – there are on average 600,000 parts on a typical jet airliner.

New materials, such as the composite materials used in the wings and airframes of the latest generation of aircraft, are more time-consuming and expensive to repair, requiring expert technicians.



Higher limits

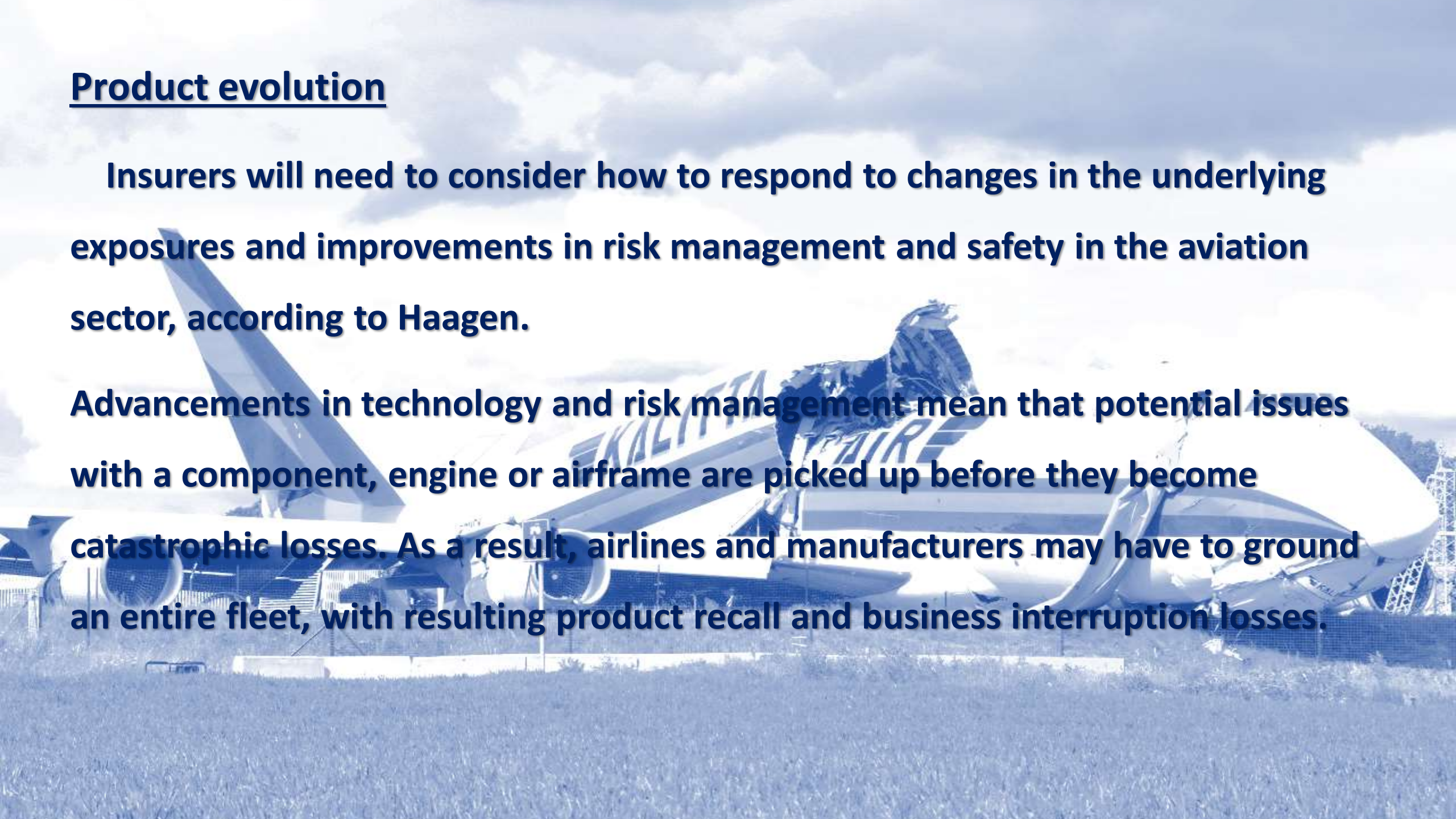
Claims costs are also affected by values, which have been steadily increasing across the board, from the largest airliner to corporate jets. An Airbus A380 was the first aircraft to require an insured limit in excess of \$2bn while the hull of a Dassault Falcon 7X business jet is now typically insured for around \$60m to \$70m.

The trend towards a more litigious society in parts of the world, and growing compensation payouts is another area driving up the costs of claims. With improved accident investigation, it is now easier to determine liability and potentially sue a number of parties involved in a loss – including the airline, manufacturer and the general aviation firms that provide components and services.

Product evolution

Insurers will need to consider how to respond to changes in the underlying exposures and improvements in risk management and safety in the aviation sector, according to Haagen.

Advancements in technology and risk management mean that potential issues with a component, engine or airframe are picked up before they become catastrophic losses. As a result, airlines and manufacturers may have to ground an entire fleet, with resulting product recall and business interruption losses.



For example, AGCS Head of Aviation recalls two separate claims for Cessna jet aircraft damaged in a hailstorm. In the absence of a repair protocol for their composite-built wings, the aircraft were a total loss at \$7m to \$8m. In the past, aluminum would have been repairable at a much lower cost, “New materials can lead to new losses, but it is the speed of innovation and the need to keep pace with understanding the risks that is the major challenge today compared with the past.”



For insurers, which have historically limited their involvement in product recall, this may mean adapting their product offering.

“Insurers need to adapt to aviation industry developments. For example, technology and safety-driven developments will require underwriters to understand clients better to make sure we keep pace and are relevant,”



Aviation Reinsurance

Aviation reinsurance rates rose by up to 250% at the key Jan. 1 renewal date, market still reeling from the impact of Boeing 737 MAX crashes two years ago. Insurers and reinsurers face claims from the crashes relating to hull and product liability that could amount to more than \$2 billion, a large sum in a relatively small insurance sector.

Aviation underwriters are also suffering from lower premiums due to worldwide lockdowns and travel bans, as insurance contracts are often negotiated based on the amount of time planes spend in the air.

Reinsurers, which share the burden of large risks with insurers in return for part of the premium, are also seeing rate rises in other sectors after years of falls.



Property and casualty reinsurance premiums are up by 25-30% for the riskiest areas of business .

The analysts showed a reinsurance hard market – in which premium rates are rising – was “underway,” highlighting gains in. property, global casualty and specialty lines such as trade credit and political risk, as well as aviation.

But rates are not rising as much as reinsurers had hoped, despite the corona virus pandemic.

Insurers have themselves benefited from higher rates this year as well as lower claims in areas such as motor, giving them a strong hand in contract negotiations.

An aerial, top-down view of an airport tarmac. Numerous commercial airplanes are parked at gates or on the apron, arranged in a grid-like pattern. The image is overlaid with a semi-transparent blue filter. The text is centered over the image.

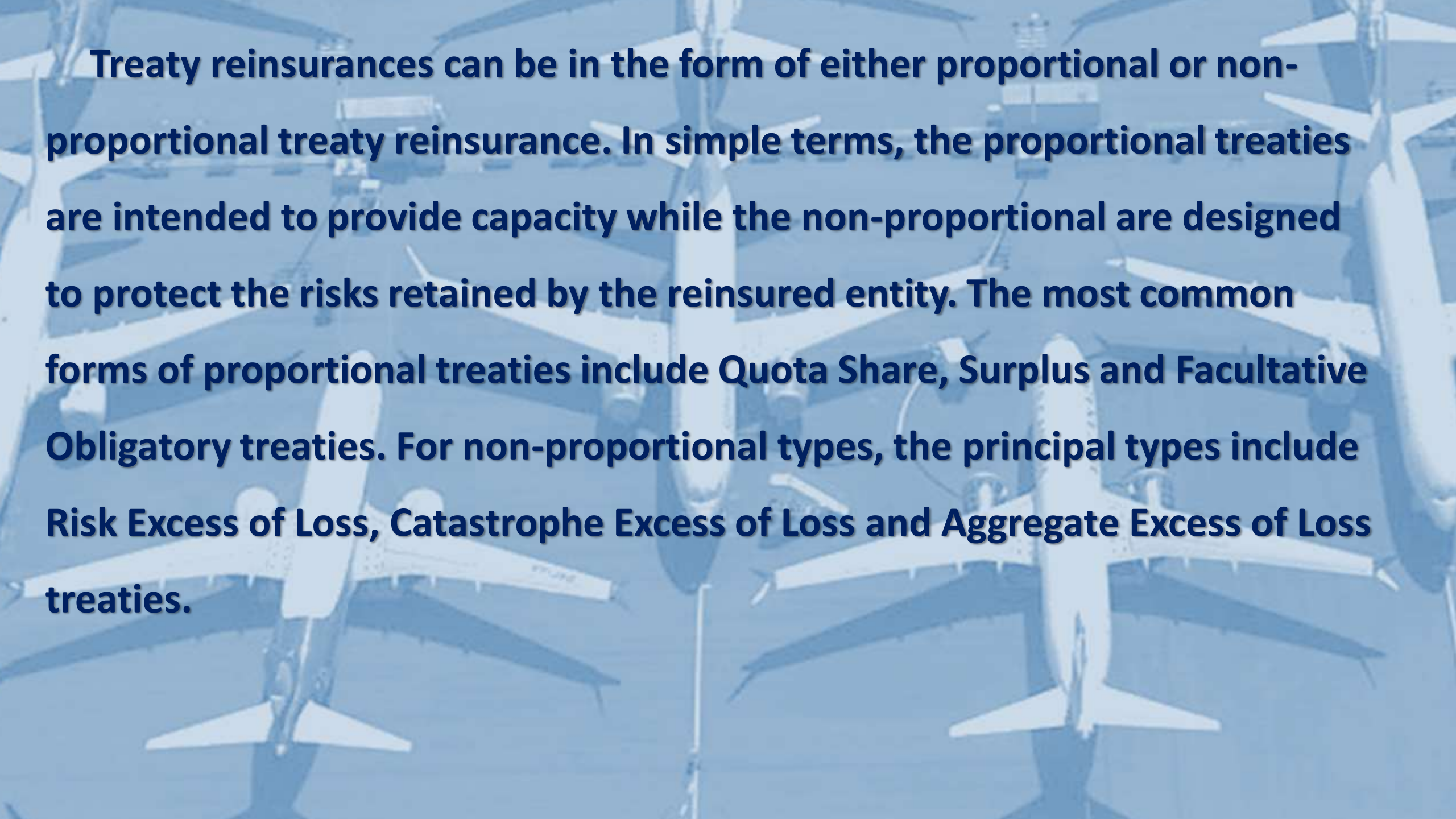
“Reinsurers were feeling quite bullish and feeling, ‘this is our moment’,” adding that they had nevertheless “achieved at least rate stability and some rate increases.”

The biggest disagreements between insurers and reinsurers had been about cover for cyber attacks and communicable diseases such as COVID-19. Reinsurers are largely excluding these risks from policy wordings .

TYPES OF REINSURANCE

Treaty Reinsurance

A treaty reinsurance is a type of reinsurance where an insurer (referred to as the ceding company) enters into an agreement with one or more reinsurers in order to cede to them a portfolio of risks, as defined in the respective reinsurance agreement or treaty. In such an agreement, the ceding company agrees to cede and the reinsurers agree to accept all the risks written by the ceding company that fall within the terms of the treaty, subject to the limits specified therein.

An aerial view of an airport tarmac with several airplanes parked at gates. The image is overlaid with a semi-transparent blue filter. The text is centered and reads:

Treaty reinsurances can be in the form of either proportional or non-proportional treaty reinsurance. In simple terms, the proportional treaties are intended to provide capacity while the non-proportional are designed to protect the risks retained by the reinsured entity. The most common forms of proportional treaties include Quota Share, Surplus and Facultative Obligatory treaties. For non-proportional types, the principal types include Risk Excess of Loss, Catastrophe Excess of Loss and Aggregate Excess of Loss treaties.

Non-Proportional Treaty Reinsurance

Risk Excess of Loss

Catastrophe Excess of Loss

Agregate Excess of Loss

Proportional Treaty Reinsurance

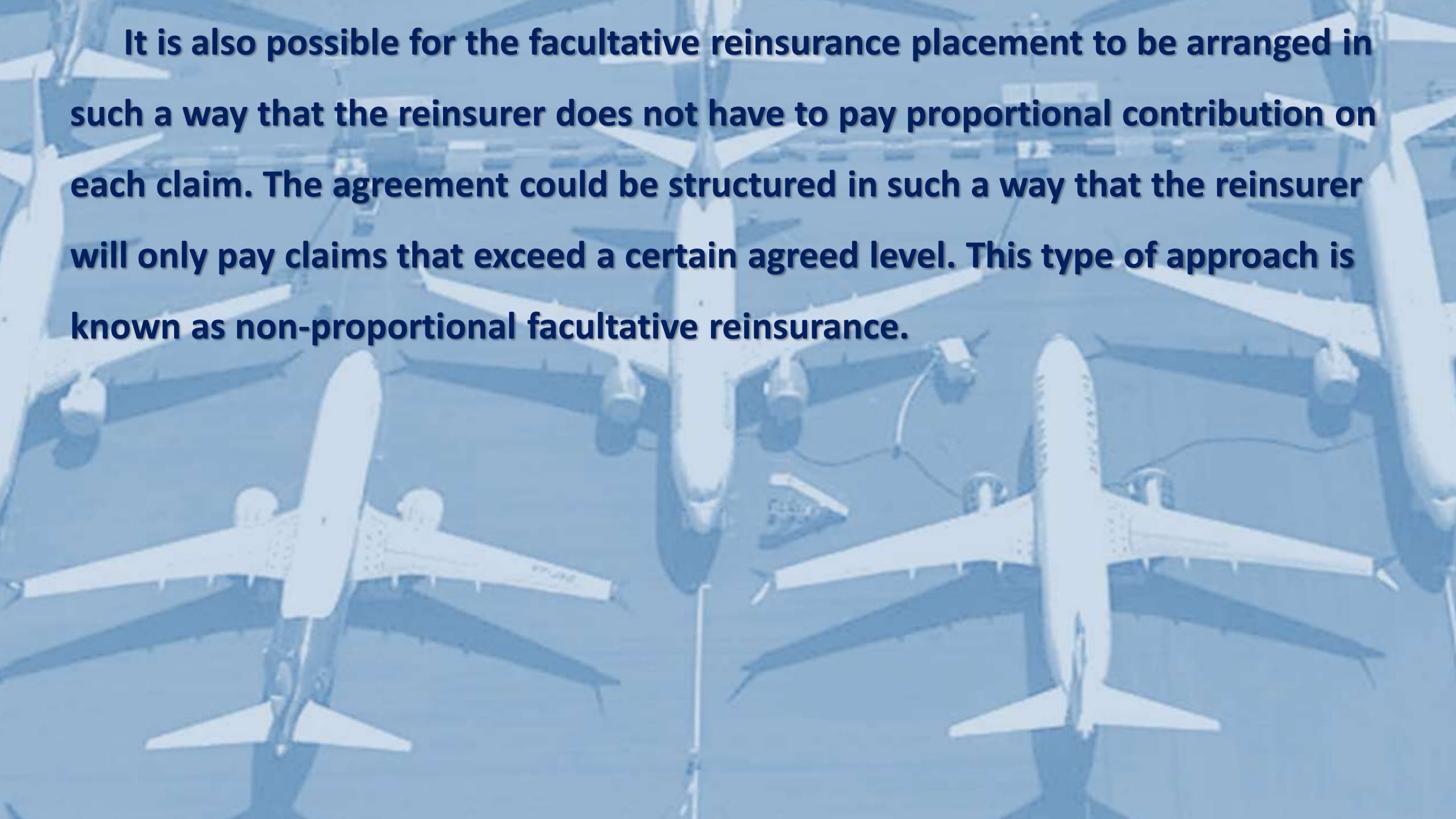
Facultative- Obligatory (Fac-Oblig)

Surplus Treaty

Quota Share Treaty

Facultative Reinsurance

This is the oldest form of reinsurance. Facultative reinsurance is a method of reinsurance where an insurance underwrite offers a risk to one or more reinsurance underwriters on an individual basis. The two parties have to negotiate on the terms and conditions for the placement of the risk in question. There is no obligation on the insurer to offer this risk, and there is also, no obligation on the reinsurer to accept the risk. In the most common form of facultative reinsurance, the reinsured party and the reinsurers share the premium and the risk on proportional basis.

An aerial photograph of an airport tarmac, showing several large commercial airplanes parked at gates. The image is overlaid with a semi-transparent blue filter. The text is centered over the image.

It is also possible for the facultative reinsurance placement to be arranged in such a way that the reinsurer does not have to pay proportional contribution on each claim. The agreement could be structured in such a way that the reinsurer will only pay claims that exceed a certain agreed level. This type of approach is known as non-proportional facultative reinsurance.

Statutory Reinsurance

Statutory reinsurance or obligatory reinsurance is a form of reinsurance that insurers in certain territories are required to cede, as defined by law in a defined territory. This can exist either in countries where there are national reinsurers or through regional agreements covering a number of countries. As part of the terms of the Africa Re Establishment Agreement of 1976, it was agreed amongst the members states that all insurers and reinsurers operating within the territories of the member states should cede a minimum of 5% of all their reinsurance treaty business to Africa Re. Notwithstanding the statutory cession agreement, Africa Re has progressed to a level where it focuses on voluntary cessions in the member states as well as in many other markets that are not covered by the agreement.

Reinsurance Underwriting Pools

A risk pool can be used to create underwriting capacity for areas of critical need not covered by traditional insurance and reinsurance companies. A pool is supposed to underwrite and accept risks using joint capacity from the different operators as well as reinsurance that may be arranged on behalf of the pool. Usually, such an arrangement is formalized in an agreement that outlines the basis on which the members of the pool can introduce risks into the pool and take a share of liability and respective premium after deduction of agreed fees and expenses of the pool.

An aerial view of an airport tarmac with several large commercial airplanes parked at gates. The image is overlaid with a semi-transparent blue filter. The text is in a bold, dark blue font.

An underwriter or a financial consultant can be appointed as a pool manager with the responsibilities of handling the accounts of the pool on behalf of the members of the pool. Within the African Insurance Organization (AIO) there are current two regional pools which are managed by Africa Re as follows:

➔ The African Aviation Pool

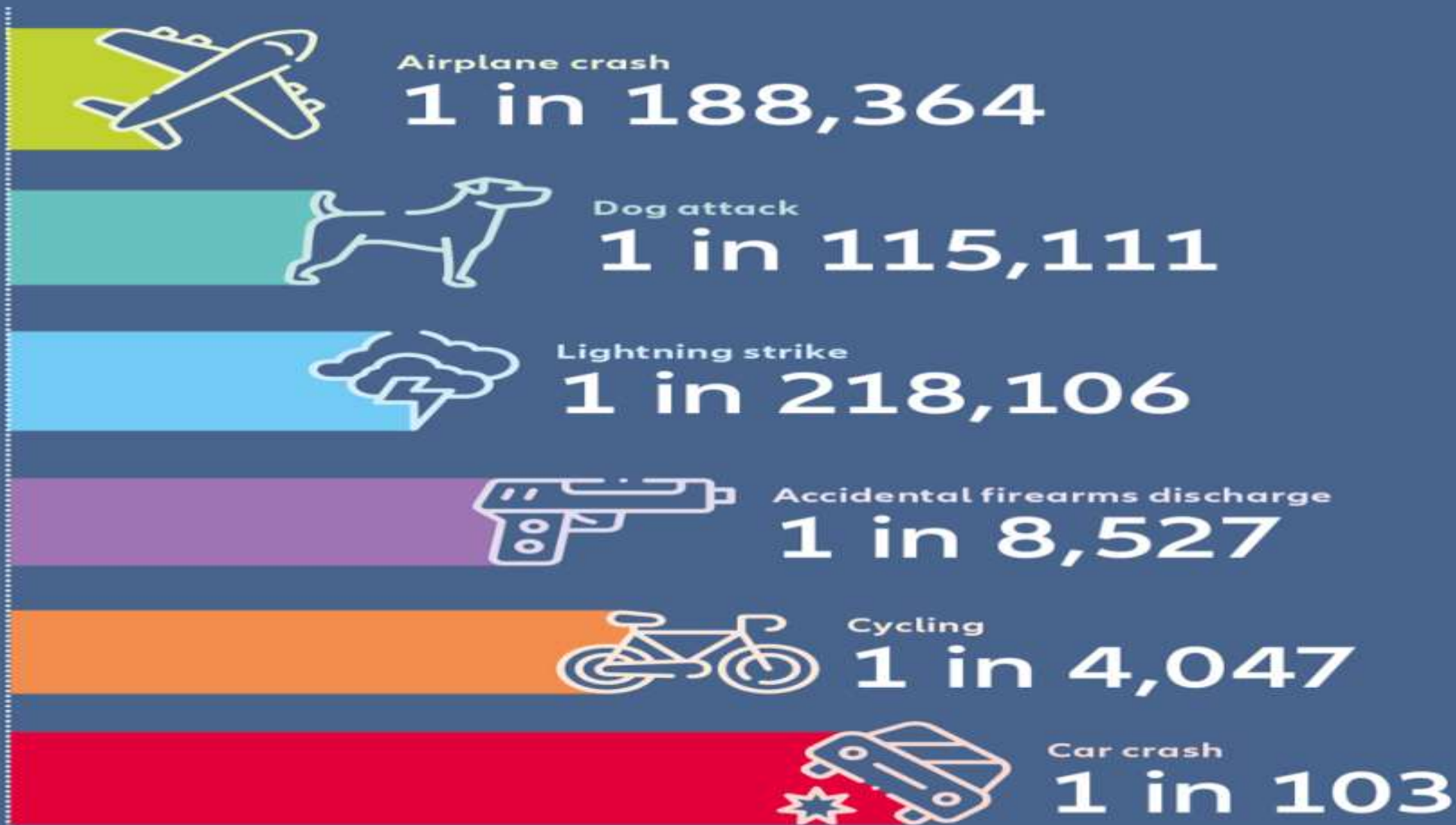
➔ The African Oil Energy Insurance Pool

An aerial photograph of a white commercial airplane on a runway. The aircraft is positioned on the right side of the frame, facing towards the bottom left. A prominent yellow taxi line runs parallel to the runway edge. The tail fin is painted red. The runway surface is dark grey asphalt with visible panel lines.

Aviation Risk Report 2020


DANGER OF DEATH... WHAT ARE THE ODDS?

Lifetime odds of death for selected causes



Safer skies


Safety in the aviation sector is of critical importance. Despite a record number of passengers, statistics show that flying has never been safer. Between 1959 and 2017, there were 29,298 recorded deaths from 500 global commercial passenger jet fleet events. However, between 2008 and 2017, there were 2,199 fatalities from 37 events, or less than 8% of the total number. In 2017, for the first time in at least 60 years of aviation, there were no fatalities on a commercial airline. Even 2018, which saw a total of 15 fatal airliner accidents, ranks as the third safest year ever.

A commercial airplane is shown flying through a blue sky filled with white, fluffy clouds. The plane is viewed from a low angle, showing its wings and tail. The overall scene is bright and clear, symbolizing safety and flight.

The lifetime chances of a person dying in a commercial aviation accident are extremely unlikely compared with other forms of transport such as a car or bicycle accident, as well as other more unexpected scenarios such as accidental gun discharge or dog attack.

The continuous improvement in aviation safety can be attributed to a number of factors. Aircraft have become more reliable.

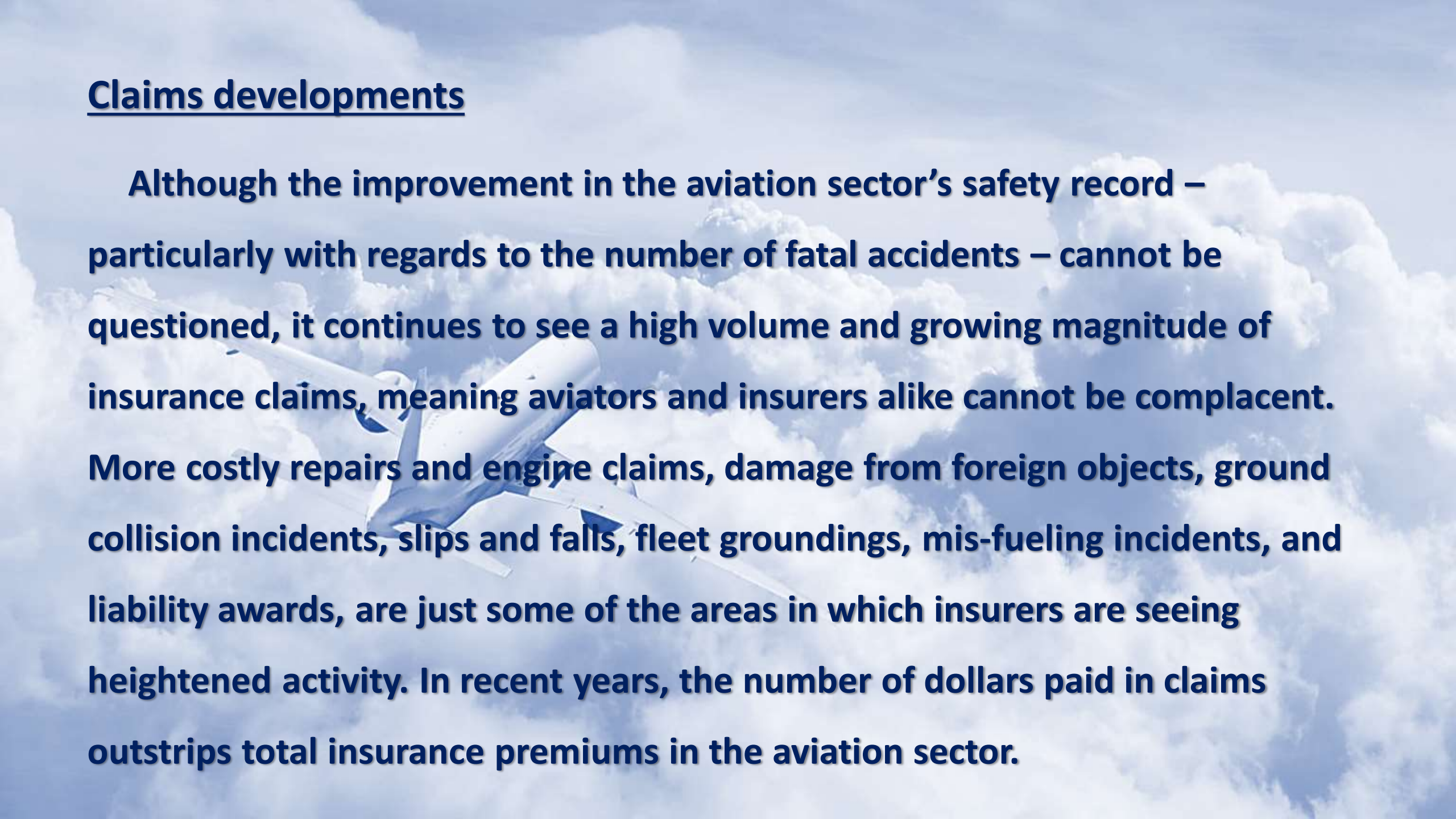


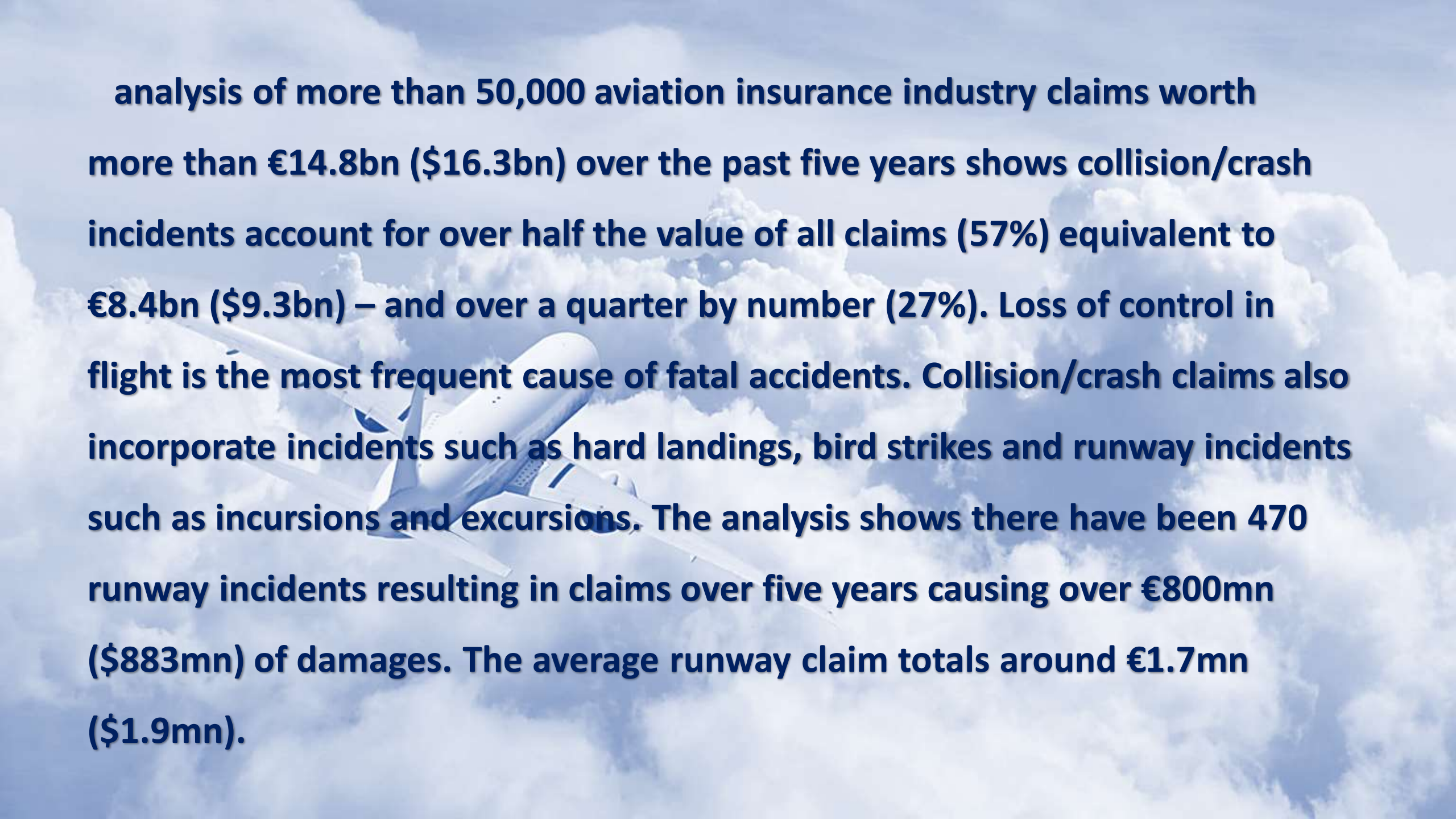
A white commercial airplane is shown from a high-angle perspective, flying through a bright blue sky filled with fluffy white clouds. The aircraft is positioned in the lower-left quadrant of the frame, angled towards the upper-right. The text is overlaid on the image in a bold, dark blue font.

Safety systems and cultures have improved enormously. A number of design implementations have had a dramatic impact on accident rates, including aerodynamic and airframe improvements, fail-safe design criteria, improvements to cockpit instrumentation and the increasing number of fly-by-wire controlled aircraft in operation. Improvements in science have also allowed the aviation industry to better understand how human factors affect safety. At the same time, there have also been significant improvements in manufacturing processes, aircraft operations and regulation.

Claims developments

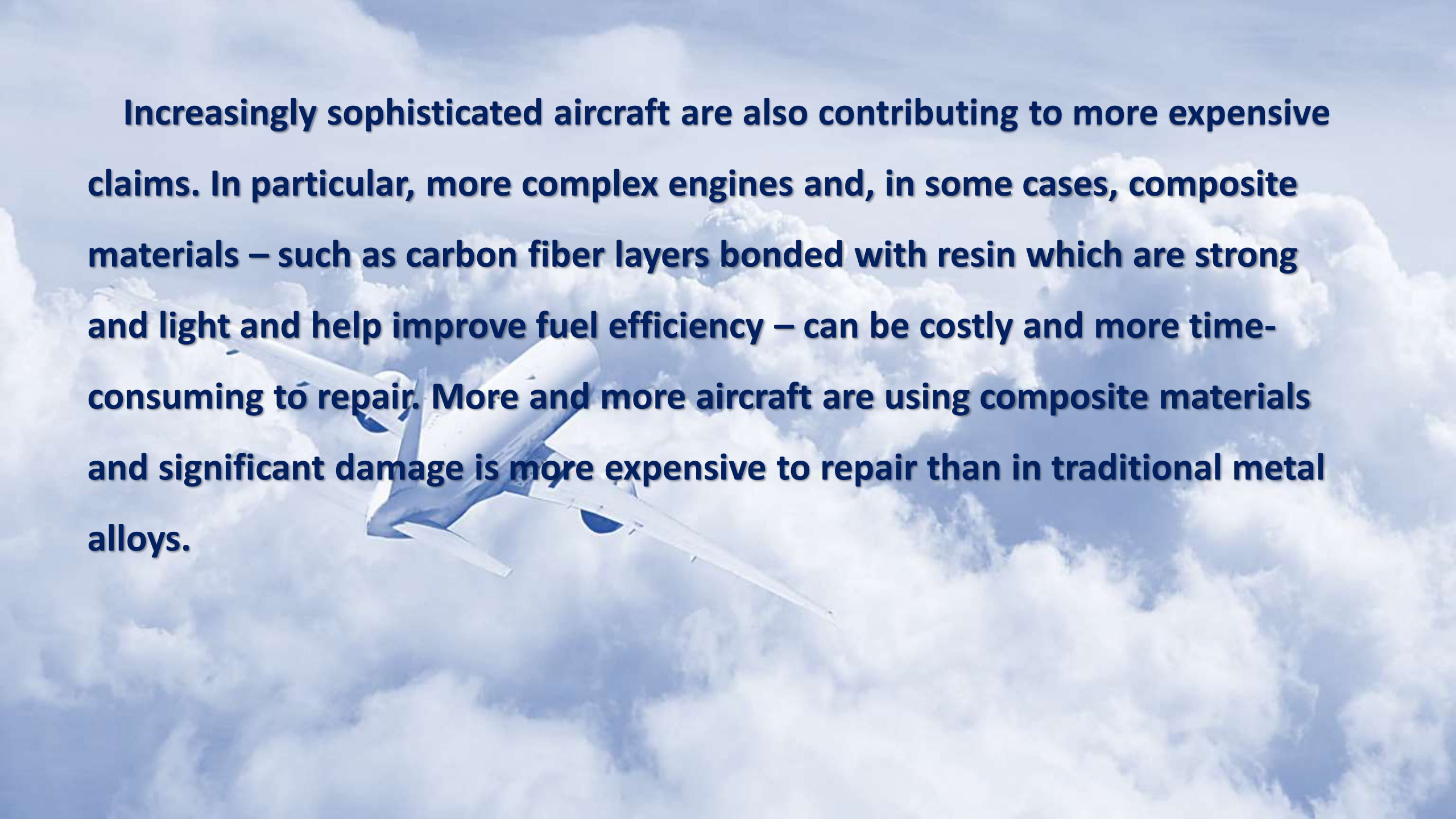
Although the improvement in the aviation sector's safety record – particularly with regards to the number of fatal accidents – cannot be questioned, it continues to see a high volume and growing magnitude of insurance claims, meaning aviators and insurers alike cannot be complacent. More costly repairs and engine claims, damage from foreign objects, ground collision incidents, slips and falls, fleet groundings, mis-fueling incidents, and liability awards, are just some of the areas in which insurers are seeing heightened activity. In recent years, the number of dollars paid in claims outstrips total insurance premiums in the aviation sector.

A white commercial airplane is shown in flight, viewed from a low angle, flying through a bright blue sky filled with large, fluffy white clouds. The plane is positioned in the lower-left quadrant of the frame, angled upwards and to the right. The overall scene is bright and clear, suggesting a high-altitude environment.

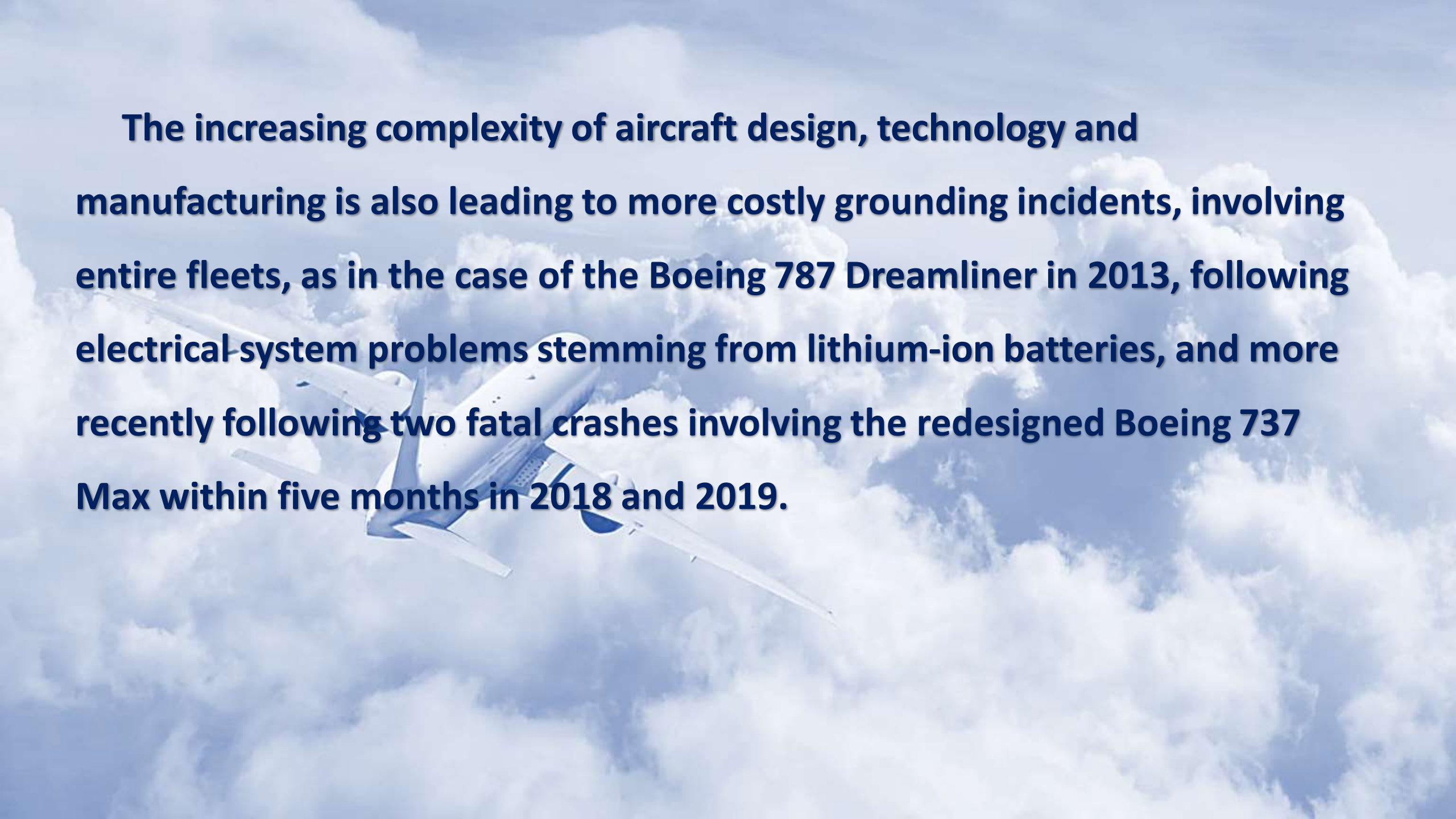
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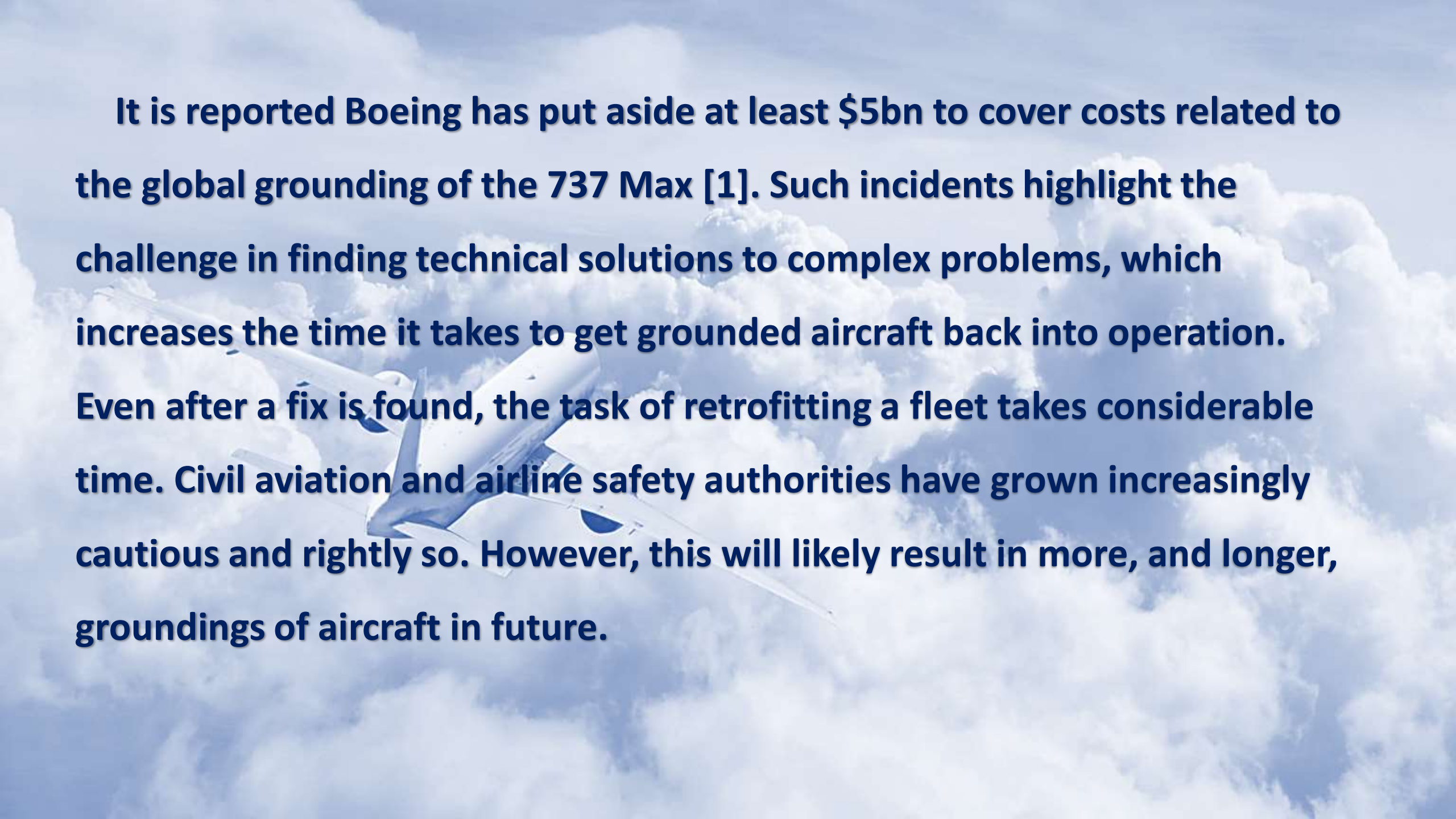
analysis of more than 50,000 aviation insurance industry claims worth more than €14.8bn (\$16.3bn) over the past five years shows collision/crash incidents account for over half the value of all claims (57%) equivalent to €8.4bn (\$9.3bn) – and over a quarter by number (27%). Loss of control in flight is the most frequent cause of fatal accidents. Collision/crash claims also incorporate incidents such as hard landings, bird strikes and runway incidents such as incursions and excursions. The analysis shows there have been 470 runway incidents resulting in claims over five years causing over €800mn (\$883mn) of damages. The average runway claim totals around €1.7mn (\$1.9mn).

Increasingly sophisticated aircraft are also contributing to more expensive claims. In particular, more complex engines and, in some cases, composite materials – such as carbon fiber layers bonded with resin which are strong and light and help improve fuel efficiency – can be costly and more time-consuming to repair. More and more aircraft are using composite materials and significant damage is more expensive to repair than in traditional metal alloys.

A white commercial airplane is shown from a low-angle perspective, flying through a bright blue sky filled with fluffy white clouds. The plane is positioned in the lower-left quadrant of the frame, angled upwards and to the right. The text is overlaid on the image in a bold, dark blue font.

The increasing complexity of aircraft design, technology and manufacturing is also leading to more costly grounding incidents, involving entire fleets, as in the case of the Boeing 787 Dreamliner in 2013, following electrical-system problems stemming from lithium-ion batteries, and more recently following two fatal crashes involving the redesigned Boeing 737 Max within five months in 2018 and 2019.

A white Boeing 787 Dreamliner aircraft is shown in flight, viewed from a low angle, flying through a bright blue sky filled with fluffy white clouds. The aircraft is positioned in the lower-left to center area of the frame, with its wings and tail clearly visible. The overall scene is bright and clear, suggesting a high-altitude flight.

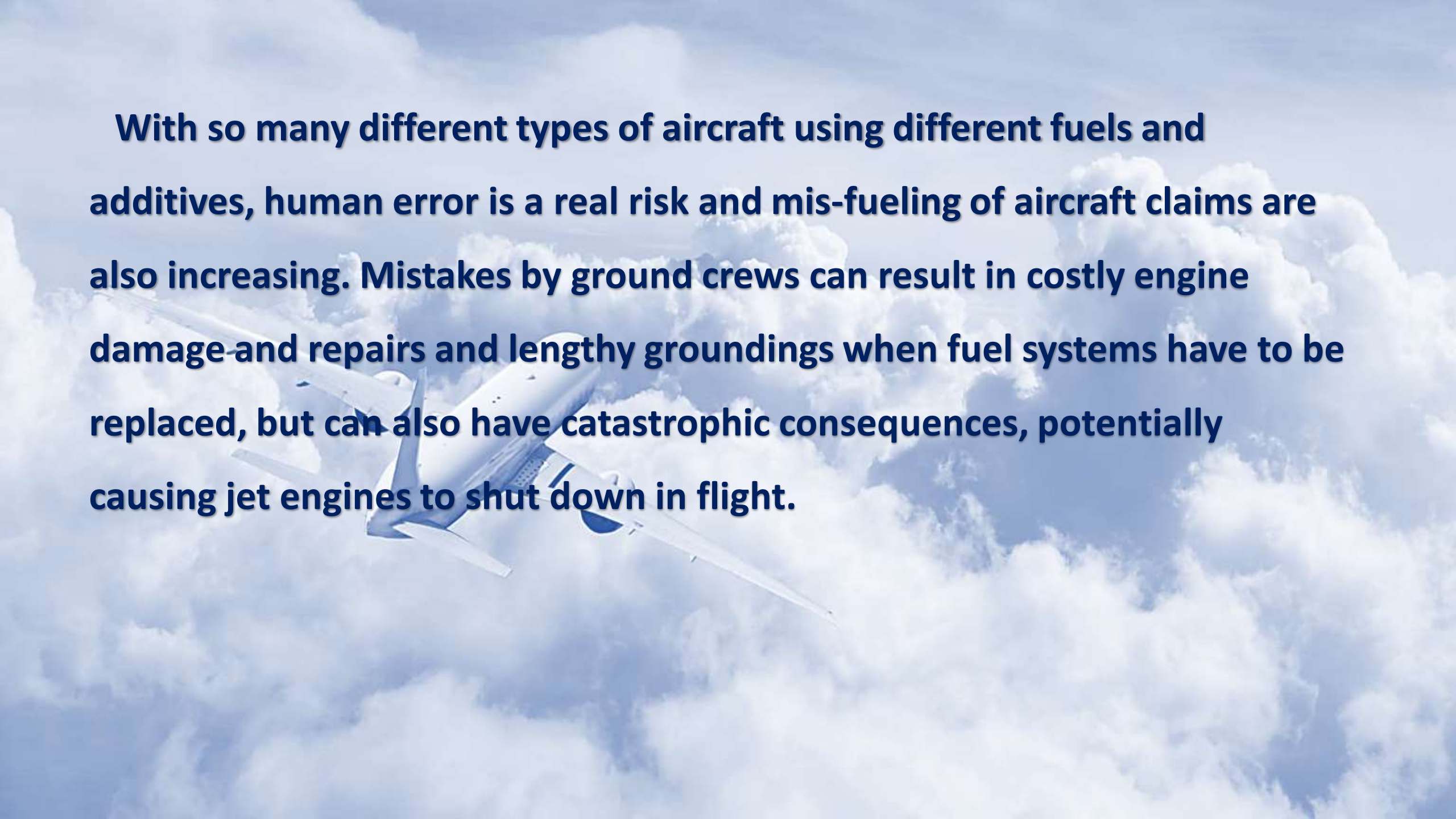
A white commercial airplane is shown in flight, viewed from a low angle, flying through a bright blue sky filled with fluffy white clouds. The text is overlaid on the image in a bold, dark blue font.

It is reported Boeing has put aside at least \$5bn to cover costs related to the global grounding of the 737 Max [1]. Such incidents highlight the challenge in finding technical solutions to complex problems, which increases the time it takes to get grounded aircraft back into operation. Even after a fix is found, the task of retrofitting a fleet takes considerable time. Civil aviation and airline safety authorities have grown increasingly cautious and rightly so. However, this will likely result in more, and longer, groundings of aircraft in future.

A white commercial airplane is shown in flight, viewed from a low angle, flying through a bright blue sky filled with fluffy white clouds. The text is overlaid on this background.

Insurers are also seeing a higher level of foreign object damage claims. There were more than 14,600 reported collisions with wildlife in 2018, according to the US Federal Aviation Administration. Bird strikes are a notable contributor to aviation insurance claims resulting in excess of €330mn (\$364mn) of damages in the past five years – over 1,000 claims were received by insurers, according to AGCS analysis. The average claim costs around \$360,000 but some can cost as much as \$16mn. Most occur when birds hit windscreens or fly into engines. The economic toll of bird strikes has been estimated at as much as \$400mn a year in the US to \$1.2bn worldwide.

With so many different types of aircraft using different fuels and additives, human error is a real risk and mis-fueling of aircraft claims are also increasing. Mistakes by ground crews can result in costly engine damage and repairs and lengthy groundings when fuel systems have to be replaced, but can also have catastrophic consequences, potentially causing jet engines to shut down in flight.

A white commercial airplane is shown from a high-angle perspective, flying through a bright blue sky filled with fluffy white clouds. The aircraft is positioned in the lower-left quadrant of the frame, angled towards the upper-right. The text is overlaid on the image in a bold, dark blue font.

AVIATION RISK 2020 IN NUMBERS



8bn

estimated number of air passengers by 2037 – double that of today.



2017 and 2018

were among the three safest years ever for the aviation industry for fatal plane crashes.



\$10bn

cost of ramp incidents at airports per year.



\$360,000

average cost of a “bird strike” claim on an airplane.

TOP CAUSES OF CLAIMS:



57%

Collision/crash



12%

Faulty workmanship/maintenance



6%

Machinery breakdown

Based on analysis of 51,867 aviation insurance industry claims worth more than \$16bn between 2013 and 2018. According to total value of claims.

CLAIMS TRENDS

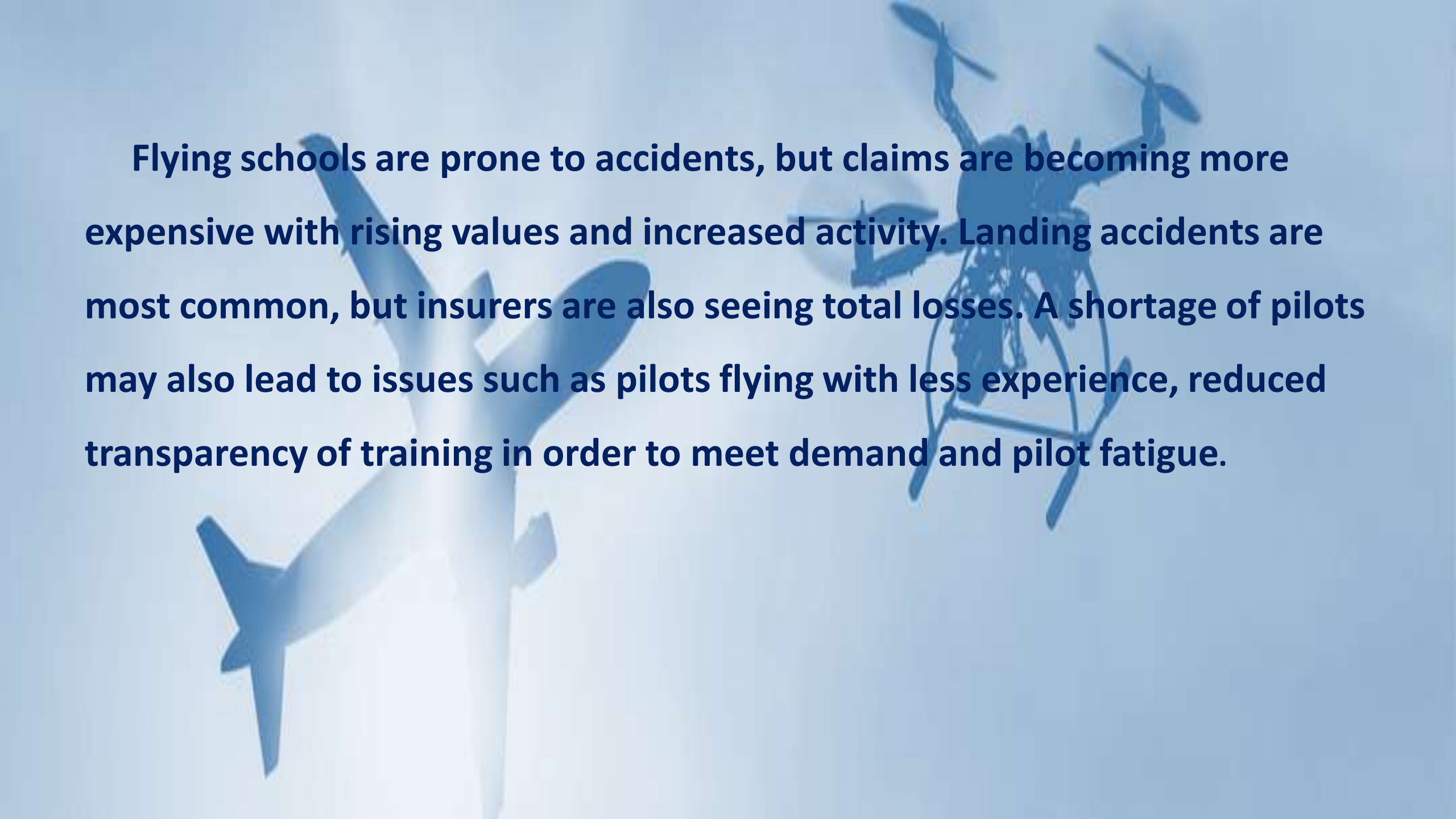
- ➔ High volume and growing magnitude of claims
- ➔ Technology driving higher values and cost of repairs
- ➔ Grounding cases more costly
- ➔ Growing potential for larger liability awards
- ➔ Foreign damage object claims soar
- ➔ Mis-fueling incidents on the rise

RISK TRENDS

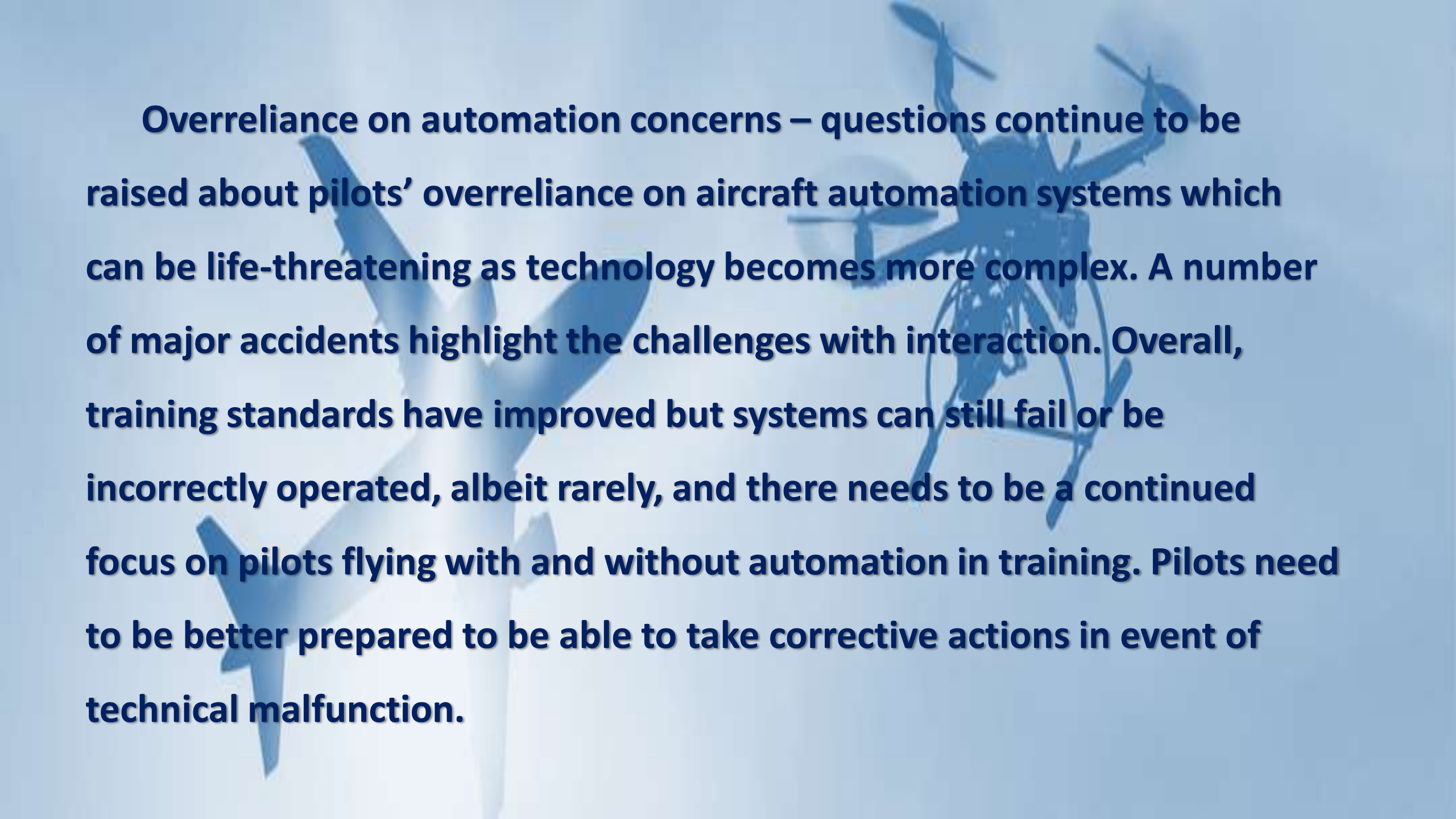
- ➔ Pilot shortage and fatigue
- ➔ Over-reliance on automation
- ➔ Exposures increasing at flight schools
- ➔ More turbulence from climate change
- ➔ Drone disruption
- ➔ Cyber business interruption threat growing
- ➔ Congested airports bring more on-the-ground accidents

Risk trends and challenges

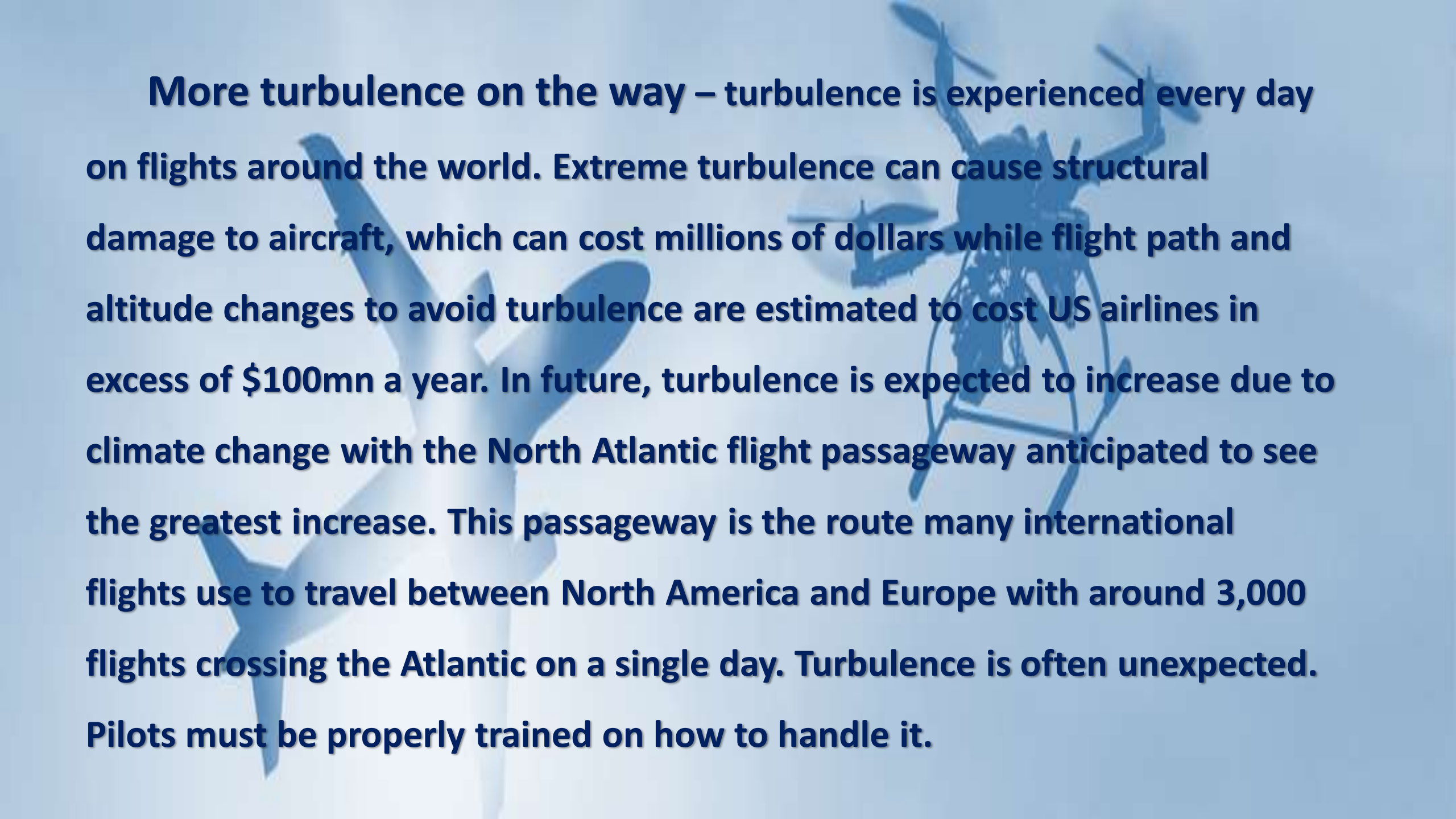
Pilot shortage causing issues – demand for new pilots is expected to total around 800,000 over the next 20 years – double the current workforce, driven by more airplanes, significant air travel demand and a tightening labor supply. The shortage of pilots has seen activity at flight schools increase exponentially, and is resulting in an up-tick in risk. Growing demand is driving up the value of aircraft used in schools, which increasingly use more sophisticated planes to train pilots. The average insured value of airplanes in some schools has increased from around \$100,000 in the past to \$1mn today.



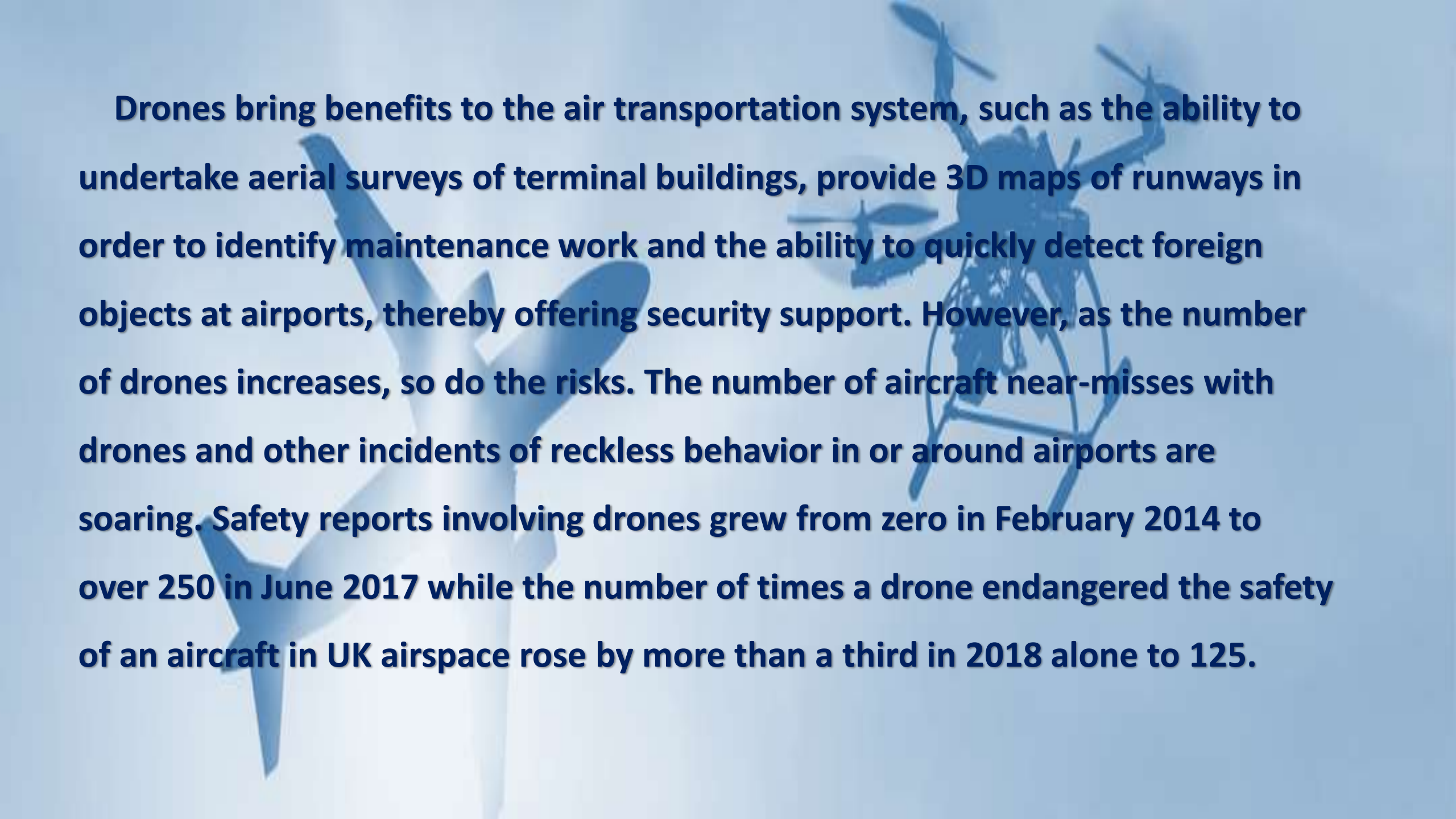
Flying schools are prone to accidents, but claims are becoming more expensive with rising values and increased activity. Landing accidents are most common, but insurers are also seeing total losses. A shortage of pilots may also lead to issues such as pilots flying with less experience, reduced transparency of training in order to meet demand and pilot fatigue.



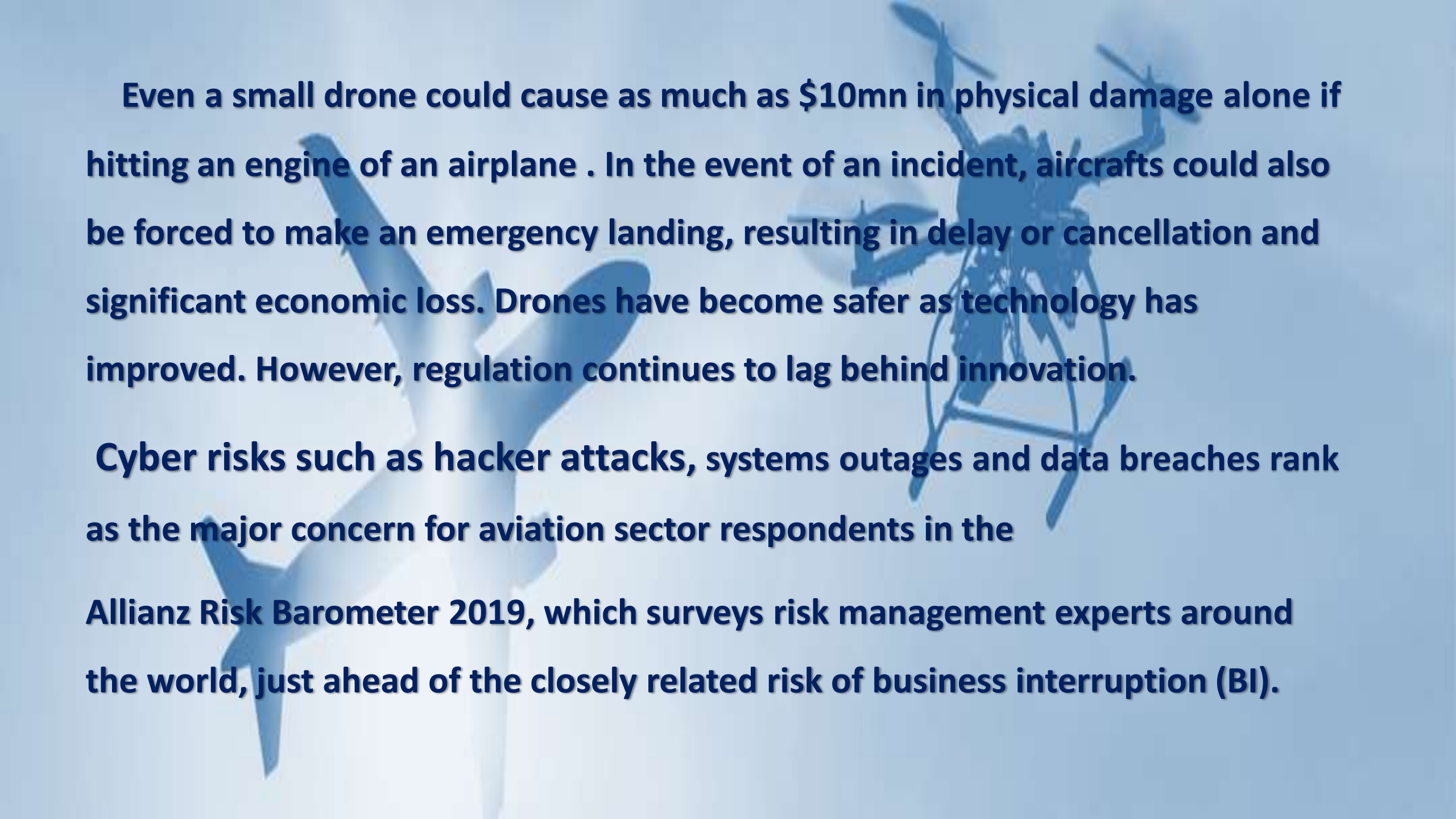
Overreliance on automation concerns – questions continue to be raised about pilots’ overreliance on aircraft automation systems which can be life-threatening as technology becomes more complex. A number of major accidents highlight the challenges with interaction. Overall, training standards have improved but systems can still fail or be incorrectly operated, albeit rarely, and there needs to be a continued focus on pilots flying with and without automation in training. Pilots need to be better prepared to be able to take corrective actions in event of technical malfunction.



More turbulence on the way – turbulence is experienced every day on flights around the world. Extreme turbulence can cause structural damage to aircraft, which can cost millions of dollars while flight path and altitude changes to avoid turbulence are estimated to cost US airlines in excess of \$100mn a year. In future, turbulence is expected to increase due to climate change with the North Atlantic flight passageway anticipated to see the greatest increase. This passageway is the route many international flights use to travel between North America and Europe with around 3,000 flights crossing the Atlantic on a single day. Turbulence is often unexpected. Pilots must be properly trained on how to handle it.

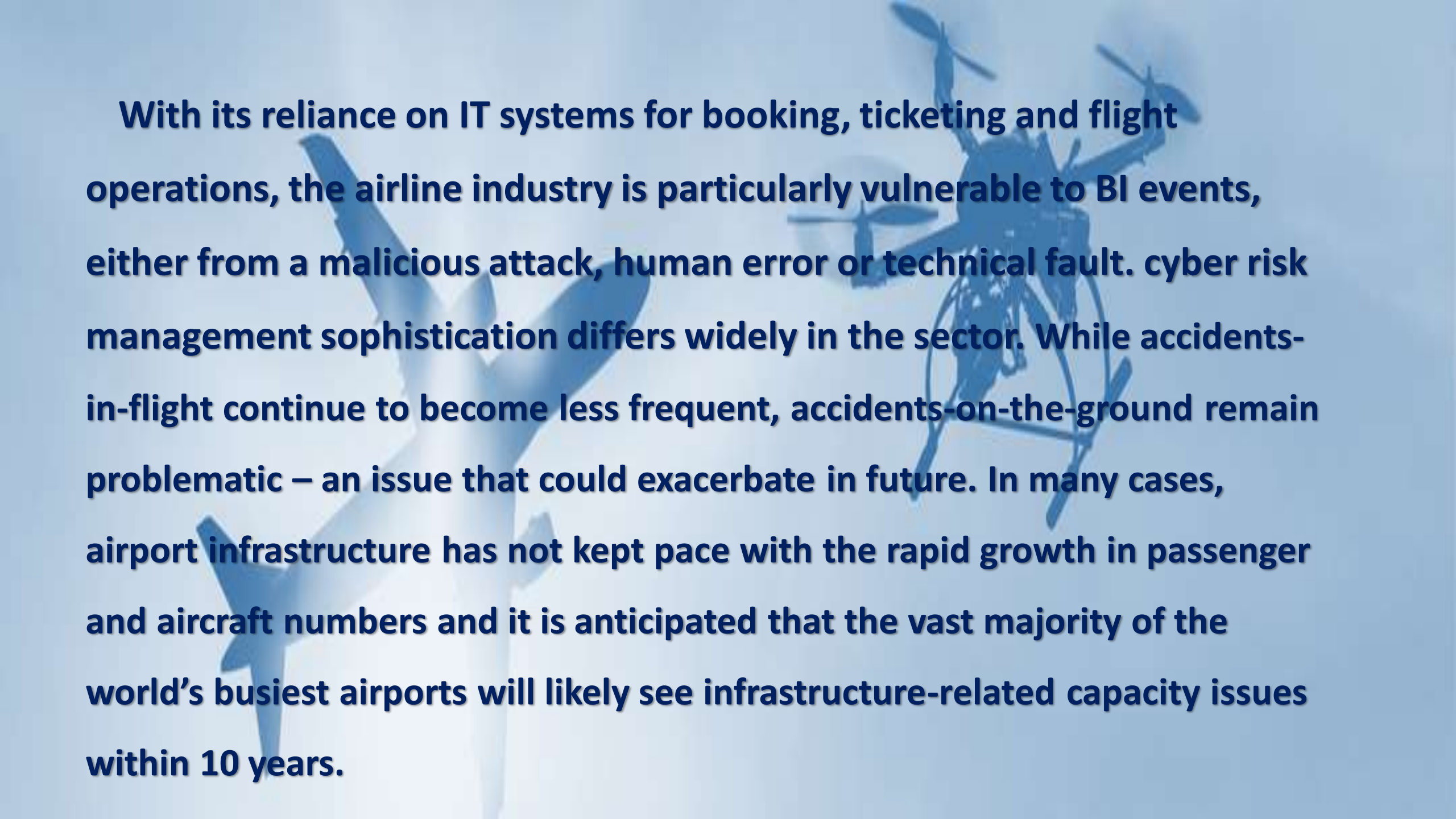


Drones bring benefits to the air transportation system, such as the ability to undertake aerial surveys of terminal buildings, provide 3D maps of runways in order to identify maintenance work and the ability to quickly detect foreign objects at airports, thereby offering security support. However, as the number of drones increases, so do the risks. The number of aircraft near-misses with drones and other incidents of reckless behavior in or around airports are soaring. Safety reports involving drones grew from zero in February 2014 to over 250 in June 2017 while the number of times a drone endangered the safety of an aircraft in UK airspace rose by more than a third in 2018 alone to 125.

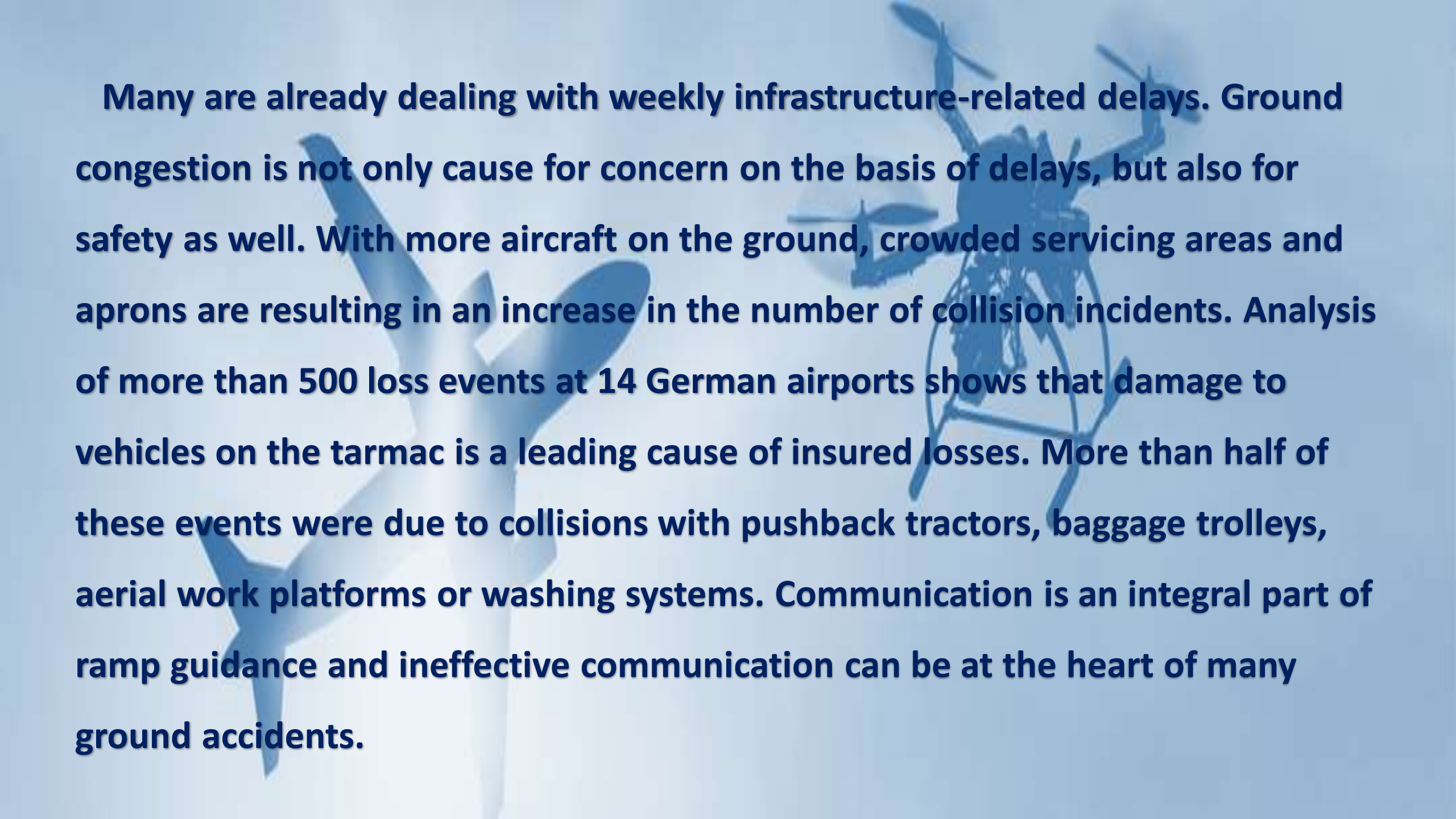


Even a small drone could cause as much as \$10mn in physical damage alone if hitting an engine of an airplane . In the event of an incident, aircrafts could also be forced to make an emergency landing, resulting in delay or cancellation and significant economic loss. Drones have become safer as technology has improved. However, regulation continues to lag behind innovation.

Cyber risks such as hacker attacks, systems outages and data breaches rank as the major concern for aviation sector respondents in the Allianz Risk Barometer 2019, which surveys risk management experts around the world, just ahead of the closely related risk of business interruption (BI).



With its reliance on IT systems for booking, ticketing and flight operations, the airline industry is particularly vulnerable to BI events, either from a malicious attack, human error or technical fault. cyber risk management sophistication differs widely in the sector. While accidents-in-flight continue to become less frequent, accidents-on-the-ground remain problematic – an issue that could exacerbate in future. In many cases, airport infrastructure has not kept pace with the rapid growth in passenger and aircraft numbers and it is anticipated that the vast majority of the world’s busiest airports will likely see infrastructure-related capacity issues within 10 years.



Many are already dealing with weekly infrastructure-related delays. Ground congestion is not only cause for concern on the basis of delays, but also for safety as well. With more aircraft on the ground, crowded servicing areas and aprons are resulting in an increase in the number of collision incidents. Analysis of more than 500 loss events at 14 German airports shows that damage to vehicles on the tarmac is a leading cause of insured losses. More than half of these events were due to collisions with pushback tractors, baggage trolleys, aerial work platforms or washing systems. Communication is an integral part of ramp guidance and ineffective communication can be at the heart of many ground accidents.

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