

Global Risk Dialogue

Allianz Global Corporate & Specialty
1915-2015



SPECIAL TOPIC

Aviation 100

Global Risk Dialogue examines some of the significant developments that have shaped 100 years of aviation insurance and looks at the risk challenges to come...

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Despite recent tragic activity, the sector has made long-term improvements

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How the loss landscape is changing

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Innovation, climate change and managing growth head the agenda

Allianz 



More than two million people lined the streets of New York in 1928 to celebrate the arrival of the **Bremen**; the first transatlantic airplane flight from east to west.

In 1915 Allianz started an aviation insurance business. The underwriting of its first airship insurance policy in Germany commenced what, this year, becomes a century-old partnership with the flight industry.

Global Risk Dialogue examines some of the significant developments that have shaped this relationship – from the daring exploits of the early aviation pioneers to the sector’s evolution into a global business on which \$2.4trn is dependent – and looks at the challenges to come...

1914

11 years after the Wright brothers power the first flight, the first scheduled commercial airline flight occurs – from St. Petersburg to Tampa, Florida, US



With just a few hours of fuel remaining, a **German Junkers W 33 aircraft** landed on a frozen reservoir on the remote Greenly Island, Canada on April 13, 1928. After 36 hours of flying in harsh conditions with just a magnetic compass to navigate by, the three-man crew of the Junkers '**Bremen**' had just made history, completing the first successful transatlantic airplane flight from east to west.

The trailblazing flight, which came just one year after Charles Lindbergh completed the first solo transatlantic flight, was insured by a pioneering insurer, Allianz, which in 2015 celebrates 100 years of underwriting aviation insurance.

"Allianz has been a partner to the aviation industry for much of its history (*the Allianz group also marks its 125th anniversary this year*). Since insuring some of the very first aviation risks in 1915 we have evolved into a global aviation insurer with clients ranging from small gliders and balloons to the world's largest airlines, airports and manufacturers," says **Henning Haagen, Global Head of Aviation at AGCS**.

As well as pioneering moments like the success of the Bremen, Allianz has also supported the industry through more tragic times, such as the **Hindenburg disaster**, for example – Allianz insured the airship that crashed in 1937, one of the world's first serious air accidents.

"It is unique in our industry to be able to look back over such a long time. While our business has evolved to meet the changing needs of the aviation sector over the past 100 years, the continuity of our offering has remained a key benefit to our clients," Haagen says.

Pioneering years

The first three decades of the 20th century were pioneering days for aviation, in a world seemingly full of technological progress. In 1900, the first ridged framed airships took to the skies while the Wright Brothers made their legendary first airplane flight in 1903. Over the following three decades the first aviators pushed man and machine to the limits, with many losing their lives in the process.

In the 1920s the world was gripped by the exploits of the early aviators, and the race to cross the Atlantic

turned the likes of the Bremen crew into international celebrities. More than two million people lined the streets of New York to welcome the two pilots, Hermann Köhl and Major James Fitzmaurice, and the owner of the aircraft, Ehrenfried Günther Freiherr von Hünefeld.

In the same year that the Bremen made history, the Graf Zeppelin airship – operated by the world's first airline, Deutsche Luftschiffahrts-Aktiengesellschaft – began the first ever non-stop transatlantic passenger flights. Early first fixed-wing airlines also began ferrying passengers and mail in the 1920s – Dutch airline KLM was established in 1919, making it the oldest continuously operating airline in the world – although commercial air flight wouldn't take off in a big way until the advent of the jet age from the 1950s onwards.

Jet age provides take-off

The introduction of jet airliners, which enabled airlines to fly further and cheaper, was a key milestone for the development of the aviation industry, explains **Josef Schweighart, Head of Aviation Germany at AGCS**. "The aviation industry really began to develop with the start of the jet age in the post-war period. Previously the aviation industry had not been commercially-driven, but all this changed with big leaps in technology after the Second World War that led to significant year-on-year growth."

In 1950, flying was a luxury that few could afford, with just **31 million** people taking to the skies compared with **3.3 billion** during 2014. Fast forward to today and there are now almost **1,400 airlines** operating worldwide, with a total fleet of **25,000 aircraft**. The aviation industry today is a critical component in the global economy - with some **\$2.4 trillion** of economic activity and **58 million** jobs worldwide dependent on it, according to The International Air Transport Association (IATA). Around one third of goods by value traded internationally are transported by air.

"The aviation industry is closely linked to globalization and economic development. Without the ease of mobility and connectivity provided by air travel, economic growth in Europe and the US would have taken a very different route," says Schweighart...



Allianz starts its aviation insurance business in Germany, insuring airships

1915

A history of risk sharing

As the aviation industry began to grow more rapidly after the First World War, so too did demand for aviation insurance. Underwriting aviation risks was to prove particularly challenging during the first decades of the 20th century, while the increasing international reach of the industry necessitates new solutions today.

Aviation risk was generally considered too volatile for individual insurers, leading companies to join together in a bid to share the risks – a model that is still followed in the commercial aviation sector today. Key to the development of the aviation insurance market over the subsequent decades was the establishment of aviation pools.

“In the early days, aviation risk was considered so unpredictable and extraordinary that it was almost impossible for a single insurer to underwrite 100% using its own capacity,” says **Josef Schweighart, Head of Aviation Germany at AGCS**.

The German pool

Allianz took a leading role in what was to become the German Aviation Pool (**Deutsche Luftpool**), first established by a group of German transport insurers to insure “**own risks**” in 1920, and later extended to accident and liability insurance from 1924.

The German Aviation Pool, which continued as the main source of aviation insurance in Germany up until the 1970s, was led by Allianz from an early stage. The pool functioned as a reinsurance company, offering its members and associated companies the chance to protect themselves from risk.

“Allianz became the de-facto aviation risk underwriter in Germany, acting as the German Aviation Pool’s underwriting department, writing aviation insurance business on behalf of the German market,” says Schweighart.

End of an era

Aviation pools continued to play an important role in providing the levels of capacity required by the world’s airlines for much of the 20th century. However, the role has

since diminished as large specialist aviation insurers are now able to underwrite much larger lines of coverage.

The German Aviation Pool ceased active underwriting in 2003, in part a response to the large losses inflicted by the terrorist attacks in the US on September 11, 2001, as well as changes to EU competition rules regarding co-insurance arrangements.

Local culture, global reach

Despite the globetrotting image of aviation, the industry has historically been national in nature, although this has been changing, especially due to the impact of the London market with its international clients.

Passenger Liability Regimes: Warsaw/Montreal Conventions

An important driver for aviation insurance was the development of passenger liability regimes, at both a national and international level.



Significantly, the Convention for the Unification of Certain Rules Relating to International Carriage by Air (Warsaw Convention) was signed at Warsaw on 12 October 1929. The law has since been amended, and was replaced by the 1999 Montreal Convention. Today, airline passenger liability is governed by a combination of international and national law, which can make claims settlement complex.

1920

Origins of the “Luftpool” in Germany: an association of Allianz and other insurers to collectively insure aviation hull risks



“In 1950, flying was a luxury that few could afford, with just **31 million** people taking to the skies compared with **3.3 billion** today”

Even today, national differences in aviation culture persist, explains **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS**. For example, France has historically been strong in aviation, especially in aerospace, where four of the global aerospace companies are based (Dassault Aviation, Safran SA, Thales Group and the multi-European Airbus Group).

Yet aviation companies, especially large airlines and manufacturers, as well as general aviation and aerospace firms, are increasingly international in their reach.

“In order to be successful aviation market insurers need to take a global view,” says **Henning Haagen, Global Head of Aviation, AGCS**. “Whether from Asia or North America, an airline today requires the same risk standards of service and offering, he says.

For example, international insurance solutions have become a key offering in the aviation sector and are very important for businesses such as product manufacturers and airport support services, which have been expanding beyond their national markets in recent decades.

Increased footprint

While Allianz began underwriting aviation risks for airships in Germany, over the past 100 years it has increasingly become more diversified and international. After initially underwriting international risks through the German Aviation Pool, it built a local presence in key aviation markets, in part through acquisition.

Over the past 100 years Allianz’ aviation business has grown its global footprint and increased its product offering – it now services clients flying over 160 countries. In recent years the insurer has been consolidating its regional aviation platforms, creating a global aviation insurer that can service clients consistently, both locally and globally.

This has been a major change in how Allianz underwrites aviation business, according to Haagen. “We need to be local to underwrite and service the risks,

but we also need to be able to take the global view, especially when it comes to the large risks,” he says.

Consistency and flexibility

Aviation risk is a volatile risk that benefits from being integrated into a large well-diversified insurance group. Large aviation insurers are also able to write large limits locally without the need to rely on reinsurance.

“We are able to service clients locally, but with the benefit of a robust and diverse portfolio,” says Haagen. “Aviation business has always formed an integral part of our group offering. Many insurers see aviation as a diversification play, but for us it is a core part of our business.

“In the current market there is opportunistic market capacity being offered. Allianz has shown that it is not just here for short term gain. We have been writing aviation insurance for 100 years and are here for the long term. That is a strong message,” Haagen says.

World Trade Center

September 11, 2001

was a major test for the insurance industry and the aviation sector. The terrorist attack, which destroyed the World Trade Centre in New York, with the tragic loss of many lives, also sparked litigation against a number of airlines, and a debate on the ability of insurers to offer terrorism insurance.



The disaster tested aviation underwriters and pools, causing many to rethink their strategy. Some national insurers and pools questioned whether they should be backing international risks.

1928

First transatlantic flight from East to West in a Junkers W 33 aircraft by Hünefeld, Köhl and Fitzmaurice, insured by Allianz.





Photo: Wikimedia Commons

Safer skies

Since the Wright brothers launched the era of powered flight in 1903 the industry has continued to improve its safety record.

Aviation accidents continue to horrify till this day, yet safety has been the highest priority for the aviation industry over the past 100 years. Big improvements in technology, training and risk management have together resulted in laudable improvements.

Safest form of travel


Despite the recent tragic loss activity, flying is often said to be the safest form of transport, and this is at least true in terms of fatalities per distance travelled. According to the Civil Aviation Authority, the fatality rate per billion kilometres travelled by plane is **0.003** compared to **0.27** by rail and **2.57** by car.

Statistically, you have more chance of being killed riding a bicycle or even by lightning. The chances of dying in an air crash in the US or Europe are estimated to be 29 million to one.

“When I started in the business almost 30 years ago, my boss had one basic message: You have to expect an average of 20 jetliner losses around the world every year,” recalls **Josef Schweighart, Head of Aviation Germany, AGCS**. “Thankfully, such statistics are now history,” he says.

“There has been a staggering reduction in the numbers of both fatal accidents and fatalities in the intervening decades, the result of technology, improvements in air traffic control and pilot training,” he adds.

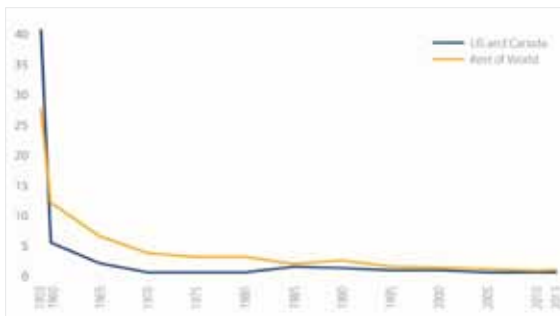
1937 The Hindenburg, the famous German dirigible, is destroyed by fire and an explosion of an unknown origin during landing proceedings at Lakehurst, New Jersey on May 6. 36 people lost their lives. The Hindenburg was insured by Allianz.



Positive statistics

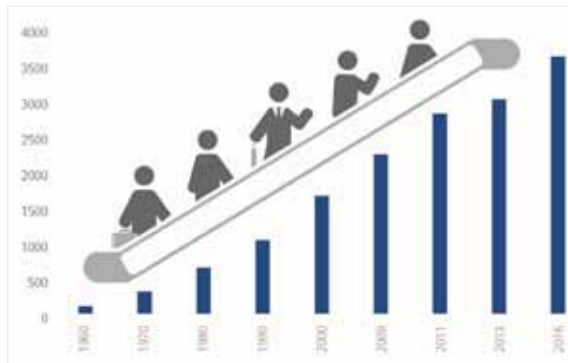
Fatal accidents have fallen every decade since the 1950s, a significant achievement given the massive growth in air travel since then. In 1959, there were 40 fatal accidents per one million aircraft departures in the US. Within 10 years this had improved to less than two in every million departures, falling to around 0.1 per million today.

Worldwide annual fatal accident rates per 1 million departures



Source: Boeing Co. Statistical Summary
Graphic: Allianz Global Corporate & Specialty

Global passenger numbers on the move (millions)



Source: IATA Airline Industry Forecast 2012-2016
Graphic: Allianz Global Corporate & Specialty

The improvements in safety are even more impressive when the increase in air traffic is considered. In 2014, the world's airlines carried a record 3.3 billion passengers in 2014. There were 641 fatalities and 12 fatal accidents last year, according to the International Air Transport Association (IATA)¹.

While the fatality rate significantly increased year-on-year (there were 210 fatalities in 2013), IATA says commercial aviation safety is still at **"the lowest rate in history"** based on hull losses per one million flights.

By these figures, the 2014 global jet accident rate was **0.23**, the equivalent of **one accident for every 4.4 million flights**. This was actually an improvement over 2013 when the global hull loss rate stood at 0.41 (an average of one accident every 2.4m flights). Both beat the five-year rate (2009-2013) of 0.58 hull loss accidents per million flights. Go back 50 years – when airlines carried only 141 million passengers – there were 87 crashes killing 1,597 people.

Engineering excellence

The improvement in airline safety is down to a combination of several factors, although the introduction of the jet engine in the 1950s stands out as a major development. Jet engines provide a level of safety and reliability unmatched by the earlier piston engines. Today, it is said that engine manufacturers have almost eliminated the chance of engine failure.

The introduction of electronics, most notable the introduction of digital instruments – known as the 'glass cockpit' in the 1970s – and the advent of fly-by-wire technology in the 1980s are also notable achievements, driving safety improvements. Improvements in sensors, navigation equipment and air traffic control technology, such as anti-collision control systems, have also played a role.

"There have been significant improvements in aircraft airframes, engines and avionics since the 1970s, with piston aircraft now largely replaced by the more

¹ not including the 298 deaths arising from the shooting down of flight MH17 in July 2014, which is not classified as an accident

1952

Launch of the jet age. The first commercial jetliner, the De Havilland Comet, enters service.



reliable turbine aircraft," says **Jon Downey, Head of Aviation – US, AGCS.**

Human factors

While technology has helped drive improvements in the aviation industry's safety record, great strides in safety management systems and insights into human factors have also contributed significantly.

"Aviation accidents are a chain of events that almost always involve an element of human error," Downey says.

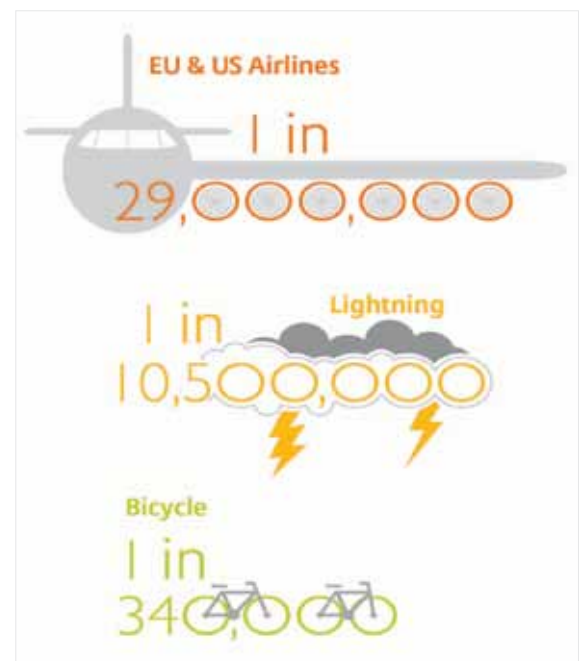
"However, the safety culture in the aviation industry has changed significantly during my career. Flight training has become a more controlled and professional environment with the development of recurrent training. The utilization and technological enhancement of flight simulators has been one of the biggest changes I have witnessed."

"In 20 years' time we may see more fundamental changes in aviation technology, driven by the economic and environmental concerns of fossil fuels"

Recurrent training, in which pilots and crews refresh their skills and prepare for emergency situations, was initially introduced in the airline sector and is now making a positive impact in all sectors of aviation, explains Downey.

Chance of a fatality...

What are the odds?



Source: Global Aviation Safety Study, Allianz Global Corporate & Specialty

"Safety management systems have radically changed the view of the human factor in the airline sector and are now making an impact in the general aviation world," he says.

Another important safety development in recent decades has been in the area of crew or cockpit resource management and the monitoring of data, which are aimed at reducing the risk of human error. For example, cockpit data monitoring systems – including digital audio and visual recording equipment – are now widely used to identify safety trends that can be addressed by training, as well as to investigate causes of accidents.

1955

The German aviation sector is boosted when a re-formed Lufthansa gains approval to start scheduled flights.



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Allianz

This aviation report is taken from the latest issue of AGCS' biannual Global Risk Dialogue magazine, featuring news and expert insights from the world of corporate risk. Discover more at www.agcs.allianz.com/insights/global-risk-dialogue/

Learning process

Improved safety is also a reflection of the aviation industry's first-class risk management and increasing ability to identify problems before they become a significant issue. Air accident investigations and aircraft safety inspections are now more effective, while improvements in manufacturing technology and better quality control are also making aircraft safer.

"Aviation companies have always focused on safety – but the tools available to run airline risk management departments and identify problems before they become critical, have improved greatly," says Schweighart.

Where next for safety?

While the accident rate improved yet again in 2014, questions remain over the industry's ability to maintain safety improvements in the future.

Further improvements in safety, while likely, are not guaranteed, according to **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS**. Aviation experiences periods of innovation – such as the recent development of composite materials or lithium batteries– which can nevertheless result in losses.

IATA notes that, given the projected growth in air travel, hull losses would double without further safety improvements. It has set a goal of further reducing the accident rate, but says that new and improved ways of managing safety will be required, such as with the greater use of data analytics.

"Fatal accidents have fallen every decade since the 1950s, a significant achievement given the massive growth in air travel since then"

Tapping into the potentially vast pool of data collected by more than **27 million flights each year** – rather than just the handful of flights where something goes wrong – will be key to improving safety in the future, according to IATA. For example, the airline industry is now looking to make greater use of data through IATA's Flight Data Exchange (FDX), which uses flight recorder data to identify systemic risk issues.



Advances in safety management systems and insights into human error factors have contributed significantly to the aviation industry's improved safety record.

Photo: Shutterstock



New technology - new risks

Aircraft technology has changed dramatically, both driving improvements in safety and shaping the industry's risk profile. Further innovations will be required in future, particularly if flying is to be kept affordable...

Photo: Wikimedia Commons

Solar-powered planes are one of the more recent aviation design innovations.

The aviation industry's impressive safety record in recent decades is in large part a reflection of technological developments introduced and then honed in the second half of the 20th century. Subsequent generations of jet aircraft have generally proved safer than the last.

The piston-driven aircraft that dominated the world's airline fleet in 1960 had an accident rate of 27.2 accidents per million departures. The second generation of aircraft in the latter half of the 1960s and early 1970s, which included the Boeing 727 and the DC-9 jet airliners, had an accident rate of 2.8 accidents per million. The current generation of aircraft have an accident rate of 1.5 accidents per one million departures.

Next generation

Aircraft design may eventually have to change more dramatically, especially if flying is to be kept affordable as fuel costs climb in the future. This could bring about new forms of propulsion – such as electric, hybrid or solar powered planes – radical new airframe designs, as well as new techniques, like assisted take-offs or unpowered landings.

"In 20 years' time we may see more fundamental changes in aviation technology, driven by the economic and environmental concerns of fossil fuels," says **Josef Schweighart, Head of Aviation Germany, AGCS.**

New materials and computer-aided aviation

In the meantime, the aviation industry continues to innovate, most recently with the introduction of composite materials and the increasing use of digital technology and electronics.

"The new generation of airliners are very innovative, but it will take time – at least several years – to see how resistant the materials will be," says **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS.**

Many of the new technologies have helped improve safety, such as better cockpit instrumentation displays and fly-by-wire systems. However, technology has a potential for creating unanticipated consequences, according to **Jon Downey, Head of Aviation – US, AGCS.**

"Once, pilots relied on their 'steam gauges' and had very little live data at their fingertips. Now the information available can be overwhelming," he says.

While 'glass cockpit' technology gives much better visual awareness it also raises issues, as was seen in the loss of the Air France Flight 447 in 2009 with 228 people on-board. Accident investigators concluded that the pilots became confused by the plane's instrumentation and took inappropriate action when the Airbus 330 flew into turbulence during a tropical thunderstorm over the Atlantic Ocean.

Concerns over pilot's reliance on automation in the cockpit were also raised by the Asiana crash in 2013.

"What we see now is an increasing reliance on technology, that pilots may not fully understand, that at some point this can diminish a pilot's situational awareness and stick and rudder skills," says Downey.



The German "Luftpool" now also offers aerospace risk insurance solutions.

1985

The changing loss landscape

Photo: Shutterstock

The Hindenburg is regarded as one of the world's first serious air accidents.

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.

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 2020.

“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,” according to **Josef Schweighart, Head of Aviation, Germany, AGCS**.

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,” says **Henning Haagen, Global Head of Aviation, AGCS**.

New vulnerabilities

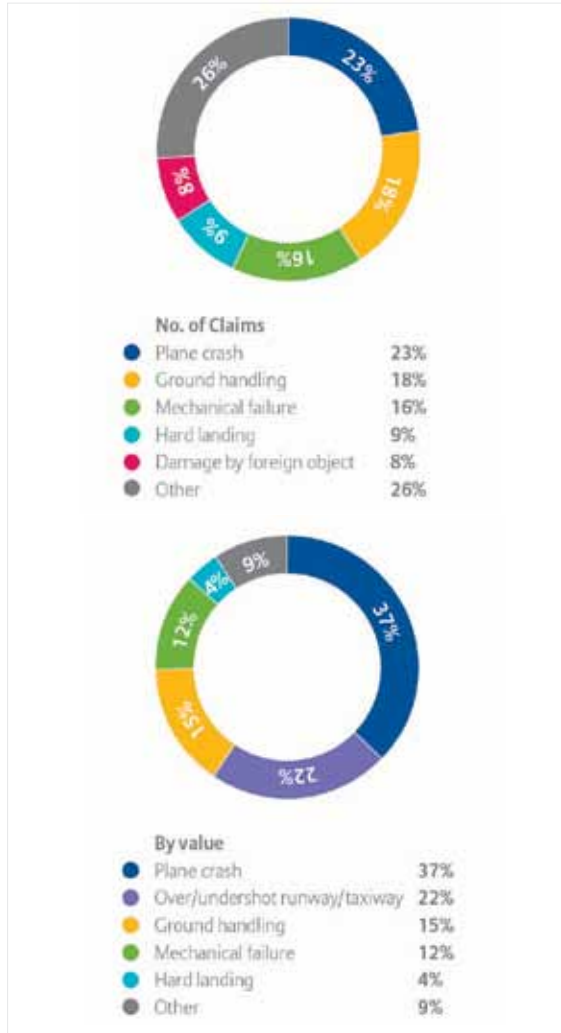
Technology that helps drive improvements in safety and reduce catastrophic losses also brings new vulnerabilities and potentially higher costs for insurance claims. Aircraft are now far more complex, using new materials and components – there are on average 600,000 parts on a typical jet airliner.

2001

Terrorist attacks on World Trade Center in New York, US on September 11.



Top Causes of Loss: Aviation Claims (€1m+)



Source: Global Claims Review, Allianz Global Corporate & Specialty.
Data based on accident years 2009-2013

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.

For example, **AGCS Head of Aviation – US, Jon Downey** 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, he says.

“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,” adds Haagen.

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.

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 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,” says Haagen.

2003

The German “Luftpool” ends its business as re-insurer of aviation risks.



The risks of the future

Innovation, climate change and managing future growth are among the risks likely to challenge the aviation industry in coming decades.

Prospects for the aviation industry look good, with growth in passenger numbers expected to reach **16 billion by 2050**, a 384% increase on today's numbers. Air freight is expected to increase to **400 million tons** from just 50 million today, according to the International Air Transport Association (IATA).

Growth in air travel will have ramifications for the industry's risk profile. For example, there will be a shift in flying and large hubs towards Asia and the Middle East, where populations are growing and where there have been large increases in infrastructure in recent years.

Mergers and acquisition among ground support companies and aerospace firms has picked up in recent years as companies look to expand overseas. Regional consolidation of airlines is on-going, but while there has not been a large cross-continental merger – between a European and US or Asian airline, such a move is only a matter of time.

Longer term, the aviation industry may have to explore more revolutionary forms of technology. If they are to achieve the expected growth potential, airlines will need

to address the high financial and environmental cost of traditional fossil fuels.

“The next big challenge for the aviation industry will be to keep flying affordable and find a way out of pure fuel-driven propulsion,” says **Josef Schweighart, Head of Aviation, Germany, AGCS**.

Climate change could also have more direct effects on flying. Scientists predict that turbulence on the North Atlantic flight corridor could increase by **40% to 170%** if carbon dioxide emissions double by 2050, as the International Energy Agency forecasts.

“Macro trends reaffirm the need for large global aviation insurers, and for underwriters that understand the changing nature of aviation risk,” adds **Henning Haagen, Global Head of Aviation, AGCS**.

Risk management challenges

Business interruption and supply chain risks are among the greatest concerns for the aviation industry, according to the **Allianz Risk Barometer**, an annual study of risk consultants, senior managers and claims experts.

Key risks for the aviation industry:



2006 Allianz Global Corporate & Specialty (AGCS), which insures aviation, and a number of other corporate risks, is founded by pooling subsidiaries of Allianz.




Photo: Wikimedia Commons



The majority of UAVs are currently operated by the military but an increasing number of units are being used in other ways, such as surveying pipelines, border patrols and search and rescue operations.

“A problem with a component, engine or airframe can now lead to the grounding of an entire fleet,” says Haagen. For example, technology problems on-board the new Boeing 787 Dreamliner saw the entire fleet grounded for three months while a solution was found.

In addition to the increasing risk of business interruption, there are a number of emerging risk challenges for the aviation industry, including those posed by new technologies – like composite materials – and human factors, such as how best to counter the potential downsides of increasing automation and information in the cockpit.

With growing demand for air travel, pilot training will become an even bigger issue than it is today. Boeing estimates that some **498,000 new commercial airline pilots** will be required over the next two decades, raising concerns over the industry’s ability to fill quotas. Pilot lapses and automation have been implicated in a number of recent incidents including the Asiana Flight 214 accident in San Francisco in 2013, suggesting that continuous training should help prepare pilots to fly and recover aircraft when automation fails, as well as addressing passivity in the cockpit from a reliance on automation.

Two other technology-related emerging risk areas for aviation likely to feature increasingly in coming years will be the threat a cyber-attack could pose to

“A problem with a component, engine or airframe can now lead to the grounding of an entire fleet”

the aviation sector as well as the increasing use of **Unmanned Aerial Vehicles (UAVs)**, more commonly known as drones.

Cyber: “the biggest focus”

The aviation sector now relies on computers for almost every aspect of its business. And with this growing reliance, the industry faces an increasing threat from cyber risk, including cyber terrorism, extortion, data breaches and network outages.

“In the next five to 10 years, cyber will become the biggest focus of the aviation industry,” predicts Haagen. Cyber risks are not currently excluded in aviation insurance policies, however, the aviation industry and its insurers will need to develop their understanding of the risk to prevent losses and risk accumulation, he adds.



Discover more about the aviation industry's safety record and the developments that will impact aviation in future in AGCS' Global Aviation Safety Study at www.agcs.allianz.com/insights

UAVs: excitement and concern

The advent of UAVs is causing excitement in the aviation world, and concern among airline pilots. The majority of UAV systems are operated by the military but as the technology matures, increasing numbers of units will find commercial uses, like conducting surveys of pipelines, border patrols, and filming sports events and movies. The US' Federal Aviation Administration (FAA) has predicted the number of UAVs in the US will rise to approximately **15,000 units** by 2020 and **30,000 units** by 2030.

However, the growing use of UAVs is a safety concern for the British Airline Pilots' Association (BALPA). It notes that in 2014 alone, an American Airlines pilot reported narrowly missing a

quadcopter at 2,300 feet above Florida while a drone was flown within 20ft of an A320 landing at Heathrow.

Currently, most UAVs are small and light (under 20kg) but capable of reaching around 2,000 feet and posing a risk to passenger aircraft. BALPA believes that large remote aircraft – the size as a Boeing 737 – could operate commercially within 10 years.

Many countries either prohibit or severely restrict the use of UAVs, although the European Union and the US are both looking at ways to safely integrate drones into airspace, including appropriate level of liability and insurance. In the case of the US, its FAA recently proposed a framework of regulations that would allow routine use of certain small unmanned aircraft systems (under 55 pounds [25kg] in weight) in today's aviation system.

Such moves mean that many now believe drone technology is here to stay. And despite concerns for safety, there are also many benefits if drones can be safely integrated and accommodated.

"UAVs could change the aviation world for the better by supplementing the more mundane and dangerous missions, such as surveying pipelines and search and rescue," says **Jon Downey, Head of Aviation – US, AGCS**. "There is a tremendous opportunity to reduce the more hazardous forms of manned flight," he says.

Aviation insurance: more than just passenger jets

Since insuring some of the very first aviation risks in 1915, Allianz has evolved into a global aviation insurer protecting a wide range of risks from the Arctic to the Australian outback – including small gliders and balloons to the world's largest airlines, airports and manufacturers. Some of the more out-of-the-ordinary risks AGCS has covered include:



Photo: Wikimedia Commons

- **Space:** In 2014 alone AGCS insured 21 space launches through its space underwriting team based in Paris, France. The launches covered eight different types of vehicles from around the world
- **Project Orbis** – the first airborne operating theatre for eye treatment in the world
- Telecommunication, earth observation and scientific **satellites**
- **Fire-fighting** and spraying airplanes
- Unmanned aerial vehicles (**UAVs**)
- **Stunt** kites

For more information visit www.agcs.allianz.com/services/aviation/

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2014

The aviation industry is impacted by a number of disasters including the disappearance of Malaysia Airlines flight MH370 and the shooting down of flight MH17 in 2014.





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