Aviation trends post Covid-19

Nine issues to watch as the industry prepares for takeoff
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Introduction

“Rusty” pilots, “air rage”, new routes, new generation aircraft and even insect infestations – airlines and airports will face some novel challenges as they turn their attentions toward restoring normal operations after being mothballed during the Covid-19 pandemic.

To see the damage Covid-19 inflicted upon the aviation industry, at one point, one simply had to look to the skies. Once crisscrossed by vapor trails, in many locations, they were largely unmarred by the telltale signs of aircraft passing.

The sudden halt imposed on aviation by the pandemic means the industry was hit faster and harder than most other sectors. At one point during the crisis, two-thirds of the global fleet sat idle on the tarmac. Figures from the International Air Transport Association (IATA) show passenger traffic, as measured by industry-wide revenue passenger kilometers (RPKs) was down 90% in April 2020 compared to the previous year. The figures for March 2021 show an improvement. While RPKs remain 67% lower than March 2019, largely due to limited international travel, there was a strong recovery in domestic travel, led by the US.

The industry is slowly rebounding and at AGCS we have witnessed firsthand how the risk management, safety, in-flight and other teams of our customers tirelessly rose to meet each challenge to ensure that air travel remained safe, while facing layoffs, financial struggles and the pressures concomitant with an overnight transformation to remote working. But as more aircraft return to the skies, there has been much discussion about the hazards that may arise from such an unprecedented period, as well as some of the changes the sector will see. In this report, AGCS’ aviation team highlights some of the potential issues facing the airline industry as the Covid-19 recovery begins.

“The global aviation industry is sophisticated with a highly-developed safety culture that has improved year after year,” says Tom Fadden, Global Head of Aviation at AGCS. “When we speak to our customers we hear that they are focused on the operational challenges posed by Covid-19 and are keen to share what they are doing with us in order to best manage and mitigate their risks. The aviation team at AGCS is focused on technical excellence and has a dedicated team of skilled experts available to assess such risks. We appreciate the open dialogue we have with our customers and all they are doing to manage risk during this difficult time.”
Earlier this year it was reported that dozens of pilots had notified the Aviation Safety Reporting System about making mistakes after climbing back into the cockpit. Operated by NASA, the US Federal Aviation Administration (FAA) watchdog system enables pilots and crew members to anonymously report mechanical glitches and human errors. Many of the pilots cited rustiness as a reason for the incidents after returning to the skies following months of lockdown.

While there have been no reported incidents of out-of-practice pilots causing accidents injuring passengers, mistakes reported included: forgetting to disengage the parking brake on takeoff, taking three attempts to land the plane on a windy day, choosing the wrong runway and forgetting to turn on the anti-icing mechanism that prevents the altitude and airspeed sensors from freezing.

Howard Hamilton, an Executive Aviation Underwriter at AGCS explains that the major airlines have developed training programs for pilots reentering service, ranging from procedural refreshers to multiple simulator sessions and supervised in-flight checks, depending on their length of absence from the skies. Anecdotally, Hamilton notes that many pilots he has spoken to felt that returning to the skies after an extended period off was not a major issue, given their extensive experience.

In Europe, Axel von Frowein, a Regional Head of Aviation at AGCS says that airlines have maintained routes to keep their airport slots, but also to ensure their pilots maintain their skills and licenses.

Till Kürschner, a Regional Head of Aviation Claims at AGCS notes that while pilots have practiced simulator training, some have not physically piloted larger aircraft, such as A380s or jumbo jets such as 747s, for more than a year. “There is nothing to indicate it is a concern, but it does needs to be monitored,” adds Kürschner.
According to David Watkins, a Regional Head of General Aviation at AGCS, the main issues the insurer sees are ongoing ones into safety protocols that precede the Covid crisis, such as the conclusion of investigations into sightseeing flights that tragically resulted in a mountain crash in 2018 and a midair collision in 2019, both of which occurred in Alaska. (A sightseeing plane crashed in Denali National Park and Preserve in August 2018 killing all five people on board. In May 2019, two sightseeing planes collided in mid-air resulting in six fatalities. In the second incident US investigators determined that these two aircraft were effectively invisible to their pilots before they collided, possibly because of the cockpit structures, highlighting the inadequacy of conventional “see-and-avoid” strategies).

Leisure flights over spectacular landscapes in tourism destinations are increasingly popular. “The problem with such landscapes, is that they can also be the most demanding and unforgiving,” says John Nowicki, a General Aviation and Airline Claims Manager at AGCS.

Post Covid-19 – and the reopening of tourism – there are potential questions about the skills of some pilots flying over such locations, particularly if they are unfamiliar with the territory. “Are the pilots flying these routes the same ones as before the Covid-19 crisis or will there be an influx of new pilots? There is a learning curve involved in such environments, so there could be a heightened risk environment in some of these locations until the new pilots gain the necessary experience,” says Nowicki.

Both von Frowein and Kürschner agree that there may be more of a concern in terms of leisure pilots who stopped flying throughout the crisis. “The question is: at what level will their skills be at once they take to the skies again,” says von Frowein.

3 Alaska Public Media, NTSB: Obstructed views, lack of alerts caused midair crash, April 20, 2021
AVIATION TRENDS POST COVID-19
2. Incidents of air rage and unruly passenger behavior on the rise

In May 2021, an attendant on a Southwest airline flight had two teeth knocked out after an altercation with a passenger over wearing a mask. It was the latest in a spate of highly publicized incidents that moved the FAA to later issue a warning about a spike in unruly or dangerous behavior aboard passenger planes.

In a typical year in the US, there are often no more than 150 reports of serious onboard disruption. In 2021, that number had already jumped to around 3,000 by June⁴, including about 2,300 incidents involving passengers who refused to comply with the federal mandate to wear a mask while traveling.

Inflight incidents have also been tracked by IATA since 2007. The numbers have been steadily increasing but the pandemic added a whole new host of pressures. Now flight crews are bearing the burden of enforcing mask mandates in an already stressful environment.

Although Carmen Paul, an Airline Claims Manager at AGCS says this trend isn’t yet translating into significant claims activity, Paul acknowledges that there is the possibility that such disruptive or disorderly passengers may later claim they were discriminated against by the airline in question. “If such claims do arise from cases which have clearly involved disruptive or disorderly passengers it would be something we would push back hard on,” says Paul. “But as insurers we have to be aware of this trend and stay on top of it.”

In the US airlines such as Delta, United and Alaska Airlines had already banned more than 900 passengers⁵ for not wearing masks by the end of last year, while the FAA has also imposed penalties of up to $15,000 against five passengers. Mask wearing has become a political issue in the US with a minority of the population seeing the requirement to wear one as an attack on their personal freedoms. Increasingly some are willing to become vocal – and even physical – about it.

Neither von Frowein nor Kürschner believe such incidents over mask-wearing will become commonplace in Europe. “In the US, if there is a confrontation, people are more likely to file a claim against the airline, but in Europe, even if people are angry, typically, they don’t think in terms of compensation to the same extent,” says von Frowein.

However, the significant, if lesser increase, in non-mask wearing incidents indicates that flying post-Covid has become more stressful. US-based pilots are already calling on the FAA and the Department of Transport to speed up making secondary flight deck barriers a legal requirement on all new commercial passenger aircraft after the soaring number of incidents in 2021 to date.

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⁴ Federal Aviation Administration, Passengers & Cargo, Unruly Passengers, June 2021
⁵ The Washington Post, Delta, United and Alaska Airlines have banned more than 900 passengers for not wearing masks, October 26, 2020
3. The perils from parked fleets

At the peak of the first wave of the Covid-19 crisis airlines parked around two thirds of the total global fleet. More than a year later, many are still mothballed. This unprecedented situation has resulted in a host of new challenges. Loss exposures do not just disappear when airplanes are parked. Instead, they change and can create new risk accumulations. For example, thunderstorms in Texas in May 2021 that pelted down golf ball-sized hail sparked fears of damage among several grounded aircraft.

Kevin Murphy, a Director in the Aviation Products & Major Claims Unit at AGCS says that having a number of aircraft parked together in one location can prove expensive when such an incident occurs, given the value of the aircraft: “Today, airlines tend to be very savvy about getting aircraft out of the way from bad weather such as hurricanes and snowstorms a couple of days in advance. It is when you can’t reactivate an airplane fast enough to move it away that they become sitting ducks.”

Kürschner says that although Europe is not subject to the same number of extreme natural catastrophe events as the US, severe weather incidents do occur. However, 2020 appears to have been a lucky year in terms of what could have happened to large numbers of parked aircraft: “You could see images of the aircraft at airports like Copenhagen, Frankfurt, Munich and Vienna. They looked like car parks, so it was fortunate there was no major weather incident as maneuvering all the aircraft to another location would have been challenging.”

Ground handling of aircraft brings risk, given they are large and tricky to maneuver. Shunting or ground incidents can result in costly claims. When operators took on the task of transferring fleets of aircraft from the runways to storage facilities at the start of the Covid-19 pandemic there were a number of collision incidents. Therefore, it would not be surprising to see an increase in similar incidents as aircraft are moved in preparation for reuse.

Aircraft in storage typically undergo routine maintenance to ensure they are ready for service when business improves. Manufacturers also give detailed instructions on how to store their aircraft. However, never has the industry seen so many aircraft temporarily put out of service.

The European Union Aviation Safety Agency (EASA) has launched a “Ramp-Up – Be Ready, Stay Safe” campaign as aircraft return to the skies in greater numbers. Underlying the campaign is a surge in reports of unreliable airspeed and altitude readings during the first flight/s after an airplane leaves storage. In some cases, takeoffs have had to be abandoned or the aircraft has had to return to the airport.

“The topic is certainly on the minds of insurers,” says Dave Warfel, a Regional Head of Aviation, at AGCS. “The question is what will it look like when aircraft that have been out for so long come back into service?”
Warfel explains that the major North American airlines have rigorous fleet management programs in place: “Airlines have worked hard to maintain their fleets and to ensure their airworthiness. As insurers, we take a keen interest in understanding these plans to return to service.”

While parked aircraft typically experience less wear and tear than when in service, they aren’t just parked until needed again. Most are left in a “flight-ready” condition, which is a detailed process that includes covering exhaust and intake points, greasing and cleaning landing gear, turning off cockpit controls and disconnecting batteries.

They are then put on an active maintenance schedule that requires basic visual inspections every seven days, electrical and brake maintenance every 14 days and fuller checks, including starting the engine and inspecting anti-ice systems, every 30 days. Deep storage is a procedure for longer term storage that involves sealing the aircraft and draining oil and fuel from the engines. Specialized reflective foil is used to cover the cockpit windscreen to keep the sun off the instruments and screens inside, among many other procedures.

“What will be interesting is when some of the smaller airlines, which have suspended their entire service for more than year, come back,” says Warfel. “They will be reactivating entire mothballed fleets, a process for which there is almost no precedent. We are watching such developments carefully, but we are not yet seeing indications that airlines are struggling with the issue.”

The aviation industry has seen few claims directly related to the pandemic to date. In a small number of liability notifications, passengers have sued airlines for cancellations or disruptions. At the same time there has been a decline in the numerous smaller slip and fall or lost baggage claims at airports because of the reduced number of passengers during the pandemic. However, a natural increase in these claims is anticipated as and when passenger traffic returns to more normal levels.

Meanwhile, large loss activity has continued from damage to parked aircraft - which can be exposed to hurricanes and hailstorms - crashes and emergency landings to name just a few examples. There have also been some tragic general aviation accidents which have hit the insurance sector. Again, it is expected that claims activity will return to more normal levels, as passenger numbers return.

Top causes of loss:
Aviation claims

By value of claims:
- Collision/crash 52%
- Faulty workmanship/maintenance/defective product 24%
- Machinery breakdown (including engine failure) 6%
- Travel issues (including late delivery, delay, baggage etc.) 4%
- Fire 2%
- Other 12%

By number of claims:
- Collision/crash 30%
- Travel issues (including late delivery, delay, baggage etc.) 13%
- Slips and falls/passenger injury 13%
- Faulty workmanship/maintenance/defective product 13%
- Damaged goods (including handling/storage) 7%
- Other 24%

Based on analysis of 46,038 aviation insurance industry claims worth more than €14.5bn ($17.3bn) over the past five years. Unsurprisingly, collision/crash incidents account for over half the value of all claims (52%) by value and almost a third by number (30%). This means that there have been 13,896 aviation collision/crash incidents resulting in claims over the past five years. Such incidents do not just include major crashes in the air, however. They also incorporate events like hard landings, bird strikes and runway incidents such as incursions and excursions.

Source: Allianz Global Corporate & Specialty (AGCS). Claims analyzed between the period January 2016 and December 2020. Claims total includes the share of other insurers in addition to AGCS.
4. Pilot shortage remains a major issue and brings risks
The initial response of many airlines to the pandemic involved furloughs, hiring freezes and layoffs to conserve cash. It, therefore, seems odd that the industry faces an imminent shortage of pilots, but Covid-19 merely paused a longer-term problem.

The tremendous increase in air travel experienced in the years before the pandemic – annual air passenger growth in China alone was 10%+ a year from 2011 – meant demand for pilots was already outstripping supply. This problem is reemerging as more aircraft return to the skies.

Training and simulator provider CAE estimated at the end of last year that the global civil aviation industry will require an estimated 27,000 new pilots by the end of 2021. Some 264,000 new pilots would be required over the coming decade. Part of the demand is driven by expected growth but also “age-based retirements and attrition.”

According to CAE, pilots over 50 years of age represent 38% of the total civil aviation pilot pool. Some 3.8% of commercial pilots are expected to retire or leave the profession every year over the next 10 years. In the US, some 27,000 pilots are due to retire over the next decade at American Airlines, Delta Air Lines and United Airlines alone. More than 10,000 of those retirements will come over the next five years.

“If you are young, it is a good time to be studying for your pilot license,” says Murphy. “Covid-19 merely deferred an imminent issue facing the industry.”

Some airlines are building their own pipelines of pilots by establishing their own flight schools but growing activity at flight schools also has the potential to result in an uptick in risk. The 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.

Given the nature of training, 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 have also seen total losses. In addition, as aircraft values increase in this arena, this can result in potentially higher repair costs and longer repair times.

“Pilot fatigue is also a known risk among existing pilots that must be properly managed. Fortunately, there is a lot of industry expertise and resources available to assist airlines in building proper fatigue management systems.”
5. Shift to new generation of aircraft brings safety improvements but higher maintenance and repair costs

In March 2021, Lufthansa announced that it had shrunk its collective fleet by 150 aircraft during the past 12 months. In addition, the company said it was considering further retirements, notably to the remaining A380s, which had been placed into deep storage for “several years” – demonstrating the impact of the Covid crisis on the sector and the extraordinary circumstances it has had to operate in.

Like Lufthansa, many airlines have retired some of their widebody long-haul aircraft earlier than planned. KLM, for example, scrapped the last of their Boeing 747 jumbo jets last year, and Virgin Atlantic brought forward the retirement of their A340-600. The pandemic has hastened a generational shift from widebody aircraft to smaller aircraft. “A lot of the rules of the game have changed during the crisis,” says von Frowein, explaining that no one is sure what shape the passenger segment of aviation will be in when it returns.

“The trend to smaller aircraft makes sense in an environment where there may be a lower load factor, (a reduced number of passengers on an aircraft). Today, we are still seeing pretty empty fleets, at least on intercontinental flights.”

A lot of the rules of the game have changed during the crisis

Simple Flying, The Future Looks Dark for Lufthansa’s A380 Fleet, March 4, 2021
Nowicki notes that the newer generations of aircraft are safer than older ones and significantly more fuel-efficient but that costs for repairs can be considerably higher: “With new aircraft comes new materials – composites, titanium, alloys – so damage, particularly to the hull, can be more expensive.”

There is no shortage of parts for older aircraft, given how many are being retired. However, Nowicki explains that in the first few years of an airplane being produced, the availability of parts is often not there, so they have to be taken from the production line.

“And if you have a new aircraft with a new design and new parts and it sustains structural damage, there is no previous engineering experience, so the manufacturer spends an exorbitant amount of time engineering a repair. So that is a huge driver in terms of claims costs at the moment,” says Nowicki.
6. Robust performance by air cargo and trend will continue

For all the tales of the devastation that Covid-19 has wrought on the aviation sector – and particularly passenger travel – it needs to be remembered that some parts of the industry have held up or performed strongly during the pandemic.

A May 2021 study by Accenture, for example, noted that while the global air cargo capacity is down 9% compared to the same weeks in 2019, specific areas have grown. Latin America to North America freighter capacity grew 31% from April 19 to May 2 compared to the same weeks in 2019. In April 2021, Asia Pacific reported its best month for international air cargo since the pandemic began, thanks to rising business confidence, e-commerce and congestion at sea ports.

Hamilton says that in North America cargo operators performed strongly during the pandemic: “Departures were up, and their profits have been terrific. While passenger airlines did not convert their aircraft to cargo configurations, they did increase cargo hauling in the belly of the aircraft and, in some cases, in the aircraft cabin.”

“We certainly believe this trend will continue post-Covid-19,” says Hamilton, driven by the strength of e-commerce demands.

von Frowein says in Europe that airlines have maintained their routes during the pandemic, but had pretty empty fleets. To counteract the fall in passengers, airlines have aimed to transport more cargo. Kürschner confirms that there has been no noticeable dip in the amount of cargo transported: “It has remained constant throughout.” Indeed it is predicted that 2021 will see an increase of around 13% in cargo transported compared to 2020.

Sources: IATA, Allianz, Euler Hermes

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8 Accenture, Covid-19 Impact On Air Cargo Capacity, May 2021
9 Aviation Week Network, IATA forecasts 13% air volume growth in 2021, November 25, 2020
7. What will happen with business travel?

Face-to-face meetings used to be seen as vital to a successful relationship-building and to a successful business. So, millions of businesspeople regularly boarded planes to participate in meetings. This traffic amounted to $1.5trn a year – 1.7% of world gross domestic product (GDP), but Covid-19 ground that to a halt. Will business travel ever return to the same volume?

“The Covid lockdown highlighted the expense of the ‘road warrior’ behavior, both in monetary terms but also in terms of the dead time individuals lost on trips,” says Joshua Ray, a General Aviation Team Leader at AGCS. “Previously, if you weren’t on the road, you weren’t seen as a real player. The question is if that ‘road warrior’ mentality will return? Many of the airlines are dialing back their expectations for the next few years.”

While the pandemic opened the eyes of managers to how much can be effectively achieved by new ways of collaborating, such as video calls, these are unlikely to fully replace face-to-face interactions. Influential economist Ricardo Hausmann (“Why Zoom Can’t Save the World”) estimated that a permanent shutdown of international business travel would shrink global gross product by 17% by hindering flows of knowledge across borders. Business travel had been growing at three times the rate of global GDP before the shutdown because direct interaction helps promote innovation, Hausmann notes.

“There will be an initial surge once lockdowns end as people are keen to catchup and meet again, but after that people might think twice before boarding a plane for a meeting, especially those involving a day trip. It will be interesting to see what premium people put on personal time,” says Ray.

What speaks for a potential rapid uptick in business travel is that business aviation was another sector that thrived during the pandemic. Companies that had aircraft continued to use them while companies that had never purchased or chartered a plane before did so for the first time. This shows an eagerness on behalf of companies to continue to meet face to face and many charter companies thrived during the lockdown.

von Frowein says European clients expect a paradigm shift in traveling, with business travel expected to be slow to pick up: “The airlines are monitoring closely what they will do with their business models.”
8. Network experimentation – a jump in the number of new airline routes

Some good news for the aviation sector as we look ahead to the post Covid-19 environment is the fact that over 1,400 new air routes are scheduled to operate in 2021 – more than double those added in 2016 – with regional airports set to be the main beneficiaries. This is driven by Europe (over 600), where many of these previously unserved routes link regional airports across the continent, and Asia Pacific (over 500). Growth in China’s domestic market alone has seen over 200 new routes added. The US has 235 new routes.

The development reflects the desire of some airlines to experiment in a time of uncertainty, particularly smaller ones, who have sought to seize opportunities.

In Europe, just 35% of new routes planned in 2021 will be added by legacy carriers. Of the other routes, Ryanair has 80 new routes planned, with Wizz Air in second place with 57 new routes. In terms of the risks associated with opening so many new routes, von Frowein says there are two offsetting effects:

“On the one side, you have less congested airspace and less congested airports. As a result, you have less rush for ground handlers and other service providers, which in the past has been an issue. This reduces many risks. However, if you fly to a new destination that you’re not familiar with it can cause problems. But there is no tangible evidence either way of an effect yet.”

11 OAG, Network Experimentation: Why new airline routes in Europe are hitting an all-time high, May 23, 2021
9. Insect infestation affecting instrument accuracy

One unusual Covid-19 consequence relates to the impact of having members of the insect world resident in mothballed aircraft. The European Aviation Safety Agency\(^{12}\) has reported an “alarming trend” in the number of reports of unreliable airspeed and altitude readings during the first flight(s) after some planes have left storage. In most cases, the problem was traced back to undetected insect nests inside the aircraft’s pitot tubes, pressure-sensitive sensors that feed key data to an avionics computer. This has led to a number of Rejected Takeoff (RTO) and In-Flight Turn Back (IFTB) events. In June 2021 UK safety regulators\(^{13}\) also urged pilots to pay close attention to speed checks during the takeoff roll, after three incidents in three days at London Heathrow involving suspected pitot blockage by insects. Kürschner says while insurers are aware of such incidents, they have yet to manifest into claims activity.

The risk of such contamination is increased, if the aircraft storage/de-storage procedures have not been completely or improperly applied at the beginning, during or at the end of the storage period. Thorough testing of the aircraft systems before use is the norm and should alleviate these issues, although it is yet another example of the range of challenges the aviation sector may face in coming months.

Warfel says Covid-19 is an unprecedented event in modern times. Although it is hard to predict in what shape the aviation industry will return once the world has dealt with Covid-19, one thing is for certain – “it will have changed.” “From our perspective, we have tried to be consistent and reassuring to our clients throughout the crisis,” says Warfel. “We are there for them and are hoping for a strong rebound post-Covid.”

Warfel says AGCS has ensured it has adequate resources from both a claims and underwriting standpoint to handle any rebound in traffic. Indeed, new employees have even been onboarded to ensure capacity when the industry returns strong and healthy.

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12 European Union Aviation Safety Agency, Pitot-Static Issues After Storage due to the Covid-19 Pandemic, August 5, 2020
13 FlightGlobal, Three airspeed incidents at Heathrow trigger alert over insect blockage, June 14, 2021
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