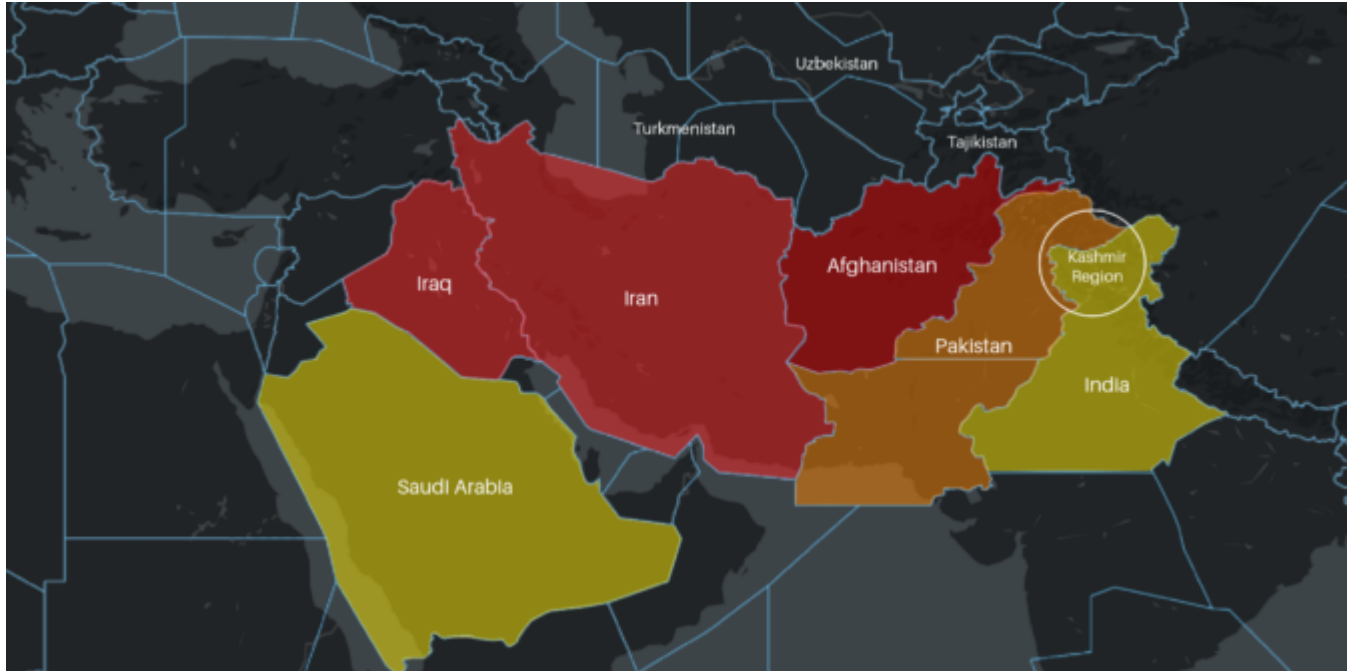# The India-Pakistan Conflict: Impact on Flight Operations

OPSGROUP Team
31 August, 2021

The current situation in Afghanistan has led to the **effective closure of the OAKX/Kabul FIR to overflights**, which means that some traffic routing between Europe, India and the Far East may now need to **plan routes which cross the northern Pakistan/India border.**

This post will take a look at the additional operational threats and info to be considered here, particularly due to the ongoing dispute over the Kashmir region, and the airspace warnings in place for Pakistan because of this.

The conflict in brief.

This conflict is rooted in **who controls the region**, with both India and Pakistan laying territorial claim to it. In fact, this **conflict has been ongoing since 1947** and shows no signs of resolving in the near future.

Currently India control around 55% of the area, Pakistan approximately 35% and China have a third party hand in the remaining 20%.

There is also a secondary focus on the region from both sides due to **cross-border terrorism and security and safety issues**. Pakistan's border with Afghanistan on the other side poses a similar threat.

The India Pakistan border is fenced with around 750km of foodlit fencing, and is still being expanded

**The route structure of the region.**

Aircraft routing from Europe and across to India and beyond have historically had **3 general routing options** available to them:

1. Via **Saudi Arabia** and then east direct to India. This avoids Pakistani airspace, or crosses just the most southerly portion of the airspace;

2. Via **Turkey** and down through **Iraq/Iran** and then east via southern Pakistani airspace and into India;

3. Across **Eastern Europe** via Azerbaijan, Turkmenistan and then south east crossing Afghanistan's central airspace, avoiding the northerly Kashmir region.
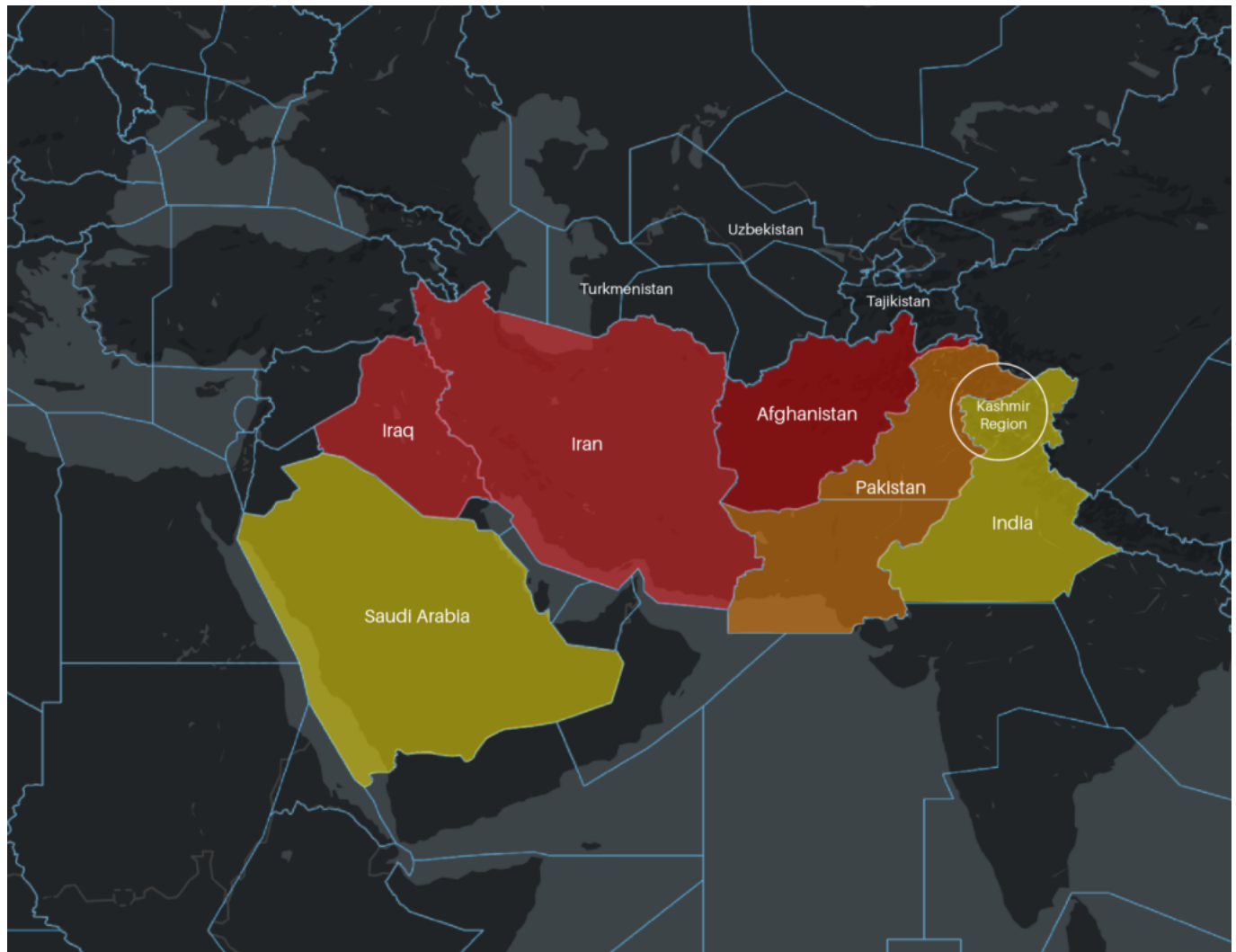
That third routing option which utilised Afghanistan's airspace, bypassed Saudi Arabia, Iran and Iraq – all of which have airspace safety considerations. Overflights across Iran and Iraq, for instance, are prohibited to US operators.

While Afghanistan also had airspace safety risks associated with it, these were previously generally low level and not "all altitude" concerns. **That has recently changed with the Taliban takeover of Afghanistan.** However, though the US and several other countries have since issued airspace bans and warnings for Afghanistan, **overflights are still generally allowed on airways P500 and G500** which run along the eastern boundary of the Kabul FIR.
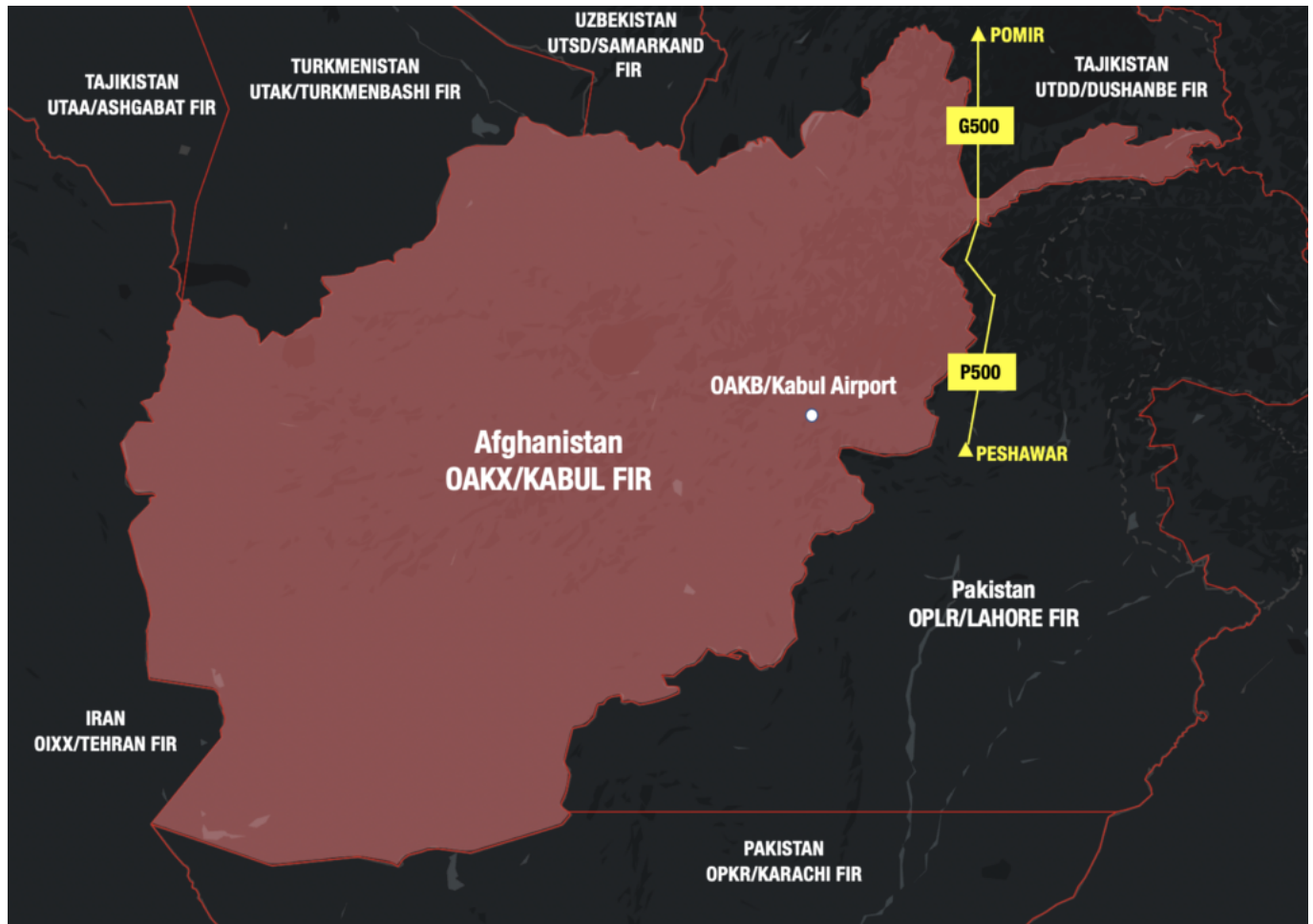
Aircraft now needing to re-route to avoid Afghanistan's uncontrolled OAKB/Kabul FIR, and who do not wish, or are unable to utilise Saudi, Iran or Iraq airspace, **may now be limited to this more northerly routing** – via the G500/P500 airway in eastern Afghanistan, the northern portion of Pakistan and into India, potentially through the Kashmir region.
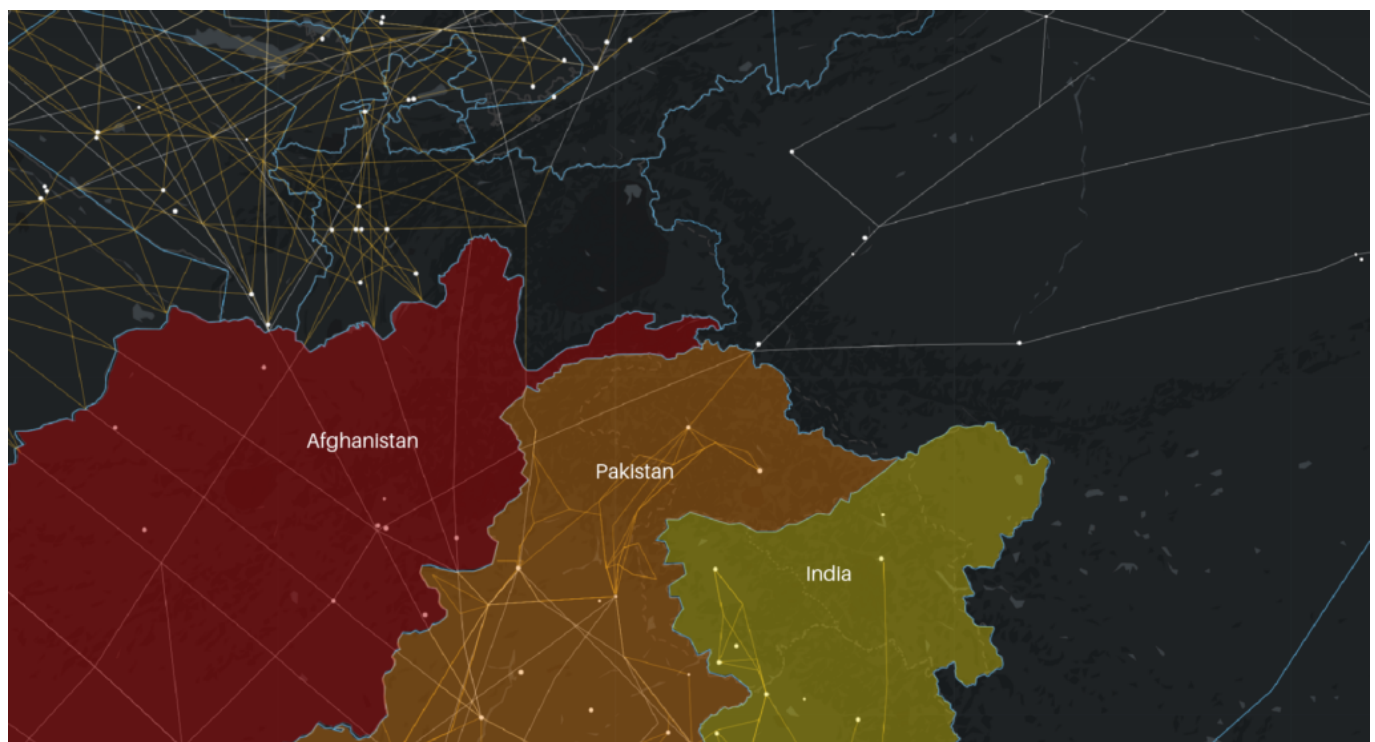
Airways are limited in the area, with no easy transfer between Pakistani and Indian ATC control.

What is the risk in this region?

Several countries have long-standing airspace warnings for Pakistan which **advise against overflights below FL260,** due the risk posed by small-arms fire and indirect weapons fire. There is also a potential anti-aircraft fire risk, and there have been previous attacks against airports.

What is the current situation?

An escalation in activity across the border has been seen of late, with the number of drone attacks and activity across the line of control increasing, including several attacks against Indian Air Bases since 2019.

India possess strong air defense systems and an active air force. Historically, they have employed both fighter jets and conventional SAM systems to mitigate attacks. With the increase in both drone size and capability, and the escalation in number of attacks, there is **a risk they will resort to SAM systems and fighter jets** once again. If this happens, this will lead to a **higher risk at all altitudes for aircraft mis-identification.**

A helicopter was shot down in the Srinagar region in 2019

General considerations for operating over or into Pakistan.

Operators to **OPIS/Islamabad** have been reporting an increase in security measures and crew procedures. Crew can expect more stringent security and ID checks. Pakistan are actively guarding against terror threats at the airport and passengers may experience stricter security and ID controls as well.

Pakistan is an ADIZ and requires crew to check-in prior to entry. **Comms handover between India and Pakistan** can also be difficult so an advance confirmation of next frequencies is advisable when

routing across any part of the border.

There traffic levels in Pakistan's airspace have also increased recently, and crew should be aware of **potential separation and traffic conflict concerns.**

Pakistan airspace closures.

Pakistan have previously closed sections of their airspace. In Feb 2019, **conflict between India and Pakistan** resulted in Pakistan closing its airspace to overflights. The conflict was a result of escalating clashes between the two countries in the **disputed Kashmir region**, with numerous airstrikes on both sides. The airspace slowly reopened, and only became fully open again in August 2019.

Diversion options.

Both India and Pakistan **allow tech stops (up to 24 hours)** and are **accommodating of diverting and emergency aircraft**, however, avoiding Indian Military Air Bases (unless a dire emergency) will save you a fair amount of extra security checks, paperwork and grief on the ground.

OPIS/Islamabad is a major Pakistani international airport close to the border, and is used as a southerly Himalayan diversion airport. It offers two well equipped CAT II/III runways of 12,001′.

OPST/Sialkot has a single runway, 11,811′, with an ILS and an RNP approach available.

VISR/Srinagar on the Indian side has s single 12,090′ runway.

VIAR/Amritsar also offers a single CAT II/III equipped 12,001′ runway.

There are also several other smaller airports which serve domestic routes.
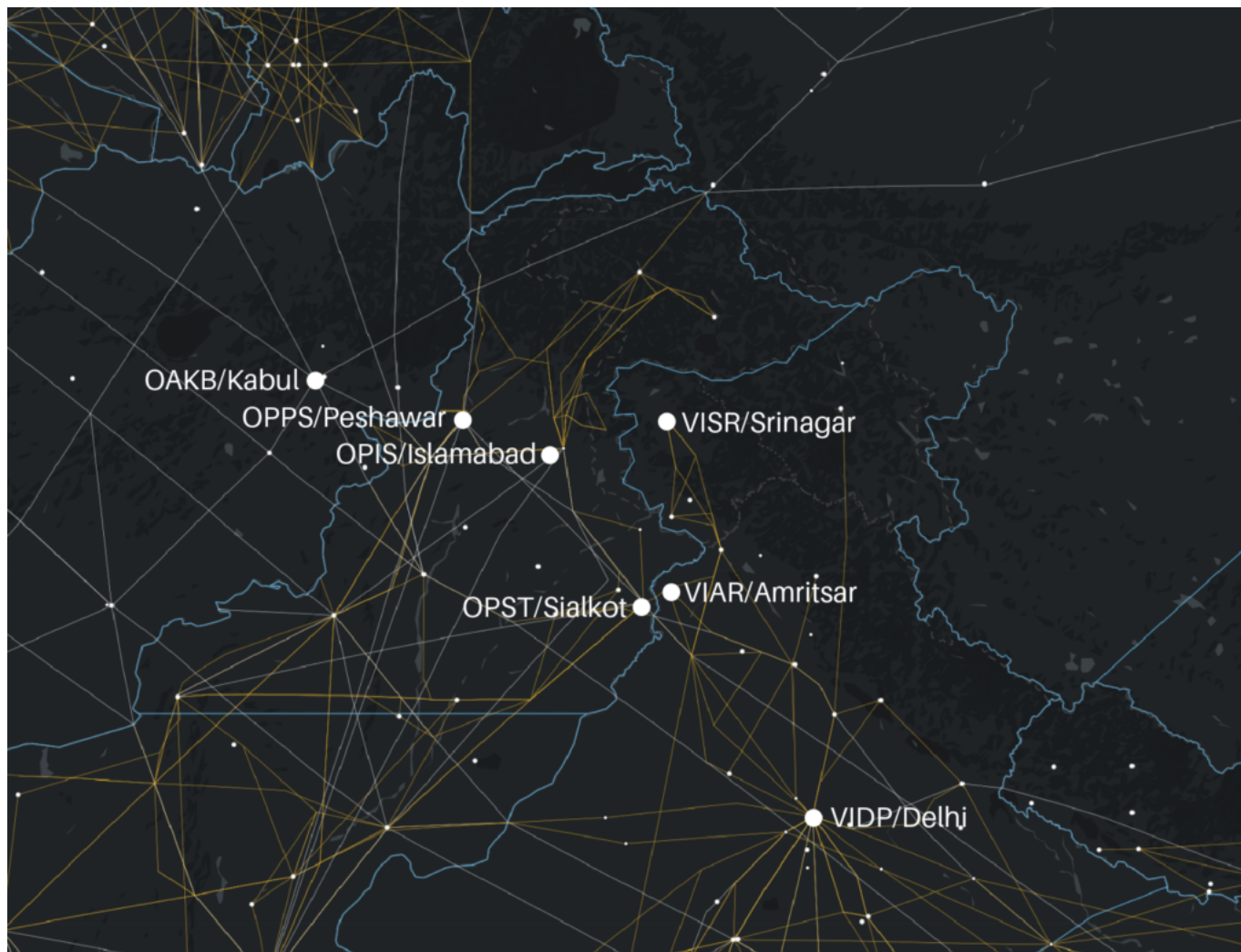
The main airports in the region.

Permits and overflights

Both India and Pakistan **require overflight and landing permits.**

For **India**, the lead in time for overflights is 3 days, while for landing it is 7 days. All permit applications are sent to the Ministry of Civil Aviation (MOCA) and then pass through several other government departments for security checks. You need your PPR overflight number available before reaching Indian airspace and they do often ask for it so have it handy.

India have fairly strict slot policies at several of their airports. During peak times they also might change your slot at short notice, or give you lengthy delays (2 hours+).

We recommend the use of an agent to assist with the permit process:

Freedom Air +91 11 2981 3311 / ops@freedomair.aero / freedomair@airtelmail.in

The CAA of India contact info is +91 11 2462 0784 / +91 11 2462 9221 / dgoffice.dgca@nic.in / irsec.dgca@nic.in

For **Pakistan,** overflight and landing permits are issued through the Pakistan CAA. These take around 96 hours for overflight and 6 days for landing.

An agent can also assist with the process:

Aircraft Aviation Services (ACAS) +92 213 468 0109 / ops@acas.com.pk / ops1@acas.com.pk

CAA of Pakistan contact info – +91 21 997 1111 extn: 2288/2289 / +91 21 9924 2004
/ support@caapakistan.com.pk / AFTN: OPHQYAYX

In summary

With the exception of US operators, flights between Europe and India/the Far East generally opt for routings via **Saudi Arabia, Iran or Iraq.** While routings via Tajikistan are possible, the lack of coordination between Pakistani and Indian ATC, and with few established airways, presents a **planning and potential safety risk**.

Pakistan has airspace safety concerns, particularly in the northern airspace (OPLR/Lahore FIR). With the closure of Afghan airspace, flights routing from Europe to Pakistan may benefit from routing via Tajikistan. However, most international flights continue to **use the southerly routing for overflights.**
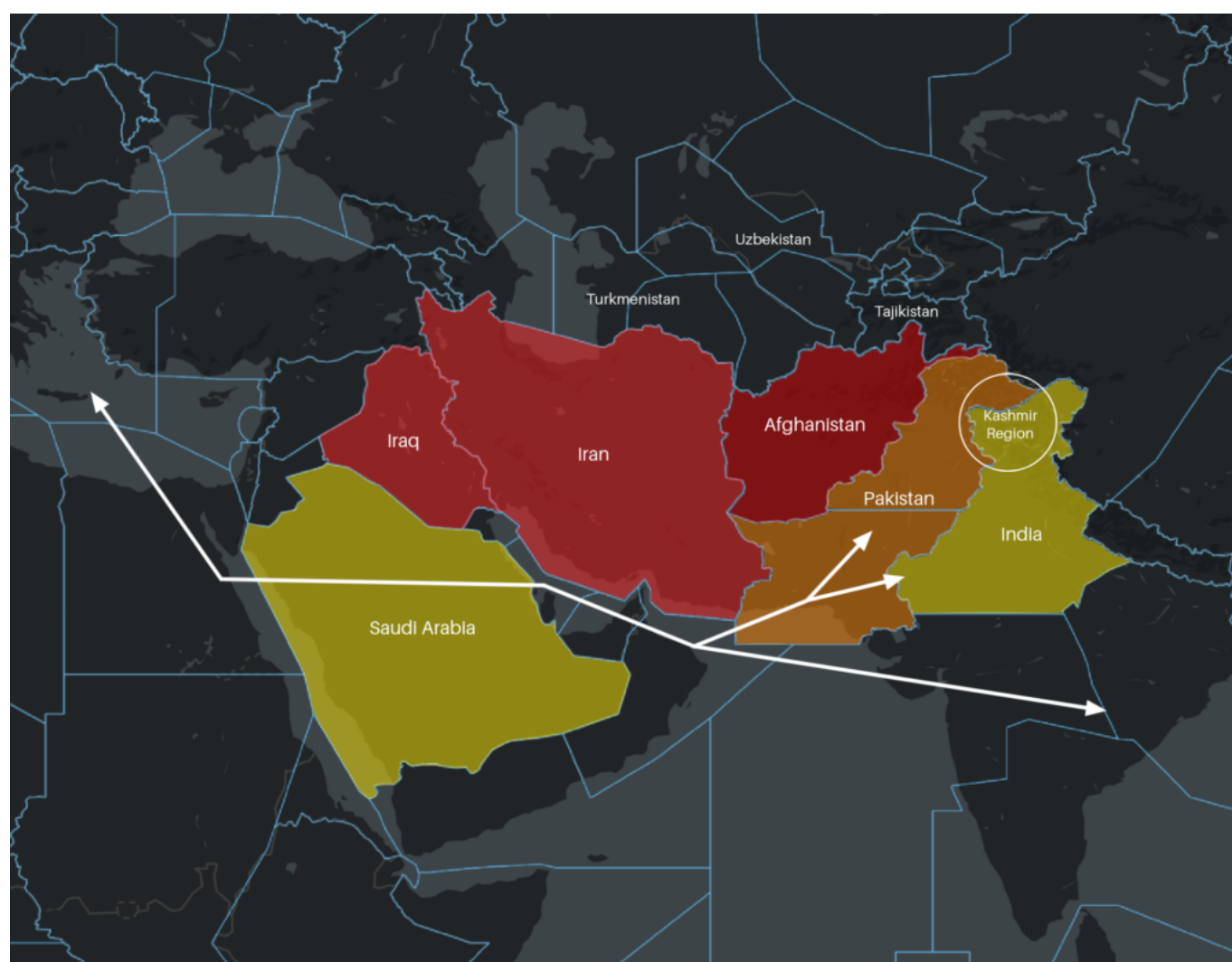
Most Europe-Asia flights continue to route south via Saudi, UAE, Oman.

Further Information

Information on Pakistan airspace can be found on the Pakistan CAA website.

If any operators or crew have experience of overflying this region please send us any insights you have on

it so we can share the information team@ops.group.

Afghanistan: Do Not Fly

David Mumford
31 August, 2021

US and allied forces have now pulled out of Afghanistan, and the Taliban have taken control of the country. **Afghanistan's airspace is now effectively closed to overflights** – the OAKX/Kabul FIR is uncontrolled, and overflying traffic should route around the country.

Overflights

For overflights of the region, flights between Europe and parts of Asia will be those most affected by the effective closure of the OAKX/Kabul FIR. All major international airlines have now stopped using Afghanistan's airspace for overflights, most electing to route **south via the airspace over the United Arab Emirates and Arabian Sea** off the south coast of Pakistan.

However, there are **risk warnings** to consider for the airspace here too. Several countries have warnings in place for **Iran's airspace** (the OIIX/Tehran FIR), including a total flight ban by the US, which were issued following the shoot-down of Ukraine Int Airlines flight 752 over Tehran in Jan 2020. The southern part of **Saudi Arabia's airspace** (the OEJD/Jeddah FIR) carries risk as well, with increasing Houthi drone and missile attacks over the past year.

To the north of Afghanistan, the options for overflights are fairly limited – via Kyrgyzstan, Kazhakstan, or even farther north via Russia. So these are not really practical unless operating from northern Europe to China, Hong Kong, Japan, etc.

Airspace Warnings

Following the Taliban takeover, several countries have updated their airspace warnings for Afghanistan. **The FAA now bans US operators from Afghanistan's airspace**, only permitting

overflights on **airways P500 and G500** in the far east of the OAKX/Kabul FIR. EASA, along with authorities in several western countries, are now advising operators to avoid Afghanistan's airspace entirely.

At **SafeAirspace.net** we are now listing Afghanistan as **Level One: Do Not Fly**. Check here for a full briefing.

FAA issues Emergency Order for Afghanistan (Updated)

Mark Zee
31 August, 2021

On August 30, the FAA revised its **Emergency Order** for Afghanistan, with a new **KICZ Notam.**

Effective immediately, **US operators and flight crew are prohibited from operating in the Kabul Flight Information Region** (OAKX) at all levels. The FAA cites three specific risk factors: extremist/militant activity, limited risk mitigation capabilities, and disruptions to Air Traffic Services.

The main change is that flights to and from **OAKB/Kabul** airport are **no longer exempt.**

Therefore the only exceptions are now as follows:

1. **You can** operate in the **Kabul FIR** (OAKX) if another US government agency authorizes it together with the FAA, or by way of "deviation, exemption, or other authorization" issued by the FAA Administrator. If you do plan to fly, you must call the FAA Operations Center in Washington.

2. **You can** overfly on one airway: Use of airway P500/G500 is authorized for transiting overflights. (That airway cross the sliver of Afghan airspace in the east of Afghanistan between Pakistan and Tajikistan)

3. If you are experiencing an emergency.

The NOTAM is issued with permanent validity, and is presented in full below.

For further on Afghanistan, pilot and local situation reports, procedures, and assistance:

- OPSGROUP ALL CALL: Information post.
- Share your updates in #flightops on Slack.
- Read our post from Aug 18 on airspace risk: Afghanistan: Do Not Fly
- Review the Safe Airspace risk summary for Afghanistan

Satellite image via Washington post, Maxar Technologies 2021.

KICZ Notam A0029/21

Issued Aug 30, 1955 UTC
Valid until: Permanent

SECURITY..UNITED STATES OF AMERICA PROHIBITION AGAINST CERTAIN FLIGHTS IN THE KABUL FLIGHT INFORMATION REGION (OAKX)

THOSE PERSONS DESCRIBED IN PARAGRAPH A (APPLICABILITY) BELOW ARE PROHIBITED FROM OPERATING AT ALL ALTITUDES IN THE KABUL FLIGHT INFORMATION REGION (FIR)(OAKX), EXCEPT AS PROVIDED IN PARAGRAPH B (PERMITTED OPERATIONS) AND PARAGRAPH C (ALLOWANCES) BELOW, DUE TO THE RISK POSED BY EXTREMIST/MILITANT ACTIVITY, LACK OF RISK MITIGATION CAPABILITIES, AND DISRUPTIONS TO AIR TRAFFIC SERVICES.

A. APPLICABILITY. THIS NOTAM DOES NOT APPLY TO THE UNITED STATES DEPARTMENT OF DEFENSE. IT DOES APPLY TO: ALL U.S. AIR CARRIERS AND COMMERCIAL OPERATORS; ALL PERSONS EXERCISING THE PRIVILEGES OF AN AIRMAN CERTIFICATE ISSUED BY THE FAA, EXCEPT WHEN SUCH PERSONS ARE OPERATING U.S.-REGISTERED AIRCRAFT FOR A FOREIGN AIR CARRIER; AND ALL OPERATORS OF AIRCRAFT REGISTERED IN THE UNITED STATES, EXCEPT WHEN THE OPERATOR OF SUCH AIRCRAFT IS A FOREIGN AIR CARRIER.

B. PERMITTED OPERATIONS. THIS NOTAM DOES NOT PROHIBIT PERSONS DESCRIBED IN PARAGRAPH A (APPLICABILITY) ABOVE FROM CONDUCTING FLIGHT OPERATIONS IN THE ABOVE-NAMED AREA WHEN SUCH OPERATIONS ARE AUTHORIZED EITHER BY ANOTHER AGENCY OF THE UNITED STATES GOVERNMENT WITH THE APPROVAL OF THE FAA OR BY A DEVIATION, EXEMPTION, OR OTHER AUTHORIZATION ISSUED BY THE FAA ADMINISTRATOR. OPERATORS MUST CALL THE FAA WASHINGTON OPERATIONS CENTER AT 202-267-3333 TO INITIATE COORDINATION FOR FAA AUTHORIZATION TO CONDUCT OPERATIONS.

C. ALLOWANCES. USE OF JET ROUTES P500-G500 IS AUTHORIZED FOR TRANSITING OVERFLIGHTS.

D. EMERGENCY SITUATIONS. IN AN EMERGENCY REQUIRING IMMEDIATE DECISION AND ACTION FOR THE SAFETY OF THE FLIGHT, THE PILOT IN COMMAND OF AN AIRCRAFT MAY DEVIATE FROM THIS NOTAM TO THE EXTENT REQUIRED BY THAT EMERGENCY.

THIS NOTAM IS AN EMERGENCY ORDER ISSUED UNDER 49 USC 40113(A), 44701(A)(5), AND 46105(C).

ADDITIONAL INFORMATION IS PROVIDED AT:

HTTPS://WWW.FAA.GOV/AIR_TRAFFIC/PUBLICATIONS/US_RESTRICTIONS/

SFC – FL999, 30 AUG 19:55 2021 UNTIL PERM. CREATED: 30 AUG 19:59 2021

Thunderbolts and Lightning, Very Very

Frightening

OPSGROUP Team
31 August, 2021

Aircraft sometimes fly too close to storms which means they sometimes get hit by lightning.

Here is a refresher on the signs you're probably too close to a storm, things to do to prevent a lightning strike, and what the risks are if you do get struck.

Avoid the flash boomers.

Not flying too close to a storm is probably your best bet for avoiding a lightning strike.

Here is a quick recap. If it is big, growing bigger and has an anvil, avoid it.

If it has lightning come out of it, definitely avoid it.

If all you can see outside is this –

Once you have turned your weather radar on, it might look like this –

Keeping away is Plan A.

Avoiding smaller ones by a **good 10 mile**s (preferably upwind so they don't move towards you) will keep you clear of lumps and bumps, thus avoiding coffee spillages and puking passengers.

Big ones should be given at least a 20nm berth. If you want to route **over the top, 5000'** seems to be a good recommendation, and **never fly under the anvil.**

You might also want to **avoid flying between large storms.** They move, and sometimes they move together. They can also combine into mega super cell storms and you really don't want to be caught in that sandwich, especially since lightning can move sideways!

Let's get back to the weather radar.

This is probably one of the **most misused pieces of equipment** on an aircraft. Reading the manual on it is the best place to start, but if you are like most pilots and prefer to learn through practice, then here is a quick guide on how best to twiddle them knobs.

In general, your standard aircraft weather radar is going to have some sort of **a tilt function, an azimuth knob and a gain knob.**

- **Tilt – for the ups and downs.** This is handy for seeing how high a storm might have grown. If it is particularly active, you are going to want to avoid flying too close above because there will be a lot of turbulence even over the cloud tops.

- **Azimuth – for the side to side.** If you need to go around one, it is probably wise to check there isn't another one you might run into.

- **Gain – to see inside.** Well, sort of. It adjusts the sensitivity of the receiver. If you slowly turn it down, it will help identify the threatening bits a bit better.

If it is really rainy out, your radar might be saturated – reducing the gain will help show where there is the heaviest precipitation in a convective cloud. Heavy precipitation can also cause **"storm shadows"** – basically a black hole where the radar signal has been blocked. **If you see a black hole on your display, be suspicious.** There could be something lurking behind whatever the radar is bouncing off in front.

Now, weather radar can't really "spot" lightning, but some do have predictive functions. If not, you'll have to use your judgement when looking at the size of the red or magenta bit. And failing even that, **your eyes are pretty handy instruments** to use.

Back to the point of this post…

Lightning. First up, what is it?

Lightning is electricity.

OK, that's a bit of an over-simplication.

In more sciencey terms (but still very basic), it is negatively charged electrons in a storm which get attracted to the positive protons on the ground, and this all results in a big FLASH BOOM.

The electricity part of a lightning 'strike' can actually go from the ground up. The 'light' part is everything in the air getting mega hot, and the thunder part is because of the rapid expansion of the air due to the sudden mega increase in temperature and pressure change.

Why are we talking about it?

Well, we all know the threats of flying into a storm. The bumps, the ice, the hail…

And we all know what lightning is.

The highest ever recorded thunderstorm power level came from a mega flash boomer in India. This behemoth of a storm had an electric potential of 1.3 billion volts. That's 10 times the previous record holder. Generally household voltages are generally 100-240V so 1.3 billion is… a lot more.

We could all do with a bit of a refresher on what the **RISK** of lightning is.

Why?

Because aircraft keep getting hit by it so obviously folk aren't avoiding it quite as well as they maybe could be.

A study estimated that an aircraft, on average, gets hit around **once every 1,000 flight hours.** So about once a year. Most of these are 'self-triggered' – meaning they occurred because the aeroplane was flying through a heavily charged cloud.

Lansa Flight 508, in 1971, is considered the worst crash due lightning of all time. Because of crashes like the Lansa flight, a lot of research has been done on improving aircraft resilience against lightning damage.

A deadly strike by lightning has not happened in years.

But that doesn't mean there aren't still other risks.

The Risks (and the fixes).

The three most 'explodable by' or 'mess up-able by' lightning parts of your airplane are your **fuel tanks, avionics** and the **skin**.

STRIKE 1: Your fuel tanks are protected by the skin, which must be robust enough in the tank area not to easily burnt through by lightning. The design also protects from any possible arcing and static. Fuel developments have reduced vaporisation which reduces the changes of it combusting uncontrollably.

Pan Am Flight 214 in 1963 (possibly) crashed due fuel vapours igniting from lighting, but in recent decades there have not been any accidents attributed to lightning making fuel tanks explode.

One more thing – those little sticks poking out from your wings and tail are your **static wicks.** They help discharge static electricity. So during your walk-around, make sure they are attached!

STRIKE 2: Modern aircraft are filled with wires. Wires which control the aircraft, the avionics, the everything really. **One thing wires don't like is too much electricity** zooming through them, and that is exactly what lightning is. So aircraft wires are shielded – conductive layers around them act like Faraday cages, and these help reduce transients (oscillations caused by the movement of the lightning across the exterior of the aircraft).

Systems also contain surge suppressants to help mitigate against big surges of voltage.

But equipment, particularly the **avionics**, can still be damaged by lightning strikes even with protections in place.

STRIKE 3: Older, aluminium framed aircraft were actually better at withstanding strikes because they are nice and conductive – the metal skin is like a slip 'n' slide for the lightning. **Composite skins** on the other hand are not, which makes them more susceptible to damage.

They generally contain a fine mesh of aluminium to help lightning flow by providing a continuous conductive path of low resistance across the aircraft exterior, but it isn't uncommon for **burn marks and even holes** to be left as a result of a strike.

Holes in the skin , if big enough, can cause decompression. Unlikely but not impossible.

Here are a few other risks to think about:

STRIKE 4: You. Not because you're in the airplane (you're protected by it due that whole Faraday Cage

thing again). But your eyes are not – if flying near a storm turn your **storm lights** in the flight deck up to full bright to help protect against **flash blindness.**

Startle is the second big risk. In 2019, a Russian aircraft crashed in Moscow following a severe lightning strike. However, it wasn't the strike itself, or the subsequent loss of instruments which led to the crash, but the crews reaction and "rush" to land.

STRIKE 5: Ball lightning. You know how I said it travels across the external skin of the aeroplane? Well, sometimes it can also come inside the cabin or flight deck, in a big ball.

Fact or fiction? An analysis of ball lightning in aircraft was carried out in 2009. The researchers wanted to find out if this was just "lore" or "for reals". They analysed reports from 1938 to 2007 discovered 87 occurrences of ball lightning being witnessed in or from aircraft.

It is described as a "metastable, rare lightning type" – basically, a horrifying ball of electricity around 25cm in size that can come swooshing through the cabin. The big mitigation here is, again, to just avoid storms.

How else to tell if you're too close?

- Be on the look out, or rather sniff out, of an **Ozone smell.**

- If you start to experience **strong static on frequencies** this might be an indicator or electrical activity outside.

- **St Elmo's fire** on windscreens occurs as static charge builds up – a sign you are in a highly charged area.

What else can you do to avoid?

- Check your **weather radar** as you line up for departure. Request an early turn to avoid and if ATC cannot accommodate then delay your take-off. **Most strikes occur between 8,000 ft and 14,000 ft** so think about the departure routing too.

- Check up ahead and **plan weather avoidance early** – double check your planned route won't lead you towards more weather, or into prohibited or unsafe airspace. Or too close to a volcano as an Air France flight accidentally did.

- Check the charts – **see what is forecast** before you get there.

- Certain areas, and certain times of year, get **more storm activity**. If you're routing through the ICTZ then be ready! If you are heading into a known region, make sure that radar is on and you are looking out!

- Use sites that show **live lightning activity** when planning your flight. Eurocontrol provides cross border forecasting and recommends Lightning Maps as a top site for tracking storm activity.

- Blitzortung has worldwide **lightning strike maps** (and they look pretty cool).
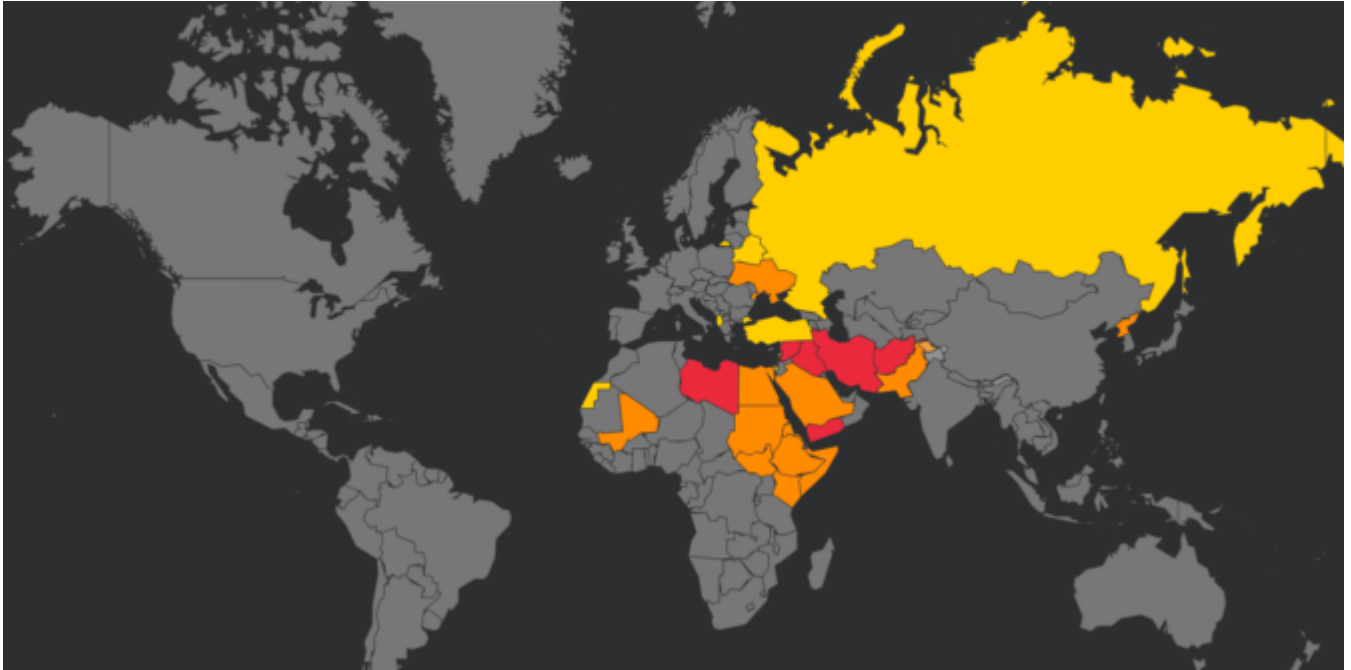
Struck by a need to read a bit more?

- This article on lightning protection in aircraft, by FlightSafety, is interesting.

- A handy piece by AOPA on using the weather radar (and deciphering what it is showing you).

Get your FAA Airspace KICZ here

OPSGROUP Team
31 August, 2021

Our SafeAirspace website contains **all the current airspace warnings** from major authorities for various airspace regions around the world.

If you are a **US registered operator**, then you can find info on the **FAA warnings** here too.

But we thought we would make a **brief summary** for you here, just as a refresher on what the current KICZ status is for each country.

Where can I find them?

SafeAirspace pulls all the latest info from the US FAA's dedicated webpage which contains all their 'Prohibitions, Restrictions and Notices'. This is where you can find their **International Security NOTAMs (KICZ)** and **Special Federal Aviation Regulations (SFAR)**, plus information relating to the background of the situations and the prohibitions/restrictions.

A summary

Here is a summary of the **countries with a US FAA airspace prohibition/restriction** in force, and what it (very briefly) says for each one.

Afghanistan

US Operators are **prohibited** from operating in the **OAKX/Kabul FIR.** Overflights are still allowed on airways P500 and G500 which run alongside the eastern boundary of the Kabul FIR.

Why? There is a risk of direct and indirect fire targeting airports and from surface-to-air fire targeting aircraft operating at low altitudes. Additionally, the recent Taliban takeover has led to zero ATC control across the entire airspace and an extreme threat to aircraft and crew safety and security on the ground. Air defense forces in all neighboring states are likely at high alert status within respective border regions – target misidentification by military air defense operators remains a credible scenario.

Belarus

US operators are to exercise **extra caution** when operating over, within, in or out of the **UMMV/Minsk FIR.**

Why? Well, they recently "caused" a commercial aircraft to land and it is not entirely clear how secure the region is and if there are any safety implications for US operators at this time.

Egypt

US operators are to exercise **extra caution** when operating over, within, in or out of the **Sinai Peninsula within the HECC/ Cairo FIR below FL260.**

Why? There is ongoing fighting between military and extremist forces and they have anti-aircraft capable weapons.

Iran

US operators are **prohibited** from operating **in the OIIX/Tehran FIR.**

Why? There are signifiant security and safety issues in the region and the US and Iran are not on the best of terms. There was also an aircraft shoot-down due to mis-identification of their anti aircraft defence systems.

Iraq

US operators are **prohibited** from operating in the **ORBB/Baghdad FIR.**

Why? Similar to Iran, there are heightened military activities and increased tensions which present and inadvertent risk to US civil aircraft due **potential for mis-identification.**

Kenya

US operators are to exercise **extra caution** when operating over, within, in or out of **Kenyan airspace east of 40 degrees East longitude (the border region with Somalia)**, at altitudes **below FL260.** The caution applies to the ground as well.

Why? Because there's possible militant activity and with it a threat of damage to aircraft from mortars, rockets and anti-aircraft capable weapons.

North Korea

US operators are **prohibited** from operating in the **ZKKP/Pyongyang FIR,** including the oceanic part of the ZKKP/Pyongyang FIR over the Sea of Japan.

Why? Because there are hazards and risk to civil aircraft safety from North Korea due their military capabilities and activities, including unannounced missile and air defense weapons testing.

Libya

US operators are **prohibited** from overflying the **HLLL/Tripoli FIR** except for altitudes at or above FL300

"outside of Libyan territorial airspace" – which is basically the international airspace over the southern Mediterranean Sea that is managed by Libya.

Why? Because of ongoing conflict between the government and the Libyan National Army over territory, government control and resources – and all this means fighting, often with weapons which could damage aircraft.

Mali

US operators are to exercise **extra caution** when operating over, within, in or out of **Mali below FL260.**

Why? There is a risk of militant and extremist activity and mortars, rocket and anti aircraft fire.

Pakistan

US operators are to exercise **extra caution** when operating over, within, in or out of Pakistan.

Why? There is a risk of militant and extremist activity and mortars, rocket and anti aircraft fire.

Persian Gulf

Exercise **caution** operating in overwater airspace above the Persian Gulf and Gulf of Oman in the OKAC/Kuwait, OEJD/Jeddah, OBBB/Bahrain, OOMM/Muscat and OMAE/Emirates FIRs.

Why? There is a lot of military posturing and political tensions in the region and this bit is particularly close to the OIIX/Tehran FIR which is prohibited for US operators.

Somalia

US operators are **prohibited** operating **below FL260** in the airspace of Somalia.

Why? There are active extremists in the region which pose a threat.

Syria

US operators are **prohibited** from entering the **OSTT/Damascus FIR,** and should **exercise caution if within 200nm** of Syrian airspace.

Why? It is a complex and ongoing conflict there, and it poses a risk to US operators.

Ukraine

US operators are **prohibited** from entering the **UKDV/Dneptropetrovsk** FIR (the UKFV/Simferepol FIR is ok).

Why? There is ongoing military action and the potential for aircraft misidentification there.

Venezuela

All operations below **FL260 are prohibited** unless specifically approved or they need to for an **emergency.**

Why? Mainly poor infrastructure, and political conflict between the two countries.

Yemen

US operators are basically **prohibited** from overflying the landmass of Yemen, but certain offshore routes

within the **OYSC/Sanaa FIR** are allowed.

Why? Because of ongoing fighting, instability and possible terrorist activity.

An even briefer summary

For further information on the situation in each country and to see the prohibitions and restrictions recommended by other authorities, visit the SafeAirspace site.

The concept of SafeAirspace is this: to have **a single source for all risk warnings** issued about an individual country, independent of any political or commercial motivation, so that a pilot, flight dispatcher, security department, or anyone responsible for flight safety can quickly and easily see **the current risk picture**.

Travel Advisories

Travel Advisories and Airspace Warnings are **different things**. But for US operators flying internationally, it's worth checking out the latest country-specific Travel Advisories issued by the US Dept of State. Each country's Travel Advisory also has a link to the local US Embassy website in that country – these will show announcements on all the latest security-related news and incidents there.

Further reading

- US and allied forces have now pulled out of **Afghanistan**, and the Taliban have taken control of the country. Afghanistan's airspace is now effectively closed to overflights – the OAKX/Kabul FIR is uncontrolled, and overflying traffic should route around the country. Here is our latest update on what is happening.

- The US reissued their **Ukraine** warnings in 2021. However, certain regions are Ukrainian airspace are now deemed safe for overflight.

- Information on the aircraft shootdown in **Iran**, and ongoing concerns with their airspace safety.

- **Assessing the risk to routing over or into conflict zones** is much more than just an "is there a weapon down there?" question. Gathering and sharing information on airspace risk is still one of the biggest barriers to safety. Are we actively seeking this information, or simply waiting for it to come our way? Read our article.

Beyond Covid: The Biggest Security Risks We Face Right Now

Chris Shieff
31 August, 2021

Aviation has always been a **reactive** industry – because it needs to be.

Over time, forces beyond our control have continued to influence the way the industry moves forward and the way we operate.

For the past eighteen months, our reactive energies have been focussed primarily on one thing – a global pandemic. But it is important that we continue to react to **other changes** too – particularly when it comes to security, and the types of threats that we face are evolving.

As the industry begins to recover from Covid and press on into the decade, here are some of the biggest security threats that it will face.

Operating Near Conflict Zones

While the lines between aviation and politics are often blurry, they undeniably intersect. The point is that regardless of which side we choose to take, **we continue to operate aircraft over or in close proximity to active conflict zones**. Which means risk.

The past eighteen months have shown that conflicts can erupt with very little warning in busy flight corridors and with significant dangers to the aircraft flying above them.

This was the case last year in Azerbaijan, where almost **all west/east bound airways were closed** by the conflict below. Only months ago, Israel's Tel Aviv FIR was heavily affected by **widespread rocket attacks** while just this week, Afghanistan's Kabul FIR has been left with **no ATC services** following an overwhelming Taliban offensive.

Things can change quickly and the problem isn't going away in a hurry.

But perhaps more concerning is that the aviation system relies on the **sharing of information to keep us safe up there** (and ICAO Annex 17 demands it). But practically speaking, concerns remain over inadequate government intelligence sharing, especially in states involved with conflicts.

Until things change, reliable risk assessments will remain a challenge firmly on the shoulder of operators – and these will rely on **timely, unbiased and accurate information**. As we have often seen, that can be very hard to get.

Terrorism

Unfortunately, aviation will continue to be a target for terrorism.

While security at airports remains tight, the challenges of breaching it have led terrorist groups to develop new ways of targeting aviation interests. While large-scale attacks the likes of 9/11 seem more far-fetched with today's protocols, there is a renewed interest by terrorist groups in attacking so-called 'soft targets' – primarily **aircraft in flight** or **airports with poor security infrastructure.**

To make matters worse, non-state actors and large terrorist organisations (such as ISIS and Al Shabaab) are encouraging smaller groups or even just lone-wolf individuals to attack by proxy, which makes the threat difficult to prevent. These attacks don't need obvious leadership, and can be accomplished by low-tech means. Weapons such as **rockets, mortars and man portable air defence systems (MANPADS)** are of particular concern.

Recent events at **ORBI/Baghdad Airport** serve as a good example, where multiple rockets were found stashed on nearby rooftops overlooking the airport.

Civil Unrest

In the past eighteen months, we've seen countries around the world suddenly erupt into periods of civil unrest. While beyond the realm of airspace warnings and Notams, the effects on **crew safety on the ground** can be dramatic.

While strikes and peaceful demonstrations can cause little more than inconvenience on the airport commute, it is when things get violent that the danger emerges.

Two examples spring to mind this year where the security situation on the ground changed rapidly and without warning.

The first is Myanmar where in February a **military coup** saw nationwide protests. Clashes with military police eventually turned violent with mass civilian casualties in the capital, Yangon. Disruptions continue there to this day.

The second is South Africa last month where a political and legal dispute led to **widespread rioting and looting** and became the worst violence that South Africa had experienced in many years.

Given the abundance of uncertainty that seems to characterise the modern world, it seems naive to believe that civil unrest is going anywhere in a hurry. Recent events have shown that even away from airports, aviation professionals continue to be at risk.

Cyber Threats

While the aviation industry has developed a strong track record of security practices from physical threats, it has struggled to keep pace with digital ones.

Studies have revealed some alarming numbers. EASA for instance have reported an average of **one thousand reported cyber on attacks on airports every single month**, while systems at airports in Israel fend off up to three million attempted breaches *per day.*

Unlike other industries, aviation is particularly vulnerable to cyber-attacks because the consequences can be so catastrophic. Successful attacks could literally cost lives.

Only two things are needed to open the doors to a cyber attack: **a vulnerability and a pathway.** We're heavily reliant on countless connected systems that have to operate in real-time and with super-high reliability. Many of them are safety-critical, and they have to be protected.

Have a ponder for a moment about just how far that rabbit hole can go. Here's a few suggestions just to get you started: Primary radar, secondary radar, EFBs, ADS-B, GNSS, Datalink, ACARs, even Fly-By-Wire. Heavy, heavy hitters in the safety game. This is before we even go down the road of the pilotless aircraft.

As technology continues to improve our efficiency and make our jobs easier, it is also opening gateways for those with malicious intent. Aircraft are becoming smarter and more connected, but arguably also more vulnerable to attack.

The challenge in years to come will be **how to protect these critical system**s, or at least limit the impact when they are attacked.

Human Trafficking

The unlawful act of transporting people around the world in order to benefit from their labour or exploit them in other ways continues to be a global phenomenon. Particularly when they are suffering from economic hardship.

Recent studies have shown that as many as **700,000 people become the subjects of human trafficking every year**, with reports from over **127 countries worldwide**. It is aviation that is often the vehicle for this malicious trade. These unfortunate people are often travelling with forged or stolen documents, and may be under duress from the people they are travelling with.

It's an ongoing problem. ICAO itself is directly involved in efforts to address it through better training and an understanding of where in the world the worst hotspots are. However it is likely to remain a threat to aviation security for many years to come.

Threats to aviation security aren't new, but our reaction to them needs to be.

Moving forward our response to security in the industry must continue to evolve to meet the threat, regardless of what other industry pressures we find ourselves under. Undeniably, our safety and that of our passengers will depend on it.

New Airspace On The Way In the Middle East: The Doha FIR

Chris Shieff
31 August, 2021

Plans are underway to establish a new flight information region in a busy air corridor over the Middle East.

Since 2018, Qatar has been campaigning to control its own airspace by establishing the **Doha FIR** – a process that would involve cutting the existing **OBBB/Bahrain FIR** in half.

For the first time, an improving political environment has led ICAO to give Qatar the go-ahead, as long as it can work directly with Bahrain to sort out all of the technical side of things. When established, over **thirty percent of traffic in and out of the UAE** will pass through the new airspace and so it is worth taking a closer look.

A little background.

With the exception of terminal airspace at **OTHH/Doha**, Qatar's air traffic is controlled by Bahrain in a long standing agreement. Qatar first proposed to assume control over its own airspace three years back – a suggestion that was opposed by several countries including the UAE, Saudi Arabia and Bahrain.

Why?

Primarily because it came at a **politically sensitive time.**

Just the year before a diplomatic crisis led to Saudi Arabia, the UAE, Bahrain and Egypt (among others) cutting ties with Qatar. From an aviation perspective, **a blockade was formed** which prevented Qatari registered aircraft from using their airspace and vice versa. From an operational perspective there was likely little regional appetite to release a large chunk of Middle Eastern airspace into a political road block.

Thus criticisms were quickly tabled. The primary feedback was this:

- Qatar hadn't provided operational justification for the change.
- An additional ANSP in this busy piece of airspace would make co-ordination more complicated.
- Safety may be compromised, while cost would go up for operators.
- Bahraini air traffic control had done a great job of safe and efficient flow of traffic for decades, why change?
- Capacity would tank.

Qatar on the other hand argued that the proposal would **improve safety** while providing some economic award for the industry too.

Then things changed.

Earlier this year while the world continued to revel in the 'delights' of a certain pandemic, the political situation for aviation in the Middle East changed for the better. Following a successful GCC summit, the blockade was lifted. Meaning all parties could once again use each other's airspace. Tensions subsided and it was good news for fuel burns and flight times.

Enter the Chicago Convention.

The what? Spoiler alert: It has nothing to do with the Cubs. It's basically the landmark agreement among all ICAO member states that establishes the core principles for international ops. It's a big deal. Buried within its many hallowed pages is this: **each state has 'complete and exclusive sovereignty over the airspace above its territory'.** And ICAO have agreed that in this case, the principle applies.

So what is the proposed airspace going to look like?

Pictures are always better than words. So here are some pictures:
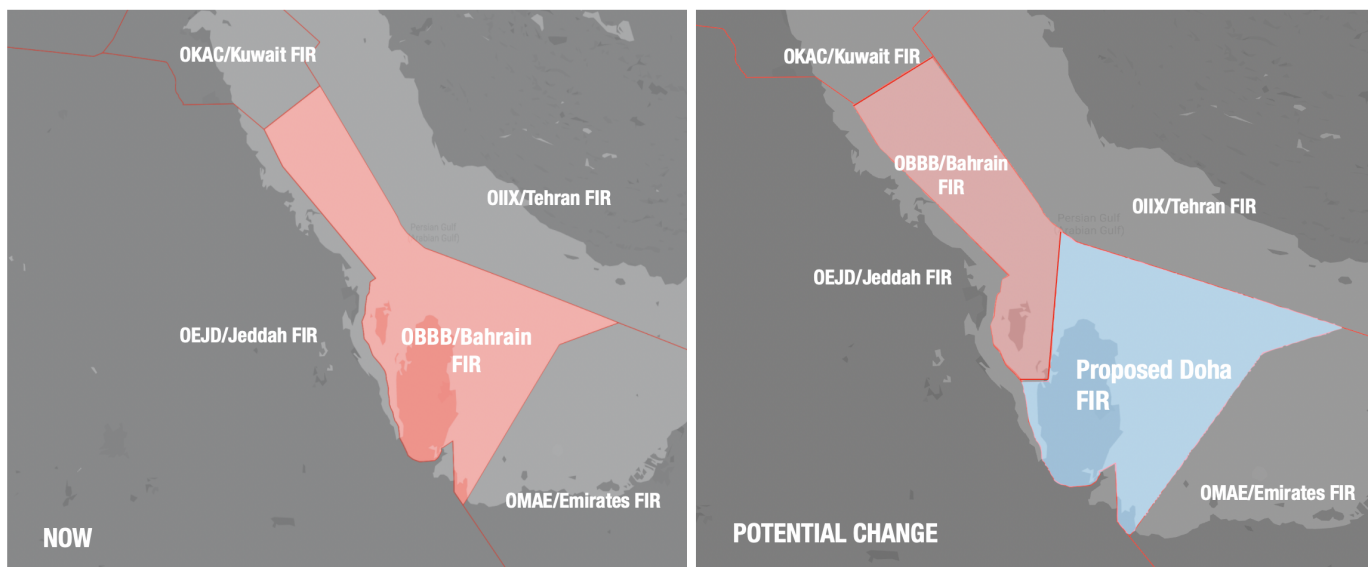
Why do ICAO only agree 'provisionally'?

Because quite a bit of work needs to happen behind the scenes to make the proposal a reality.

Essentially Qatar has to do two things:

1. Prove that **safe and efficient systems and infrastructure** are in place in their airspace to be.
2. They need to **work directly with Bahrain** to report back on all of the technical arrangements that will make the proposal real. It is not the easiest task for either side given diplomatic histories but in promising signs for the region, work is under way.

What happens now?

Qatar and Bahrain are due to report back to ICAO later this year, likely November or December. How long after that meeting the changes may be implemented is still up in the air (bad pun not intended).

But keep an eye out for updates on the change which appears to now be well on its way to altering the skies over the Middle East.

Is Aviation in South Africa Going South?

OPSGROUP Team
31 August, 2021
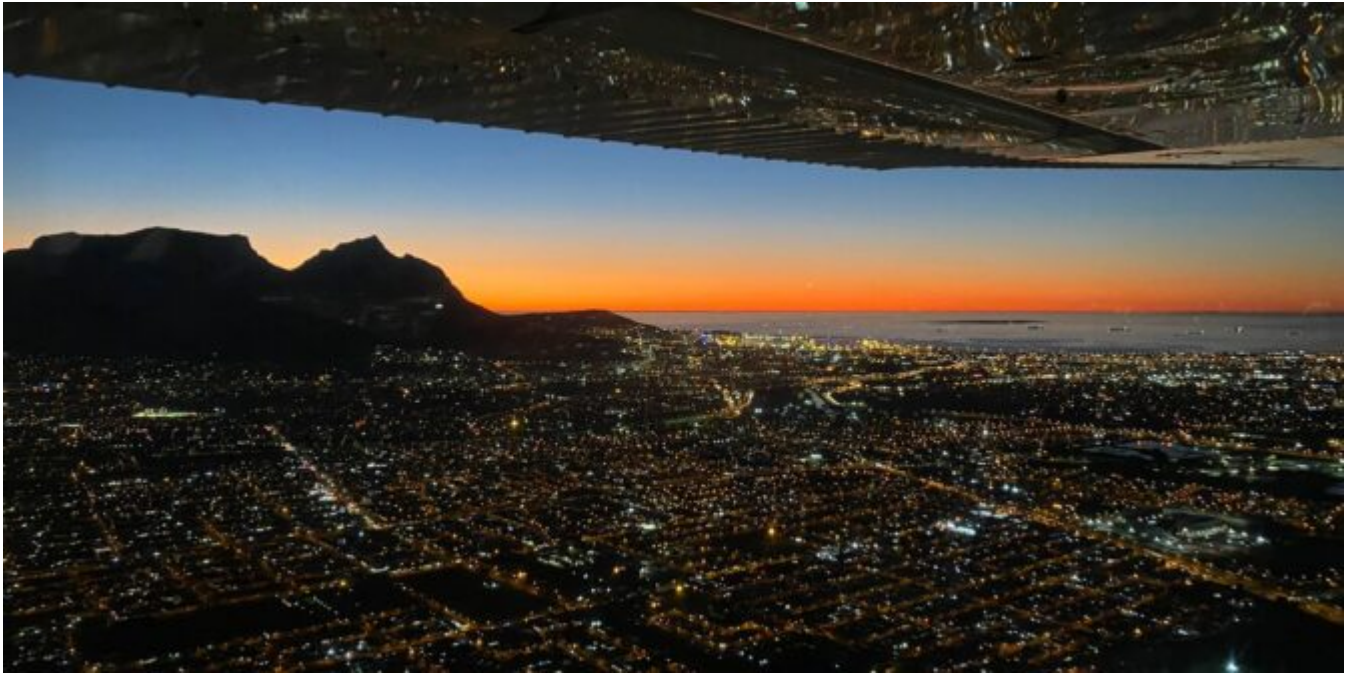
Two South African airports have recently had their licences revoked.

Why has this happened and does it mean anything bigger for aviation, particularly commercial aviation, in South Africa?

FAPP/Polokwane

Polokwane International Airport in the Limpopo Province had their airport status downgraded in April 2021, moving it from a Category 7 to Category 2 after the SACAA determined they were non-compliant in safety standards.

Category 2 means it is unable to provide the minimum level of emergency services required for commercial aircraft. FALA/Lanseria and FAOR/Johannesburg are now the closest major airports for this province.

FAPG/Plettenberg Bay

Plettenburg airport had their licence revoked August 2021, following a downgrade from category 4 to category 2, also due non-compliance with safety standards.

FARB/Richard's Bay

The municipal airport in Richard's Bay lost its status in 2020 as the airport management company were unable to finance the necessary emergency and fire services to support commercial operations.

FAUT/Mthatha

Mthatha airport (formerly Umtata) was downgraded in 2019 due a lack of emergency services and emergency systems which need technology upgrades.

What are the regulations?

The SACAA applies standard ICAO licensing requirements to their aerodromes. These are laid out in **ICAO Annex 14** (Aerodrome Design and Operations), **Doc 9774** (Manual on Certification of Aerodromes) and **ICAO Annex 19** (Safety Management).

The oversight and ability of the authority to monitor is also monitored.

ICAO audit countries through the **Universal Safety Oversight Audit Program (USOAP)**. It is a little less in-depth than the **FAA's IASA program** (which recently saw Mexico downgraded) but looks at the *"effective implementation of the critical elements of a safety oversight system and conducts a systematic and objective review of the State's safety overs.... something something... implementation of ICAO SARPS, procedures and aviation safety best practices."*

Basically, is the authority checking everything is up to scratch in their region of jurisdiction, and if not, do they do something about it.

ICAO only have 8 countries red flagged. South Africa comes out pretty well in it.

So the downgrades are necessary?

Unfortunately, yes, but it means a Catch 22 situation for these aerodromes because without traffic, they do not have the finances to improve their capability.

Aviation is a **major contributor** to the South African economy.

IATA published a report on aviation's contribution to the South African economy (it is not clear when this was published). What is evident is South Africa is, like many countries, struggling with the Covid pandemic. The South African variant has seen them **cut off to most of the rest of the world**, and this is having a longer term impact on their aviation infrastructure.

The downgrading of airports unfortunately points at a **lack of funding** within the country. There are also questions of corruption within the government and the airport management companies. Whatever the reason, funds are not reaching (or are not available) to the **airports which need investment,** particularly those which do not not benefit from cash flow from international flight operations and so facilities and services are not being maintained.

In 2020, the SACAA released this (rather odd) statement regarding rumoured ILS issues across the country. It isn't immediately clear why or where the rumour started from.

A NOTAM check actually shows surprisingly few issues at the major airports.

Political problems

The country is undergoing moderate levels of civil unrest and political divide. King Shaka airport was targeted in attacks in July 2021, and there do not seem to be signs of it improving in the near future.

Power problems

South Africa is undergoing **continuous load shedding** due issues with their power supplier, ESKOM. The Airports Company South Africa (ACSA) confirmed however that **all nine of its airports have the ability**

to operate on diesel generators covering essential loads for between 18 and 72 house – so load shedding should not impact their operations.

Fuel problems

A NOTAM search brings up fuel issues at several airports, however, they are **all small domestic ones** – FAEL, FAUT, FABE and FAUP

The Big Picture

South Africa is, like many countries, struggling with the long term impact of the Covid pandemic. However, the standards at the major international airports remain good and the aviation infrastructure is still more than able to support international flight operations.

Additionally, reports suggest general aviation is going strong within the country.

Cape Town was the top tourist destination for UK travellers in 2016, and regularly tops the top tourism destinations lists.

As the world reopens, hopefully the situation will improve. For now, all the global aviation industry can do is look to support countries like South Africa once they are able to again.

Out of Options, Out of Time: Why Aren't We Declaring Emergencies?

Chris Shieff
31 August, 2021

In 2016, an RJ85 operating a charter flight ran out of fuel in a holding pattern while waiting for another aircraft to land. The crew knew they were critically low on fuel but seemed reluctant or unwilling to tell ATC they were in trouble and get back on the ground.

This tragic accident highlights a dangerous mindset that continues to expose pilots to risk the world over: **reluctance to declare an emergency.**

Accident reports reveal that the RJ85 crew were certainly not an isolated case either. So, what's going wrong up there? Why are we asking for help far too late or not at all?

The real world may offer up some answers.

For starters, what is an emergency?

Have a go at defining one in your own words. As I discovered, it's not actually as black and white as it seems.

The US FAA tells us they come in two flavours:

Distress. These are things that need you to act on *immediately*. Engine failures, a fire on-board, structural failures. In other words, you have to do something about it now. Crew are good at declaring emergencies in these cases because it is an easy decision.

Urgency. The smoking gun here. These are emergencies that often develop through a set of deteriorating circumstances which become increasingly critical as time and options run out. You may not have an emergency to begin with, but through failure to act earlier it has developed into one.

It seems that in these cases crew are waiting until they have few or no options left before declaring an emergency, far too late.

So why not just declare earlier?

There are a few factors at play here, and the first is this – **fear of the fall out**. Or in other words, *'what will happen once we're back on the ground?'*

It's not hard to imagine mountains of paperwork awaiting your arrival, but this often isn't the case. In most cases it is very limited and sometimes non-existent. Generally, aviation authorities just want to know if you have broken the law in dealing with the emergency, which the regs say you're allowed to do.

Of course, operators will have their own reporting practices, but crew should never face disciplinary action for declaring an emergency – **it is a safe response to an unsafe condition.**

Enter Just Culture – if you haven't heard of it, it's worth googling and it's part of a revolution in making the industry safer by **enabling crew to act and report without fear of the repercussions**.

It's no secret that pilots tend to be mission orientated. In other words, **we want to complete our flight as planned**. We hang our professional hats on being able to navigate operational challenges on a daily basis and find ways to make it all work with our safety margins intact at the other end. You know the ones – weather, delays, MELs. They all make for long days and grey hairs, but we make it work.

The problem is that in this belief and dedication to 'make it work' that we can begin to **fixate on completing the task**, rather than **taking notice of early warning signs** that those safety margins are being steadily eroded while we still have options.

This is when declaring an emergency early really makes a difference. Here's why...

'The Emergency Mindset.'

By telling ATC you have an emergency you are sending yourself a powerful psychological message. You're essentially flicking a switch in your brain from 'complete the mission' to the realisation and acceptance

that there is **a threat to your survival**. Your training is essentially triggered.

Your new mission now becomes to do what you need to do to get back on the ground safely and as quickly as possible. You essentially put yourself onto a new script. This is the emergency mindset, and it is a powerful call-to-action.

But it's not just our headspace that matters here. It's also important to weigh up **what you gain from ATC by declaring an emergency**, against the perceived pitfalls of doing so.

By declaring an emergency to ATC, you are activating a huge resource and will have their undivided attention. While they'll continue to control other aircraft around you, their priority will be your safety. They may even give you your own discrete frequency or controller. It is then up to the pilot-in-command to advise what help they need and their intentions. It is basically your call, and they'll facilitate it – **even if it means breaking the rules.**

They're also a wealth of knowledge. At a time where you're likely busy managing the aircraft they can tell you what you need to know and quickly. They can help you find suitable airports for landing and begin co-ordinating with those control facilities.

While they're giving you priority handling, they'll also be facilitating a chain of events behind the scenes including organising rescue services both on and off the airport (all without you even having to ask).

According to FAR 91.3 pilots can **deviate from the rules to the extent required by the emergency**. Which means you can kiss goodbye to speed restrictions, clearance limits and other workload increasing airspace procedures.

There's a lot you can do once you've declared one. On a side note, you don't have to have physically declared an emergency for this to apply, but it certainly helps. Especially if you need an immediate change of course, speed or level.

When to declare?

The intent of declaring an emergency is to mobilise all the resources available to you **while you still have options.** Which means the earlier you do it, the better. Waiting until you have none left before you advise ATC is already too late.

In the simplest of sense, if you feel apprehensive for you or your passengers' safety for any reason, you are likely already experiencing some type of emergency. The safest course of action is always to **make the decision**, **and inform ATC sooner rather than later.**

Fire Onboard: A Pilot's Worst Fear?

OPSGROUP Team
31 August, 2021

Ask a pilot what their worst fear is and one of the responses you will probably hear the most is FIRE! Ironically, an aircraft's engines only actually work when they are "on fire" so not having a fire "onboard" could be problematic...

But a fire in the cabin or cargo hold is a rather different deal. So, here is a look at what many consider to be one of the most challenging and concerning problems they could encounter in-flight.

For those who don't think it is that scary.

A CAA study back in 2002 looked at aircraft crashes due to fires onboard and discovered a rather fearsome statistic – the average time it took for an aircraft to become **catastrophically uncontrollable was under 20 minutes.** Various fire tests saw that a fire allowed to spread through the aircraft's overhead area could become uncontrollable in just 8-10 minutes.

The average time for a crew to get their aircraft onto the ground was around the **17 minute mark.**

So, not much time to spare.

The infamous Nimrod ditching (a favourite CRM example of decision making) shows how quickly a fire can disable an aircraft.

The problem is aircraft are built to burn.

Well, not literally, but there is a significant amount of flammable, combustible and generally burnable bits onboard. Add in the fact there are very hot bits (the engines) linked to big chambers full of fuel and the risk of an un-contained fire suddenly seems a lot worse.

Un-contained being the important word here.

Engines have fire identification and protection systems in them. So do cargo bays. So do cabins for that matter (Cabin Crew make wonderful fire detection and fire suppression systems). Aircraft interiors, and cabin fire fighting procedures, and the monitoring of Dangerous Goods transit have also developed significantly over the last decade or two.

So, the means to prevent or control fires before they become uncontrollable have increased.

Unfortunately, though, **so have the number of devices coming onboard which could start a fire** in the first place.

Lithium Ion batteries burn hot. They are hard to put out, and every passenger on your flight probably has at least one, probably nearer three of them (phone, second phone, computer, tablet, smart luggage, spare power banks, watches, electric toothbrushes…)

And of course phones are not the only potential fire hazard onboard. There are ovens (hot), hydraulic fluid (thankfully not in the cabin, but very flammable), electrical things (seats, tvs, lights), waste bins (in toilets for hiding illegally smoked cigarettes in), oxygen systems (a food delicacy for fires) and a multitude of wires.

An FAA study from 1995 to 2002 found reports of **nearly 400 wiring failures**. 84% of these were burned, loose, damaged, shorted, failed, chafed or broken. And this is probably not a representative number given how many might go unreported.

The Swissair accident was due to faulty wiring, with a secondary prominent factor being the flammability of materials that ignited and propagated the fire. The crash occurred just 16 minutes after the first alert message.

Let's take a look at what can burn in the cabin.

Seat coverings, blankets, cushions, other furnishings, clothes… basically everything inside the cabin can burn.

In 1993 a Northwest Airlines B727 had a fire in the cabin and it turned out they were using 100% polyester blankets. Polyester actually melts more than burns, but it gets really hot when it does and tends to set alight to everything else around it. The incident led to the FAA developing new fire performance test methods and criterion for all blankets.

Interesting fact: Emirates actually make their economy blankets out of recycled plastic bottles. 28 of them per blanket.

Actually, the burning ability of everything onboard is now monitored.

Since 1990, aircraft interiors have had to comply with a **maximum total heat release of 65 kilowatt minutes per square meter**, and specific optical smoke density of 200. Basically *burn less, burn less hot, and put out less smoke if they do burn.*

The current rules for what everything should be made of, and how burny/smoky/toxic they can be are contained in FAR/JAR/CS 25.853.

Crew training is important as well.

The training and ability of the crew to both fight the fire, and evacuate the aircraft is strictly monitored. The FAA require that an airplane can be **evacuated in 90 seconds.** For big commercial aircraft (these are Boeing stats) this means the **slides have to be able to inflate within 10 seconds** (15 if it is a big wing slide), and they need to be able to support 60 people sliding down at once.

It doesn't take into account the huge heap of people at the bottom of the slide, but once they are out and away from the fire all bets are off.

But accidents still happen.

Between 1990 and 2010 there have been **18 major accidents involving in-flight fires** which resulted in

fatalities. During the 1990's, the US saw, on average, one flight a day diverting due to smoke; and a report by IATA suggests there are more than 1,000 smoke related events annually.

That's about 1 in 5,000 flights which is a pretty big number when you consider how many flight you will do in your career, or how many movements there are worldwide every day.

In 2010, a UPS B747 freighter crashed in Dubai following a main cargo deck fire which ultimately led to loss of control of the aircraft. The pilots were incapacitated earlier however due to the rapid build up of smoke in the flight deck.

What to do. The important bit.

1. Troubleshoot.

Finding the source should be a top priority. That means working out where the smoke is coming from.

If it is coming from something **avionics** related then you are going to want to **switch it off.** If it is something in the **cabin** then it might be locatable, reachable and extinguishable. Don't forget to get your crew to check the lavs.

2. Communicate.

One of the biggest challenges in dealing with a fire in the cabin is the communication between the cabin and the flight deck.

- Ensure there is a communicator in place who can pass messages to you and keep you updated.
- If you are trying to establish the severity of the situation, ask open, non-leading questions:
  - "How much smoke?" could lead to *"lots/loads/not as much as you'd see at a rock concert in the 60s..."* . Instead, try "How many rows of seats can you see?"
- Establish whether they can see where the smoke is coming from, if they can get to the source, and if they can put it out:
  - Ask about the colour, the smell, and while troubleshooting make sure you leave enough time for them to identify a change (after turning stuff off or on).

3. Keep flying!

Don't forget to keep flying – one pilot should focus on the fire procedures (or on the comms with the cabin) while the other flies the aircraft! This probably means aiming for an airport.

Declare an emergency – this can be downgraded later if the situation improves, but get the support you need early on.

If there is an autoland option you might want to set up and plan for that in case the smoke in the flight deck builds up too much.

4. Don't forget…

You have **two procedures –** one for sourcing and "fighting" the fire, and one for dealing with smoke (and fumes). If you need to, suck that smoke out!

● At ANY TIME of the procedure, if smoke/fumes becomes the GREATEST THREAT:

SMOKE FUMES REMOVAL.....................CONSIDER
ELEC EMER CONFIG............................CONSIDER
Refer to the end of the procedure to set ELEC EMER CONFIG

● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:

IMMEDIATE LANDING............................CONSIDER

On the ground.

Your Ops Manual will have a required **RFF category for airports**. However, this is based off the equipment available at an airport (and the response time). A Captain can chose to disregard this if the only option does not meet their RFF requirement.

The emergency isn't over until you and the passengers are safely off. If the cabin is filling with smoke then a top priority is getting those engines switched off so your cabin crew can evacuate. If in doubt, evacuate!

Depending on where the fire is (and how the wind is blowing) you might need to avoid evacuating through certain doors. **Getting folk away from the aircraft is critical.** The main injuries resulting from the Emirates B777 accident in Dubai were some inhalation from passengers and crew, and heat stroke from the firefighters – it took 16 hours for them to bring the fire under control.

What to do earlier…

1. Have a plan

This means knowing what airports are around that you could go to if you suddenly, urgently need to.

- Check the weather and Notams en-route.
- Have something in the box ready (if it is a difficult airport to route to, or there is airspace to avoid, or if a straight in visual might not be an option).

2. Know what equipment you have onboard.

Know what it is, where it is, and how to use it:

- **Halon:** Great for electrical fires, not so good for you. If you are using this in the flight deck, get a smoke hood or oxygen on first.
    - Remember **PASS:** <u>P</u>ull the pin, <u>A</u>im at the base of the fire, <u>S</u>queeze the handle or lever, <u>S</u>weep it about from side to side like an aggressive elephant.
    - EASA are recommending the removal and substitute of Halon Extinguishers because of their mean effect on the environment, and also on people.

- **Oxygen masks:** If there is smoke in the cabin, don't drop these thinking it will help your passengers breathe better. Oxygen + Fire = not a good result, and their masks are not designed to keep smoke and fumes out anyway.

- **Smoke hood:** You look like a weird spaceman in it, and sound like Darth Vader, but this is a

very important bit of equipment.

- If you are on the ground and evacuating, use this before doing the cabin checks.

- **Fire Sock:** For putting things in. Usually has some gloves nearby for picking the hot burning thing up with.

False Alarms

These do happen.

An IATA study saw **2,596 reports of fire/sparks/smoke or fume occurrences**. Of these, **20% were false warnings**, which meant 11% of the in-flight diversions were due to false warnings. 50% of cargo compartment fire warnings were also false.

Air spray is a common culprit for causing false alarms in toilets.

But – if you get a fire warning, treat it as real unless there is some very, very obvious something to suggest it is not.

FIRE!

They critical thing is to be prepared. Have that airport option in mind, know where to find the procedures (and familiarise yourself with them), and make sure that if it does happen, you and your team are ready.

A fire onboard is a time issue. Being prepared and ready will hopefully give you those extra minutes that could make a big difference.

Burning desire to read some more?

- The **RAeS** have two papers entitled 'Smoke, Fire and Fumes in Transport Aircraft'**.** Part 1 is a reference paper with a lot of scary accidents discussed in it. Part 2 covers training recommendations. If you never read anything else on this subject, at least read these – most of the reports referenced in this article are pulled from these.
- Boeing's Evolution of Airplane Interiors is quite an interesting read on the testing and cabin interior requirements.
- A briefing on Bad Air, Fumes and Contamination takes a look at other dangerous fumes that might be swilling about in your aircraft.

Wrong Runway, Wrong Airport, Wrong Country

OPSGROUP Team
31 August, 2021
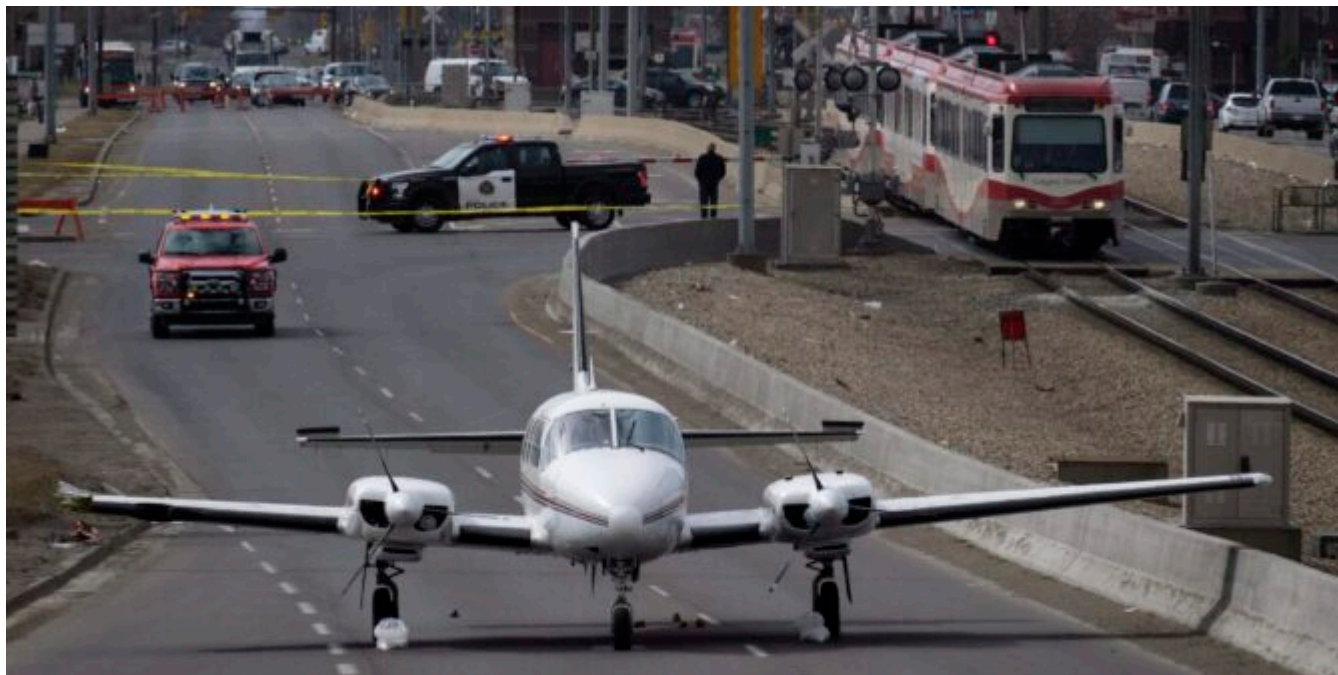
Even with today's levels of planning, monitoring and onboard safety systems, aircraft are still managing to land at the wrong airports, crew are still mistaking one runway for another, and even (occasionally) heading to the wrong country entirely.

Here is a look how and why these rather embarrassing, and potentially dangerous mistakes happen, and how to avoid them.

Wrong Runway.

Landing on the wrong runway is a hazardous event which poses a major traffic collision risk. It also has potentially big performance implications and by that we mean the chance of a runway excursion.

EASA Safety Information Bulletin 2018-06 looked at reports filed by European operators between 2007 and 2017 and found **82 occurrences of aircraft landing on the wrong runway.** An average of 8 a year might not seem high, but the consequences of an aircraft landing on the wrong runway could be catastrophic so **even one is really one to many.**

Thankfully the **majority of incidences occur in visual flight conditions** and are a result of visual illusions or misidentification during visual approaches and side step manoeuvres. So, instances of **crew just aiming at the wrong runway.**

While 'being visual' might mean a traffic collision risk is lower, the risk of performance issues and runway excursions remains high.

There are numerous airports worldwide which present a risk due to their runway orientation, approaches and prevailing conditions. **KJFK/New York's Carnasie approach** has seen several an aircraft incorrectly establish inbound for runway 13R instead of 13L following the inbound turn, particularly when there are crosswinds which affect the "picture" (the runway doesn't appear in the window where you expect it to).

There are also instances of mistaken clearances. Like the one that took place in July 2020.

United Airlines flight UA57 was on **finals for runway 09L at LFPG/Paris Charles de Gaulle** when ATC incorrectly cleared them to land runway 09R. The crew, **used to sidestep procedures in the USA**, failed to query the clearance which was unusual for Paris and instead commenced a low level turn to runway 09R. An EasyJet aircraft already lining up on 09R for departure reported the conflict on the radio and the United Airlines flight initiated a go-around from 260 feet AGL.

While an initial investigation into this has raised **probable causes primarily resulting from the ATC mental slip,** a sidestep at that altitude should be a visual manoeuvre. The crew of the United Airlines should have spotted the aircraft already on a runway which they were turning towards at 300 feet. The FAA have released a new SAFO related to this.

So being visual does not always reduce the traffic collision risk after all.

Then there are the more concerning **'not aiming for a runway at all'** events.

The KSFO/San Francisco Air Canada incident in 2017 is a serious example of visual cues going wrong. The Air Canada A320 was cleared to land runway 28R. However, they had **missed a Notam advising that runway 28L was closed** and, expecting to see an open runway to their left, mistook 28R for 28L and **aligned themselves with an active taxiway**.

The aircraft missed traffic on the taxiway by between **10-20 feet during their go-around.**

In 2007, an MD-83 routing from Lisbon to Dublin was carrying out an approach at night to Dublin runway 34. There was a prevailing wind of 260/12 which orientated the aircraft heading to 336° in order to maintain the inbound track of 342°. The **crew mistook a 16 storey lit building for the runway** and aimed for it, carrying out a missed approach from 1700 feet (around 200 feet above the building).

TNCM/Princess Juliana airport in Sint Maarten is known for a large hotel to the left of runway which, in hazy or rainy conditions, can be mistaken for the runway due to it being more conspicuous than the runway.

Then there was the KLM crew who managed to mistake taxiway B for a runway on takeoff from EHAM/Schiphol...

So how to avoid making this mistake?

The recurring factor throughout all of these is visual illusions and incorrectly interpreted visual clues. **Not looking at stuff, or not looking at stuff right.**

Of course, it is easy to say that from the comfort of a chair, on the ground.

Sat in the pilot seat, barrelling towards said ground at several hundred feet per minute with everything else going on around you as well... less easy. But there are some fairly common sense methods of identifying threats and errors before they become a problem.

The FAA released SAFO 17010 following the KSFO incident. It provides some 'best practices' for accomplishing an approach and landing on the correct airport surface:

- Any visual approach, or visual segment of an approach, should be **well briefed and monitored.**
- Known risks (such as hotels that somehow look more like the runway than the runway) **should be talked about.** If there is a chance of visual illusions, talk about them and talk about what you expect to see.
- **Think about the wind** and where you will actually need to be looking in order to see the runway. It might not be straight ahead.
- Fly a **stabilised approach.**
- Monitor things like height, heading, to **make sure they make sense.** And back it all up with Navaids and other information if that is available.

Wrong Airport.

Landing at the wrong airport also happens!

One analysis found at least **150 flights by US carriers landed (or almost landed) in the wrong airport** between the 1990s and 2014. Not including totally valid diversions of course.

The most common reason for wrong airport landings is down to pilot error once again – **both visual and procedural.**

In 2017, a Delta flight 2845 landed at the wrong Minneapolis airport. They were due to touchdown in KRAP/Rapid City, but mistook nearly Ellsworth air force base for their intended airport. Both have the **similar runway orientations** (although that's really the only similarity – Rapid City has two runways which possibly should have been a giveaway).

In 2006, a Ryanair flight aiming for EGAE/Londonderry-Eglinton ended up landing at a military base in Ballykelly 5 miles away, again just due to a misidentification of the airport.

Ethiopian airlines suffered two near embarrassments when **two of their airplanes both tried to land at the wrong airport in Zambia.** Actually, one of them did. Destined for Ndola, both mistook the new (and unopened) Copperbelt for their destination airport.

The fix remains the same:

- Brief what you expect to see.

- Brief how you expect to get there.

- Check and monitor that other clues – navaids, waypoints, airport layout – make sense!

- A lot of airport **charts also have warnings** on them when there is another airport nearby which has been known to trick pilots in the past. Look out for these.

- Many aircraft have systems which monitor their position in relation to what you told it (in the box) you were going to fly it. If your airplane is beeping, blaring or swearing at you then it is trying to tell you something – **don't ignore it!**

Are these just embarrassing stories?

Unfortunately, there is a much more serious side. The wrong airport might be **a commercial, logistical problem,** but the real big risk comes down to that runway performance again.

Of the 150 or so near/actual landings at wrong airports which took place in the US since the 1990s, there were **35 actual landings** and **23 of these** occurred at airports where the **runways were shorter than those at the intended destination.**

In 2014, Southwest flight 4013 aiming for KBBG/Branson airport accidentally touched down at KPLK/Clark Downtown airport instead. **Branson's runway is 7140'. Clark's is 3738'.**

A Boeing Dreamlifter made a similar error when routing to McConnell Air Base but instead touched down at Jabara airport, on a runway only 6,101 feet long.

The critical safety issue here is the performance – the fact it hasn't been checked and that it might not therefore be, well, ok.

And if it is *happily* ok, then you might still be looking at a bit of an **issue getting the airplane back out**

again. Much like our Dreamlifter friends found out.

Wrong Country.

Finally, wrong countries. A much rarer occurrence but possibly the most embarrassing should it happen.

A British Airways flight (in all fairness it was actually a German aviation business operating on behalf of BA) managed to fly to EGPH/Edinburgh instead of EDDL/Düsseldorf after a paper work mix up had the crew sent totally the wrong flight plan.

However, since the flight was planned and fuelled for Edinburgh this **only really impacted the rather put-out passengers.**

A potentially more serious incident happened in 2015 when an Air Asia crew had to divert back to Melbourne, Australia, after the **pilot incorrectly input the route** from Sydney to South Africa instead of WMKK/Kuala Lumpur.

Given the fairly different direction you have to wonder how far they got before they, or ATC, spotted something was up?
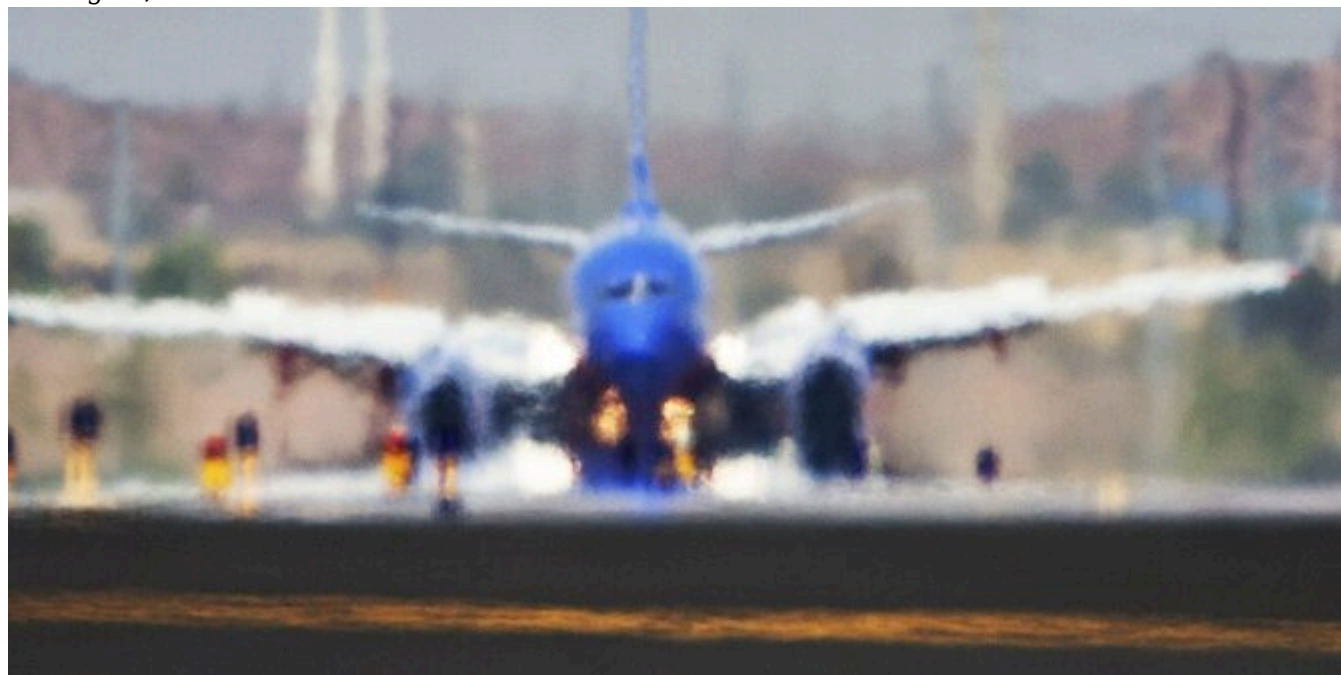
Fancy a bit more reading?

NASA have a handy analysis on visual traps that is worth a read.

Check out the FAA's project on 'runway surface events' here – including some info on the ASDE-X project which uses surface radar to detect when an aircraft might be lining up on a taxiway for departure.

Top Tips for Operating in the Heat

Chris Shieff
31 August, 2021

Summer has hit the Northern Hemisphere with a vengeance.

In the US, heat alerts have been issued from the Pacific Northwest to the Louisiana Gulf Coast with temps in some areas hitting the triple digits.

Over in Europe, southern and eastern regions are currently sweltering while in the Middle East several countries are currently the hottest places on earth. Kuwait hit 50 degrees Celsius the other day – that's 122 if you prefer your temps in Fahrenheit.

Chances are if you're operating in the Northern Hemisphere right now you are running into hot weather ops.

While you may be discovering that those board shorts you bought on layover pre-Covid are now a frightening three sizes too small, the hot weather presents some other unique operational challenges that are worth reviewing.

Flight Planning.

Make sure you check the books. If it's getting really hot out there, keep an eye on your manuals. Most commercial aircraft have an operating envelope for ambient temperature. When the heat becomes extreme it can actually ground you, as happened to a number of CRJs in Arizona back in 2017.

Watch those MELs – You may be allowed to dispatch but have a think about whether it is appropriate to. Passenger comfort can become a problem here. Look out for anything that affects cabin cooling – bleed faults are a classic. A 30-minute taxi on a hot day running on a single bleed may see you unable to keep the cabin cool.

If you have an extended turn-around without ground equipment you may need to factor in a little extra fuel for APU burn to keep the AC flowing.

Pre-flight.

First things first, **get that cabin cool**. High cabin temperatures are not only uncomfortable but can lead to medicals. The challenge on the ground is to control cabin temps – it is easier to keep them down than bring them down.

Consider using ground equipment if it's available and keeping the aircraft's window shades and door(s) closed. Random fact for the day: adult humans produce about as much heat energy per hour as a 100w light bulb – you may need to delay boarding until things cool off.

It's not just ground *air* either. Some manufacturers think ground power helps too, as it takes some load off the APU.

Also, don't forget to look after the bleed system – they have a tendency to overheat. In some aircraft types it can help to partially extend the slats and flaps to improve cooling while on the ground.

Start Up.

Whether you use ITT, TIT, EGT or some other type of -T you will need to **keep your eyes glued on limits**, both during start and take-off.

Starting can be particularly problematic if your engines are **already warm**. Each aircraft type will have a specific procedure to follow to avoid hot-starts but more often than not they will include a dry crank cycle and a manual start.

By manual, we mean no fanciness like FADEC. Which means it's on you to **get rid of the fuel** (quickly)

before you roast one. Over-temps can happen very quickly. Pay close attention to the *rate* at which temps are rising. You don't have to hit the limit to cut the fuel.

On that note – use every advantage you can. If there's wind you want as much down the core as possible. You may need to tow into a better position for start – avoid tailwinds!

The Taxi Out.

The issue here is **brake temps**. Large aircraft usually use carbon brakes. They're designed to absorb energy by converting it to heat. Aircraft have brake temp limits for departure – on a sidenote, any guesses why? It's due to the flash point of hydraulic fluid – they don't want you to have superhot brakes in a wheel well near potential leaks.

The point is you have to keep your brakes cool and hot weather makes that difficult. It helps if you're lucky enough to have brake fans and some airports are equipped with portable ones if you ask engineering nicely.

Otherwise, a little planning ahead helps here. If you expect a long taxi, give yourself a 'build up' margin so that you don't hit your limit the second you get to the holding point, and use them as sparingly as you can.

It's also worth considering that a longer single application of brakes is better than a bunch of them – let that speed build up before you brake again.

Departure and (lack of) performance.

Chances are you already know that as temperature rises, **air becomes less dense**. Our engines and wings have to work harder to get the job done and the penalty is performance.

If we really want to know how our aircraft will perform on a given day, we need to think about **density altitude** – pressure altitude corrected for how hot it is out. And correct we must, because for every degree outside above ISA, an airplane will perform like it is 120 feet higher. In extreme heat this can push up into the thousands.

So, when it gets super warm out there you can expect **longer take-off distances and decreased climb rates**. You might find yourself unable to lift weights off runways that you usually can either because there isn't enough of the hard stuff in front of you or because of climb gradients.

Even if you can lift it all, don't get caught out by restrictions on your SID down the track (at or aboves). Make sure you check them ahead of time in your FMS with a healthy buffer to avoid getting some egg on your face. Consider asking for a waiver or a different SID.

Dodge that weather

High temps produce convection – or in other words, it makes air rise. In humid climates you're likely to run into build-ups and thunderstorms, especially in the late afternoon and evening. Visibility can also be severely limited by haze and poor air quality.

The Approach.

There are a few things to think about. The first is the approach you're about to fly. Make sure there are **no temperature limitations** – RNAV approaches publish them for the use of LNAV/VNAV minima while in other cases, such as RNP (AR), the whole procedure may not be usable.

Expect mechanical turbulence near the ground, especially in dry climates. It can do a great job of destabilising an approach right when you have it on rails.

And don't forget the missed approach either, especially if they require a steep climb gradient. Performance may once again become a problem.

Landing.

Runways surfaces get hot – expect some thermal lift in the flare.

Once again, look after those brakes! Especially if you're headed out again. **Consider using reverse or exiting the runway further down the track.** Any extra heat energy you put into them can turn into extended delays for cooling.

Parking Up.

Get that APU fired up pronto, close the shades and keep things cool.

Carbon brakes cool a lot faster with the park brake released. Once you're on chocks, think about releasing – just don't forget the chocked bit.

There's more hot weather to come.

It's not surprising to hear that the earth is warming up. 2020 saw the second hottest global temperature on record, and the figures show that that the rate of warming is accelerating.

From an operational perspective we are increasingly likely to encounter periods of 'extreme heat' on the line – when temperatures are six degrees Celsius or higher than average temperatures for an extended period of time.

In summer months more and more often we are going to have to deal with operating our aircraft at the high end of what they were designed for, so it's important to remember how to keep things cool out there… literally.

Al-Shabab: A Threat Beyond Somalia

OPSGROUP Team
31 August, 2021

Al-Shabab poses a significant threat to aviation in Somalia, but the threat extends beyond the nation's borders. This briefing will take a closer look at the background and nature of the threat, and will provide a brief overview of Somalia's aviation infrastructure to help enable operators and pilots to carry out a full risk assessment.

The root of it.

Somalia sits on the Horn of Africa, bordered by Ethiopia to the west, Djibouti to the Northwest, Kenya to the southwest and the India Ocean to the east. The **capital is Mogadishu** and the primary international airport is **HCMM/Aden Adde International.**

It is an extremely volatile region of the world. It is also a pretty important airspace because it is **one of the primary routes for aircraft routing from the Middle East and Asia into Africa.**

Al-Shabab

Al-Shabab are an insurgent group seeking to establish an Islamic State in Somalia. They are active across Somalia, as well as Kenya and Yemen.

In 2006, Ethiopia supported the transitioning Somalian government to push Al-Shabab out of Mogadishu. In recent years, an African Union-led military campaign has been in force against them. The group retreated from Mogadishu, but still frequently target HCMM/Aden Adde airport, and the capital city, using small arms fire and vehicle-borne IEDs.

They also potentially have **access to anti-aircraft capable weapons.**

Which is why there are some big warnings for the region.

In our SafeAirspace risk assessment, **Somalia is a Risk Level Two – Danger Exists.** The reason for the Level Two rating comes down to the fact the risk is predominantly limited to certain levels. The threat to aircraft is generally low level, with high altitude overflights less at risk.

Most authorities have therefore issued AICs which **advise against flights below FL260** across the HCSM/Mogadishu FIR, or operations into Somalian airports. Certain airways such as **UR401 SIHIL – AXINA** only route over the oceanic airspace and so are exempt from the "Don't Fly" warnings.

The USA have **KICZ Notam A0005/21** in place warning against flights below FL260, along the region bordering Somalia (40°E).

The threat within Somalia.

The main threat comes directly from Al-Shabab who may have access to anti-aircraft weaponry. They pose a threat to low level aircraft and to security and safety on the ground as they frequently target Aden Adde airport with mortar attacks.

There is an additional threat from the Ethiopian military forces – the possibility of misidentification of civilian aircraft by them.

In 2020, a Kenyan cargo plane was inadvertently shot down following a misidentification. The cargo aircraft was routing from HCMM/Mogadishu to HCMB/Baidoa.

The threat beyond Somalia.

Al-Shabab have also targeted neighbouring countries. While the infrastructure and security in these countries is stronger than Somalia, which reduces the hazards and disruptions to airborne aircraft, it still presents a **high security risk on the ground.**

The group have attempted to attack aviation infrastructure and facilities, and have attempted to use aviation to launch other attacks on countries.

In early 2020, a complex attack was carried out against a Kenyan military base which houses US troops. Similar targets in Djibouti were also identified.

In 2016 , an Airbus 321 was targeted with a **bomb on board** which exploded shortly after takeoff, earlier than intended. The aircraft was able to land safely at Mogadishu.

Some arrests of Al-Shabab operatives were made in December 2020. A Kenyan man and member of the group was planning a "9-11 style attack", and had enrolled in a flight school in the Philippines, intending to obtain a pilots licence with the purpose of gaining access to a flight and using this as a means to carry out the plan.

In 2019, a major attack on a hotel in Nairobi, Kenyan took place. Operators should be aware of the ground threats, particularly the security issues for their crew if they are staying in major hotels in regions Al-Shabab have targeted previously.

Kenya had its airspace threat level downgraded in 2018. There remains a ground based risk to security.

Sites such as International SOS provide good, up to date information on ground security threats.

Additional risks to aircraft operating through the region.

HCMM/Aden Adde is the **only major airport in Somalia.** Aircraft routing down the east coast of Africa are **limited in their emergency and diversion options.** HDAM/Djibouti to the north, HKMO/Mombasa to the south or FSIA/Seychelles to the east are the only relatively close ones.

In the event of a time critical emergency, if crew use HCMM, security and safety on the ground must be considered. In the event of a diversion, with limited options, careful and regular checks of the weather (due to common storm build ups during summer months) will be critical to ensure the aircraft is not committed (fuel wise) to an airport which then becomes unsuitable.

A closer look at Somalia.

The Airport:

Aden Adde International airport is the primary airport for Somalia. It has a **single runway 05/23, which is 10,446 feet (3184 meters)**. The only published approaches are RNAV (GNSS) or RNAV (RNP) for runway 05.

There is minimal apron space and parking, and only a single taxiway midway down the runway meaning **backtrack and 180 degree turns** are required.

There is a **'Do Not Descent below FL100' sector** north and northwest of the airport, and the RNAV approaches descends and routes aircraft over the sea to avoid aircraft flying over the land low level, where risk of attacks would be significantly increased.

Despite the potential risks, **several international airlines do operate** into Aden Adde.

Routings and Airspace:

Because of the position of **Yemen, which is a 'no fly' country**, and Eritrea and Ethiopia where the Tigray region is also a 'no fly' area, aircraft are limited in the connecting routes to and from Africa. Routing via Egypt and through Sudan and South Sudan is longer, and has other challenges and airspace risks associated with it.

Routing along the east coast oceanic section of Mogadishu airspace is significantly shorter.

All of the Mogadishu FIR is Class G airspace, with only an FIS.

Communications:

The infrastructure in Somalia is limited. The minimum radio and navigation equipment requirements for overflights are:

- HF Radio
- VHF radio
- GPS received (ATS routes)
- TCAS

There is a H24 flight information service and alerting service in the Mogadishu FIR, callsign "Mogadishu Information".

The **primary VHF frequency is 132.500, with primary HF 11300/5517**

Mogadishu also has a (relatively responsive) SATCOM number you can call – **466601 (Inmarsat) or +252 185 7392/7393**

Aircraft need to check in at least **10 minutes prior to the ETA for the FIR** entry point.

Routing through the airspace, aircraft are required to maintain a listening watch on the **IFBP frequency 126.9.** If aircraft experience an HF failure, they should attempt to contact Mogadishu FIC via SATCOM, or request relays via other aircraft.

Summary

Al-Shabab present a risk both directly to flight operations, and to operations and ground security in neighbouring countries:

- Flight operations below FL260 are at risk

- Since 2020, the group has issued new warnings suggesting they are increasing their anti-aircraft weapon capabilities, with intentions to target US aircraft specifically

- Crew and aircraft security on the ground is a risk

- Crew should be aware of security and safety in neighbouring countries, particularly at tourist spots and in major hotels which may be targeted

- Infrastructure and security in neighbouring countries may be at risk

- Regional stability is threatened by ongoing conflict

Aviation & Humanitarian support.

Somalia has its own CAA. The need for better infrastructure and equipment because of the importance of overflights through the Mogadishu FIR has led to other State's funding and supporting the CAA.

The UN work with Kenya to organise humanitarian air services and missions into Somalia. More information can be found on that here.

How much radiation are we getting zapped with as crew?

OPSGROUP Team
31 August, 2021

How much radiation are we getting zapped with as crew, and what sort of levels should we be concerned about?

The Airport Security Scanner

Most pilots have probably experienced rather overzealous security scanners in an airport. You know the ones – when you go through, it beeps. You remove the watch you forgot to take off. It beeps again. You take your jacket, shoes, tie off. It still beeps. Now you're wondering if you'll need to strip down like this South African Airways pilot did...

Anyway, it is frustrating, but it is not really a big deal radiation-wise. One dose of the airport scanner is **100,000 times lower** than the average annual dose we get from **natural background radiation and medical sources.** It actually delivers around 0.1 microsieverts per scan which is 100th what a standard chest x-ray delivers.

For comparison, every banana you eat contains around **half a gram of potassium-40** (an ionising radiation source) which means eating it is the equivalent of 1000th of a chest X-ray in terms of the radiation dosage. The granite counter top you prepared your lunch on is also dosing you. While if you live in the UK you are getting about **2.7 millisieverts of radiation annually** just by being there because it is one giant granite counter top under your feet.

So, no, we shouldn't be worried about radiation from airport scanners. But given that every minute on an airplane is equivalent to one airport scan, should we be worried about that?

Flight Risk

When you fly you are exposed to low levels of radiation – from some of the onboard equipment, to the fact you are way nearer space and all the cosmic and UV rays swilling about up there.

UV radiation is what we protect ourselves against by not destroying our friend, **the Ozone Layer**, and with all the SPF suncream we slather upon ourselves. The ozone layer sits around 10-15 miles above the ground (so our airplanes stay below it), and it blocks out a good whack of UV-B, all of UV-C and some UV-A.

Now, that *some is the reason why we should be **slathering more sunblock on** ourselves when we fly, because the ozone layer and our windscreens help, but not enough. A study showed that the amount of UV radiation the pilot seat (and you in it, presumably) gets smacked with when **flying for under an hour at**

30,000 feet is equivalent to a 20 minute tanning bed session.

Studies also show the rates of skin cancer in pilots and cabin crew are significantly higher than the general population. So, you need to be careful. Plus it makes you wrinkle more.

- **Wear sunblock** (decent UV-A and UV-B ones)

- **Get decent sunglasses** with UV protection lenses because your eyeballs are damaged by it too! Polarized sunglasses help reduce glare, but don't necessarily provide more UV protection (and they mess with the screens).

- **Check them moles** (if you're a moley sort of person) – it isn't just areas exposed to direct sunlight which can be at risk.

In fact, going back to the sunglasses point, IFALPA have a very handy handout on the 'Ocular Hazards of UV Exposure'. It is basically 'scary stuff, bad stuff, scary stuff' and then a "get sunglasses that have a UV absorption up to 400nm/ 100% absorption'.

Cosmic Vibes

Cosmic radiation is high-energy charged particles – x-rays and gamma rays which come from stars, like our very own sun. It differs to UV radiation in that it is higher energy and ionising.

We don't like **ionising radiation** because it causes damage to our squidgy little insides.

The closer to space we get, the more cosmic radiation we are exposed to, and the **higher the latitude the more** we get as well, which means those high altitude, **Polar flights** are the ones to really monitor.

The Northern Lights displays we see, despite their "radioactive" green colour actually do not emit any radiation that reaches us. Although, if you were up there, in it, it probably wouldn't be great for you.

What are the numbers looking like?

The International Commission on Radiological Protection (ICRP) basically **classify aircrew as 'Radiation Workers'** and recommend a **maximum of 20mSv a year averaged over 5 years.** So a maximum of 100 mSv in 5 years.

The average person in the US receives up to 3mSv, with a recommended dose of 1mSv per year. Anything between 3 and 20mSv is considered moderate.

So, how much are we getting?

Well, heading from the **east to the west coast of the USA you probably get about 0.035mSv.** Not a tremendous amount if you're a passenger, but what about if you are doing flights several times a week?

2 sectors a day, 3 times a week, plus or minus a few for holidays, and you could be heading towards something in the region of 10mSv which is higher than normal but still in the moderate (and acceptable) range.

If you are flying from **Athens to New York** – a flight likely to take you along a relatively northerly route and at a flight level of 41,000ft or higher, then the 9 to 10 hours airborne are going to dose you up another **0.063mSv – 0.63mSv per 100 block hours.**

A study carried out in 1998 suggested the average crew member flies around 673 block hours, getting an **average cosmic ray dose of 2.27mSv**, while the annual cosmic ray dose for a long haul Captain was

calculated at around 2.19mSv.

Ok, that was back in 1998, but as far as we know the levels of cosmic rays haven't increased. Our block time might be a few hundred higher, but still well within limits on the radiation dose front.

How can you monitor it?

Airlines and operators should monitor this for you, but if you want to keep an eye on it you can via various apps out there in the mobile phone world.

CRAYFIS is an app developed by scientists to help monitor the amount received via the pixels in your smartphone screen.

Apps like **TrackYourDose** have options to plug in a route and uses average flight paths to help you monitor your dose on specific flights and days.

Or you can work it all out yourself using this handy little formula.

So, should we be worried?

The figures suggest no.

A study of 10,211 pilots carried out in 2003 also supported this, with skin cancer showing slightly higher incidences.

So unless you are flying an excessive number of long haul Polar Flights, the overall the radiation dosage received by air crew is higher than the average ground dweller, but remains within acceptable limits.

That space weather is likely to have more of an impact on your HF than it is you.

Want to read some more (official) stuff?

The CDC offer some good guidance.

As do the FAA in this useful booklet for air crew.

New FAA Airspace Warning for Afghanistan

Chris Shieff
31 August, 2021

The FAA has issued an emergency order for Afghanistan's airspace which **bans all US operators below FL260** throughout the OAKX/Kabul FIR.

KICZ Notam A0020/21 has the details but essentially there are only three exceptions:

- **Flights in and out of OAKB/Kabul are allowed to continue.**

- **If a flight has a special approval from either the FAA or the state.**

- **If you have an emergency and have to land.**

What's the risk?

Due to increased extremist activity on the ground, civil aircraft are increasingly exposed to a number of threats. **Aircraft at low levels and those taking-off and landing are especially vulnerable.**

The first is indirect fire caused by militant groups targeting airports with mortars and rockets. **OAKB/Kabul** was attacked in December last year by ballistic weapons which damaged a parked aircraft.

The second is direct fire from a variety of sources. Militia are known to have access to multiple weapons that can be used to target low level aircraft. These include rocket propelled grenades and **man-portable air defence systems** (MANPADS) which are capable of reaching aircraft as high as **FL250**. Even small arms fire has been actively used to target aircraft.

In recent years there have been several reports of anti-aircraft fire incidents from both military and civilian traffic. Tragically in two cases, military aircraft were actually shot down.

So why now? What's changed?

While the threat from militant activity in Afghanistan isn't new, the FAA has been closely monitoring the situation there for changes in safety and security. And things are changing…

As US forces begin to withdraw, two groups are now engaged in an **escalating conflict** there – the Taliban and Afghanistan's own military, which may lead to a **civil war** if no agreement can be met. Essentially the Taliban seek to regain power, while the existing government is defending itself.

For aviation this means an increase in **exposure to known risks.** The situation is volatile, and no one really knows where the conflict is headed. But with increasing extremist activity on the ground and a **possible intention to make an international statement**, the FAA appears to have decided that a simple caution is no longer enough.

What about above FL260?

US operators can continue to overfly the OAKX/Kabul FIR above FL260 but is recommended you **stay on established airways.** It's also important you continue to monitor the situation on the ground which may change with little warning.

What are other countries saying?

Several long running airspace warnings remain in place, and it is likely we will see these changed in the near term as the situation in Afghanistan continues to evolve.

France follows similar rules and requires all operators to remain at or above FL260 throughout the Kabul FIR. Both **German** and **UK** operators are advised to consider the risks of operating below FL330 and FL250 respectively.

Stay safe up there.

As US troops withdraw the real question now is whether the Afghan Government (or another international force) can put the brakes on a resurgent Taliban.

Until that happens, the situation remains unpredictable. You can keep up to date with airspace risk changes as they happen over at SafeAirspace.net – our conflict zone & risk database.

Click here for a full global briefing.

2021 New North Atlantic Plotting & Planning Chart

David Mumford
31 August, 2021
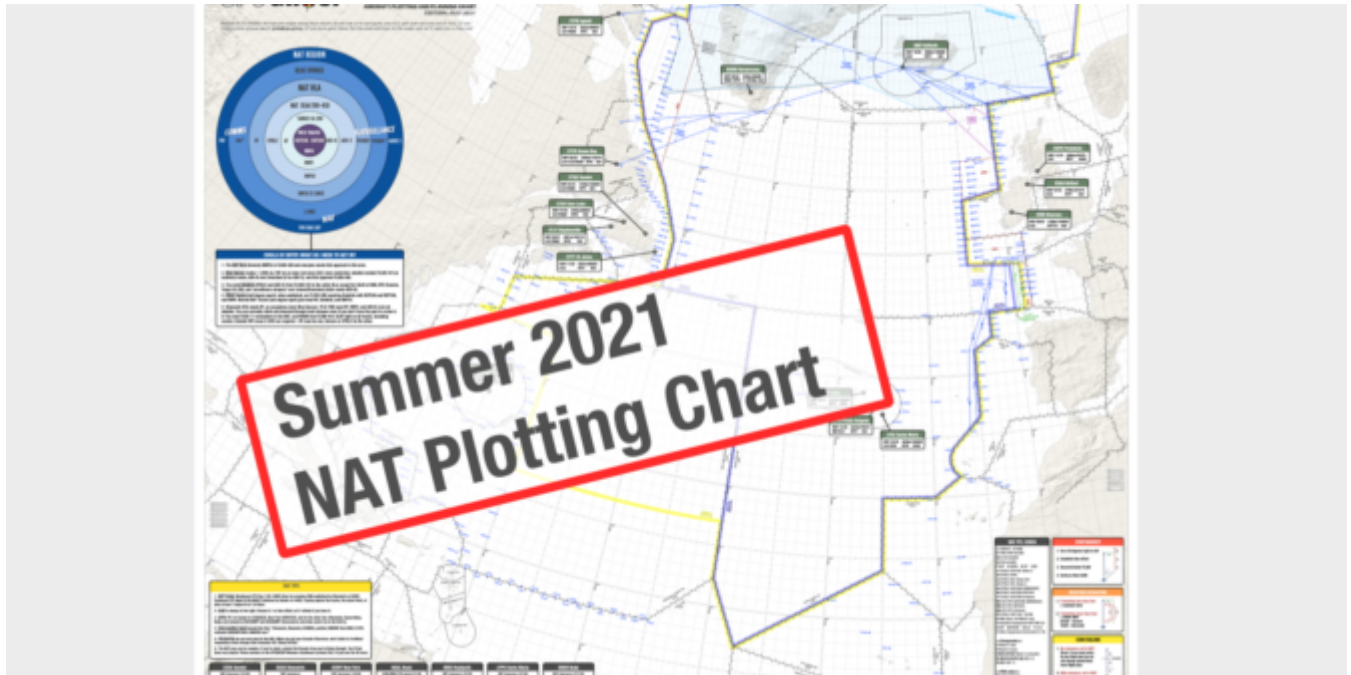
Hi members!

First, **thanks to all the group members who were part of making this**. We sat down from scratch and wanted to build the best possible NAT chart we could. A lot of work went into this, and we're grateful to you all! With this format and structure, we're also looking at making useful plotting charts for other areas like the Pacific, Africa, etc. – but for now, enjoy this completely updated NAT map for 2021.

So .. It's ready! You can grab it in Slack, or in your Dashboard. View it on your iPad or Laptop etc. as a PDF, or print it out as a giant wall map! It prints really well up to 15 feet wide – but you can also just put it onto A3 or A2 size paper.

If you're not a member, read on for how to get a copy.

About the 2021 NAT Chart

This chart is completely new – we started from scratch, expanded the coverage area, and then worked as a group to add all the useful things we could think of that a pilot or dispatcher crossing the North Atlantic might need.
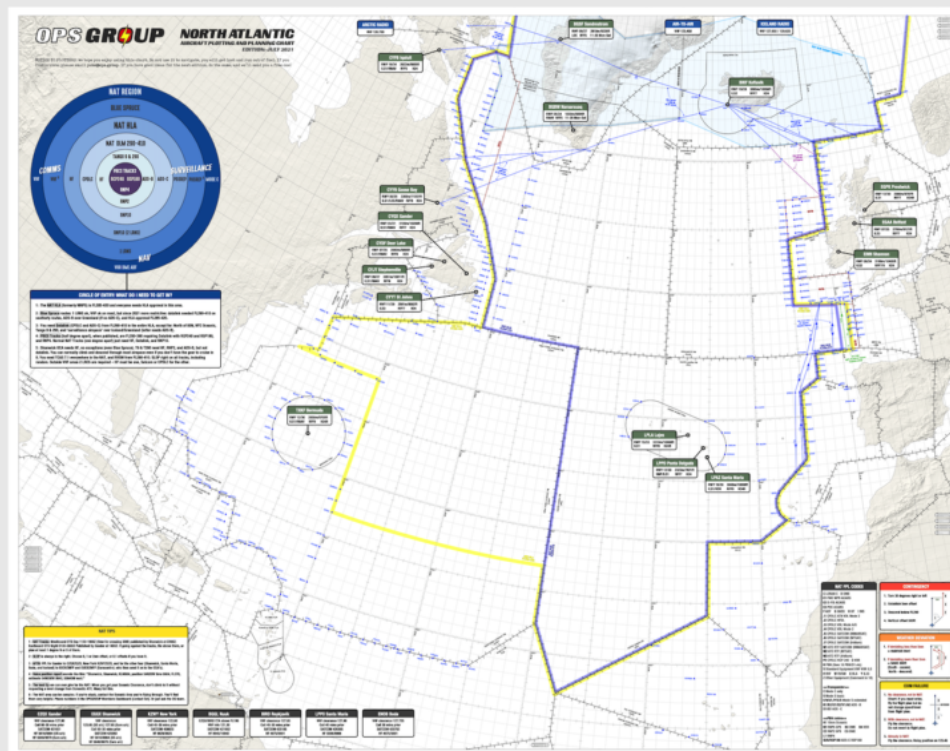
New on this chart – effective July 2021:

- **FULLY UDPATED** for 2021 post-COVID flying!

- **EXPANDED** coverage area – much further down into the Atlantic, and further west.

- **NEW**! NAT Tips – using NAT Tracks, SLOP, filing an Oceanic Flight Plan, and helpful tips

- **NEW**! Quick reference for contingency, weather, and comms failure with easy graphics.

- **Updated**: NAT Airspace Circle of Entry 2021 – easily check what you need for Nav, Comms and ATC Surveillance depending on which bit of the NAT you will be flying through.

- Additional diversion airports, now 16 total primary NAT alternates with runway, approach, length, RFF, and hours

- Easy view of boundaries for HLA and DLM/Datalink mandated airspace

- Updated NAT FPL codes, clearance frequencies, Satcom, and HF

- Fully updated "South East Corner" with new Tango routes

- and … Treasure Boxes!
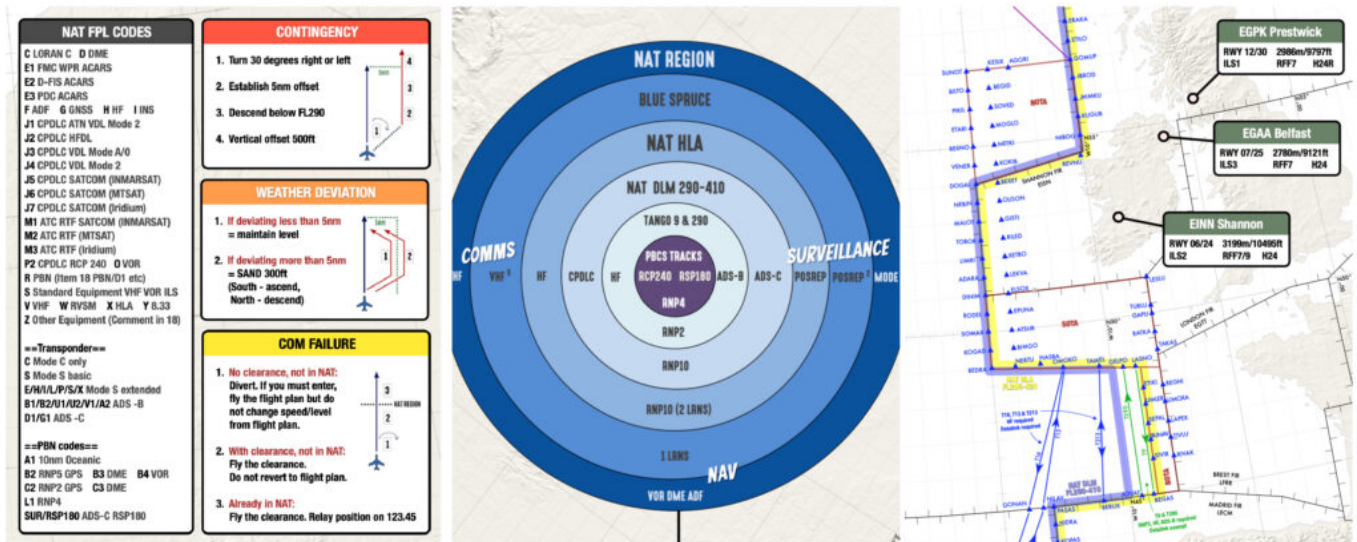
Other chart features:

:: Requirements for NAT tracks, PBCS tracks, datalink mandate.
:: Common NAT Diversion Airports.
:: Runway Orientation, Length, best IFR Approach.
:: RFF Category and Opening hours.
:: NAT FPL Codes and sample FPL.
:: Blue Spruce routes and equipment requirements.
:: All NAT Entry/Exit points with associated required landfall fixes.

How to get the new chart, if you're not a member?

- **Option 1**: Buy the chart in the store (**$35**)

- **Option 2**: Join OPSGROUP, and **get it for free**!

OPSGROUP members get this and other publications free of charge, all available through your member dashboard.

There have been **many changes on the North Atlantic** since we published our previous chart in 2019. Here's a few things to read up on:
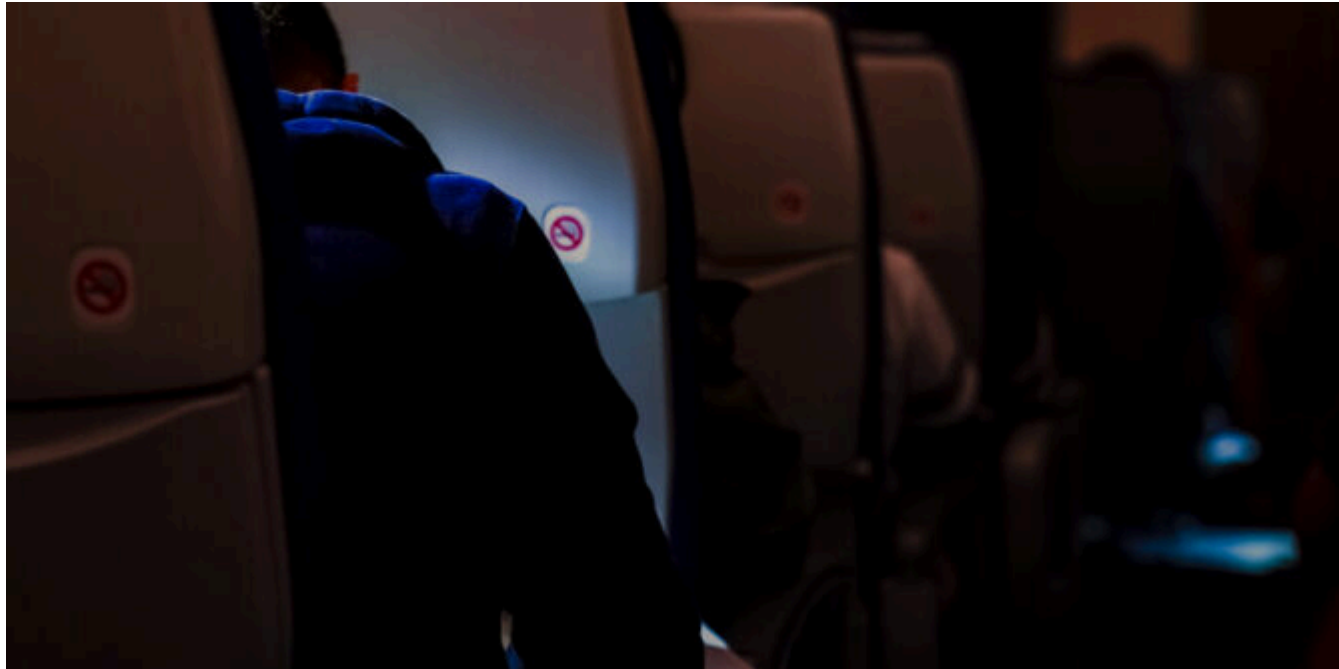
- Feb 2021 changes here

- July 2021 changes here

- The full NAT timeline of all changes going back to 2015

We hope you find it super useful, but also have fun using it!

Pax Problems: Do you know who you have down the back?

OPSGROUP Team
31 August, 2021

How often do you think about who you have down the back? The recent Belarus incident might be prompting you to think a little more about who you have onboard and whether there are any political or operational considerations their presence might lead to.

So, here are some things to think about – from the political considerations of country politics, to what to do if the troublemaking is taking place onboard.

The Politics.

It would nice to stay above this, but unfortunately **even at 40,000 feet we seem unable to escape** the (often messy) world of politics, which means some consideration of who you have onboard, where your aircraft is registered, and where you are heading to and from, should form part of your overall risk assessment.

Israel is a fairly obvious example. They have a long history of strained relationships with neighbouring countries. It was **only in 2020** that several of their closest neighbours renewed ties with Israel and allowed operations and overflights to re-start.

This has not happened with all their neighbours though. If you are routing to or from Lebanon then LLBG/Tel Aviv is unlikely to accept you in a diversion. Likewise, if you divert to OLBA/Beirut with Israeli passengers onboard, this could pose some serious issues for them. Checking **Country Rules and Restrictions** for notes on Israeli flights (originating from or routing to) will bring up a fair few places that you need to be aware of – such as Pakistan – who still will not accept overflights or diversions to aircraft coming from, going to, or registered in Israel.

Israel itself is allowing aircraft in, but **read the small print** on this because in order to land in Israel you must be departing from one of their approved airports, and your crew and passengers must be nationals of countries that have diplomatic relations with Israel.

India/Pakistan have an ongoing feud that has led to huge fence being erected along much of their border. The countries allow over flights from each other, but if you are operating into one, a diversion to the other may cause some consternation. OPLA/Lahore in particular is one to look out for because of its proximity to the Indian border.

If you divert into India with a technical issue that sees you grounded, and you are carrying Pakistani passengers there may be issues with them overnighting in the country.

It isn't always political though.

Sometimes the folk causing problems are the troublemakers onboard.

If you can spot them before takeoff then all the better. Cabin Crew are your last line of defense for ensuring anyone under the influence of alcohol (or just being generally offensive) is offloaded before they have a chance to cause issues. Remember, **the law is on your side here** – most countries specify that it is a criminal offense to be drunk onboard an aircraft.

The FAA have just made it a whole lot easier to handle disruptive passengers. In January 2021 they announced a **zero tolerance policy for bad behavior**, and they have a hefty **57 different civil penalty actions** available to them. So far for 2021, they have received around 3,100 reports of unruliness and these have led to open investigations for 465 incidents – a sizable increase on the 146 seen in 2019.

What counts as disruptive?

Anything that is disrupting the flight, causing a nuisance to other passengers, or impacting the safety onboard really.

- Being intoxicated with drugs or alcohol

- Refusing security checks

- Disobeying instructions

- Threatening, abusive or insulting words

ICAO put out a list of the **top reasons for unruliness** and unsurprisingly, alcohol topped it, with compliance with regulations (smoking, seatbelt signs etc) not far behind. In the top 16 there were also pet/emotional support animal related reasons, along with seat reclining disputes.

What actions do you have available onboard?

A PA from the Captain telling all the other passengers that "The Annoying Person in Seat 45B is going to delay everyones' holidays unless they **sit down!**" might do the trick for passengers who are just a bit of a nuisance (although your company might frown on this). But for those passengers that are posing an actual danger, the **Tokyo Convention** is your go-to convention here.

First written in 1963, it focuses on security and **lays out what the rules and rights are**.

The convention gives any passenger the right to take **"reasonable preventative measures"** to maintain their own safety (without having to ask permission first), but also makes it pretty clear that **only the Captain has the right to order a passenger be restrained,** and this requires some thought because it does need to be justified – a *"high burden of proof"* will be needed.

And justified means it really is **the only remaining option available to prevent the person from endangering the safety of themselves, passengers, crew or the aircraft.** What you deem "endangering safety" is up to you but bear in mind there will be a bunch of witnesses on board.

Following on from Tokyo came the **1970 Hague hijacking definition** and then the **1971 Montreal convention that deals with sabotage**, and the criminalization of anything being brought onboard to jeopardize safety. In 1974 they revisited the good old **Chicago convention** and aviation security standards were developed. History lesson over, but it is worth having a vague understanding on what these contain in case you ever need to call on one.

Aside from these there always remains the option to divert.

In 2015, a flight from Las Vegas to Germany was forced to divert after a passenger became unruly over a cat. The woman had managed to board with the cat in her purse, rather than an official carrier, leading crew to storing the offending feline in a bathroom. This upset the lady and she threatened to "bring the aircraft" down if her pet was not released from its prison. Purr-ison if you like.

Diversions due unruly passengers are alarming not uncommon because while a passenger can be restrained, the implications of doing so for a substantially long flight need to be considered, as does the

ongoing stress for other passengers onboard.

The UK CAA suggest that a diversion typically **costs from around £10,000 – £80,000** depending on aircraft size.

Back on the ground

OK, so you've called the cops. Before they get there you might want to do a PA ensuring the other passengers know to remain in their seats and not get in the way of the police or that bad passenger might just slip out with the rest of the herd. But when they are arrested, **who actually has the right to prosecute?**

The Tokyo Convention give **explicit jurisdiction rights to the airline's country of registration** when it comes to court. However, there are some doors left open there for other countries to seek extradition as well. These were brought in following a case in 1949 where a passenger sunk their teeth into the ear of the pilot. Alas, the US had no laws at that time which could apply to crimes committed while flying over an ocean, so the biter went free.

In 2014, the Montreal Protocol was also issued. This extends automatic jurisdiction over the crime to the destination. Important because it stops criminals sneaking off free because they were clever enough to commit the crime while heading into a country that the airplane was not registered in.

This rather ugly slide by ICAO gives an 'Example of the problem'.

So, for now, the crime is punishable by the country of registration, but the Montreal Protocol sort of extends the right of police in destination country to basically help in arresting the passenger.

In-ads/ Prisoners

An inadmissible passengers is not a prisoner.

Generally, it is some poor person who forgot to get a visa in their passport and have been turned away at destination. Usually it is on the carrier that brought them in (and didn't check them at the departure airport properly) to take them home again, and as the Captain, you can expect to be handed the documents and passport for the in-ad at departure. However, you cannot detain an in-ad onboard when you land back wherever you are going. So **alert the authorities** and make sure they are there to meet the passenger. If not, you pretty much have to let them go.

Prisoners will always be escorted. For any "unusual" passenger, it is best to board them first and disembark them last. They must not seated at an emergency exit and preferably should be near the back of the aircraft and away from the aisle.

Emotional Support Animals

The rules for these recently changed and no more bizarre creatures have to be accepted. The UK do not allow any animals that are not service animals with full documentation. The US is the same, and only classify dogs as **bone-afide** service animals.

So, have a think about who is down the back.

Having an awareness of the nationalities of your passengers and considerations as to the countries you are overflying and their political relationships with other countries can be useful.

Knowing what the Tokyo Convention does and does not allow you to do with unruly passengers is also a good one to read up on. Your power as Captain only really extends to when the doors open.

If want to read more on unruly passengers then IATA put out some handy info here.

If it's the Tokyo Convention then ICAO have it published here (although it makes for some dull legal reading).

And if you'd like to read about the emotional support pet rulings (for the US) then here you are.

IFALPA have a very useful paper on carrying in-ad, deportee and other non-revenue passengers.

Article photo courtesy @surachetsh.

Simthing to Think About

OPSGROUP Team
31 August, 2021

What are you practicing with your crew in the sim nowadays? An engine failure on take-off? A few technical malfunctions? An assessment of their competencies and then send them on their way for another year?

Well, we thought we might suggest **a slightly different sim scenario** for you to think about...

What else should you be throwing at your crew?

There have been a bunch of recommendations out from the authorities suggesting crew swot up on their Unreliable Speed procedures because the number of these occurring have increased a lot recently. Something to do with aircraft coming out of long term storage with bugs nesting in their probes...

However, an **'Oracle of the NAT'** recently pointed out to us that many crew have not been doing anywhere near as many NAT routings, which means their NAT procedures probably need as much attention as their airplane's pitot ports do.

What are we talking?

Incorrectly flown contingency procedures (not to do with weather) were one of the top reasons for lateral deviation events in the NAT in 2020. Now it was admittedly only 6% but that is still one of the Top Ten mess ups, and a mess up easily prevented with practice.

There were also a few **incorrectly flown weather deviations.** These procedures are not hard to do, but they do need thinking about once in while (preferably before you're actually up there needing to know them) which is why the sim suggestion was presumably made.

Now, you could just email everyone a reminder of how to do it. A bit of text and a diagram. But a handier way to recap (and in a way that properly puts the info into their heads) would be **to really put crew up there**, throw some "fun" failures at them, and let them practice "for real" in the sim.

So, what's the recommendation?

Well, we ain't no trainers, but between us we have seen a few sims ourselves in our time. So here is what we suggest you might want to throw into a sim session if you think your crew could do with a refresher…

The Opsgroup Ops on the NAT Sim Scenario Storyline Suggestion.

Let's set the scene. *It is the middle of the night, the flight is somewhere over the North Atlantic, dark, lonely and quiet, when…*

KABOOM! Rapid decompression.

This throws in a nice bit of startle factor (which is also something pilots need practice in dealing with.)

Now those contingencies will be put to the test – **how much to turn, how much to offset, what else do they need to do and say?**

There is also that good old Situational Awareness thing to look at as well.

Do they, for example, identify where **other traffic** is, think about the **NAT tracks** and their proximity to the next parallel one, and think about whether they were **SLOP**ing already or not?

Let's get really mean.

A big thing to consider with NAT flights is just how remote and far from land you often are. So **Big Picture proactive planning** is a good habit to get into.

This means setting up for **emergency diversions** before you find yourself suddenly having to do one. An awareness of where the closest and most suitable spot for a landing is *in advance* might really save the day. Or at least a few panicked minutes of trying to work it out.

This is important anywhere, but particularly so when flying in the NAT because something like a **rapid decompression** is going to have you zooming down to FL95.

Fuel can become a big problemo quickly, but so can **separation to other traffic** if you start diving down and crossing tracks.

Where we would do it.

We would be mean trainers. The ones that people always call sick for. Power-crazed with the fun of coming up with mean scenarios to inflict on our poor pilots!

We would definitely make sure it was remote, with a massive headwind making the **"nearest" in distance the furthest in time.** We would probably throw in some **bad weather** at one to see if the crew fly themselves into a corner, and maybe an **HF blackout** or **ATC Zero** just to make those radio procedures a bit more fun.

Then we would sit back and enjoy watching it unfold while rubbing our hands together gleefully.

You might be nicer than us though.

If you are then you could always share the following with your crew before the sim session:

- The latest changes to ICAO NAT Doc 007

- Contingency Procedures for the NAT

Skills Fade.

The real point of this is that recent surveys of pilots returning to work (after prolonged periods) have shown that it isn't the hand flying that gets rusty (well, it does, but comes back pretty fast).

It is the **Procedures and the Workload Management** which really suffer.

Unusual or unused (or not regularly used) contingencies and SOPs will need refreshing. The NAT is a prime spot where additional threats and challenges make it all the more important to **not be rusty when you route through**.

So sims to get your pilots' flying skills up to scratch are critical. Practicing those **engine-out procedures**, **crosswind landing techniques** and general "How do I make actually it move?" **hand-flying sessions** will definitely help with confidence levels.

But opportunities to (re) consolidate those procedures, particularly those ones in challenging airspace like the NAT which are *likely to be required on a standard flight* could make a very big difference to safety in a practical way.

Hitching a Ride: How To Save Fuel with Geese

Chris Shieff
31 August, 2021

Industry heavyweight Airbus is currently running an innovative new trial over the North Atlantic that has potential to **change the way we fly in oceanic airspace** – and ANSPs Eurocontrol, NAT, DNSA and Navcanada are all on board. It's called **wake harnessing**, and it was invented by geese. Okay maybe not 'invented' – but certainly provided by nature.

Geese, you say?

Geese have already left their mark on aviation history in ways that that we'd probably like to forget. So, it seems only fair that they do something positive for the industry too.

And now it seems that they are (unintentionally, but we'll still take it). When a flock of Canada Geese infamously downed an airliner over New York back in 2009, they were flying in formation.

They were doing that because they were going somewhere and using each other to make things easier. Geese are known fly 1500 miles *in a single day*. That's only possible because they use very little energy doing it.

So why do we care?

One word: **biomimicry**. Or in more simple terms – copying nature. When we want to figure out how to do something that we don't know how to do, it's often worth looking out the window. *Nature, it seems, always finds a way.*

Enter aviation. **When it comes to fuel, it is facing a couple of big problems.** The first is that ICAO have set some seriously lofty goals for improving fuel efficiency and carbon emissions. While the other issue is dosh. Jet fuel is expensive and modern aircraft use a lot of it. Reducing fuel burn is big business, especially in an environment where profit margins are tiny.

There are solutions coming. Sustainable aviation fuel and next-gen turbine engine design have been making headlines recently. But behind the scenes Airbus has been turning to nature to help solve the problem using **existing technologies** we have today and by changing the **way we fly** – and it's all thanks to geese.

The Flying-V

Geese fly long distances in formation. Have you ever wondered why?

It's because they are using something called **wake energy retrieval**. It's a really fancy term for **riding each other's wave**. It's the result of countless years of evolution and it may have big implications for airplanes.

Here's how it works: When a bird flaps its wings its tips creates vortices. In the same way that our man-made wings do. These vortices create a horizontal swirl of air – an outer upward component and an inner downward one.

The reason why birds fly in a V is because if they position themselves in such a way that their wings stay in upward-moving air from the bird in front, **they can effectively fly in an updraft, constantly**. Which means they flap less and travel further.

What if airplanes did the same thing (but with less flapping)?

Airbus thinks that's a good question. Since 2016 they have been copying geese by flying large jets in formation so that the trailing aircraft 'rides the wake' of the one in front.

It turns out that if you find just the right spot, not only is it smooth for the passengers, but also **very fuel efficient**. *Get this* – Airbus have shown **fuel savings of five to ten percent** simply due to the effects of this phenomenon, and potential to reduce overall climate impact by twenty-five percent.

They're heavyweight numbers. That's because by flying in the upward component of the wake from the aircraft in front, we are essentially getting **free lift**. Or in other words, 'harnessing' energy we'd otherwise lose – which is why the concept is also known as 'wake harnessing'.

It's almost as though the trailing aircraft is flying in a gentle descent while level. That means **less thrust, less fuel and less emissions.**

But here's the kicker – **you have to get close**. Like real close. Airbus have found the optimum distance between aircraft is only 1.5nm. That's a fraction of the spacing applied by ATC. But with existing technologies like TCAS and ADS-C it's not unreasonable to think that this can be achieved safely.

Airbus have called the project Fello'fly.

And here's how it works.

ETAs would be used by ATC at **feeder waypoints** to set aircraft up for their 'wake energy retrieval pairing'- i.e. formation. The aircraft will still be **separated both horizontally and vertically**, but close enough for the pairing process to begin.

Responsibility for separation will then be handed to the two aircraft. Using newly developed FMS software, the trailing airplane will slowly close in on the leading one until it is positioned in the **optimum spot for wake harnessing**. There it will stay until the two aircraft part ways again. The lead aircraft will be responsible for talking to ATC while in formation.

But it's not all smooth sailing.

 While the idea has some serious potential there are some fairly obvious hurdles that would need to be overcome:

Wasting energy. The idea only works if aircraft don't waste energy flying at sub-optimal speeds to make it happen. In other words, loitering or playing catch up. Which means it will be difficult to achieve for aircraft departing the same airport.

Instead the answer may lie in new software. For instance, German researchers have developed 'MultiFly' –

a system that identifies jets that can be paired together based on type, location and how long they will be on the same route.

Different aircraft. Unlike a flock of geese, all aircraft types are different. 1.5nm may be optimal for a pair of A350s, but more testing needs to be done to find the sweet spot for all possible combinations of jets. Both aircraft would also need to have the same optimal cruise speed – otherwise all the gains would be pointless.

Then there is the raft of regulatory changes that would be required to make sure this can all happen safely.

Full Speed Ahead

Despite the obvious challenges that wake harnessing presents, if they can be overcome the potential benefits are obvious. Airbus is pressing ahead with the project and hope to make it reality in oceanic airspace by the middle of the decade.

Considering the growth potential of the industry in a post-Covid world, formation flight may be the next big step in cleaner and more efficient flying.

Who'd have ever thought we get there with the help of geese?

July 2021 North Atlantic Changes

David Mumford
31 August, 2021

Just when you thought it was safe to go back in the water…

WE'VE KNOWN PEACE IN OUR VILLAGE SINCE FEBRUARY, WHEN THE LAST NAT DOC 007 WAS UNLEASHED ON US... THAT PEACE ENDS TODAY.

Yep. Barely five months since the last version of the NAT Doc 007 was published, **we now have a new one**.

First things first – links…

To see **just the new changes**, click here.

To see **the new NAT Doc 007 in its entirety**, click here.

To see **the old NAT Doc 007**, and painstakingly cross-check all the changes compared to the new version (i.e. what we did so we could write this post), click here.

Here's the lowdown of what's changed…

The Datalink Mandate

No changes to the rules here. The old NAT Ops Bulletin 2017_001 which contained all the info about the Datalink Mandate has been discontinued, and the essential info incorporated into the NAT Doc 007.

Key points:

- Aircraft **without datalink** can request to climb/descend through datalink mandated airspace, but will only be considered on a tactical basis by ATC.

- Flights without datalink that file **STS/FFR, HOSP, HUM, MEDEVAC SAR, or STATE** in Field 18 of the FPL, may be permitted to flight plan and fly through datalink mandated airspace, but may not get their requested flight levels.

- For datalink failure **before departure**, you should re-file your FPL to stay clear of NAT DLM airspace. If it fails **after departure** or **whilst in NAT DLM airspace**, ATC may let you

continue based on "tactical considerations" (i.e. how much other traffic is around).

Which brings us neatly on to...

ATS Surveillance Airspace

This one has had us scratching our heads for a while now...

So, there is an **updated chart** showing the areas of ATS Surveillance Airspace in the NAT:

We have to say, we really don't like this chart very much. **The green blobs are misleading.** Here's what we mean...

Essentially, the NAT Doc 007 says that **these are the datalink-exempt bits within the NAT Region:**

1. Everything north of 80°North.
2. New York Oceanic East FIR.
3. Tango Routes T9 and T290.
4. ATS Surveillance Airspace, where surveillance service is provided by means of radar and/or ADS-B, coupled with VHF.

So these green blobs give a **rough idea** of where ATS surveillance service is provided by radar and/or ADS-B within VHF range. But rough ideas don't win prizes, and neither do they explicitly tell you what the rules are. **Where is this mythical ATS Surveillance airspace in reality?** Give me some hard coordinates!

Thing is, they actually do, right there in the NAT Doc 007, they just don't say it very clearly.

Here's the answer (we had to get in contact with Gander and Reykjavik ATC to confirm this): **ATS Surveillance Airspace is the area over Greenland and Iceland shown in this picture below. This is where you're allowed to fly above FL290 if you don't have datalink.**
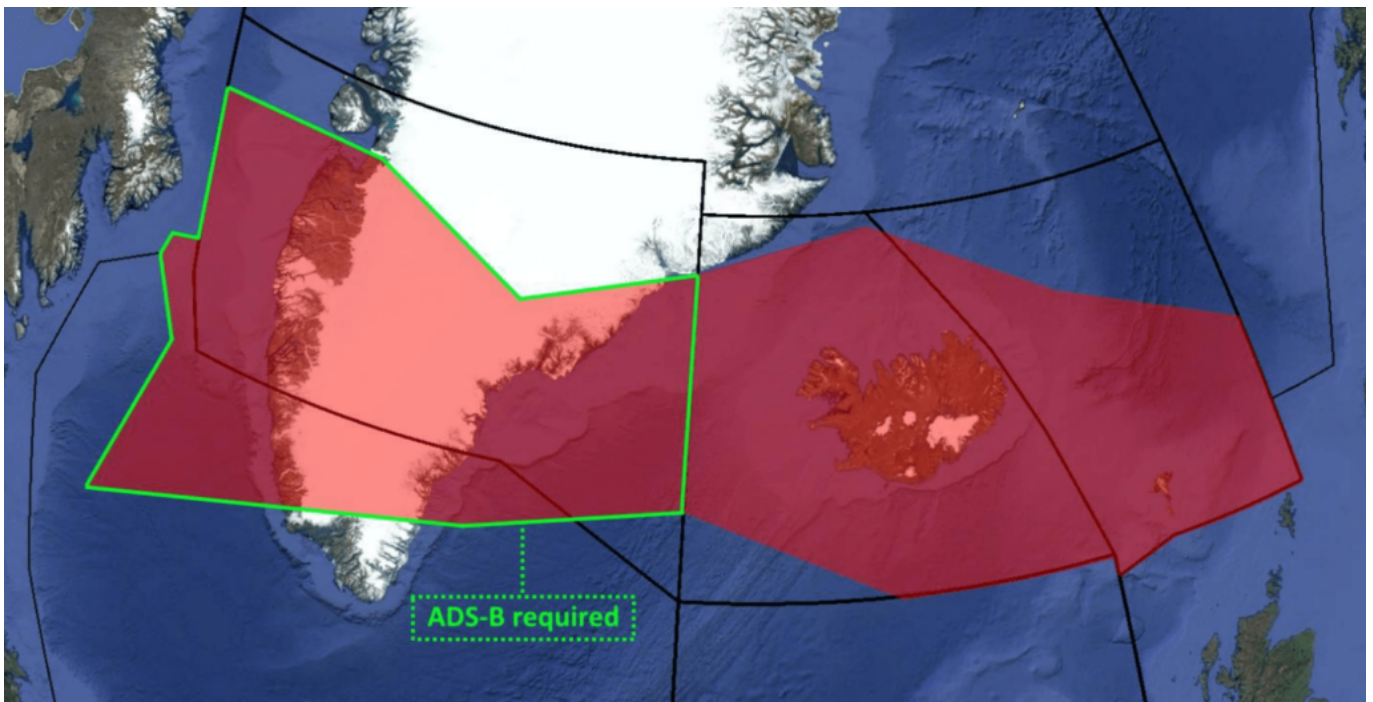

There is no special datalink exemption for the **Blue Spruce routes**. That's another key point here.

The **southerly** Blue Spruce routes are not fully contained in the exempted airspace. So if you're flying

these routes you will have to meet the NAT DLM requirements or fly below FL290 or above FL410.

The **northerly** Blue Spruce routes are different (i.e the ones going overhead BGSF/Sondrestrom airport). These do fall within the exempted area of airspace – so datalink is not mandatory if you're flying here.
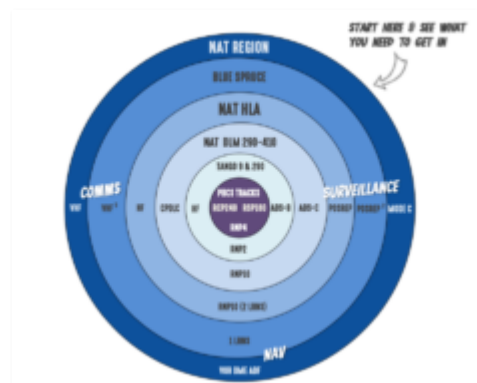
Confused? We don't blame you. Here's something that might alleviate some misery though – our **NAT Airspace Circle of Entry**. OPSGROUP members can download the full hi-res PDF version here. The Circle shows you what equipment you need – like CPDLC, ADS-C, HF – for each different type of airspace in the North Atlantic. With the datalink requirement effective Feb 2021, and the introduction of new requirements for the Tango Routes on the eastern side of the Shanwick OCA (T9 & T290), there are some important changes.

This NAT Airspace Circle of Entry will also appear on the **new NAT Plotting/Planning chart** that we are finalizing at the moment, and we'll send you that when it's ready.

"SET MAX UPLINK DELAY VALUE TO 300 SECONDS"

This thing started back in 2018 – a new procedure designed to **prevent pilots from acting on any old CPDLC messages** that might have been delayed in the network.

So, we have CPDLC where ATC can basically 'text' you some sort of message. Usually a clearance to do something. There is a risk though that the message is latent meaning 'existing but not yet developed or manifest; hidden or concealed'. **Basically lost for a longish time in the digital void** and it means there is a risk pilots might get a message to do something way after they were supposed to do it, and it is no longer valid (or safe to) anymore.

The old NAT Ops Bulletin 2018_002 about CPDLC Uplink Message Latency Monitor Function has been discontinued, and the essential info is now incorporated into the NAT Doc 007. But there is some **new info** to be aware of.

The key change here is that all the NAT ANSPs have agreed on **300 seconds** as the period of time all aircraft should set their uplink timers to (any message that takes longer than that to reach you will be deemed 'latent'). Also, they will be **sending this to all CPDLC connected aircraft immediately after they enter each control area** – so you might receive the message a bunch of times (a bit annoying) but the procedure is the same regardless of whether you've "done it already" or not.

This procedure is covered in section 8.50.20 of the new NAT Doc 007, and it **works like this:**

- When you receive the message to set your max uplink delay to 300 seconds, acknowledge it with a Roger [ACCEPT].

- If you don't have a message latency monitoring function available then you still have to acknowledge the message but say 'TIMER NOT AVAILABLE'.

- Now, if you do have the function available then change the max uplink delay to 300 seconds

and you're done.

If the system gives you an indication that a message has been delayed over 300 seconds then **don't follow what it says but get in touch with ATC (by voice)** and let them know so they can confirm whether they still want you to do carry out whatever the clearance told you to do. They will also close the message out of the system.

Bottom line: don't act on a delayed uplink message until you've checked with ATC.

Weather Deviation Procedures

No new rules here, they've just made a nice little graphic to help understand the Procedures.
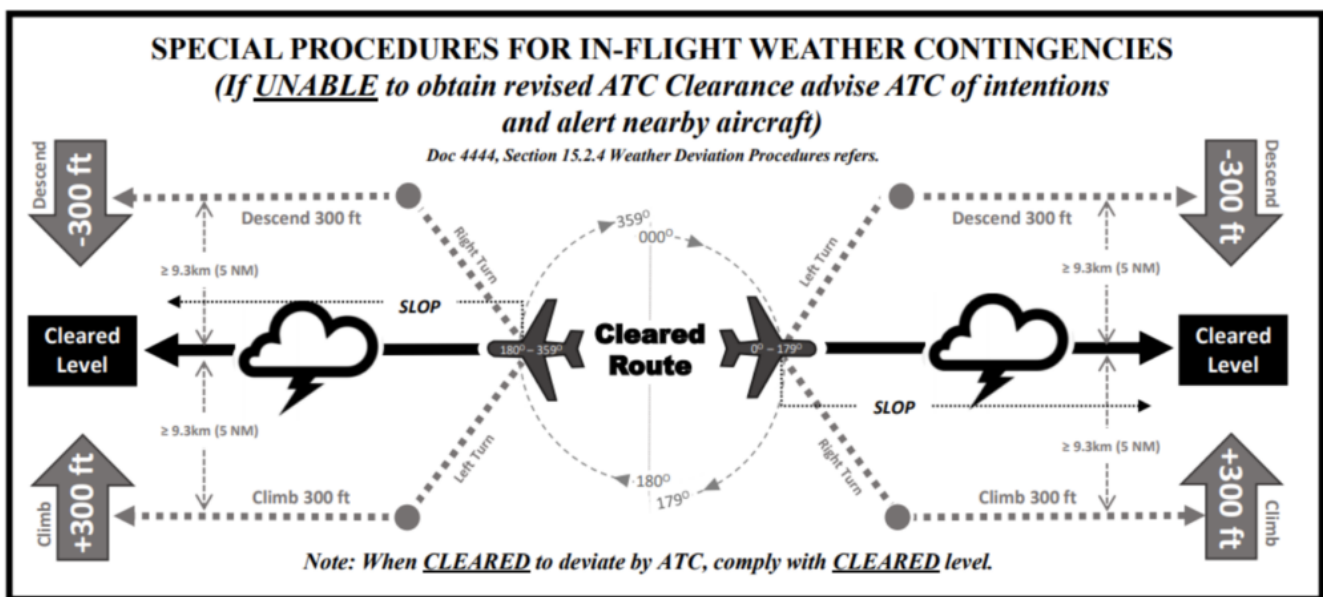

Figure 13-2. Visual aid for understanding and applying the weather contingency procedures guidance.

Funky! If you prefer a slightly simpler version, check out this one we made earlier:

Almost finished now. That's the big stuff done…

Climbs in Gander and Shanwick airspace

Gander and Shanwick have decided that they will **advise crew in their OCA when a higher flight level becomes available**. Basically, they have a function in their ATM system which lets them interrogate the flight's vertical profile to determine when a higher level is available. They will then check there is no separation issue and if not, will offer the new level.

What did it used to say?

It used to say that clearances tend to specify a single flight level, but that **sometimes there might be 'scope' for higher climb**. It had some stuff about how, if you got a re-clearance you should climb without delay. It also said that if you aren't CPDLC equipped you should tell ATC as soon as you've left your old level and when you reach the new level.

Actually it still says that in the new document but now it has a new bit about how Shanwick and Gander **will be a bit more proactive** about letting you know when the levels become available.

PBCS operations

The only changes in this section are wording changes. Separation minima is no longer **"as low as"** – it is now **"as small as"**. *"How small can you go"* doesn't have quite the same ring to it...

And that's it!! That's all the changes!! At least, we think so. If you have spotted any biggies not listed here, send us an email at: news@ops.group

And if all this is not enough for you, and you want a comprehensive timeline of all the old significant changes on the North Atlantic stretching back to the dawn of time (actually, just to 2015), then click here.

Covid Catchup: 18 months of ops changes in one game

Mark Zee
31 August, 2021

Hi members,

I don't know if you're one of the many returning to international ops this summer, but quite a few of the group are.

The last 18 months have seen quite a lot of changes for international ops. If you're just jumping back into the cockpit after a prolonged absence, it would be good to know about them – right?

We thought the best way to communicate that summary was in a game!

So we made Covid Catchup. It's easy to play: follow the boxes, read a little, and then answer some quiz questions to see how you rate.

It's in PDF form so you can download it, print it out, or play it on your iPad (and feel free to share with you friends that might not be group members).

How to get the game?

We're dropping it into OPSGROUP Slack this evening. Just go to the **#crewroom** channel and you'll see it there.

If you'd prefer to get the game by email instead, we can do that – just send a note to ops.team@ops.group.

Enjoy the game and let us know how you do! We're pretty confident that if you do well on it, you'll be up to speed on all the big changes since January 2020.

Cheers,
The O.G. Team.

How to play
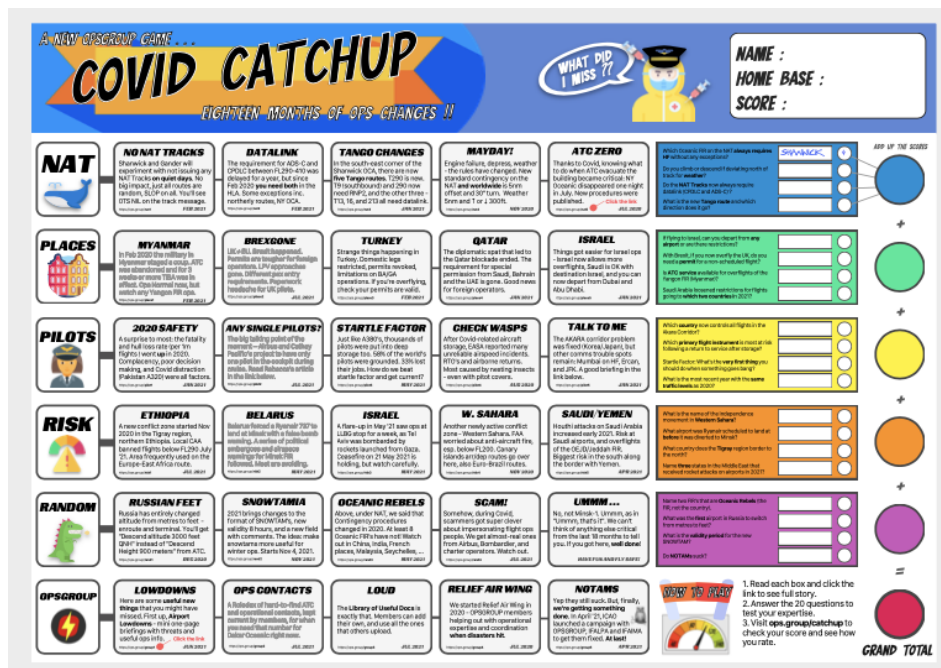
1. Get the full game in **OPSGROUP Slack**
2. Print it out, or open the PDF on your iPad

NO NAT TRACKS

Shanwick and Gander will experiment with not issuing any NAT Tracks **on quiet days.** No big impact, just all routes are random, SLOP on all. You'll see OTS NIL on the track message.

https://ops.group/nat1   FEB 2021

DATALINK

The requirement for ADS-C and CPDLC between FL290-410 was delayed for a year, but since Feb 2020 **you need both** in the HLA. Some exceptions inc. northerly routes, NY OCA.

https://ops.group/nat2   FEB 2021

TANGO CHANGES

In the south-east corner of the Shanwick OCA, there are now **five Tango routes.** T290 is new. T9 (southbound) and 290 now need RNP2, and the other three - T13, 16, and 213 all need datalink.

https://ops.group/nat3   JAN 2021

3. Each box has a little nugget of operational change. if you don't know about it, click the link for the full article. The date is when the change happened.
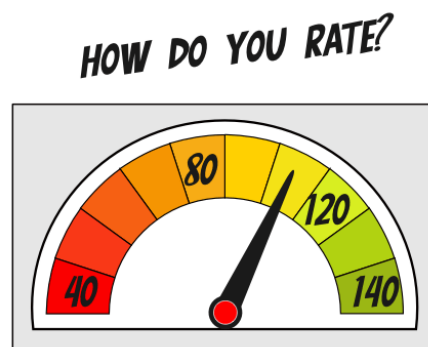

4. Answer the questions
5. Finally, check your answers and see what points you got for each correct one (all are different!)

Don't forget to share you how did! You can humble-brag your high score claims in the **#crewroom** channel

Genghis Khan's Second Rising

OPSGROUP Team
31 August, 2021

There is a new airport in Ulaanbatar so we thought we would tell you a bit about it. But then we thought *"How many people operate to Ulaanbaatar?"* so we figured we'd throw in some information about Mongolia and a history lesson on Genghis Khan too because it's all quite interesting.

So, Ulaanbaatar is in Mongolia.

Yep, it is the capital in fact. Mongolia itself is a country landlocked between China and Russia.

Mongolia has some tough terrain which means roads and railways aren't so big there, but aviation has also remained relatively underdeveloped as well. **The country only boasted 46 airports** (this was back in 2010 so there might be a couple more now). Of these, only 14 were actually paved and the original Ulaanbaatar airport was the only one with a runway over 3047m long.

So aviation in Mongolia is mainly domestic, small traffic moving necessities and cargo from remote regions. Mongolia does have its own Aviation Authority (MCAA) which also oversees the air traffic services in the country.

Do they need another airport?

ZMUB/Buyant-Ukhaa International Airport is the original one, built in 1957, and it sits just 18km away from the capital city. It sees around **18,000 traffic movements a year** and about 5,500 tonnes of cargo. That's just under 1.6 million passengers a year. Beijing sees just over 100 million for comparison.

It isn't a huge industry, Mongolia is relatively quiet in terms of tourism, and the Mongolian diasporas

around the world are fairly limited too. The majority of flights come in from Russia and China, with some South Korean, Hong Kong and Turkish operators also routing there.

Buyant-Ukhaa has one main runway **14/32 which is 10,170 feet (3,100m)** and sits at an **elevation of 4,634 fee**t. There is an ILS CAT I approach to runway 14, and no approach to runway 32 at all actually. I suppose you could do a visual.

The New Airport.

The new Ulaanbatar airport **ZMCK/New Ulaanbaatar** is officially called **Chinggis Khan International (named after Ghengis Khan*).**

Quick aside: yes, Ghengis Khan was a bit of a mean one. They reckon around 16 million men carry his DNA (that's 1 in 200!). But aside from his prodigious wife taking, he was also an amazing military strategist who helped unite much of Asia (and not by using religion). In fact, he banned torture, outlawed slavery, and established a universal law across his empire. He also developed what is considered one of the earliest universal writing systems and brought the early version of a postal system to Europe.

So Mongolia feel he is worth celebrating with his name on their new airport.

Anyway, this has been built in collaboration between the Mongolian and Japanese government, and it looks good. The airport is 50km south of the main city, so **less accessible**, but will enable a **much greater capacity.**

It provides **RFF Category 9, operates H24 and has an 11,811 ft (3600m) runway** with both ILS CAT I and RNAV capability. A second runway is expected to be added to further improve capability, particularly in poor weather.

As with Ulaanbaatar the old, it also sits at a rather **high elevation of 4,485 ft** and has some challenging terrain around it with a highest MSA of 9,900 ft.

A bit more info.

Airport Admin are available on +976 71 287 300

The airport also has its own website – https://en.ulaanbaatar-airport.mn

You need permits to operate to Mongolia. The Mongolian CAA are pretty good to deal with. Call +976 1282101 / +976 71282016 or try their email fpd@mcaa.gov.mn

It is easier to use an agent for landing permits and we recommendAlpha One Mongolia on +976 9595 0212 or via email ops@alpha-one.mn

But why fly to Mongolia?

Well, it is a pretty safe place to go and has some interesting stuff to see and do. There are a lot of Buddhist monastery ruins if you like your cultural history. There are some awesome national parks with hot springs if you like your nature.

They are also big into their bars – the drink of choice (for Genghis Khan) was fermented milk if you fancy trying it.

So, there you have it. Lots of reasons to visit Mongolia, the top one being they have **a shiny new airport for you to fly into.**

Red Sky at Night, Aviator's Fright

OPSGROUP Team
31 August, 2021

Summer in the Northern Hemisphere means a few additional challenges for aviation, particularly in the USA – Hurricanes (which we wrote about here) and **Wildfires**.

You probably read 'Hurricanes' and think *yeah, I get that, but fires?*

Wildfires do pose a fairly major risk to aviation though, so we thought we'd take a quick look at what those risks might be and what the forecast is for the 2021 Wildfire season.

Too hot to handle.

Wildfires are prevalent across the US during the hotter summer months, typically running from **May through October.**

Looking back to previous years, California saw 13 fires in 2019, but **over 30 major ones in both 2018 and 2017.** The 2018 fires led to over 1.8 million acres of land being burned. 2020 saw the first 'rain free' February (in San Francisco) since 1864 and the drier months, and warmer spring resulted in some of the worst wildfires in California's history.

The outlook for 2021 is not much better.

There have been extended dry periods with over **90% of the West now in drought conditions.** There have also been record high temperatures in the Pacific Northwest, Northern Rockies and northern Great Basin with warmer than normal conditions forecast for the summer. Add to that an increase in lightening activity and you are left with a recipe for significant wildfire risk.

In fact, the figures so far for 2021 are already **at a ten year high.**

Where can you monitor the fires?

There are multiple sites which track and monitor wildfires. This is a particularly good one and will link to specific info on the major fires.

But the risk to aviation is often not from the fires themselves. The big hazards comes from:

- **Smoke**

- **Increased traffic levels, diversions and ATC capacity**

- **Changes to localized weather conditions.**

Out of the frying pan and into the fire.

Major airports generally have good protection from wildfires, and are a distance away from areas which will readily burn. However, smaller and more remote airports may not and damage to infrastructure, or disruptions to ground transport has a knock on effect. Fires also lead to power outages which impact services at the airports.

The major hazard comes from smoke though, and this can cause **significant disruptions through reduced visibility.**

Smoke has been known to reduce visibility to around 200m. In 2005 all four major airports in Honduras closed because of limited visibility from wildfires. In 2010, the visibility at KBOI/Boise Municipal Airport reduced from **10 miles down to 1 3/4 miles in just 9 minutes** after a shift in wind direction carried smoke from nearby wildfires into the airport vicinity.

KSFO/San Francisco has also experienced delays and cancellations due to smoke from nearby Butte Country wildfires.

While Sonoma Country airports faced multiple closures in 2019.

Then there is the reduced Air Quality.

The health hazard this poses to ground workers means airports may find themselves understaffed and reduced resources lead to reduced services, which lead to more disruptions for aircraft and operations.

The smoke hazard isn't just at ground level.

In 2013, a NASA satellite captured images of smoke from Canadian and Colorado wildfires which extended over the North Atlantic, and in 2020 an aircraft diverted into CYYT/St John's after smelling fumes in the flight deck which were attributed to wildfires (again in Colorado).

What's cooking.

Disruptions at airports lead to increased traffic levels requiring ATC support for diversions.

Smaller, regional airports have less capability for dealing with the impact of nearby wildfires, and when small regional airports in areas like Oakland, San Jose, Silicon Valley which have a **high density of private jet traffic** close, this can mean a lot of diversions happening very suddenly, and **where they go can becomes an issue.**

In addition to diverting aircraft, there is the firefighting aircraft to factor in as well. They might operate low-level, but they are not small and they need to operate from somewhere and this is added pressure for ATC.

MD-10s and BAE 146s are commonly used. **The world's largest is a B747 Supertanker** which can carry up to 19,600 US gallons of fire retardant or water.

TFR zones are set up for major fire zone areas to allow for safe movement of the firefighting aircraft. You can check these here.

Where there are fires, the risks of incidents increases and **between 2000 and 2013 there were 298 wildfire firefighter fatalities** in the US. **26% of these were caused by 'aviation associated' activities** which occurred across 41 separate events involving 42 firefighting aircraft. Three of these were midair collisions.

Pyromania.

Wildfires can impact the weather environment as well.

When large enough, **Pyrocumulus cloud** (also called Flammegenitus clouds) filled with rising ash and aerosols can build. These aerosols often carry a charge that **increases the likelihood of lightning** and with that an increased chance of fires spreading rapidly.

The **"Station Fire' of 2009**, which burned more than 160,000 acres just outside of Los Angeles, also **produced a convective column estimated to reach around 23,000 ft.** Other majors fires have produced ones reaching as high as 40,000 ft.

These huge clouds are similar to cumulonimbus, only without rain. But they still contain **significant up and downdrafts** and can result in localized wind shear from gust fronts. The change in ground temperatures can result in significant thermals and large temperature gradients can result in **significant localized vertical and horizontal winds.**

There are ways to help.

Check those TFRs and check the wildfire maps. If you are operating into an area showing significant activity, consider how much busier ATC might be, and remember to check the capacity at your airport destination.

Report fires when you see them. Early notification of developing fires means the authorities can deal with them quicker, before they grow out of control.

Consider other ways to help. If you have an aircraft available, consider using it to help with evacuation flights. Airlines pulled together in 2016 following some major fires in Canada, and **helped evacuate more than 80,000 residents.** They also helped them bring their pets out safely. Be warned – you will have a tear in your eye after reading this one so open at your own risk!

The Forecast

There is a full seasonal outlook published here. But for a quicker summary of the 2021 Wildfire Forecast:

- **Alaska** has 'normal' fire potential through summer and into the fall.
- **The Northwest** is expected to experience significant and above average fire potential into September.
- **Northern California and Hawaii** also have above normal significant fire potential expected.
- **Southern California** will be at high risk through September (although this is 'normal' for the region).

- **The Northern Rockies** region is expected to be above normal through August and September.

- **The Great Basin** is expected to see increasing fire potential through August and possibly into September

- **The Southwest** is expected to remain normal.

- **The Eastern Area** is expected to be normal.

- **The Southern Area** is expected to be below normal.

Wildfires pose a significant risk to aviation operations. They also pose a huge risk to those living there, the infrastructure and the economy. The Fire Fighter pilots are an extraordinary bunch of aviators and **we wish them the best for this year.**

There is a very interesting podcast available here if anyone wants to hear more about what their 'Day at Work' involves.

All Stressed Out: Are We Ready to be Back in the Sky?

Chris Shieff
31 August, 2021
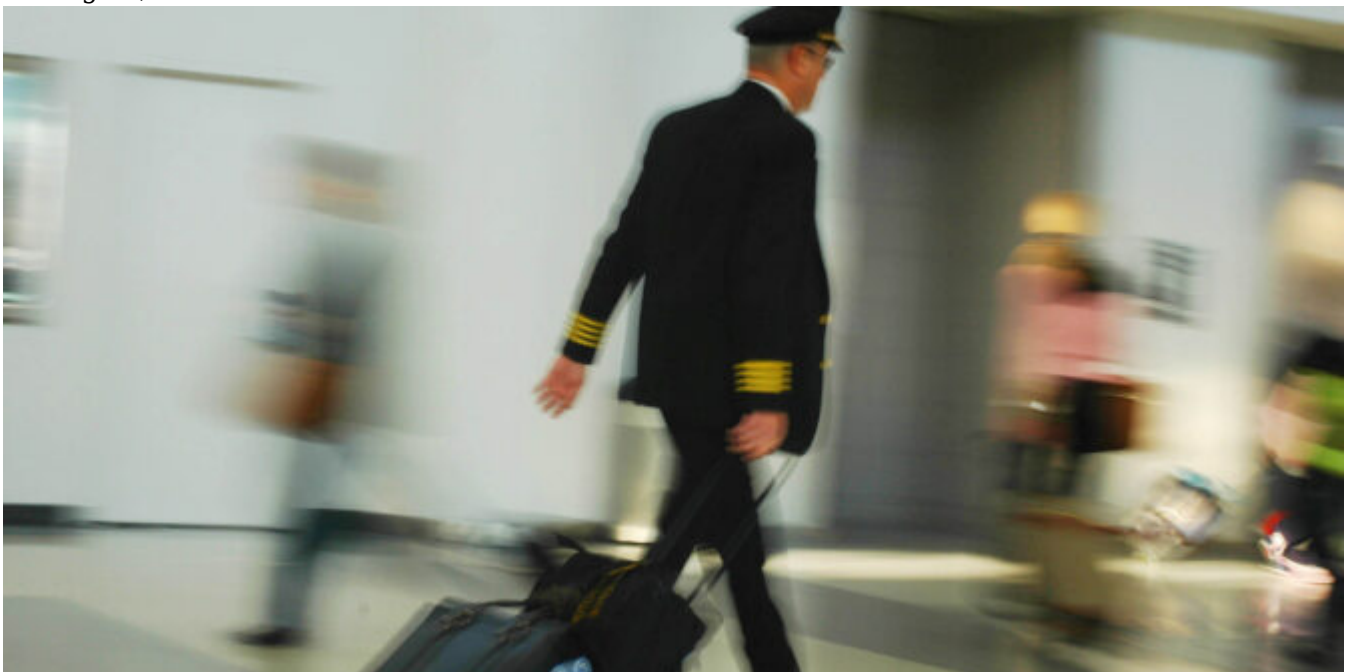
There have been some welcome headlines in the news lately.

In the US at least, people seem to be taking to the skies again. One US major almost tripled its scheduled flights in June when compared to the lowest points of the Covid pandemic.

When it comes to airplanes in storage and furloughed pilots, as we've mentioned before, **the industry**

has inertia. For a bunch of reasons, that big ol' wheel can't just start turning the minute we can get bums on seats. And the cracks are already beginning to show (no pun intended).

That same US major also had to cancel nearly one thousand flights recently due to staff shortages. Part of the problem was that a number of its pilots were still dusting off their stripes in post-furlough training.

The point is that renewed desire for travel is likely to (hopefully) one day soon outpace how quickly employers can get their pilots back in the sky. Is it possible that in this eagerness to get us flying again employers may overlook the mental health and wellbeing of their pilots?

Or in other words, even if they are ready for us to return to the flight deck, *are we?*

Aviation workers were among the hardest hit during the pandemic. And it wasn't just pilots – cabin crew, air traffic controllers, engineers and other aviation professionals were left facing **redundancy, loss of livelihood and financial stress.** This was then combined with all of the other sufferings that Covid created in our lives.

It's no surprise then, that one study found they suffered substantially more during the pandemic than the general population did. Is it then naive to think then that we're all mentally match-fit to get back in the game?

When you combine that with an **immediate need to be employed again** along with **reluctance to speak out about mental health** for fear of loss of medical is it time that employers take a moment to make sure their staff are fit to fly in other ways?

And it's not just about pilots who lost their jobs either – those who kept theirs faced **pay cuts, downgrades and constant anxiety about job security**. Then there is the constant testing, fear of catching Covid, and time away from family in isolation. In fact it's a fairly safe bet that almost all pilots have had a lot on their minds over the past eighteen months.

It's a stressful business.

And it's no secret. In fact, another study recently found that airline pilots have the **third most stressful job in the US**. *And that was before Covid...*

When it comes to what causes stress, there's actually a widely accepted measure. Just google Holmes-Rahe – according to it, here are some of the biggest things that stress us out the most (and we're talking life-changing here): **loss of employment, change in financial state and default on debt** all feature in the top twenty, and that's ignoring the more personal problems that those issues have a tendency to create. *Covid pandemic anyone?*

The point is that by the time we get back to the skies, we've already been through a number of factors that cause **chronic and prolonged stress**. Unlike short term stress, it's just not that easy to shake off. Even the toughest and most resilient among us will in some way carry that with them into the flight deck.

Here's the bottom line: **All of the hazards that were there before Covid will still be there.** But our resilience to deal with them will be reduced. **And that means risk.**

The problem of stress in the cockpit.

Although a little stress can be beneficial by making us more alert and task-orientated, the human body isn't designed to cope with chronic stress. For pilots it is well known to negatively affect our cockpit performance and increase our proneness to **poor decision making, bad judgement, loss of situational awareness and confusion** – all of which can be dangerous up there.

At its most basic level it can make us us feel irritable, fatigued and disengaged which can lead to a **break down in monitoring or communication** with other crew members.

Although the effects of stress may not be obvious when things are ops normal, they can greatly reduce our capacity to deal with whatever might be thrown at us **when something goes wrong**. This accident serves as a good example.

If not dealt with, chronic stress can also lead to more serious mental health problems such as anxiety and depression.

So, what needs to be done?

Because of the ongoing pandemic, pilot mental health and wellbeing is arguably more of an issue now than ever before. We need to prioritise wellbeing as part of our recovery plan and it really is a shared responsibility.

Employers need to do provide more support to their staff. **Mental health awareness training, access to counselling and peer support programs** should become common place. The positive impact of other lifestyle changes on the job such as **flexible rostering, better crew pairing options and more time off** shouldn't be overlooked either.

And most importantly the inconvenience and cost of these things should **not be prioritised over safety**.

From an industry perspective we need to continue to **de-stigmatise mental health problems and encourage openness** so that pilots with wellbeing issues have the confidence to step forward and acknowledge their problems without fear of loss of job or medical. Regulations need to be improved to allow this.

Pilots themselves have a role to play too, particularly not to underestimate how much underlying stress can affect your performance at the controls and how you interact with your other crew. It's important to **self-diagnose and recognise the signs**. There are a bunch of steps you can take both physically and mentally that can help you overcome it.

Getting back to a 'new' normal.

As people take to the skies again and borders begin to reopen it's important to remember that **pilot mental health can have a big effect on safety**. And considering what we've all been through it's worth taking a moment to make sure the industry is doing enough to address it.

In that way we have a chance to use Covid as a catalyst for positive change even when the pandemic is one day far behind us.

More places to look.

ICAO Mental Health Working Group . They've been active throughout the pandemic and are doing a lot of work on the psychological effects that Covid is having on pilots.

Cleared for Takeoff. A handy and easy to read guide on how you can prepare mentally and physically for return to flying.

Article photo courtesy @vlkvojtech

Flying outside the Procedures

OPSGROUP Team
31 August, 2021

Aviation is full of procedures. We fly by them, sometimes we kind of live by them. But other times there are situations where we need to disregard them. So when is it ok to throw the rule book out the window?

In an airplane, never.

In the literal sense anyway, given the risk of opening a window mid-flight and getting sucked out. But what about in the less literal sense?

Procedures are not there to stop us just doing whatever we want. They are there to keep us safe, to make sure everyone is operating to the same standards and to provide pilots with a guideline of what they should do in ***most situations.**

Why the asterix?

I will come back to that. But for now, that reasoning makes sense. If every airplane did what it wanted, flew how and where it wanted, the sky would be a messy mass of chaos. So, we have procedures and we have them so we know what to do, when to do it and how to do it.

More importantly, everyone else knows as well. Which brings us back to the "most situations" comment.

We cannot expect there to be a procedure in place for every possible event. They are there to offer guidelines and standards, but they are not designed to cover everything.

And they are definitely not supposed to **remove the need to think.**

So what should we think?

Well, thinking about situations where we might be without a procedure, or where there is a procedure but it no longer leads to a safe outcome is a good place to start.

Let's take a look at **ICAO Doc 007** – the "bible" for the North Atlantic. It is quite clear on a lot of things – for example, what the **contingency procedures** are if you experience some sort of emergency while flying in the NAT.

We are talking some busy airspace out there, with a lot of aircraft flying on specific tracks, and so the last thing you want is aircraft barreling across them setting off TCAS warnings as they zoom off on a diversion.

So NAT Doc 007 lays out some procedures to follow. Things like turning **30 degrees off track and offsetting 5nm**. And one that says –

"W*hen below FL290, establish and maintain 500' vertical offset when able and proceed as required".*

Ok, great, it is pretty clear. Get yourself down to below FL290, establish on your offset, and now go where you need to go.

OCEANIC CONTINGENCIES

WHAT TO DO WHEN YOU CAN'T COMPLY WITH THE ATC CLEARANCE (ROUTE, SPEED, FLIGHT LEVEL) DUE TO:

• EMERGENCY MEDICAL DIVERT • ENGINE FAILURE •
• DEPRESSURIZATION • ICING • TURBULENCE •

1 TRY TO GET REVISED ATC CLEARANCE!!!

2 IF NO ATC CLEARANCE TURN AT LEAST 30°

Maintain FL / Minimise descent
ACAS and visual watch
Lights on!
Talk! 121.5, 123.45, 7700, SATCOM

5NM

SLOP up to 2NM

3 ESTABLISH 5NM OFFSET TRACK

OPTION 1:
Stay at current flight level.
Vertical offset by 500ft,
or 1000ft if above FL410.

OPTION 2:
Descend to below FL290.

6 PROCEED UNTIL NEW ATC CLEARANCE RECEIVED

5 FLY AT 500FT VERTICAL OFFSET FROM NORMAL LEVELS

4 DESCEND TO BELOW FL290

WEATHER DEVIATION

When returning to track, be at the assigned flight level when 5NM away.

If less than 5NM, remain at the flight level assigned by ATC

If 5NM or more... SAND!
South of track = Ascend
North of track = Descend
Up/Down by 300ft

5NM

30WEST IP

OPS GROUP

But...

What if our emergency is a decompression, and we are right out in the middle of the NAT where routing at 10,000ft the whole way to an airport might turn into a fuel problem?

Do we still need to get to FL95 before starting a diversion?

There might not be a black and white, right or wrong answer, **but this is the point** – there are situations where there isn't necessarily a procedure telling us what to do, or when to follow another procedure.

So this is something we should probably be thinking about a bit more. The "What If?" things that could happen.

So, what is the rule for breaking procedures?

Is there sort of **a checklist for when we can, can't, ought to or must?** Why isn't there a rule for every time you are allowed to break a rule?

Well, the reason is no-one can think through every situation, and more importantly they shouldn't try to!

The day pilots can only do something if a procedure tells them to is the day you might as well replace them with a computer. We need to retain the skill of weighing up risk and reward, consequence of actions, because there are so many situations out there which are **not going to be black and white.**

NAT Doc 007 document actually states quite clearly several times –

"The pilot shall take action as necessary to ensure the safety of the aircraft..."

And this goes for any procedure, any rule, anytime you are flying.

Just because the book says "No, don't do that!" never means you cannot do it if it is what you need to do to maintain safety.

The tragic Swissair Flight 111 accident is often raised in CRM discussions as an example of when following procedures to the book **might not lead to a safe outcome**.

But…

Not following procedures because you think there is a quicker, better, easier way to do something is probably not the best idea either.

A Qantas pilot experienced "incapacitating" symptoms after a technical malfunction where they decided to cary out their own troubleshooting, rather than following the checklist.

So, having a good reason to not follow a procedure is important because you are going to have to justify why you broke the rule. **If you need to break it for safety then break it,** but the key seems to be having a **valid, justifiable and safety related reason.**

That is airmanship, and that is why the Commander has final authority. It is also a cornerstone of our pilot licence that we "agree" to accept the ultimate responsibility for the safety of the flight.

Why are we even having this discussion?

Possibly because *we sometimes forget why we have procedures in the first place*.

Unfortunately none of us are immune to this. I can remember several times in my career when **procedure-following took over from common sense.** The time when we shut down an engine with 10 meters of taxi left, ran out of steam, and had to be towed the last 9… *But hey, we still ticked the one engine out taxi box.*

So, all of us stepping back and considering why the procedures are there, and then what we might do when we find ourselves potentially having to operate outside of them, is important.

Which brings us back to the debate about FL95 over the NAT.

Different folk might answer this question differently. It is going to depend on the day, on you and on the situation, and there probably isn't a definitive answer to be given.

What is clear is that at some point in our flying career we will all probably find ourselves in a situation where there is no procedure, no clear cut answer, no simple solution, and this is where our **experience, airmanship and judgement** will really be put to the test.

When we end up in that situation we should't be asking *"What is the risk of me getting into trouble if I do?"* but rather *"What is the risk to my safety if I don't?"* because all the procedures we fall back on were not put there to be blindly followed, and were not written into stone to keep you out of trouble – they are there to be thoughtfully followed when they keep *your aircraft out of trouble.*