Safety on the NAT: B+ with room for improvement

OPSGROUP Team
29 June, 2021

The eighth Annual Safety Report for the North Atlantic Region is out, and it looks good. **A solid B+ for pilots and ATC alike.**

But there is still room for performance improvement, so here are the highlights from the report to focus on.

Did anyone fly in 2020?

The number of flight hours in the NAT HLA through 2020 was **892,137** which was unsurprisingly a decrease on the 2019 hours (2,063,908 in case you're wondering).

The **peak week** was July 15-21 when it saw 5,621 flights crossing, compared to 13,733 for the peak week of 2019.

If you want to check and compare all the stats to 2019 then here is our post on that.

What have they been monitoring?

Safety Performance in the NAT HLA is monitored and measured in **12 areas**. The targets for 6 of these were achieved in 2019, while **2020 achieved an impressive 8.**

The biggest improvements seem to be:

- Less Large Height Deviations where Datalink was **not** in use
- A reduction in the amount of time aircraft **with** datalink spent at the wrong flight level
- A reduction in the number of GNE events involving aircraft **with** datalink

How likely are you to fly into someone else?

Much of the safety focus in the NAT really boils down to this – **it is an area of reduced separation and high density traffic**. So, they also worked out **the risk of collision** and in 2020 it reduced by **74%**, which is probably down to less aircraft but also to less mess-ups.

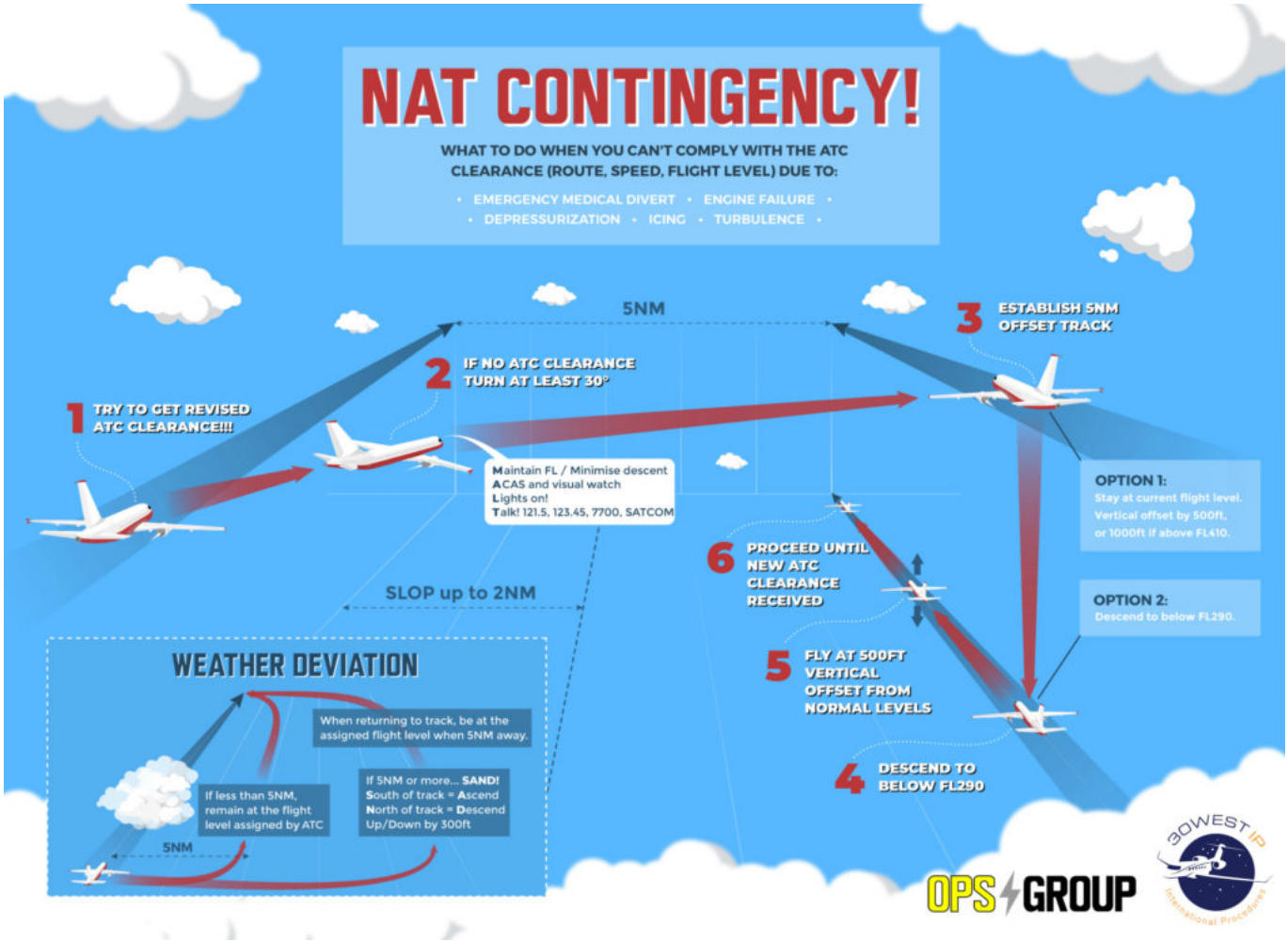
SLOP is one of the main factors in reducing this number. And it doesn't just reduce the risk of collision, it reduces your risk of running into wake turbulence as well. So keep up that slopping, up to 2nm right (and 0.1nm increments).

Who's to blame for the times it did go wrong?

Ok, ok, the purpose of the report is not to point fingers, but to understand where improvements can be made.

The Top 10 factors in errors haven't really changed – ATC coordination errors are top, closely followed by "crew other" (which pretty much means crew not doing what they're told, messing up etc) and then interestingly **application of contingency** (other than weather).

So here is a quick recap on those Contingency Procedures to follow



Follow it!

Some facts and figures

Since 2019, **70%** of core NAT traffic has been using **ADS-B**.

There have been **no accidents** in the NAT since at least 2017. 2020 also saw **no losses of lateral separation** for the first time since 2017.

They did see 47 LHDs, 57 Lateral Deviations (15 were GNEs, the other 13 were caught and corrected by ATC), 26 coordination events, 1 longitudinal loss of separation and 30 events they prevented where someone was basically just flying the wrong flight profile.

18% of events were down to **ATC coordination** between different ATC sectors.

18% also came down to **fight plan versus clearance** issues.

11% were **weather** related.

Issues with **dispatch** contributed another 8% and everything else was down to, well, lots of other things.

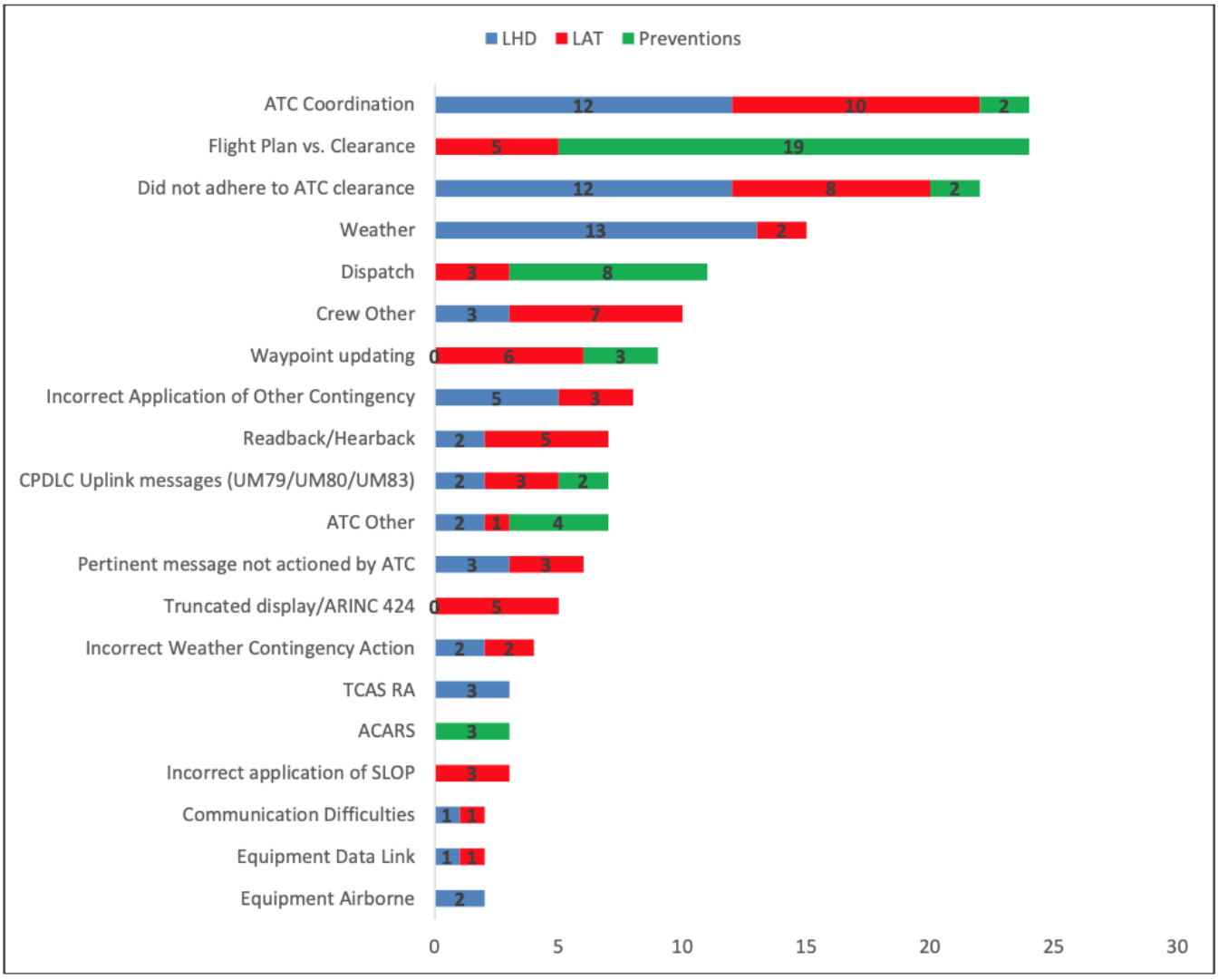


Figure 2: Contributing issues to events in the NAT HLA in 2020 (subject to change – see Note 1)

How can we improve?

Follow the **Golden Rules** of operating in the NAT HLA:

- **Have the Right Equipment:** If you ain't sure then check out our Circle of Entry.
- **Have a Clearance:** If you can't get it on CPDLC then have those HF or VHF frequencies ready for a voice clearance, and make sure you read it back and confirm it correctly.
- **Check your Route:** This means flying what you've actually been told to fly which means checking what is in the airplane box matches what is in the clearance. It probably should say 'flight profile' because it means route, altitude and speed.
- **Know your Contingencies:** We added the picture above to help. Read more about this here.

And don't forget to **SLOP.**

Keep up to date on NAT info

- Here is your link to the full report for 2020.
- ICAO Doc 007 is your go to guide.
- We also try to keep you up to date with changes on the NAT. See our latest update here from Feb 2021.

Photo @Algkalv from Wikimedia Commons

Please be Wary of Malicious Phish

OPSGROUP Team
29 June, 2021

There is a new threat to flight ops security, and it might not come from where you think it would.

The Hack Attack

We talked about the threats of airplanes and control towers being hacked before. But now we want to talk about cybersecurity.

Anyone who works for a big company has probably had to do their cybersecurity training at some point. If you haven't, here is an example. Answers at the bottom of the page.

The trouble is, the scams we have been seeing are getting more and more, well, *smart.*

The Nigerian Prince

The good old Nigerian Prince who wants to give you One Hundred Million Gazillion Dollars scam. **As old as the internet itself.**

How does it work? (And yes, these do still work. Apparently they **rake in over $700,000 a year** from unwitting victims).

In a Kola nutshell, you receive an email from someone overseas (and there are different iterations of this now but it is always along the same lines) – a royal prince is **wanting to give you money,** or a disgustingly rich recluse of a distant uncle has passed away and mentioned you in their will.

Whichever they use, the trick is the same – they supposedly have money for you, and all you need to do is **provide your bank account details** and they will transfer it all over, for a small fee.

Only here is the catch (sorry to break it to you) – There is no Prince, there is no money, and **now they have your bank details** and maybe even a payment you have sent them.

This doesn't affect Flight Ops though?

No, it doesn't. Not really. Unless you count the **Nigerian Astronaut stuck in space** one.

There is also the recent one which the NBAA warned about involving **Imposter CBP Agents** who call private residences and businesses and attempt to gain banking information.

And then there are the **fake websites** offering free tickets or special deals, and steal "passenger" information which they freely provide. [https://deltaairlines-flights.com] is not a legit website. Don't buy tickets from there.

The ones that we want to bring up though are **Phishing scams and Malware emails**.

So, what do you need to be on the look out for, and how do these even **impact Flight Ops and Security?**

Be Wary of Malicious Phish

This is when an email is sent which looks legit. You open it, maybe it tells you there is an iTunes bill you need to pay. You wonder what you bought on iTunes, you can't remember, so **you open the attachment and BAM!**

Malware is sophisticated nowadays. It doesn't always just shut your computer down, or flash up a retro laughing skull icon. It might destroy data, it might steal data. It might install ransomware on your systems.

Hackers recently took hold of an oil pipeline in the USA.

The Colonial Pipeline supplies half of the east coast's fuel supply. Hackers managed to shut it off, probably

via an email. The impact was **no fuel supply from Houston to New Jersey** and this affected all the airports along that route. It also led to **increased fuel prices and ongoing impacts** even after the fuel supply was re-established.

Phishing is a similar scam.

An email, or a phone call from **a "trusted source"** appears in your inbox and somehow cons you into into giving login data, passwords, user info. Once access has been "granted" the hacker can do a lot of damage. From **stealing confidential information, to taking control of systems.**

I.T. Operator SITA which serves major Star Alliance airlines such as Lufthansa and Singapore suffered a **data breach in Q1 2021** with hackers gaining access to ticketing and baggage control systems which led to the information of thousands of passengers being stolen.

In 2020, major European regional airline EasyJet admitted an attack may have **compromised data of around 9 million passengers.** Several thousands had their credit and debit card details accessed.

What are we seeing at OPSGROUP?

We are seeing scammers getting more cunning, scams which are more targeted and ones which are **worryingly specific.**

First up, the **Nav Fees scam.** This one has been around for a while – we reported on it here. They send you an email, pretending to be from Eurocontrol or IATA or some government agency, with a new bank account to send your Nav Fees to. Pretty standard stuff. Fortunately, most of these emails are poorly written, and easy enough to identify as bogus – but that's only if you are on your guard.

Then there's the **charter quote email scam**. These have believable company names. Some of the names are even "real" people, so the email looks legitimate, and **all it does is ask for a quote.** So you open the email attachment and now they have you.

Thankfully, **OPSGROUP is not in the charter quote business** (and our email system is fairly good at spotting these now), but for some of you reading this, who do see real emails for quotes, this might pose a problem.

The more concerning ones come from very specific, and **very genuine aviation linked companies** such as 'Airbus'.

These are worrying because they are **so specific, so targeted,** that it is often hard to spot the real from the scam.

Microsoft put a warning out earlier in 2021 saying they are tracking this 'dynamic' campaign which is targeting the aerospace and travel sectors with **spear-phishing emails**. When the PDF in the email is opened it delivers RevengeRAT or AsyncRAT to your computer.

RATs it seems are the new worms. A Trojan is installed and user credentials, webcam info, statistics about the system are pilfered and pillaged.

Your OPSGROUP Cybersecurity Assessment

1. If you receive an email from an unknown sender, or for something you haven't signed up to – should you open the attachment?
    - Yes
    - No

2. You receive an email or a call asking for details that involve passport info, bank details or anything else sensitive – should you share it?
    - Yes
    - No
3. There is a Nigerian Prince/Princess who really wants to marry you and send you several million dollars – should you trust them?
    - Yes
    - No

If you answered “Yes” to any of these questions, go back to the start of this article and read it again.

What’s the deal with China crew visas?

OPSGROUP Team
29 June, 2021

The process for obtaining a crew visa for China can be very confusing. We definitely recommend using an agent to assist with this, and with the permits for your aircraft. G3Visas are a good one – they really know their stuff. But if you are determined to go it alone then here is what we know.

What’s the deal?

Crew need a C-type visa. This are usually valid for 7 days.

Simple so far.

However, crew can actually enter China on different visas at certain locations, if pre-arranged. And if you

rock up with the wrong sort, you are probably going to get a fine or be asked to go home again.

In fact, for **crew entering as a passenger on a commercial flight** (heading in to ferry out an aircraft for example) **you cannot enter on the Crew C-Type visa.** This means you are going to need a **business or a tourist via.**

In 2013, they added in a **new immigration policy for transit passengers.** If you are from one of the 45 countries on their approved list, and you transit in via **ZSPD/Shanghai Pudong, ZSSS/Hongqiao or ZBBB/Beijing** to a third country, then there is a **72 hours without a visa regulation.** The US is included on this list and we are mentioning it because of the above point about crew entering (as a tourist) to ferry an aircraft out.

You can also obtain **multi-entry visas** depending on your operations, but you are going to need a schedule showing the multi-operation and some sort of official company letterhead proof of why you want multiple entries. We definitely recommend having an agent assist with this because the paperwork can be daunting.

What are the Visa types (that you need to know about)?

- **C –** The standard crew visa
- **L –** Tourist visa generally valid for single, double or multiple entry. US and Canadian citizens may be eligible for a 10 year L-Visa
- **M –** Business visa useful for folk visiting regularly or work reasons (and who aren't employed by a Chinese company)
- **Z –** Work visa (if employed by a Chinese company)
- **G –** Transit visa. It is basically the same price as an L visa so probably better to just go for that one if you need one

The Bilateral Agreement

China and the US have a bilateral visa agreement and it can be a little tenuous.

Back in December 2020, the US put in new rules to try and "curtail" travel by member of the Chinese Communist Party and their immediate family members. It limited them to one travel visa a month. Prior to this a 10 year visa could be obtained.

All very political.

This didn't impact crew visas. However, we have heard recently that:

"Due to unilateral change of the visa application arrangements by the US side, a large number of crew visa applicants from Chinese airlines are unable to obtain US visas through the previous channel. In response, we are compelled to take necessary reciprocal countermeasures for crew visa applications from the US side."

We have not been able to verify this, but it comes from G3 Visas who are a bit of an authority on Chinese visa getting. So get in touch with the agent you are using to help you organize your visas, and leave a little more time in case of delays. So far, there has been no further update on what the deal is at the moment.

Are there other options?

Some operators who are ferrying aircraft out report that they have flown in via Seoul or somewhere else close and not part of China (**so not Taiwan or Hong Kong**), and then simply hopped from one aircraft to the other and flown it out again. This circumvents the requirement for the visa since you are not really entering the country…

We are not recommending or advising against it. We will say that a fair few operators have reportedly done this, and it has worked fine. But you might want to think about **what will happen if you have to divert** and go into a Chinese airport because then you are going to visa-less and this could get messy.

Customs and Immigration

Don't have any mistakes on your Gen Dec. It will cause BIG delays.

Also, be aware that certain nationalities are going to be asked a few more questions. This includes crew.

Turkey

For reasons unknown, if you have been to Turkey and have a visa or entry stamp in your passport, then you are going to have to explain yourself. Actually, it might have something to do with the Turkic Uyghurs in Xinjiang / the Uyghurs diaspora living in Turkey…

Uyghurs

If a crew member is from the Xinjiang region, expect them to be taken aside for additional checks. Nothing to be alarmed about, but good to know in advance that it will happen.

Chinese Citizens working outside of China

They can be a little "funny" with Chinese citizens who work for a foreign airline. Again, it tends to lead to additional immigration "chats" so be prepared for a brief delay.

What about permits?

Getting a permit is **notoriously intimidating.** They require use of AFTN/SITA, have specific routings and are only valid for exact timings given. If you want to land then you need a sponsor letter written in Mandarin by the receiving party…

Basically, use an agent. The authorities are not always the most patient or helpful. You'll be paying around $75 for a one way overfly, $100 for a round trip landing and some extra depending on handling.

Mainland Ground Express are a helpful bunch and you can get hold of them on **+86 20 8111 7474** or via email at operations@groundexpress.aero

Useful links for more info

- The US government travel resources site has some handy info on general visa and travel stuff.
- G3visa is a really handy agent for helping obtain any type of visa.
- Universal Weather maintain some pretty up-to-date info on the situation as well.
- **The OPSGROUP member Forum and Slack channels**. Yeah, we're going to throw this one out to our members and say ask on there because the rules and procedures seem to change a lot and often the **best info comes from someone who has just been there.**

And finally...

If you have been to China recently, experienced issues (or good things) with the visa or permit getting process, or have any tips for other operators then please let us know! Your up to date experience would be very handy to pass on to everyone!

Any Single Pilots Out There?

OPSGROUP Team
29 June, 2021

The big talking point of the moment – Airbus and Cathay Pacific's project to have **only one pilot in the cockpit during cruise.**

So let's take a look at what this might mean for **safety**, **operations** and **pilots** worldwide.

The headlines are misleading

Cathay and Airbus have **not** designed a new A350 which no longer needs pilots operating it. There is **no** mega computer AI robot involved which is stealing our job.

The plan is to simply allow **one pilot to go and rest during "quiet cruise" phases**, while another pilot remains in the cockpit vigilantly monitoring (and probably with toothpicks propping their eyes open). This will allow them to potentially reduce the number of crew required on long haul flights, and while it means a change to procedures it is not really, as many are reporting, a leap towards pilotless flight decks.

Maybe just a small step

So, what are the considerations here that people are talking about?

GermanWings

The GermanWings accident resulted in a rule that there must be two persons in the cockpit at anytime. So if a pilot needed a bathroom break, a cabin crew member was required to come in. This was fairly contentious at the time because, as many pointed out, **what is a cabin crew member going to do** if a "situation" arises?

This **rule was eventually revoked**, in part because EASA and other authorities brought in new regulations relating to pilot psychometric testing. However, with only one pilot in the flight deck, this does raise various safety concerns – from events similar to the GermanWings accident, to the question of pilot incapacitation or even, what do they do if they need the loo?

What about the AF447 accident?

AF447 was, in part, **attributed to the experience levels of the two crew in the flight deck** – both First Officers while the Captain was out sleeping.

Using cruise relief pilots is not a new thing though, and in order to operate with a single pilot, that pilot will presumably need to meet a minimum experience level. Additionally, the Captain will maintain the decision as to when they leave the flight deck in their First Officer's hands.

The lonesome pilot can also recall their colleague to the flight deck should a situation require it. So the question really comes down to whether a situation is likely to arise where, by **having only a single pilot the result is more critical or catastrophic** than if two had been present and therein lies the problem – because years of aviation safety studies have shown time again that there is a reason we operate with two crew.

Safety in numbers

Modern aircraft, and the A350 in particular, have **many levels of safety and redundancy** to support the crew. They can automatically fly TCAS maneuvers. They can carry out an emergency descent at the push of a button. In addition, Airbus are working to demonstrate that their aircraft and systems are robust enough to basically not really fail. They are also designing them to be able to **autonomously handle any situation without pilot input for 15 minutes.**

This will be a big deal. It will mean, should something fail, *and* the single pilot be incapacitated, that there is time for the second pilot to wake up and make it to the flight deck to solve the situation. However, **recent aviation accidents involving malfunctioning systems** (designed to minimize pilot workload), and ongoing concerns about automation complacency highlight the potential downside of such advancements.

Can ETOPS can teach us something?

The A350 was certified for 370 minutes ETOPS. That's a long time. It is over 6 hours. 6 hours on one engine potentially. So what leads to this?

ETOPS is given to the operator, not the aircraft, and it is based on the operator's ability to demonstrate necessary airworthiness, maintenance and ops requirements. **It is really a statistical thing.** If an operator hasn't had an engine issue in a really long time then they are probably going to be able to get a better ETOPS approval.

So what does this have to do with only one pilot in the flight deck?

Well, it boils down to the same thing – statistics and procedures:

- How often does something go wrong in the cruise (which requires two pilots to handle it)?
- What procedures will be in place for ensuring safety and redundancy levels are maintained?

The answer to Question 1 might be *"hardly ever"*, but aviation safety improvements are built on the fairly simply idea that **if there is a risk, find a way to mitigate it.**

Even if that risk is minute, if it can be removed it should be. This is why astronauts have their appendix out before heading into space. This is why we have redundant systems onboard, or each pilot eats a different meal. Statistics might suggest an event occurring which a single pilot cannot deal with and which then results in a fatal accident or hull loss is tinier than a hair on a fleas back…

But if a risk exists that can be mitigates simply by retaining two pilots in the cockpit, then two pilots should remain.

A Disco onboard

They gave the A380 a bar and showers, now the plan is to have Discos…

DISCO actually stands for Disruptive Cockpit (I am not sure that sounds any better). This is the Airbus project looking at enhanced cockpit design to enable single-pilot operations on new aircraft.

The DISCO concept is looking to place core technologies into the flight deck in a 'multi modal' way. Things like pilot monitoring systems which track eye movement, voice recognition for commands, improved ground collision avoidance systems, new navigation sensors.

And of course pilot health monitoring systems.

An integral safety aspect of this concept lies in the monitoring of the sole pilot, and the availability of a system to detect if they become incapacitated, and to alert the remaining crew member.

It is only happening in 2025

The plan is to implement this in 2025. That is **3 and a bit years of procedure writing, regulation making, testing and trialling** before it is put into action, and there are a fair few obstacles that stand between now and that day :

- Regulators will be looking at their procedures with a fine tooth comb
- The pilot will probably need monitoring, particularly to ensure incapacitation does not occur (or if it does, the other pilot can quick-foot it back)
- There will need to be pilot training in place
- Airbus need to hit that 15 minutes of safe autonomy.
    - And these systems will also need to deal with situations where 'Black and White' failures do not occur. When you consider the multiple, varied and often "illogical" failures which can arise from a lightning strike, a bomb onboard, or multiple computer failures this does not look as simple as Airbus might say
- The approvals for this do not just sit with the Hong Kong authorities. Any state that the airline might overfly with only one pilot in the driving seat is going to have to be convinced as well
- Passengers will need convincing…

And they still need to answer the question of the toilet. We all want a little more information on how that ‘specially designed unisex toilet’ to be used ‘in coordination with ATC’ will work.

If this happens, they won’t need pilots anymore

This is a contentious one to raise right now. Say ‘single pilot’ or ‘autonomous systems’ and a lot of pilots break out in a sweat, seeing themselves replaced by AI computers. But aviation has always been very innovative and those in it have always had to adapt to new technologies. Take a glance back to the 1980s and flight engineers were still a relatively common site in flight.

Ignoring the rather decimating impact of Covid though, **aviation was growing, and it was growing fast.**

Chances are it will again.

There are around 200,000 active pilots and forecasts suggested upwards of 500,000 would have to be trained over the next two decades to meet forecast growth demands. Even if every (long haul) flight deck sees the number of crew in it halved, it is still probably safe to say none of the current or new generation of pilots will be out of work anytime soon.

But we still are not convinced

There are unresolved questions here. **The main one being “Why?”**

You see, there is already this rather marvelous thing in an airplane – it can watch the pilot, it can monitor aircraft systems, and it can take over no matter what the failure or the complexity of that failure might be…

It is called “the other pilot”.

There is a good reason why aircraft are multi-crew machines. So why are Airbus and Cathay Pacific investing millions into developing systems which can do this?

It isn’t for safety…

This is being driven, not by manufacturers looking to increase safety, but by **an operator looking to reduce costs.** And for many, that appears an unwise and arguably unethical reason. Even if the statistical impact on safety is a 0.0001% decrease, that is still an unacceptable decrease when it is made for business reasons. There are also a great many places within an airline or operation where costs can be cut, and when cuts are made these should never occur at the price of safety, even if that price does seem negligible.

The main photo is of a pair of VietJet co-pilots who got married – because we think that’s nice, but also because we liked the play on ‘single pilot’ in the flight deck idea. Congrats to them both for their lovely day!

Intercepted: What You Need To Know

Chris Shieff
29 June, 2021

There are several reports that amidst the events surrounding the forced diversion of Ryanair Flight 4978 to Belarus last month, at least one MiG-29 was scrambled to intercept and escort the 737 to Minsk airport.

While military interceptions of civilian airliners are very rare, they *can* happen and for serious reasons. Which poses an important question – **if a jet were to appear off your wing tip tomorrow, would you know what to do?**

Each interception is **potentially hazardous** which is why ICAO publish rules and procedures (Annex 2) that both military and civilian aircraft *should* be following to minimise the risk. Each state is responsible for its own airspace, but where possible they should be following ICAO's guidelines. For crew this includes knowing the actions to be taken and the visual signals to be used.

Here's a break-down of what you need to know.

Why do they happen?

ICAO are very specific – an interception should be avoided and **only used as a last resort**. ATC must try and establish communications with you first. The primary reason is that they **haven't been able to talk to you.**

There are lots of simple reasons why this can happen – usually a wrong frequency or perhaps they've forgotten to hand you over. In this instance they will try and contact you on 121.5 (which is one reason we monitor Guard), or via another aircraft. If that fails, ATC have a problem. You're flying through their airspace and you're not talking. It is not clear what is happening on board.

Incapacitation is a biggie, the crew may have fallen asleep or perhaps something more serious has happened as Helios 522 tragically reminds us. Or the aircraft may have been hijacked. Either way, they need to get someone up there to check things out.

What will they want us to do?

One of three things, depending on what the problem is. They'll either want to **identify** you, **communicate** with you or **re-direct** you. The latter may be because you have strayed off-course or busted some kind of restricted airspace. Far less often it is because authorities may believe you are involved with illegal activity (such as drug smuggling) or or you are for some reason hazardous to other aircraft.

The Interception Manoeuvre.

ICAO have a standard procedure for military aircraft to follow to minimise startle factor for you and decrease collision risk. A standard interception will take place in three phases, here's how it works.

Phase I.

Intercepting aircraft should approach you from **astern (behind)**. They will disable pressure reporting on their transponders – not to hide from you, but to avoid triggering a nuisance RA. They should still be visible on your TCAS but only as a TA. The lead aircraft will take up a position on the left, ahead and slightly above at a distance so as not to cause startle and to be clearly visible to the captain. It is likely there will be an accompanying aircraft which will remain behind you throughout. They will be **trying to contact you on guard frequency (121.5)** using the callsign 'INTERCEPTOR' or 'INTERCEPT CONTROL.'

Phase II.

The lead aircraft will close slowly with you but not closer than needed to establish communications. All other aircraft will remain well clear of you.

Phase III.

What happens next depends on the situation. If they have finished their interception (they have identified you, re-established your comms with ATC or understand your intentions) they will perform a break away procedure to clear you.

Or they may need to divert or re-route you. In which case they will remain in position and **clearly visible at all times**.

What you need to do in the flight deck.

Stay calm. You'll likely be startled. Slow it down and remember the following:

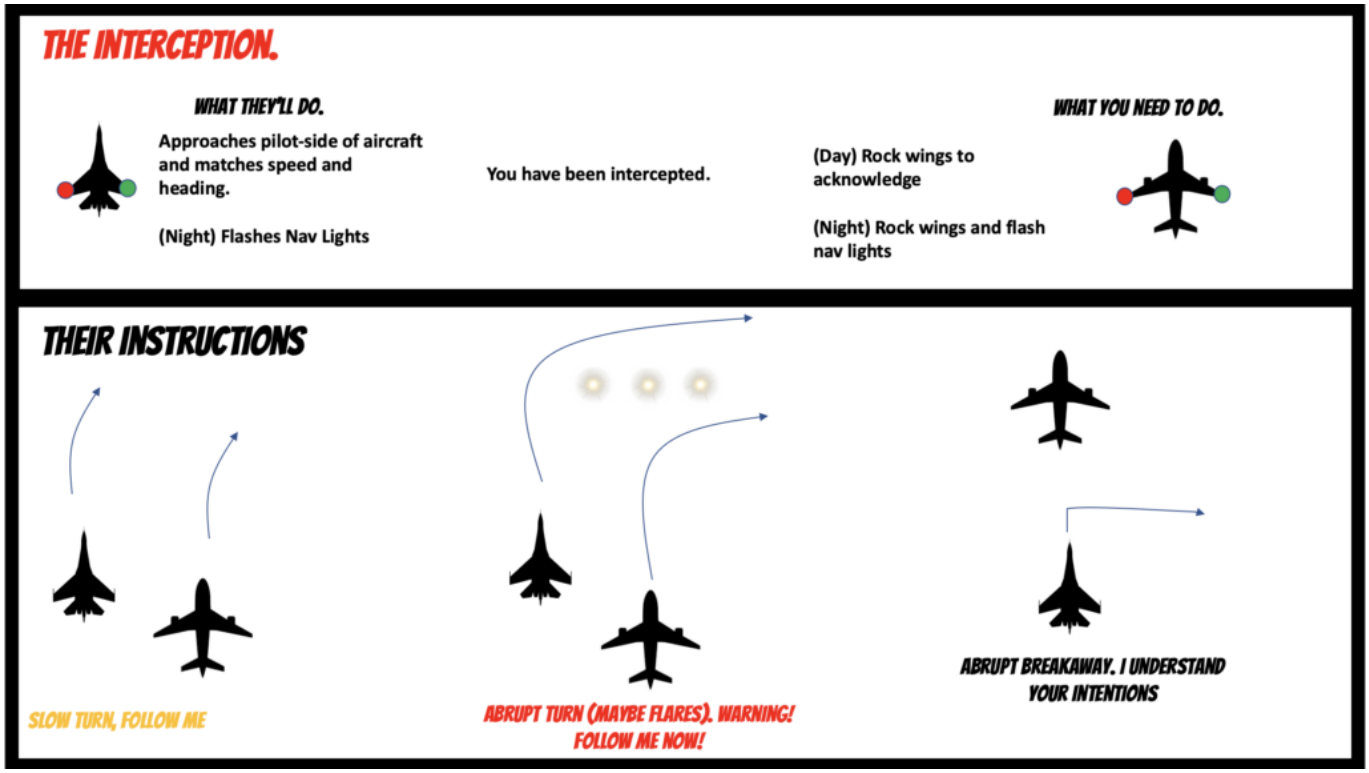
- **Notify ATC (if possible).** Make sure you have 121.5 active, the volume turned up and that your headset or speaker is working. Try and establish contact with them. Listen out for the callsigns above.
- **Select Mode A** on your transponder and **squawk 7700** (unless ATC tell you otherwise). If you have ADS-B or ADS-C onboard, select the appropriate emergency function.
- **Communicate** (more on that below).

How do we talk to them?

The primary way they will want to talk to you will be **in plain English on 121.5.**

If they can't raise you on that, they will use **visual signals** which is why they need to get so close to you.

There are ICAO standard signals used across most member states (including the US) that you need to know (or at least know how to find quickly). Here's how they work:



When they want you to land.

If they can't talk to you and want you back down on the ground they will direct you to an airport, turn on their landing lights, lower their gear and begin to circle.

If you intend to land you should lower your own gear and land. If the airport is inadequate, you should continue to circle 1000 – 2000ft, raise your gear and flash your landing lights until your escort re-directs you some place else.

What about if their instructions contradict someone else's?

According to ICAO, if you receive contradictory instructions from other sources you should **continue to comply with those from the intercepting aircraft.**

Their duty of care.

You have to do as you're told, but they should be looking after you. ICAO are very clear that nothing can be done during interceptions to unnecessarily put your aircraft or its passengers at undue risk. So, when they are requiring you to land, it is important to know they must take care to **ensure your safety.**

Firstly, they **should not divert you to an airfield which is unsafe for your aircraft type**. For civil aircraft this means the runway must be equivalent to at least 2,500m long at sea level, and have a bearing strength that is strong enough. The surrounding terrain must be suitable to allow for a safe approach and missed approach.

They must also take steps to ensure that you have **sufficient fuel** and if possible the airport they want you to land at is published in the relevant AIP.

Finally, they should give you **sufficient time** to prepare for the landing, including giving the crew a chance to check landing performance and brief.

Should I be worried about being shot at?

Seeing a fighter on your wing is an intimidating sight. **But t**he **use of weapons is very unlikely**, especially if you are complying with instructions or are obviously unable to respond. ICAO have asked all contracting states for a commitment that all measures will be taken to refrain from the use of weapons **(including to attract attention)** as they endanger the lives and safety of everyone on board. However, that's not to say they *can't* be used. So the best defence is always to follow instructions.

Military interception of a civil aircraft is extremely rare.

While the diversion and alleged interception of Ryanair last month raises valid concerns throughout the aviation community it is important to remember that ICAO's procedures have been designed to minimise risk across a broad range of scenarios. It's important that we stay aware of them and how to apply them.

Saudi Ops for Hajj 2021

OPSGROUP Team
29 June, 2021

Hajj is the annual pilgrimage to Mecca, which means a change in traffic density and also some flight restrictions into Saudi Arabia.

The Hajj period this year is July 17-22

However, with current quarantine measures (1 week in a hotel if you haven't been jabbed), the increase in inbound traffic might start a little sooner.

Where in Saudi?

OEJN/Jeddah and **OERK/Riyadh** airports are the two main entry points to Saudi Arabia for those attending Hajj. In fact, to fly in here during Hajj period your passengers may well need special Hajj visitor visas, or will likely experience some **pretty long delays in customs.**

Use these airports as alternates with caution during this period because traffic is going to be much higher even this season (2021) when visitor numbers are restricted. You might also experience delays if a VIP is landing as they tend to add in security measures (which can include holding other aircraft if there are enough "V"s before the "IP")

Where else?

OEMA/Madinah can also see more traffic since those holding Visit or Seasonal Work visas are often transferred via here instead.

OETF/Taif Regional airport is also apparently open for Hajj flights if you are moving people domestically.

If you are planning on operating a Hajj charter

You are going to need to **get a request in with the GACA (General Authority of Civil Aviation)** Administrative Liaison Center. There are quite strict quotas because they want a 50/50 split with Saudi air carriers so an early request is a good plan.

We suggest doing it through an authorized agent like fbo@spa.sa – these folk are nice and responsive.

Operations requests have to be sent to GACA through official channels. Hajj flight schedules should sent via e-mail to: hajflights@gaca.gov.sa

You can find a bunch of useful info on how to apply for that here. Actually, if you are thinking of operating a Hajj flight then definitely read this since there are a lot of things you need to be aware of. **It is the official GACA produced 'Hajj Instructions Governing the Carriage of Pilgrims by Air'.**

Airspace Warnings

There are a fair few in place for the south-western region of the Jeddah FIR. The general view is to avoid that part of the Jeddah FIR, and **avoid Yemen, and anywhere near the Yemeni border.**

It is also worth reading up on the **ESCAT procedures** Saudi Arabia have because an escalation in attacks is possible during Hajj season, particularly with a focus on Riyadh and Dammam airports due to the higher numbers of traffic. Basically, if they activate, you will have to **follow exactly what ATC tell you** and will probably be required to **land at the nearest suitable** aerodrome, or **leave Saudi Airspace** right away.

Any other alerts I should know about?

We have a few alerts out at the moment for Saudi Arabia including one about hotel room shortages. Anyone who is unjabbed needs to quarantine for at least a week so these have been filling up fast.

Crew are exempt from quarantine but do still need a PCR test less than 72 hours old.

Hajj Routes

Usually, **ASECNA put out an AIP SUP for Hajj routes through Africa**, because the number of Muslims routing from Africa to Saudi Arabia means changes to the traffic flows and standard routings are required so ATC can deal with it all.

Normally, traffic is very much **north-south predominant**, with Europe-Africa flights being the main flow. When Hajj operations start up, a good amount of traffic starts operating east-west (ie. Africa-Saudi Arabia and vice versa), and this is something to be aware of when cruising along at **FL330 with spotty HF comms.**

However, we haven't seen one published yet this year, possibly because **numbers are so restricted.** So

keep on a look out, and listen out if routing through Africa just in case.

Where can I find more info?

You can find it right here with this handy list:

- Useful Info on Hajj and Umrah travel conditions
- The official GACA site
- The official GACA info pack on Hajj flights

Finally, if you are flying any Muslim passengers and they ask which direction Mecca is in, then there is a waypoint **MECCA** which you can use to find the bearing.

The June OPSGROUP Open Mic

OPSGROUP Team
29 June, 2021

We are changing up our Opschats

Why? Well partly because we are tired of our own voices, but mainly because **we want to hear from you!**

Don’t panic

We are not going to ask people to **sing, tell jokes, or entertain everyone**. We are going to ask folk to bring their own ideas, questions and (aviation) topics of conversation because we think our chats should be a chance to **talk about the subjects you want to talk about.**

If you don’t fly regularly to the Tigray region then a 10 minute update on what is happening there might

not be want you want to hear.

Maybe you are more interested in the latest change to the North Atlantic? Or maybe you have had issues finding parking at LDSP/Split and want to ask anyone if they know of an alternative?

Perhaps you are about to fly to a new airport and want some intel? Or maybe you are actually routing through Tigray soon and you do want that update…

So, what are the pressing aviation industry issues for you?

We want to hear them because OPSGROUP is about that – it is about trying to tackle those **things that are making aviation less safe, less friendly, less human.**It is about connecting the community and sharing the info and expertise, the experience and the ideas.

And we find that sometimes, when we stop talking and listen, that is when the best ideas are discovered.

So we invite you to our Open Mic

An OPSGROUP chat where we won't be giving the info, or leading the conversation, but **we will be asking you to offer up some comments.**

We also thinking hearing what **other information can we share** and what else would you want to find from OPSGROUP would be interesting.

And if you don't have answers for those then **just come along for the hello**, bring a beer if you like, and see if anything pops into your head.

When: June 21 at 1300 UTC (9am New York, 2pm London, 5pm Dubai, 9pm Singapore).

How to attend: Reserve your spot here! Members only. We won't be recording these sessions, so it's very much a "be there or be square" kinda situation

What would you like to discuss? What could OPSGROUP do to help you? What's the barrier to your next flight? Let's talk about it, and see who else is struggling with the same thing (you're never alone!)

See you there!

Opschat replay

If you missed **last week's Opschat** – members can now watch the replay via the dashboard.

We talked about:

- Some of the **latest ops alerts:** Greenland diversion fees, Suriname ATC strike, the Mali military coup, DRC volcanic ash, Russia permit tomfoolery, and the really big news about Europe starting to open up to travel again.
- We also covered the **strikes** coming up in Greece, UK, Paris, Portugal, and Italy.
- We discussed the recent **Albania ATC farmout**, and the **Belarus situation (politics or risk?)**
- We touched on recent **Safeairspace** hotspots **Israel** and **Saudi/Yemen**.
- Some new things we're working on: **Airport Lowdowns**, **Relief Air Wing**, and **Open Mic** chats.

Wake Turbulence: See You On The Flip(ped over) Side

OPSGROUP Team
29 June, 2021

We last wrote about this back in 2017, after the en-route wake of an A380 flipped a Challenger 604 upside down over the Arabian Sea. But as the skies start to grow busier again it's worth having a think about **how to avoid** wake turbulence or **deal with it** when you come across it.

If you are going to run into wake turbulence, there is a good chance it will happen **near the ground**. Not the ideal place to suddenly find yourself banking sharply without warning.

The levels of **traffic operating in close proximity** (and in configurations specifically designed to produce lots of lift which is what basically leads to wake) can make the approach, departure, takeoff or landing **a gauntlet of swirling vortices of doom.** Added to that, aircraft are generally operating at low speed with lower controllability margins.

A study in Australia looked at the vortices of an A380 and in 35 knot winds, at 2,400ft, it took **72 seconds for the vortices to cover 1300m**. They move, and they take a while to dissipate. This study took place after a Saab 340B temporarily lost control, dropping 300-400ft in altitude and **rolling 52 degrees left and 21 degrees right.**

An ILS calibration aircraft crashed in OMDB/Dubai after breaching minimum separation distances from commercial traffic. Hitting wake is not fun and can lead to catastrophic consequences.

Thankfully, wake turbulence is taken seriously. In fact, in 2016, wake turbulence categories were rethought.

They used to just be based off MTOWs:

- Super (the A380 held this spot)
- Heavy (anything with a MTOW more than or equal to 136 tons)
- Medium (7 tons to 136 tons)
- Light (anything under 7 tons)

Nowadays, the categories are a little more complex and consider **both weight and wingspan,** because wing design is a big contributor to what sort of vortices roll off the tips. **Now we have 7 categories: G-A.** Ultimately, the important thing to remember is the distance you need from each depending on what you

are in.

Get woke about wake.

So, we have our 7 categories, and we have our distance based separation (which ICAO allows to go as low as 2.5NM).

Something to remember – these have been designed to allow **maximum runway capacity and operational efficiency.** You won't be ATC's favorite pilot if you ask for more separation (you might even lose your spot in the sequence) but safety is ultimately up to you.

If you need more space, say something.

There are a few other things you can do to help avoid wake in the airport area:

- Consider requesting a **SLOP on arrival** – yes, this is possible. Except where they have super strict NABT routes.
- Consider asking for an **extended holding pattern, or opposite direction hold** – just check where that might fly you (if you're close to the border with another airspace you might run into another sort of trouble).
- Try and **remain above the flightpath** of the preceding aircraft, and avoid long level sections by flying a **CDA**.
- **Watch those speed margins** – if you think you might meet some wake, think about taking some flap a little earlier so you have more margin.
- If you are a 'heavy' or a 'super' then **ATC might not want you to fly a CDA**, especially in high density airspace. JFK are one such spot.
- **Look at what the wind is doing** – if it's light or variable then those vortexes are going to sit there, waiting for you to fly into them…

Is there any technology to help?

There is indeed. In fact, there are several interesting projects and technologies being tested to help with wake.

Vortex modelling is playing a major part in the EU's Single European Sky ATM Research and has led to some rather clever folk in Germany discovering that if you **build a "plate line"** (basically a wall of large wooden boards) this effectively cancels out most of the wake. This is being tested at EDDF/Frankfurt and EDDM/Munich airport using smoke and lasers.

Turbulence can really CAT-ch you out.

Going back to the 2017 **Airbus 380 vs Challenger 604** battle – the Challenger came off a lot worse.

The big takeaway from this: **the risk of wake in cruise is a pretty big one as well**. So what can you do about it?

- **SLOP** – It is one of the things it was designed for.

But use a bit of common sense here – if the wind is from the left (and slopping to the left is not available), then flying to the right of track just means when you get to abeam where the aircraft in front was, their

wake has probably been blown right of track as well. **Maybe ask them to SLOP!**

Of course, **severe turbulence isn't only caused by wake**. Weather, mountains, atmospheric stuff are all to blame as well.

There are technologies out there to help with this as well. **Lidar is just such a thing.** The Japanese Aerospace Exploration Agency and Boeing have discovered that if you stick one of these onto the side of an airplane then it can detect aerosols on the air. These are tiny particles, such smaller than water droplets so a conventional radar won't detect them. The Lidar system does though, and can **provide up to around 70 seconds warning (about 10 miles).**

This might not always be enough to avoid, but it's **enough to switch the seatbelt sign on** and warn everyone down the back.

So, sometimes there are warning signs, but sometimes there aren't. We aren't going to bore you with a science lesson on Clear Air Turbulence or how to check your shear rates. **What we do think is worth talking** about is what ICAO, EASA, the FAA et al. have say about what to do when you have inadvertently come across something that has *really* upset your airplane.

UPRT

Upset Prevention and Recovery Training. **This is a big (and very good) thing.** Since the AF447 accident it has become mandatory for crew to be trained in UPRT.

But what actually is it?

Well, it is one answer which is hoping to solve the issue of **LOC-I incidents** amongst other things. Loss of Control in flight is the biggest cause of fatal accidents over the last two decades (on commercial jet aircraft), having led to **33% of fatal accidents.**

It is designed to **solve the "startle" factor** by giving a clear, defined method of what to do if you don't really know what is going on. Basically, when you experience an "unusual attitude" (with the airplane, not with a strange co-pilot).

An unusual attitude is anything outside your aircraft's normal limits. For a large transport category aircraft we are probably talking **nose up more than 25 degrees of pitch, or down more than 10, a bank angle greater than 45 degrees** or any flight within these parameters but with airspeeds "inappropriate for the conditions".

What has changed here from the old-school stall recovery type training?

Well, the big change is what we are really learning during the training. Upsets are not "some aerodynamic phenomenon lurking in the atmosphere to grab pilots following well structured procedures" – they happen when things have gone very, very wrong and procedures have flown out the window.

So, UPRT is about **training to deal with the startle and the confusion** – giving a method to right the airplane when that startle and confusion is likely preventing you from doing so. It is also about learning how to **recognize a potential threat** that might lead to an upset, and it is about **better monitoring** to prevent the startle.

Tell me how to do it.

Probably more for a trained instructor, but the general gist is this:

- **Push**

- **Roll**
- **Power**
- **Stabilise**

(Sometimes Roll and Power might want to go in the opposite order.)

Pushing does not mean ramming the stick forward. It means unloading the wings. And once they are unloaded you want to stop the push, but that **doesn't mean yanking the nose back up into a negative-G maneuver.** You are going to have to trade some height for speed (and safety) here. When the aircraft is back under control, that means *gently* returning it to the horizon.

Roll is similar – it is all about **giving the wings the best chance of performing**, and that means getting them level and not barrel-rolling around the sky. But… if your nose is mega high, and you have power on, then pushing forward is going to be tough to do. So adding some roll can also help us out here, getting the nose to drop, and giving us control of, well, the controls.

UPRT is about monitoring, recognizing and handling.

Fancy some further reading?

- Here is a link to the FAA Advisory telling you all about their **recommendations for UPRT.**
- Here is a big old document on **Wake RECAT,** by EASA.

I Feel The Need For Reliable Speed

OPSGROUP Team
29 June, 2021

Speed is a big thing when it comes to flying. Lift is, after all, equal to half of something multiplied by something else and, oh yeah, velocity squared…

Now, with so many airplanes being hauled out of storage complete with **bugs, beetles and other nasties nesting in places they should not be nesting in**, there has been what EASA described as "an alarming trend" in the number of aircraft experiencing unreliable airspeed indications.

So we thought we would take a more practical look at what unreliable airspeed might really mean for you.

What are we talking about?

Airbus reported that in the period from January 2020 to March 2021, they had **55 events of unreliable airspeed**. But 55 in a 14 month period (considering how many Airbus are out there flying) doesn't sound that many.

So why is everyone so worried about it?

Well, we wrote a bunch of stuff about it here. We also talked about startle factor because that really is one of the big danger elements of the unreliable speed problemo. You see, if you get unreliable airspeed, there is a good chance you will do so at a **horribly critical moment in flight**. Like takeoff when you are near the ground, don't have much speed, and have even less time to deal with it.

So, we are talking about you (the pilot) or it (the aircraft) not knowing what airspeed is reliable, and everything getting fairly confusing, very quickly.

What happens when it happens?

Airplane systems are clever. They use teamwork. They don't just rely on one sensor or one probe, instead, they have independent probes talking to independent systems, and then these talk to each other and on a good day everything matches. On a bad day they might not.

But air data computers don't argue, they get logical. If two are receiving the same information then chances are number three is wrong and then majority rules and the other systems effectively vote it out. Of course, they tell the pilot when this happens so you can judge for yourself, and maybe try to work out why there is a discrepancy.

The situation gets **more complex when the computers cannot determine which is reliable** and which is not. When we talk about 'Unreliable Airspeed' this is the situation we are really referring to because now you are going to have to troubleshoot, pretty quickly, in order to work out what to trust. More critically, you are going to have to decide pretty fast whether or not your airplane is in a safe condition.

So your first action needs to be that 'Aviate' bit of those **Golden "ANC" rules.**

Don't forget the first line…

The memory items for 'Unreliable Airspeed' are going to vary between types, but the general gist is probably the same: *decide if the airplane is safe and if it isn't, make it safe before you do anything else.*

Airbus, for example, say **"if safe conduct of flight impacted".**

So what they mean is don't go hurling on thrust and yanking the airplane nose about unless you actually need to (but if you need to, then do!)

If you are in cruise – **straight and level, with a sensible pitch attitude and thrust setting –** and your autopilot disconnects because it ain't sure about the speed, then **do you actually need to do anything?** Other than making sure you have control, probably not. The speed hasn't suddenly become unsafe just

because you cannot say exactly what it is.

The same goes for a nice, stable approach. If you're configured, heading down the ILS, and your autopilot disconnects, but the airplane is still on the ILS, descending at a normal ROD with a normal thrust and pitch setting, **why not continue** (or at least see if it is safer too before you throw it into a go-around)?

Destabilizing it is potentially just going to give your a whole load more work, and the airplane a whole load more trouble.

But don't forget the first line...

There are also **instances when you do not have time** to think about whether it really is or isn't reliable.

V1 is determined during your performance calculations. This is the speed by which **you need to have made the decision to stop, if you are going to.** But it is not "just" the speed that matters. What your performance calculations are actually thinking about is how long (and by how long, really *how far*) it will take you to accelerate to that speed, and then how much runway you will need to decelerate back down from that speed if you reject.

So we sort of need to think about **V1 in terms of the point on the runway** we will pass when we reach that speed. If our airspeed indications are unreliable, then we cannot really say if we are at the point, before it or past it, and if we don't know that and don't know our actual energy then...

Can we stop?

Common sense and airmanship will probably tell you when rejecting versus taking TOGA and setting a pitch attitude is the best option.

Why does it happen?

Aircraft coming out of storage with stuff stuck in their probes seems to be the most common reason. Of Airbus' 55, **44 of them were due to things "obstructing" the probes.** One fix is to put covers on to stop stuff getting in. Unfortunately, this also led to a few situations where covers were *left on* stopping the air from getting in and resulting in, well, unreliable airspeed.

Icing if you fly into **adverse weather is also a common cause.** This can be incipient and hard to spot. Combined with high altitude handling differences, half asleep pilots, and a few other factors and you have a scenario starting to sound similar to the one Air France 447 encountered.

Damage to probes (hail stones, birds and things flying into them at high speed are probably to blame here) and **Volcanic Ash** are less common but equally possible reasons.

What can we do about it?

Well, EASA, ICAO and other wise folk say to try and avoid it happening in the first place with some **decent maintenance checks** if pulling your aircraft out of storage. They also recommend **good procedures and good monitoring** as a good way to not get caught unawares.

The general advice is:

- **Know your pitch and power settings.** Old school, back to basics flying, but having an idea about these will **a)** help you notice when something just doesn't look right and **b)** might just save the situation.
- **Don't ignore your stall warning.** This works off Angle of Attack, not airspeed. Think of it

like your wife/partner – it is probably yelling at you for a (very valid) reason.

- **Follow your aircraft memory items and checklist.** This means getting the airplane into a safe flying condition and then troubleshooting.
- **Make life easy for yourself.** Talk to ATC – ask for a block altitude. If you are heading in to land, ask for a long descending final so you can take your time configuring. Remember there are other resources onboard as well – GPS gives approximate altitude and speeds.

Breaking the Barrier: Sonic Boom or Sonic Bust?

Chris Shieff
29 June, 2021

Two big pieces of supersonic news have hit headlines in recent weeks.

The good news was that a US major has agreed to purchase fifteen Boom supersonic jets still in development, with the option to purchase many more. All going well, they'll be gracing the upper flight levels by the end of the decade. Cool stuff right?

But then **the bad news** was that Aerion Supersonic, widely regarded as being the closest to delivering a viable supersonic business jet, shut down after seventeen years and many millions of dollars spent trying to make the dream a reality.

This emotional roller coaster poses an important conundrum: purchase agreements are one thing **but are we really that close to commercial supersonic flight?** When you start digging it becomes clear just how much the sound barrier becomes a hurdle for the industry as it stands today.

And it's not just about shock waves either – **even though it's possible, will it ever be profitable?**

The iconic Concorde to this day remains one of only two commercial supersonic jets that was were in service (the Tupolev briefly being the other). In its twenty-seven year career of rattling windows at JFK and Heathrow, its profits were certainly subsonic. It's possible that in its legacy it leaves an unpleasant truth: *is it really worth flying faster than Mach 1?*

The aviator inside me hopes so, but the writing may already be on the wall.

We know we can build it, but here are the issues.

Ironically the formula to going supersonic appears quite simple: take a super slippery airframe, make it heat resistant and then liberally apply loads of power. *But if only it was that easy.*

When things go boom.

Firstly there's the issue of sonic booms. ICAO's current policy says that operators have to ensure that no 'unacceptable situation' is created for the public by the sonic boom of a commercial aircraft. The FAA have taken it further and said **no-bueno to <u>any</u> commercial ops above Mach 1 over the US** unless you have very special permission.

Low-boom technology is real, using special shapes to reduce the impact of the big bang on the ground **but we're still a ways-off going zero-boom in the near future**. You might be thinking – why not go subsonic over land and wind it up over the ocean? That works for trans-continental flights but not so much for long legs over land. To make matters worse, supersonic airframes don't fly efficiently at subsonic speeds. It would just not be viable to fly subsonic for hours burning copious amounts of gas.

What's that noise?

All sonic booms aside, there is still an issue with noise. As speeds become supersonic, jet engines must lose bypass to stay efficient. The huge N1 fans we see on modern subsonic jets would only cause huge amounts of drag at high speeds.

Unfortunately this means they have a tendency to be **ear-splittingly loud when they take off and land**. Just listen to a video of Concorde – cool, yes. But legal? Not with today's regs. Here's what I mean.

Although this is set to change, **ICAO** hasn't yet published specific noise guidelines for supersonic aircraft. Instead they say that noise levels for subsonic aircraft can be used as the guideline. **The FAA** say that commercial supersonic aircraft are banned unless they meet stage 2 noise limits – what are those you say?

They're about as loud as older aircraft like the 727. For comparison, they used to produce around 90 decibels on the roll. Concorde once recorded 120 – about the same as a clap of thunder.

It's clear that engine technology needs to be drastically different and **new regs will need to be written** to let the supersonic birds fly.

What about the trees?

The industry is in the midst of **a massive move toward sustainability** and the goals are ambitious. ICAO for instance is tasked by the Kyoto Protocol to control aviation's burn-off that affects global warming. They're now targeting carbon neutral growth until 2050 despite how quickly things once again begin to expand. There is an industry-wide push toward alternative fuels including hydrogen and Sustainable Aviation Fuel which can be run in conventional turbine engines using waste products that need to be seen to be believed.

The world is worried about global warming, ozone depletion and air quality and super-fast jets *just don't fit this mould.* The future wants us to be squeaky-clean. This is a big barrier to supersonic aviation as the

industry is unlikely to give the thumbs up to new technologies without knowing whether they are playing their role in keeping emissions down.

But how will she handle?

Then there's the airframe. We're going to fly these things which means **they need to perform on several levels**. First of all they need to have acceptable handling and ride qualities – and delta wings are different. They need to be safe, and the passengers comfortable.

And how will they perform at **high altitude?** They have to be recoverable from jet upsets. Finally it's safe to assume that if one of these aircraft makes it to the line (and I hope one does) it will be packed full of technology. But it's important to remember that advanced technologies need to be approved and reliability becomes a pressing issue. This all takes time.

The Elephant in the Room – The Profit Barrier.

That old chestnut. It gets in the way of all the fun.

The shutdown of Aerion Supersonic raises some serious questions about the viability of these spectacular flying machines. All of these technological challenges are certainly boundaries but money talks. Perhaps the biggest challenge of all is economic.

Concorde first flew in 1976. Since then no one has come to market with a solution that would make them affordable to airlines and corporate operators alike. Companies like Boom, Spike and Exosonic are certainly weighing in on the challenge, *but is the model missing the mark?*

How do you put a dollar sign on time? Before Aerion left the market it estimated its AS2 jet would cost $120 million off the production line. Market leading subsonic jets like the Phenom 300 or Challenger 350 cost substantially less – not only to own, but to operate.

Supersonic jets will also use more fuel per mile than conventional aircraft, with far reduced range. In an environment where profit margin is based on the scent of an oily rag, what is a few extra hours enroute and how do you actually quantify that when signing on the dotted line?

At what point do time savings account for the extra cost? That is the crux of the issue.

Industry heavy weights Airbus, Lockheed Martin, GE and Boeing were all at one time or another onboard with Aerion. If they couldn't make it happen, what challenges lie ahead for those who think they can?

The answer may lie in volume (more bums on seats), which is where Boom may get it right where Aerion and other corporate jet concepts did not. Only time and the bottom line will tell.

Supersonic commercial flight will be here one day.

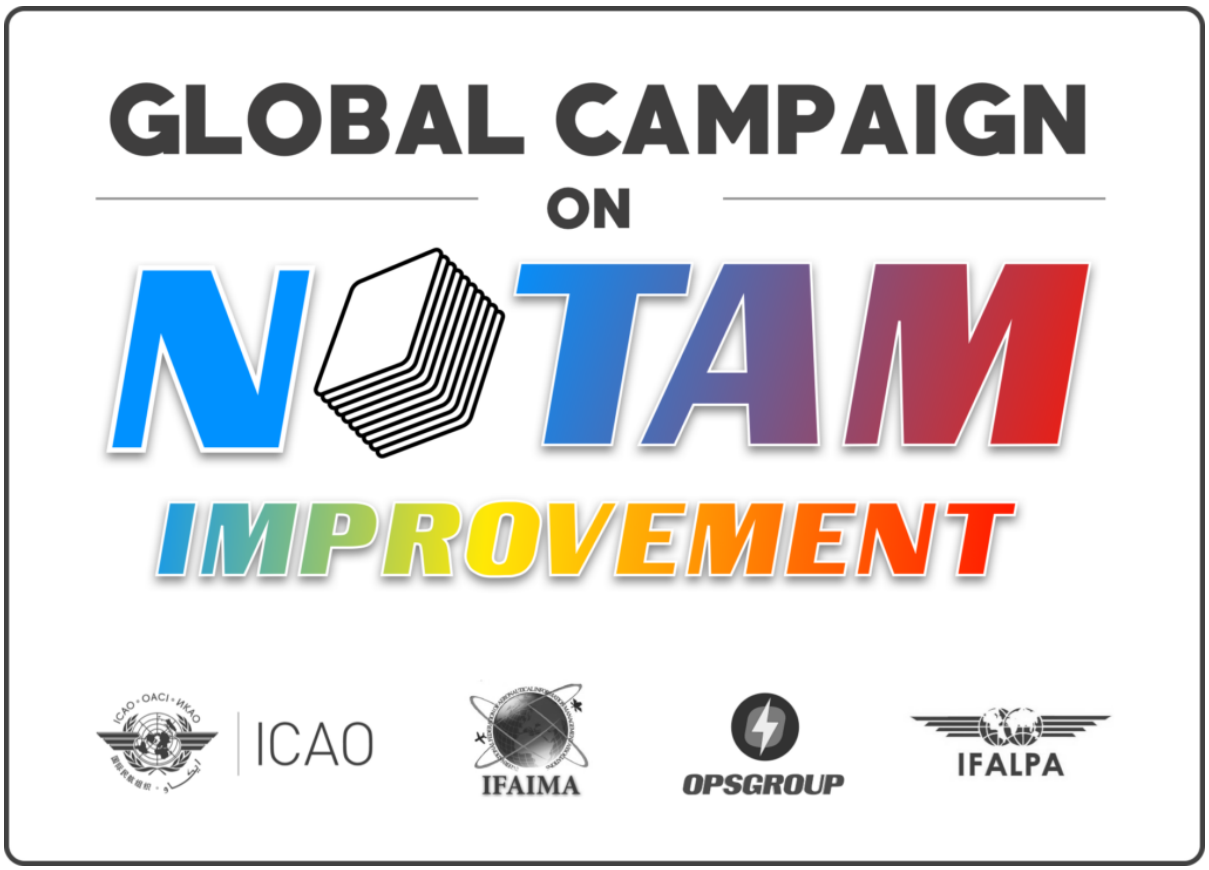
But we have a ways-to-go yet. There is no doubt that some of the smartest brains in the world will solve these challenges but from an industry perspective a lot will have to change in a hurry if supersonic commercial travel is to become a reality within the next decade.

Global Campaign on NOTAM Improvement

Mark Zee
29 June, 2021

Update: The NOTAM campaign was launched with 1,500 attendees on April 8th – and yes, it was the largest virtual event in ICAO history! The first update webinar on progress being made is on **June 16th at 1200Z** – register with this link, and join the call.

The **Global Campaign on NOTAM Improvement** is being launched on April 8th, 2021. Spearheaded by **ICAO**, and supported by **OPSGROUP**, **IFAIMA**, and **IFALPA**, the campaign will focus on making significant improvements to the NOTAM system to **enhance its effectiveness, usefulness, and reliability** as a mechanism for pilots to receive critical flight information.



Kick-Off Webinar, April 8th 2021

At 1200Z on April 8th, 2021, we will launch the campaign with a worldwide webinar. So far, we have 600 registered participants. We are on track to make this **the biggest virtual event in the history of ICAO**. If you think about it, that's pretty amazing for a meeting about NOTAM's!

This webinar is open to everyone, and we would be delighted to have you join it – to show your support for the Notam Improvement campaign, to learn more about what the plans are, get the latest update, and see how you can get involved: this is a collaborative, shared mission that needs your help, whether you are a pilot, dispatcher, AIS officer, software developer, Flight Planning provider, ANSP, CAA, or are in any other way a user or provider of some aspect of the Notam system.

So, **please join us** – it's open to all:
Register for the Worldwide Webinar on Thursday, April 8th, 2021 – 1200 UTC

1200 UTC = **7am** Lima, **8am** New York, **1pm** London, **2pm** Berlin, **4pm** Dubai, **7pm** Bangkok, **10pm** Sydney, **12am** Auckland.

Why should I join the Webinar?

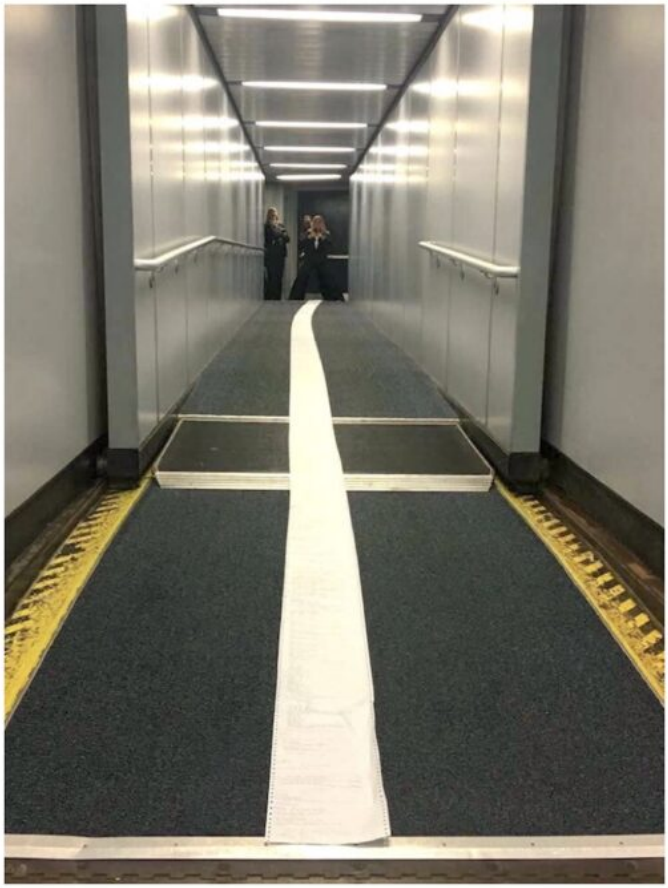
Over the last few years, as many as 10,000 pilots and dispatchers have supported a move to fix Notams – through petitions, surveys, comments, emails, and joining the OPSGROUP Notam Team to help fix the problem. Your voice has been heard: this work is the result. Now, we need your support for this campaign – to reinforce the message that as an industry, **we really care about this**. Your presence will encourage those working on solving the Notam Problem, and you will get the full picture of where we stand in the progress to fix things.

We will speak about the mission, demonstrate the problem with some real world examples of pre-flight briefings, showing how these impact the daily lives of pilots and dispatchers, clarify the definition of “Old NOTAM’s”, and show how AIS staff can use the existing regulatory framework in Annex 15 and Doc 8126 to become a gatekeeper for NOTAM quality, demonstrate the Notameter, address regional challenges, and have a Q&A session.

Our presenters and speakers will include **Stephen Creamer** (Director of the Air Navigation Bureau at ICAO), **Alex Pufahl** (ICAO Technical Officer), **Mark Zee** from OPSGROUP, **Capt. Lauri Soini** from IFALPA, **Fernando Lopes** and **Antonio Locandro** from IFAIMA, **Marco Merens** from ICAO, and ICAO Regional Officers.

What is the Notam Campaign all about?

First, the problem: Pre-Flight NOTAM Briefing packages are often far too big to be fully read and understood by pilots before a flight. The result: **critical information is missed**. Finding safe ways to decrease that volume is the key focus of this campaign.



In the **Global Campaign on Notam Improvement**, our aim is to solve the Notam Problem in manageable chunks, gathering energy as we solve them and make progress. Rather than re-invent the wheel, we will fix the system from within, starting with the easier aspects and progressing from there. **The first phase** of this campaign focuses on Old Notams. At any one time, there are about 35,000 active Notams globally, and 20% of these – one in five – are old; in other words, not respecting the existing rules of Notams being issued in principle once only for a maximum of three months (everything else should go into the AIP, an AIC, or some other publication).

We are drawing on the collective cooperation of the AIS community – the Notam Officers – to uphold the rules and get rid of Notams that don’t follow them. The result will be a potential decrease of 7,000 Notams

per month, and a 20% reduction in the size of the average briefing packet. For more on the Notam Problem itself, have a look at “Why pilots are reading a Reel of Telegrams in the Cockpit“.

Who is behind it?

The Global Campaign is a meeting of minds, agreeing on one thing: **Notams need fixing**.

ICAO is spearheading the campaign, in the recognition that the Notam Problem is a worldwide issue that affects flight operations in every country.

Providing support, energy, and huge enthusiasm to help solve things are **IFAIMA**, representing the Aeronautical Information community, **IFALPA**, voicing the concern of Airline Pilots, and **OPSGROUP**, whose pilot, dispatcher, and flight operations members have been tirelessly involved in the mission to fix Notams since 2017.

What can you do to help?

Thank you for asking! If you are in the **AIS community** – perhaps as a Notam Officer, AIS Officer, Publisher, or Promulgator – please tell your colleagues, join the webinar, and get involved in this Campaign. If you are a **Pilot or Dispatcher**, join the webinar, share the news of this campaign (#NOTAM2021), voice your support, and monitor progress – we’ll want your help down the track as well. If you are a **Flight Planning Provider or Software Developer** – again, join the webinar, and when the time comes, get involved in the collaboration around technical improvements. If you work for an **ANSP or Civil Aviation Authority** – join the webinar, encourage your colleagues to join too, and help support the Campaign. If you work for an **Organziation**, tell your members, and share news of this campaign (#NOTAM2021). Oh, and join the webinar!

How we got here …

This is a Global Campaign for a very good reason. We only solve this problem when we solve it for all countries – so we take the lessons learned domestically from those countries that have seen NOTAM wins, and amplify that across the rest of the globe.

In terms of change so far, most notable is the work done by the AIS Reform Coalition in the United States, chaired by Heidi Williams from the NBAA. This group of people from NATCA, ALPA, AOPA, IATA, A4A, ACI, the NBAA and others have been working feverishly in partnership with the FAA to drive change and improvement. And it has had remarkable results – the US has radically improved NOTAMs in the last 2 years: NTAP gone, a big reduction in PERM Notams, a single office for AIS, a transition to the FNS, and NOTAM Search replacing Pilot Web. Canada has transitioned to ICAO format for Notams, and provided a new delivery mechanism through CFPS.

We must also recognise huge efforts from the members of OPSGROUP, who as pilots, dispatchers, and other flight operations specialists have made their voice heard, sharing support, input, ideas, and enthusiasm for change; the efforts of IFALPA to bring attention to the issue, and IFAIMA who have given full support to solving things on the AIS side.

An important distinction to make here is that this work is on “**NOTAMs, Now**“. There is separate, ongoing work in the field of the “Future of NOTAMs”. You may have seen acronyms like SWIM and AIXM, and terms like Digital Notams or Graphical Notams. The FAA, ICAO, Eurocontrol, and other agencies are building a

model for the future, when NOTAM's will change from the current AFTN format and transmission into an internet, IP based, transmission and follow a service-oriented approach. This work is valuable, but with a target implementation date of 2028, has a different focus. Even if it goes smoothly, it would not instigate change until 2028. Needless to say, if we don't fix the underlying issues now, it may not even solve them then, either.

The AIS Community, Pilots, and Dispatchers, working together

Here's the really exciting part of this Campaign: for the first time we are seeing pilots, dispatchers, and AIS staff working together on solving the issue. This is a core tenet of the campaign: only when you have all parties involved, do you have a shot at success.

The AIS Community is invaluable in solving the problem, but they need our help. First, they need to know exactly the impact of the Notam Problems we describe – this drives their will to make change and improvement. Second, they need the support – which this Campaign will provide – to stand as gatekeepers for Notams. They themselves are often under pressure to publish Notams that they know don't align with the rules, but have no alternative.

Phase One

So, once the Campaign is launched, what does the roadmap look like? Logically enough, we start with Phase One. A simple, bite-size chunk of the problem – **Old NOTAM's**. In volume terms, it's a lot more than bite-size – it's actually 20% of the problem. The key is that it's easy to understand, and therefore easy to work on. We don't need to make any structural changes, or change how the system functions. This is simply about focusing on a known issue – that 7,000 of the 35,000 active Notams that should not be there.

Even more importantly, the focus is also on the **energy, enthusiasm, and goodwill** to make the changes necessary. As we gain momentum, we get encouragement from each and every Old NOTAM that is removed forever. We see that through collaboration, community, and support for each other, we can make change happen.

Remembering that this is a decades old problem that has been on the agenda since 1964, and that there are 193 countries on this journey, progress may feel slow at first. But we're going to learn from each other, and go as fast as feels right. We'll be celebrating the small wins!

Phase Two

The next phase will look at **technical improvements**. In other words, what structural and systemic changes can we make to NOTAM's to leverage quick improvement.

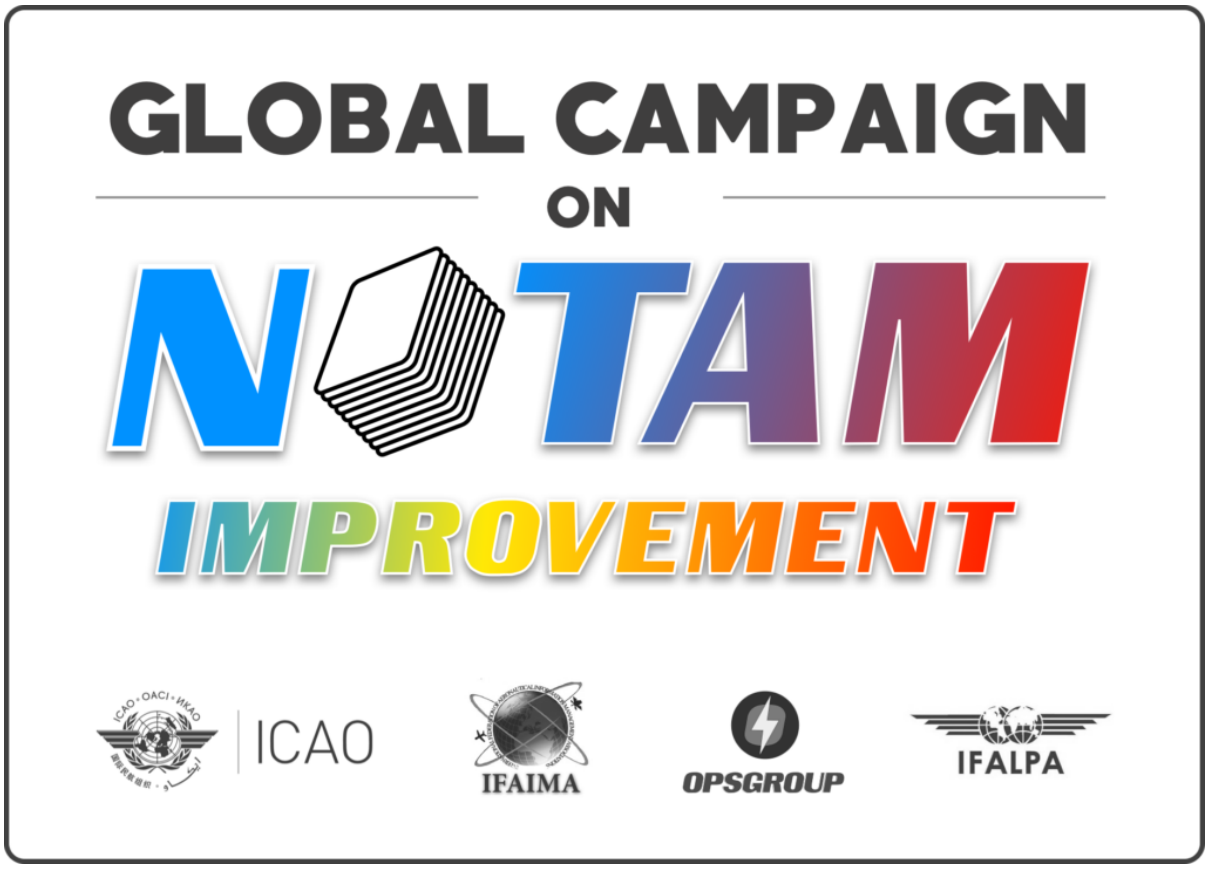
We envision that this stage will be best served by a great deal of **collaboration and discussion**. One of the key groups here will be Flight Planning software providers. The vast majority of NOTAM briefings today are provided by these companies. As things stand, each one has a different, in-house method of

processing the Notam flow – usually with algorithms, keyword searches, date/time validity ordering, and some Q-code assessment. So we might ask, how can we best structure the Notam data to provide a robust, reliable format with metadata that allows sorting and filtering – the two big asks from the pilot community. In other words, **show me the critical stuff first**, and skip the fluff.

We also, again, need full collaboration with AIS to see what the impact of those technical improvements will be, and whether they support them. Adding pilots and dispatchers into the mix will allow us to verify that the changes being discussed will actually have an impact by the time they reach the cockpit. If they don't, then we're not doing it right.

More about #NOTAM2021

- **Kick-Off Webinar**: Register for the event on April 8th, 2021 at 1200 UTC
- Progress Webinars start on June 16th, 2021.
- ICAO information page on the Global Campaign.
- OPSGROUP
- IFAIMA
- IFALPA
- FixingNotams.org – the journey so far



The Mexican Downgrade: What's the impact to ops?

OPSGROUP Team
29 June, 2021

Mexico have recently found themselves downgraded by the FAA under their IASA program.

So, what does this mean for Mexico, and what does everyone else need to know about this?

First up, what is the IASA program?

It might sound confusingly like a combination of EASA and IATA, but 'IASA' is actually the International Aviation Safety Assessment Program run by the FAA, and used to determine the safety standards in foreign countries.

It was set up in 1992 to monitor air carriers operating in and out of the US – not to monitor the operators specifically, but to **check the authority in the country is up to scratch** with ensuring their operators are up to scratch. If not, the US don't want to let them into their airspace.

What do they look at?

They are focusing on the country (not the operators in the country), to see how well they adhere to **international aviation safety standards and recommended practices**, as suggested by ICAO in Doc 9734.

There are **8 elements** that the FAA/ICAO reckon a decent aviation safety oversight authority should be doing well:

- Legislation
- Operating Regulations

- The State civil aviation system and safety oversight functions
- Technical personnel qualifications and training
- Technical guidance, tools and provision of safety critical information
- Licensing, certification, authorization and approval obligations
- Surveillance obligations
- Resolution of safety concerns

I feel like they combined a few there, and its actually more than 8. But there's the list.

How do they do the assessment?

If you visit the IASA site, on the FAA main site, then you'll find each of those areas has its own checklist. These are **thorough, lengthy things.** The Operating Regulations alone is 19 pages with a whole bunch of points to check off per page. Oddly, all that checking **leads to only two possible outcomes.**

A country either meets the standard or it doesn't. There is Category 1, or there is Category 2, no in-between.

- Category 1, **Does Comply** with ICAO Standards
- Category 2, **Does Not Comply** with ICAO Standards

Basically, if one or more deficiencies are identified, it's a Category 2 ranking, and Santa won't be bringing you a present that year.

What does it mean to be on the naughty list?

Well, if you already have air carriers flying to the US then you can continue but they are going to monitor them pretty closely. If you don't already have air carriers operating in and want to, then you're going to have to improve before they give you permission.

But why should we all care?

After all, the oversight is to do with their air carriers and nothing more? Surely it just means their aircraft might be a risk coming into US airspace, or their pilots might not follow procedures properly?

Well, actually no. The problem is these air carriers **share airspace with you**. If their pilots are not licensed or trained correctly (think Pakistan's recent problem) then this can **degrade the safety for all aircraft operating in their vicinity.**

If a state is failing to ensure minimum safety standards in areas such as the promulgation of safety critical information (notams), technical personnel qualifications (the maintenance folk who might be fixing your aircraft, or the CAA inspectors checking compliance) then this is something any **international operators might want to be aware of as well** because there are potential knock-on safety impacts for those heading into the country in question.

So does it tell me if another country is safe to fly to?

No. The FAA is **not saying every country ranked 1 is safe**, no issue, no problem.

It also isn't telling you a country is **unsafe** to operate to if they **don't** meet compliance standards.

Remember, it is purely looking at the **regulatory and safety oversight** and asking if they ensure minimum ICAO standards. There are countries out there that pose significant threats (just not because of any deficiencies in the authority's oversight).

It might also mean that **the FAA have not ranked that country**, because no-one from that country is flying or planning on flying to the US.

Remember, these rankings are looking at **how a state ensures its air carriers are safe and compliant**. It does not consider whether services or infrastructure within the state itself are safe or compliant.

How should operators and pilots use this list?

For operators and pilots, if a country is ranked Category 2, it means you **might want to be doing your own risk assessment** before heading in. No-one is saying that country isn't going to be safe, but they are saying there are **deficiencies with the authority**, and since that authority looks after a lot, it is worth asking whether there **might be other deficiencies** as well.

You should be looking at the following:

- What are the standards of the handling agents and maintenance services you are going to require there?
- How reliable are Notams, and are they providing the information required?
- What level of service and safety will ATC provide?
- Will procedures and regulations be correctly adhered to there, and if not, what will this mean operationally for your flight safety?

You can get this info from sites like Safeairspace, Airport Spy, and through talking with colleagues who have operated into there before.

Who is on the Category 2 list?

So the big news this week is that Mexico were downgraded. Again, actually.

Along with Mexico the FAA also have the following countries ranked at Category 2:

- Bangladesh
- Curacao
- Ghana
- Malaysia
- Eastern Caribbean States
- Pakistan
- Thailand
- Venezuela

It changes though.

In 2014, the FAA downgraded **India**, citing inadequate oversight by local regulators, and in 2001 **South Korea** found themselves downgraded due to unskilled technical staff, pilot screening problems, issues with flight operations rules and a lack of objectivity in air crash investigations.

Both made it back on again relatively quickly.

Let's take a closer look at Mexico...

The FAA have not yet given the reasons for their downgrade. However, Mexico was downgraded previously – back in 2010 – due to **shortcomings in technical expertise, trained personnel, record-keeping and inspection procedures.**

Actually, Mexico has a pretty decent infrastructure in terms of airports, although these do pose some operational challenges of their own (things like high terrain, high elevation). The CAA was actually "revamped" back in 2019. We put out this post about ramp checks.

Mexico's political problems seem to be at the root of most issues here for the aviation industry. A project to build a new airport was recently cancelled (Texcoco airport was partially constructed already.) Now the government are instead looking to improve **MMTO/Toluca** and build new runways at an Air Force base near Mexico City. Plans are also under way for a third terminal at Mexico City Juarez, but given it is already congested and operating over its designed capacity, this might not be any solution.

Combined with Covid Pandemic problems, the latest downgrade will mean a big financial impact for various Mexican airlines now unable to access the **major Mexico-USA market**, and the knock on effect from this might be further felt in the aviation industry there as a whole.

The Big Taco-way?

If you are operating into an FAA IASA Category 2 ranked country, **doing your own risk assessment** on the standards and compliance you can expect to experience there might be worthwhile.

Go / No-Go: Why Are We Rejecting Above V1?

Chris Shieff
29 June, 2021

Rejected take-offs aren't new

Every time we open up those thrust levers and accelerate down a runway there is a risk that something will go wrong and that we will need to stop again. Which is why we brief before every departure.

But they are also **pretty rare**. One study found that they happen on average once in every two thousand take-offs. For a long-haul pilot that's about one every twenty-five years, and for short-haul folks once every four years. And of those RTOs, **ninety percent happen below 100 kts**. So when they happen at speed they are usually accompanied with a healthy serving of startle factor.

Common sense and physics tells us that the faster we go, the more dangerous it becomes to reject, rather than get airborne. Once we hit V1 we go, because there may not be enough of the hard stuff in front of us to stop anymore. The problem is that reports continue to tell us that **avoidable accidents are happening because crew are still rejecting take-offs above V1.** Which poses an important question: why?

There is no simple answer. But accident and incident reports may hold some clues…

The Real World is Different

The vast majority of high speed RTOs we practice in the sim are related to **engine problems**. Failures, flame-outs, bird ingestion, compressor stalls. Those sorts of fun things. They are generally easier to identify and illicit a strong and confident decision to reject the take-off.

But here's the kicker: **Most high speed RTO's are not caused by engine problems.**

In fact historically, less than quarter of them are. Which means when something unexpected happens that we haven't seen before, the Go/No-Go Decision suddenly becomes a lot more difficult.

Here are some of the other leading causes:

- Wheel/tire failure
- Config warning
- Bird strike
- ATC
- Noise/vibration
- Directional control issues
- Crew coordination
- Malfunction Indications

A lot can go wrong and the process of detecting, deciding and acting takes time. **At high speeds close to V1 this is a problem.** Here's why…

V1 is not a Decision Speed

V1 has been redefined a number of times over the years and has ultimately ended up with the current FAA definition:

'…..V1 means the maximum speed in the take-off at which the pilot must take the first action (e.g., apply brakes, reduce thrust, deploy speed brakes) to stop the airplane within the accelerate-stop distance. V1 also means the minimum speed in the take-off, following a failure of the critical engine at VEF, at which the pilot can continue the take-off and achieve the required height above the take-off surface within the take-off distance….'

I know what you're thinking – *that's a lot of words.* Which is why it is still casually referred to as 'take off decision speed.' It just rolls off the tongue better. But hidden amongst all those words is this key concept – **by the time you reach V1, the decision must have already been made and the first action taken.**

Here is an easier way to put it: **V1 is the end of the go/no-go decision making process, not the beginning.**

It may seem like a technicality, but it's not. It has been shown that with a balanced field length, if an RTO is initiated just two seconds after V1 an aircraft will exit the end of the runway at between 50 and 70kts. On average it takes pilots between 2-4 seconds to react. In other words, **time is critical**.

But there's more to it than that. What does 'unsafe to fly' actually mean?

We know that the faster we're going, the more dangerous it is to stop. Which is why we become **'go-minded'** at higher speeds (usually above 80 or 100kts). It is in our efforts to embrace this go-mindedness that we have adopted the philosophy that there are four things that could trigger a high speed abort: **engine failure, engine fire, windshear or an unsafe condition.** Makes sense right? We brief them every sector.

But what constitutes an unsafe condition? Or in other words, **what are the signs that an airplane is unable to fly?**

Accident reports show that pilots are having difficulty recognising these conditions and that is leading them to **stop above V1 when it would be safer to go**. They often interpret anomalies (like a tire blow out) as events that threaten the safety of the flight and decide to reject at any speed. The overrun of a Learjet departing KCAE/Columbia Metro in 2008 serves as a tragic example.

In fact one study found that almost half of all high speed rejected take-offs were the **wrong decision.** That's a startling statistic.

And to make matters worse, sometimes it *is* the right decision as the accident of an MD-83 in 2017 certainly proved.

The Decision Isn't Easy

Go/No Go – if only it was as straight forward as it sounds. From a pilot's perspective, it is difficult to make the right decision. Given any number of failures, the incredibly short timespan we have to make the decision and the lack of information at hand, it's no wonder that that not all rejected take-offs go to plan.

But there is still room for improvement if we continue to train for them and brief them using lessons learned from accidents past.

The Joint Industry/FAA Takeoff Safety Training Aid was published in 1993 as a guide to pilots and operators on how reduce the number of RTO related accidents and improve the outcome of go/no-go decisions. We still widely use those same principles today. There were four key takeaways identified from accident reports which might prove as a decent starting point:

- **We must be prepared to make the decision before V1.**
- **We need to be able to differentiate between 'safe to fly' and not.**
- **Crew must be ready to act as a well co-ordinated team.**
- **We have to be well practiced and able to fly RTO procedures proficiently.**

It may be unrealistic to think that we can get rid of RTO related accidents entirely. But with more training and a focus on what is going wrong out there we can certainly work toward keeping everyone safer on the roll.

Close Encounters Of The Third Kind

OPSGROUP Team
29 June, 2021

Back in April, the Pentagon confirmed that **some leaked photos and videos of UFOs were, indeed, legitimate**. Of course, 'UFO' just means "unidentified flying object" – it doesn't necessarily mean extra-terrestrial. In fact, these days the US government generally use the term 'UAP' (unidentified aerial phenomena) which makes us think of old, retired aliens…

Reports of UFO's/UAP's, or whatever you prefer to call them are relatively common though, and over the years there have been **numerous sightings directly from airline pilots**.

So, do we need to be wary of alien spaceships in our airspace? **What sort of risks do the other possible explanations actually mean for aircraft safety?**

What is out there?

First up, let's take a look at what sightings have been reported in the past, including the recently acknowledged ones.

The Metallic Blimp

The videos the Pentagon recently acknowledged were actually taken back in 2004 and 2015, and they show objects moving at mega speed. In one, a pilot is heard exclaiming "Look at that thing, dude! It's rotating!"

But is that a UFO, or is there a more reasonable explanation?

The most obvious answer would be that it is **a military aircraft of some sort**, but given the videos were made by military pilots who were not aware of other military traffic operating in the area, and considering the Pentagon confirmed the videos' authenticity, but not what they were showing, the mystery continues…

The New Mexico Sighting

In February 2021, a radio transmission from an America Airlines crew was picked up by a random blogger who happened to be listening in on a radio scanner. He apparently just 'stumbled across' the transmission.

The aircraft was routing over New Mexico at 37,000ft when they reported seeing an object zooming over them. On querying it with ATC, they were informed that the controllers could see no object on their radarscopes.

The Bright White Light Flight

In 2018, a British Airways crew called in after seeing a ‘very bright light that disappeared at very high speed’. The sighting was backed up by a Virgin Airlines pilot who said they also witnessed multiple ‘exceedingly bright’ objects.

New Age Reporting

The US Government is certainly taking sightings more seriously, and in 2019 announced they would bring in a new ‘data driven’ approach to reporting and recording them.

You can visit the official US NUFORC site here. NUFORC stands for the **National UFO Reporting Center**, and they have a database of all reports. In fact, the number of reports is quite impressive, as are some of the things written in them.

Here are the Other Theories (and the real risks)

The other possible explanations for many of these sightings actually have some i**mportant risk considerations** to think about if you come across them in your airplane.

First up, **meteor showers** and **falling space debris.** These are pretty common and appear bright and fast-moving for more than a few seconds, particularly if they are entering the atmosphere at a certain angle and are big enough to withstand being immediately incinerated.

The American Meteor Society has a ‘Fire Ball Log’ which you can check to confirm whether your ‘UFO sighting’ was spotted by someone else and logged as meteor.

You can also keep an eye on the calendar for the reoccurring meteor showers which light up the skies each year.

The real risk here is fairly minimal. Aside from being a distraction, these are not going to hit an aircraft. Space debris is potentially another matter, and something we talked about here if you want to read up on it. The recent “return” of a Chinese Satellite gave some cause for concern just because of its size, and unguessable re-entry point.

The second theory (well, theories) are more earth-based. **Atmospheric balloons** and **Chinese lanterns** have been mistaken for UFO’s in the past – and these are often released without regard for how close they might get to aircraft. In 2018, an airplane narrowly missed a lantern while cruising at 20,000ft and despite being relatively thin these can still cause damage if ingested into engines.

In 1970, Aeroflot 1661 crashed shortly after take-off after colliding with a weather balloon. However, Radiosonde balloons are generally Notamed given their size and proximity to airports when released, so you should be aware of these in advance.

Rocket Launches. And other launches for that matter. An experimental rocket test in Norway caused concern after atmospheric conditions produced a bizarre illusion in the skies. It was in fact a missile test from Russia which went wrong, resulting in a spectacular (and presumably quite expensive) cloud.

Rocket launches mean prohibited airspace, so when they are going up they shouldn’t be an issue to aircraft. The FAA are reporting rocket launch site on charts nowadays, and you can find launch dates published on their Temporary Flight Restrictions page.

Clouds. Yep, weird clouds have confused people into thinking a spaceship is loitering nearby. Lenticular clouds often form over mountains when moist air is pushed up over them. The time to watch out is when you see lines of these sitting beyond the mountain crests because they can mean some pretty serious

mountain waves are out there – and this means turbulence.

Other planets, even the Moon, have been mistaken for other flying objects by pilots.

A crew once took evasive action because they mistook Venus for another aircraft. In all fairness, they didn't think it was a UFO so much as a C130 known to be in their near vicinity. This incident boiled down to a loss of SA, and a lot of fatigue.

Then there are **drones, UAVs, UASs.** The FAA have a website dedicated to reports on sightings of these, and it is important to report them because they are a genuine threat to aircraft when they encroach on airspace they should not encroach upon.

So, do we need to keep an eye on the sky?

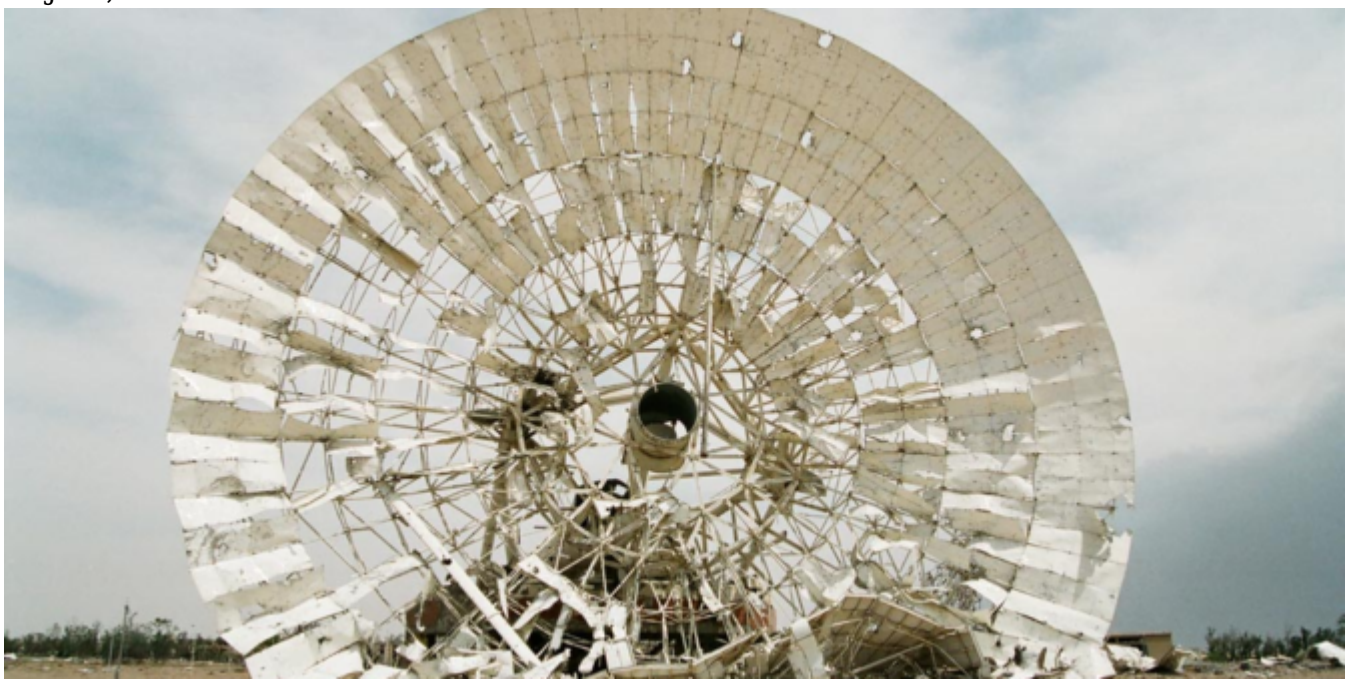
Regardless of whether you think something is terrestrial or extra, **if there is an unidentified object in your airspace – report it**. It might be a real and immediate hazard to other aircraft, and recognizing what you see out there for what it really is will also help avoid the real threats.

A preliminary US intelligence analysis of unidentified aerial phenomena has concluded that such incidents are at least a threat to flight safety and potentially present a broader hazard. Particularly because they are often physical, and are one more thing inside already cluttered airspace.

Of course, UFOs might really be aliens coming to say hello. Some of the mysteries are still, after all, unsolved…

GPS U/S in the US

OPSGROUP Team
29 June, 2021



We have written a fair amount on worldwide GPS Jamming issues. Here is what we said about it in 'GPS Jamming: All the Wrong Signals'. But there is another GPS problem though which is a little closer to home

(if your ‘aviation’ home is in the US anyway).

What’s the deal?

Let’s take a step back to 2017, when the NBAA and a bunch of other stakeholders took part in the 2017 RTCA tactical operation committee. That’s the **Radio Technical Commission for Aeronautics** and they are great – they try and help find compromises amongst the competing interests on critical aviation modernization issues.

One of these very issues is with GPS.

The FAA’s NextGen modernization program is using more and more GPS ‘stuff’. Stuff that is critical for commercial flight operations safety and efficiency. The US Department of Defense on the other hand is sort of doing the opposite – they are running GPS Jamming tests which are critical for National Security and the **big problem** with this is that the jamming tests often interfere with the GPS signals civil aircraft are using.

What was the 2017 outcome?

After they talked about it in 2017, the compromise was that the DoD will notify the FAA at least **120 hours before any planned tests.** This should give the FAA time or put out Notams to warn crew and operators.

Problem solved?

Unfortunately not. The 120 hours notification is given, **but the information which filters down to the pilots and operators who need to know about it often not sufficient.** One of the difficulties is that the Notams have to provide information on different outage locations and this means **looooooooong Notams** filled with lots of Lat and Longs and times and dates. And this means critical information can sometimes get buried inside and makes it difficult or confusing for the crew to find it, extrapolate it (or even be aware of it in the first place).

What’s the plan now?

Well, the NBAA have reported on this, and say that the FAA are taking their concerns onboard. They plan to revisit the idea of producing **visual representations of the outage areas.** These will be much easier to digest than lines of lat and longs, and would hopefully enable crew to use them in conjunction with planning apps in the future.

There has also been a reminder issued to crew asking them to **report outages and issues.** If you find yourself in a jammy area, let ATC know. Tell them what you have lost so that they can warn other aircraft in the immediate area. The reminder has been sent to ATC as well because in the past, when aircraft have made these reports, the information has not always been shared out to other operators in the near vicinity.

What do you need to look out for?

What an outage means, practically, is interference to the GPS signals which your navigation system is using. The result can be a **degradation in accuracy, or a full loss of the system** (GPS primary).

If you are enroute, let ATC know your capability has been degraded so you can get the support you need to continue navigating safely.

Some aircraft are particularly sensitive to disruption in the GPS signals, and it can lead to you losing that system until it is reset on the ground. **This means RNAV/RNP approaches might not be flyable anymore.** Having an awareness of what this means for your aircraft is important. Think about your plan B for approaches in case you do loose GPS navigation capability.

Notams are out there and it might be frustrating picking out the areas which could impact you, but knowing about the outage spots in advance will help.

Where can you look for info?

- The Navigation Center website is run by Homeland Security, and this is where you will find notices of GPS service interruptions and a link to their GPS Testing Notices. You can also file reports here if you encounter unexpected disruptions.
- This will take you to the Official government page on GPS.
- Your WAAS monitoring site is here. There are some good real time maps of current coverage
- The FAA also have a site where you can find Notams specific to GPS outages.

The 5G Update

We thought we'd throw in a little update in on this as well.

Last year we saw increasing concerns about possible **interference from 5G networks** because they operate on the same slice of radio spectrum usually reserved for Radio Altimeter signals (the 3.7-3.98 GHz band).

The big concern here is that interference could result in degradation of accuracy from spurious emissions, or outright failures in the radio altimeters. Not sure how much of a risk that means? Well, Turkish Airlines TK1951 crashed in EHAM/Amsterdam Schiphol in 2009 and one of the primary factors was attributed to a malfunctioning radio altimeter which sent an erroneous -8ft reading to the autothrottle system, commanding it to idle.

The NBAA are fronting a campaign here as well. Twenty organizations have joined forces to send the FAA a letter raising their concerns over this, in response to a report issued on March 3 that they don't feel addresses the threat with enough analysis.

You can read the letter here.

Military aircraft and UAVs are also at risk here. Their radio altimeters use the same C-band frequencies, but they tend to fly a lot nearer the ground a lot more often. A very good summary of the issue can be found here.

No overnight ATC in Suriname airspace

David Mumford
29 June, 2021

Watch out if planning to overfly the **SMPM/Paramaribo FIR** this week – there's an **ATC strike happening each night between 0100-1100z**, finishing at 1100z on June 4.

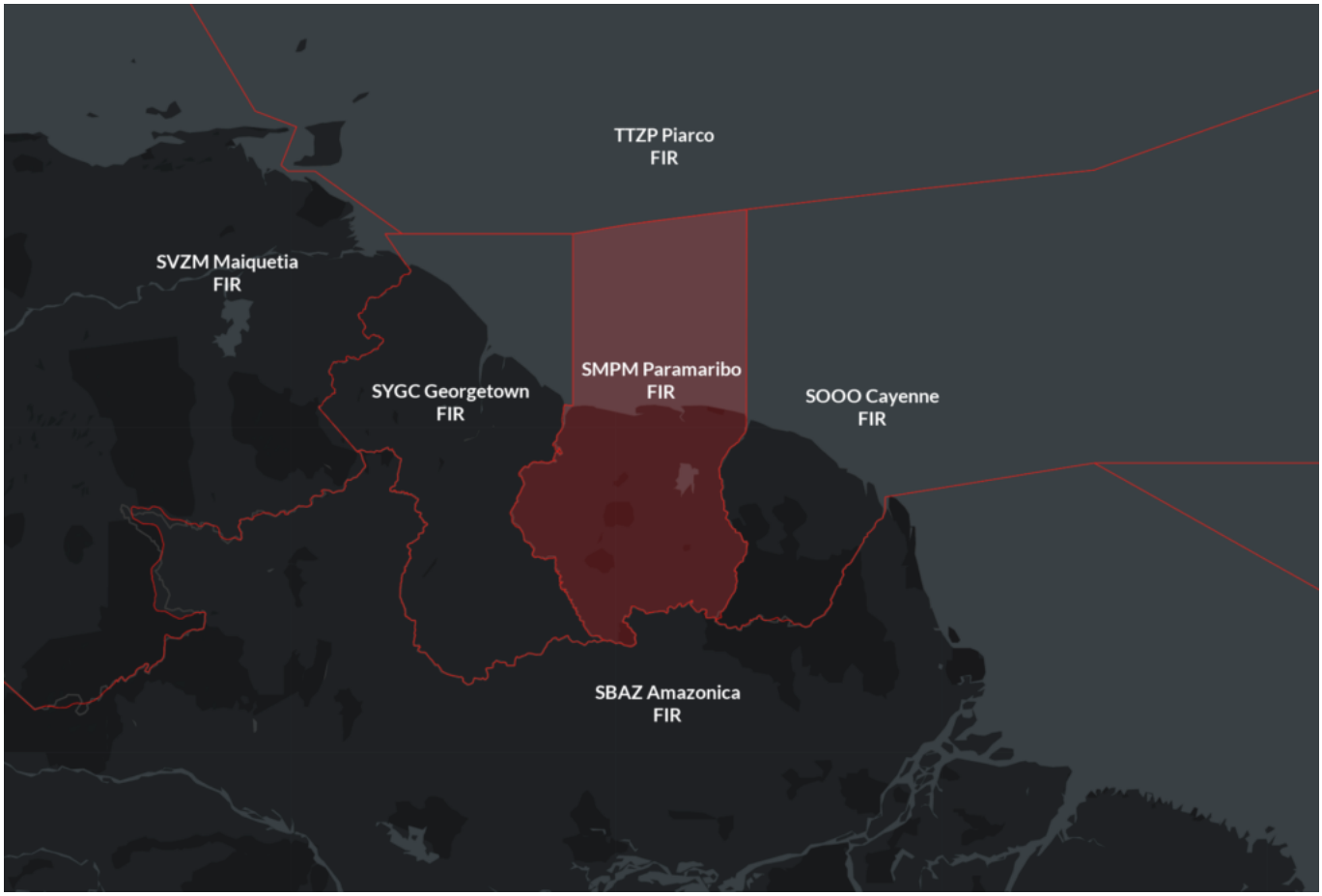
Each night, the airspace will effectively be uncontrolled with Contingency Procedures in place:

- Neighboring ACCs will be controlling the airspace
- Only certain routes are available
- No speed/level changes are allowed.
- Only medevac and emergency flights will receive any air traffic services.

Here's the Notam:

```
SMPM PARAMARIBO (ACC)
A0063/21 - DUE TO INDUSTRIAL STRIKE NO ATC SERVICE AVBL
ATM CONTINGENCY PLAN FOR PARAMARIBO FIR ACT
ONLY MED AND EMERG FLT WILL REC ATS.
DAILY 0100-1100, 29 MAY 01:00 2021 UNTIL 04 JUN 11:00 2021.
CREATED: 27 MAY 23:01 2021
```

Here's where we're talking about:



Procedures for the neighbouring ACCs:

a. Transmit Flight Plan messages to Paramaribo ACC through AMHS.
b. Authorize entrance into Paramaribo FIR, in agreement with the longitudinal separation established in this Contingency Plan.
c. Do not authorize any Flight Level or speed (Mach number, if applicable) change in the 10 minutes prior to the aircraft entrance into Paramaribo FIR.
d. Instruct pilots to keep the last assigned Flight Level and Mach number while over-flying Paramaribo FIR.
e. Instruct pilots to contact the adjacent ACC as soon as possible and at least 10 minutes before the estimated times over exit point of Paramaribo FIR.

Pilot and operator procedures:

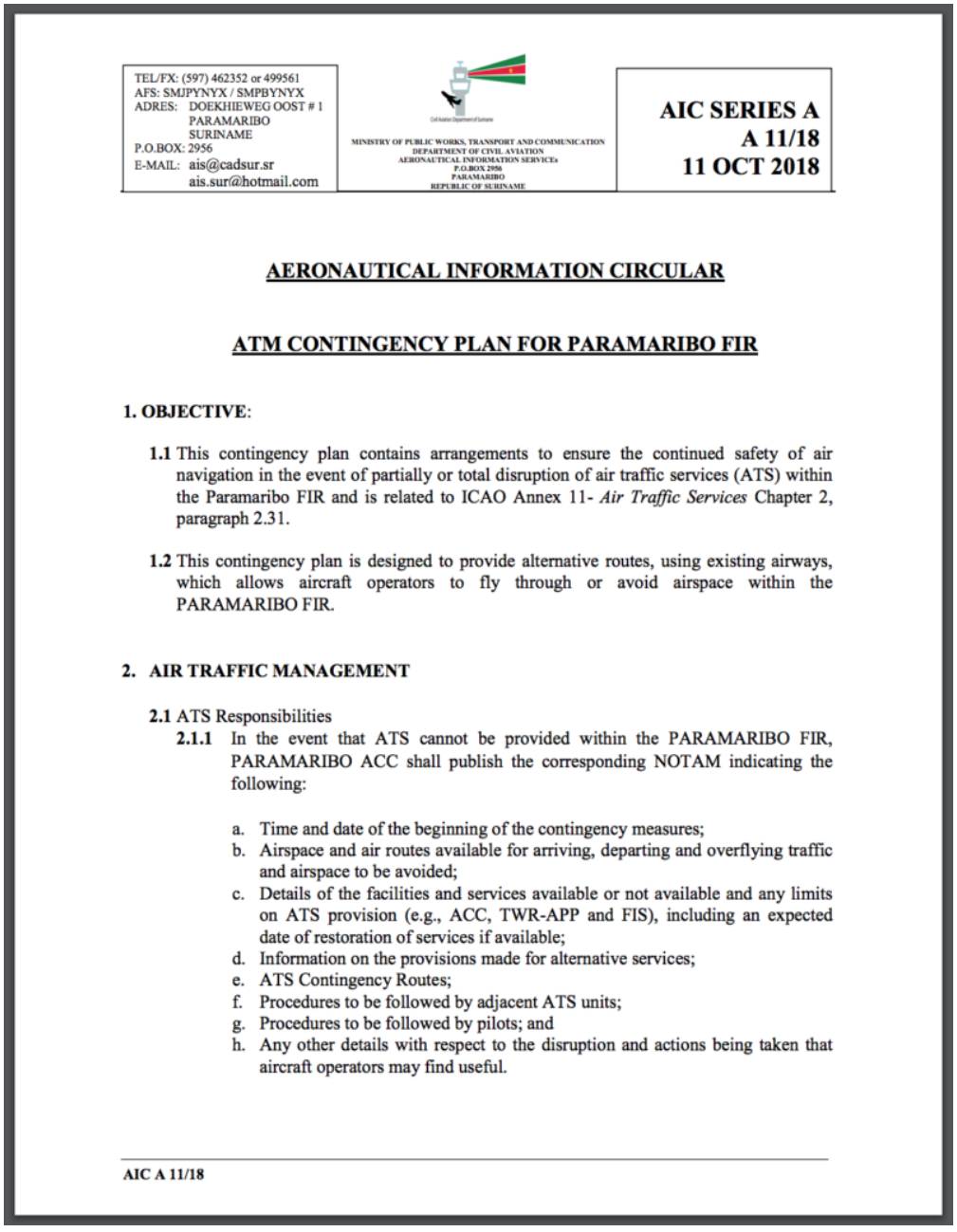
a. Pilots shall include in the last position report to the competent adjacent ACC the estimated times over entry and exit points of the PARAMARIBO FIR.
b. Aircraft are to operate as close as possible to the centreline of the assigned contingency route.
c. contact the competent ACC as soon as possible and at least 15 minutes before the estimated times over exit point of PARAMARIBO FIR.
d. Keep navigation and anti-collision lights continually on while PARAMARIBO FIR is being overflown.
e. Maintain the flight level and the Mach number assigned by the competent adjacent ACC while operating within PARMARIBO FIR, unless for emergency or flight safety reasons.
f. Pilots need to continuously guard the VHF emergency frequency 121.5 MHz and should operate their transponder at all times during flight.
g. Transponders should be set on a discrete code assigned by the adjacent stations of PARAMARIBO ACC or select code 2000.
h. whenever emergencies and/or flight safety reasons make it impossible to maintain the flight level assigned for the transit through the PARAMARIBO FIR;

- The pilot shall immediately inform all other aircraft of the emergency, eventually level change,

using blind transmissions on emergency frequency 121.500 MHz and on pilots' air to air frequency 123.450 MHz.

- Broadcast every position and intention on emergency frequency 121.500 MHz and on pilots' air to air frequency 123.450 MHz.

To check which routes are available, check out the Contingency Plan in full here:



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AIC SERIES A
A 11/18
11 OCT 2018

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ATM CONTINGENCY PLAN FOR PARAMARIBO FIR

1. OBJECTIVE:

1.1 This contingency plan contains arrangements to ensure the continued safety of air navigation in the event of partially or total disruption of air traffic services (ATS) within the Paramaribo FIR and is related to ICAO Annex 11- *Air Traffic Services* Chapter 2, paragraph 2.31.

1.2 This contingency plan is designed to provide alternative routes, using existing airways, which allows aircraft operators to fly through or avoid airspace within the PARAMARIBO FIR.

2. AIR TRAFFIC MANAGEMENT

2.1 ATS Responsibilities

2.1.1 In the event that ATS cannot be provided within the PARAMARIBO FIR, PARAMARIBO ACC shall publish the corresponding NOTAM indicating the following:

a. Time and date of the beginning of the contingency measures;
b. Airspace and air routes available for arriving, departing and overflying traffic and airspace to be avoided;
c. Details of the facilities and services available or not available and any limits on ATS provision (e.g., ACC, TWR-APP and FIS), including an expected date of restoration of services if available;
d. Information on the provisions made for alternative services;
e. ATS Contingency Routes;
f. Procedures to be followed by adjacent ATS units;
g. Procedures to be followed by pilots; and
h. Any other details with respect to the disruption and actions being taken that aircraft operators may find useful.

If you need to contact the authorities in Paramaribo, here are their details:

Paramaribo ACC
E-mail: pengelacc@gmail.com and radha_atwaroe@hotmail.com
TEL: 00597-325203 or 00597-8555025

International NOTAM office
E-mail: ais.sur@hotmail.com and ais@cadsur.sr

TEL: 00597-462352 or 00597-499561

Belarus: Politics, Piracy or Airspace Risk?

Chris Shieff
29 June, 2021

Several countries and aviation bodies have urged airlines and operators to **avoid the airspace of Belarus** following the country's interception of an international flight bound for Lithuania and forced to land in Minsk.

Is there any cause for additional concern? Or was this a one-off event that poses no additional threat to airspace safety?

Here's what happened:

- On Saturday, a Polish registered Ryanair 737-800 was operating a commercial flight between Athens and the Lithuanian capital, Vilnius. Toward the end of the flight while overflying the UMMV/Minsk FIR, **ATC suddenly instructed the flight to divert to UMMS/Minsk** due to a security threat onboard.
- They were **not allowed to exit Belarusian airspace** despite being closer to EYVI/Vilnius at the time.
- There are unconfirmed reports it was **escorted to Minsk by a fighter aircraft**.
- Believing the threat to be genuine **the crew squawked 7700 and made an emergency landing** where all passengers were subjected to additional security screening. One passenger of particular political interest to Belarusian authorities was **arrested and detained.**
- **No bomb was found** and the flight was cleared to depart seven hours later. It continued on to Vilnius (minus the arrested passenger).

Operational impact and airspace risk

The forced landing of this flight was politically motivated, and the crew were misled into believing that there was a credible security threat against the aircraft. Understandably, this is of major concern to civil aviation.

The perspective that OPSGROUP takes on any aviation-related incident or situation, is formed solely through the lens of **operational impact to our members**; in other words, "**what does this mean for the flight we want to operate tomorrow**". If I am a pilot planing to operate a flight through the Minsk FIR tomorrow, am I subject to heightened risk of any kind?

Purely from this standpoint, we view this as a one-off incident, that is not likely to recur. We do not consider there to be additional risk to aircraft flying through the Minsk FIR.

But it's still a major incident ...

That does not mean that we are downplaying the magnitude of this event. The conventions and agreements that protect civil aviation are and should continue to be sacrosanct. **Aviation itself here has been hijacked**, not just this Ryanair aircraft: a dictator-led state has used the civil aviation system for its own nefarious, political purposes.

And as we have seen from the EU ban on Belarus related flights announced this week, the political response has been swift and strong.

But again, purely from an operational perspective, we must differentiate between **political sanctions** and **genuine airspace risk warnings**. The Belarus response is heavily weighted to the former, not the latter.

What aviation authorities are now saying

ICAO has issued brief statements online expressing concern, but are waiting for the circumstances of the incident to be investigated further.

EASA has published a Safety Information Bulletin saying that both EU and Third Country Operators should avoid the UMMV/Minsk FIR. However, EASA says it does not believe the safety concern relating to the incident comprises an "unsafe condition" that would warrant a Safety Directive which would force airlines to comply.

Latvia and **Lithuania** have banned all flights to/from their airports if overflying the UMMV/Minsk FIR. **The UK**, **France**, and **Canada** have all published Notams advising operators not to overfly the airspace of Belarus, and it seems highly likely that more countries will issue warnings in the coming days.

For an up-to-date list of these warnings and advisories, you can check the **SafeAirspace.net page for Belarus** here. SafeAirspace is a Conflict Zone & Risk Database, and we maintain this warning system to alert operators to tangible, credible threat information that should impact their flight planning decisions. **To repeat – we do not consider there to be additional risk to aircraft flying through the Minsk FIR following this recent incident.** However, with SafeAirspace.net we simply want to ensure that operators have a single source for all official risk warnings and advisories issued about individual countries, and it's for that reason we have listed Belarus on the site.

How unprecedented is this?

It's not a routine event for a country to force an overflying aircraft to land, but it's also not as rare as you might think. Usually, a forced landing and/or fighter intercept occurs because of unpaid navigation charges, or the lack of an overflight permit. Each country publishes intercept procedures, so that pilots know how to respond to a military interception.

Indonesia is well known for this, and it doesn't usually make headline news, but it did in 2019 when they forced an Ethiopian Airlines aircraft to land in Bantam. In 2016, **Iran** forced a Fly Dubai aircraft to land in Iran, following confusion about its flight plan. **Peru** is also known for forcing enroute aircraft to land because of issues with overflight permits.

Politically motivated interceptions are also not without precedent. In 1985, the Interception of EgyptAir 2843 followed US intelligence received reports that four Palestine Liberation Front Terrorists, responsible for hijacking a cruise ship, were located at an airfield near Cairo, and that **Egypt** was planning on flying them out to Tunis aboard an EgyptAir airliner. The flight was expected to route over international waters, close to a US Navy ship, and so the US coordinated with local ATC to ensure the aircraft was refused landing at both Tunis and Athens, and a pair of Tomcats were sent up to force the airliner to divert to a NATO base in **Italy**. Once on the ground the hijackers were removed and detained.

In 1977, **Lebanon** accused Israel of 'Air Piracy' after they forced a Lebanese Middle East Airlines aircraft to land in **Israel**. The aircraft was en-route from Beirut to Baghdad, when it was intercepted by two Israeli fighters and diverted to an Israeli military air base in Haifa. Israeli intelligence thought the aircraft was carrying leaders of the Popular Front for the Liberation of Palestine. In fact, it did not have them onboard but had been chartered by Iraqi airlines following a delay by one of their own aircraft. The crew and passengers were all forcibly removed from the aircraft add interrogated, according to reports, but were released and able to depart some two hours later.

Bottom line

For now, our guidance to crews and aircraft operators is to follow whatever your national aviation authority prescribes in the first instance – and we may expect to see a US FAA KICZ Notam on the way in similar fashion to the EU ban announced this week.

Outside that, it's your choice as to whether to operate through Belarussian airspace, or not – but be aware of the difference between **politically motivated sanctions** (even if that motivation is highly justifiable) and **genuine airspace risk**.

In rushing to respond to this unusual hijacking of civil aviation protocols, we must be careful not to create another hijack in turn – the trustworthiness of conflict zone and airspace risk warnings.

When Worlds Collide: Commercial Space And Civil Aviation

Chris Shieff
29 June, 2021

Change is in the stars, literally.

Cheaper launch costs, reusable rockets and the world's insatiable appetite for space based technologies have dangled a cosmic carrot for private enterprise to make money in space. **The commercial space industry is booming**. It turns over hundreds of billions of dollars each year and will hit the trillions by 2040.

This means more launches and re-entries than ever before as demand for earth's lower orbit soars. In the US alone there have been sixty-five licensed commercial launches since the start of last year shared among twelve different launch sites – that's a lot of rockets.

Space is also the realm of the billionaire visionary. Richard Branson's Virgin Galactic aims to soon make space tourism a reality. Over at Space X, Elon Musk dreams of colonizing Mars while Jeff Bezos seeks to inhabit our moon. Ambitious plans are on the horizon.

We're on a Collision Course

The problem for commercial aviation is that **the space industry needs our airspace** more than ever. There's no other way to the stars than straight through it.

Unless we find new and more efficient ways of sharing it, an increasing burden will be put on aviation to accommodate more and more launches in our skies.

The cost will come in more time, more fuel and more emissions.

Here's the problem.

Space launches used to be a pretty rare occurrence. Across its career, the Space Shuttle for instance averaged only five launches each year.

Procedures haven't changed a great deal since then either. When a rocket is launched, **large chunks of airspace are closed for long periods of time.** And once it's all over, everything gets reopened. Safe right? But practical?

Not really, when staring down the barrel of hundreds of launches per year.

Take the US for example. The majority of launch sites are located on the coast and affect oceanic airspace. When you factor in the type of launch vehicle, its trajectory, where it will go if it needs to abort, where its boosters will land and any other hazards the airspace closures **quickly become huge.**

Launch sites in California affect Pacific routes. A single mission can affect half of the airspace between Hawaii and the West Coast. Launch sites in Virginia and Florida affect North Atlantic routes and lead to congestion in other airspace, such as Jacksonville.

Launch windows are also hours long, with **backup windows** in case of poor weather.

A famous Space X launch back in 2018 is a great example. You might remember the one – it delivered a small red Tesla Roadster to space in the very first test launch of the Falcon Heavy rocket.

Its launch window was open for two and half hours. Due to unfavourable winds, it used up most of that. In the meantime, the FAA couldn't re-open the airspace above it.

While the world waited for **a ten minute launch, 563 flights were delayed and 34,841 extra miles were flown.** 5,000 square miles were affected resulting in cumulative delays of seventy-seven hours.

That's an expensive ride to space.

What's the solution?

ALPA suggested that the current approach is based on *segregation* – keeping airplanes away from rockets. But the future relies on *integration*.

In a nutshell, here's what they suggest to make it happen:

Better Comms.

Broadly speaking, spaceflights need to be operated using similar procedures to how we manage earth-bound traffic.

Just like flight plans, launch plans could be introduced with similar details which can be communicated to all other airspace users and controllers in real time and amended when disruptions inevitably happen.

Existing technology used for remote or oceanic airspace can help here too. Fancy things such as next-gen HF and datalink could be used for live communication between pilots, air traffic control and space operators.

Better Surveillance.

It's already on the way. The FAA's Space Data Integrator is a huge step forward in automating and simplifying the flow of live launch and re-entry data so that areas of risk to aircraft can be more efficiently predicted. The project has global potential.

Space-based ADS-B is another opportunity. Already making a big impact over the NAT, it could also be used for spacecraft, including their boosters during re-entry to help air traffic controllers manage airspace closures far more efficiently.

Better Sep.

With technology leading the way, we can begin to safely reduce the margin between aircraft and spacecraft. New international standards would need to be developed to make this happen – and both industries would need to be onboard.

With all these launches, what about debris?

Are we actually at risk?

The uncontrolled re-entry of debris from China's Long March 5 rocket raised a few eyebrows (including NASA's) a couple of weeks back when it splashed down east of the Maldives in the Indian Ocean.

For several days **no one could say for sure where or when it would re-enter**, making the issue of accurate aviation warnings impossible.

The launch and re-entry phases of space flight are usually protected by airspace restrictions designed to keep us well away from anything that could go boom. And unlike anti-aircraft weaponry designed to actively seek out aircraft, space-bound rockets only present a ballistic risk – in other words, **being in the wrong place at the wrong time**. But this is solved by closing airspace.

Space debris is another danger, albeit a tiny one. It poses far more danger to people on the ground that it does to us up in the air. Admittedly there is a bunch of it up in orbit – 170 million pieces to be precise, but the US Government estimates that only about 400 of them re-enter each year. **That's about one per day.**

A recent study actually crunched the numbers. The chances of a single piece of space debris (such as that from China's Long March 5) hitting an aircraft is somewhere in the realm of a tiny fraction of a percent. That's not to say it can't happen – back in 2007 an A340 operating over the South Pacific came uncomfortably close, but the odds of a direct hit are almost zilch.

So far more pressing right now is how we fit two industries into one sky.

The sky's the limit.

NASA and the FAA have an MOU regarding spaceflight, where they have committed to working together to **improve safety and integration** between space and earth based operations.

The FAA have also recently announced new symbols on their navigation charts, showing launch sites for better pilot awareness. Your first point of call remains the published TFR list, and notams regarding launch windows.

The potential **benefits of commercial space travel are huge**. But practically speaking both industries need to keep working on better and more efficient ways to share airspace. Otherwise **we are all headed for one heck of a traffic jam** up there.

Dangerous Goods: The Bad Ones

OPSGROUP Team
29 June, 2021

IATA recently ‘urged action’ over rogue lithium-battery shippers. Folk are apparently sneaking them onboard without proper notification or packaging, and this could turn into one big, hot mess for airlines.

So, here is a closer look at Lithium Ion batteries, what they are, what they can do, and how to better deal with them onboard.

What are they?

In big terms they are things that **power a lot of our airplanes**. In smaller terms, they are the **batteries in our phones** and portable electronics.

And in **super simple terms** (and with some creative licence thrown in) they are a cell that contains an electrolyte liquid. **Lithium Ions** get all charged up, and when they are feeling particularly positive, they dive into the electrolyte and swim through it. The movement of them gets the **electrons all excited too**, and they go zooming along from the current collector, through the device (your phone, laptop, airplane) which sucks out their charge, and then they get collected up by the negative current collector.

They are different to regular Lithium (without the ion) batteries because **they are rechargeable**. They also have no memory effect (they don’t get lazy when repeatedly recharged) and they have good energy-to-weight ratios.

What is the risk?

They sometimes go into **thermal runaway**, usually when charging, but also if you bash them about (think iPhone stuck under business class seat, getting repeatedly run over by the chair mechanism as the passenger tries to pull it out again).

Thermal runaway, as the name suggests, involves them getting really hot – so hot it reaches the melting point of the metallic lithium and causes a **pretty horrid reaction** when it just keeps getting hotter and hotter until **flame, fire, explosion…**

You might think a small phone would not be much of a hazard but there are a lot of **very flammable things in your airplane cabin**. And there are a lot of things with lithium ion batteries in them that people bring onboard.

Then there are airplane batteries themselves. Boeing had an issue early on with their 787 Lithium Ion

batteries leading to an **All Nippon Airways 787** having a pretty serious incident with one before the problem was resolved.

The biggest risk though comes from those in the cargo bay. Particularly the ones that you don't know are there, should not be there, and which you cannot monitor. A UPS 747 crashed in Dubai after LI batteries in the cargo hold caught fire. The report suggested the heat and smoke from the fire disabled the crew oxygen system and **entirely obscured their view within 3 minutes** of the initial warning.

What can we do about them?

Most airlines will have a procedure written into their manuals, but it is worth a quick recap because there are some important bits to note.

- If it has **flames, use Halon**. If you are using halon (in the cockpit) make sure at least one of you puts a smoke hood on – the stuff is very bad for you.
- If there are no flames and it is just smoking hot, then **cool it down** by pouring water or a non-alcoholic liquid on it. If it is a laptop or something fixed in the cockpit then have a little think before you go slugging water on it though, because there are other electrics around which might not like it that much.
- **Don't try to pick it up** (without gloves on). **Don't cover it with ice** thinking this will help cool it better, because it actually just insulates it more making it hotter. Don't put it in fire resistant bags for the same reason.
- Once it is safe to move, use fire gloves and **put it in a receptacle** – things like waste bins are good. Fill with water and store it somewhere safe where you can keep monitoring it.

Getting your crew to be vigilant for phones under seats (and passengers not moving said seat until phone is retrieved) is a good plan too.

The Cargo Concern

Lithium Ion batteries in the cargo hold are a different matter. If you have **Dangerous Goods approval** then you will have manuals and info on this. If you don't have DG approval then any mention of Lithium Ion batteries on a NOTOC should be concerning you.

Lithium Ion batteries are a **Class 9 Dangerous Good**. The ones to look out for are the **UN3480 and UN3090** numbers:

- **UN 3090**, Lithium metal batteries (shipped by themselves). These are are not rechargeable and are designed to be chucked out after their initial use. They are actually Lithium Metal batteries. These are prohibited for carriage on passenger aircraft.
- **UN 3480**, Lithium ion batteries (shipped by themselves). These are the rechargeable ones found in your phones and things.
- **UN 3091**, Lithium metal batteries contained in equipment or packed with equipment
- **UN 3481**, Lithium ion batteries contained in equipment or packed with equipment

Lithium Ion batters are allowed to be **carried on cargo aircraft** so long as they have been handled properly. The proper handling, packing, labelling and loading (what they need to be separated from) is all covered by **IATA in their massive DG Manual.** You can get that here, and find some handy online while

you're at it.

Again, if your operator doesn't have DG Approval then this is just for info. If you're wondering whether they do have approval then they don't – crew have to undergo a yearly Dangerous Goods refresher course and you would remember this (because it is generally quite boring).

So, the simplest thing is to not carry them…

That would be great, but unfortunately it is not that simple. **Lithium Ion batteries are in everything nowadays.** They come in all shapes and sizes. So the first step is ensuring your passengers know what they are in, and are aware that they shouldn't be putting these in their checked baggage.

Here is a handy info brochure to give to passengers.

This is a general 'heads up' list of some of the things an LI battery might be lurking within:

- **First up, those luggage bags** which have them installed in them – if the battery can't be removed and is more than 0.3g or 2.7Wh it probably shouldn't be carried. If the battery is under those limits, or if it is removable then it can come onboard but only in the cabin, not in checked baggage.
- **Any lithium ion battery** that is under 2g or 100Wh can generally be brought into the cabin. There is often a limit here (20 per person) but this varies with different operators.
- **Mobility aids** – electric wheelchairs – often cause problems because folk don't always know what their battery details are, and it is the airport staff who have to deal with this. The battery on these has to be in an enclosed container to prevent short circuits, and it must be attached as per the manufacturer instructions, or removed if it can be. If it is removed then it must not exceed 300 Wh or 160Wh if there are two of them on the device.
- **Hidden batteries –** A lot of devices contain batteries. eBikes. Drones. Things that passengers don't always think about.

The Captain probably needs to know about the location of these, so if you see stuff being loaded on and haven't been informed about it, ask.

Finally, **rogue shippers**. Because of the restrictions, people are **sneaking them onboard hidden in incorrect packaging**, and without declaring them. They key to stopping this is going to lie with the airlines, operators and ground staff who need to be vigilant. The crew cannot do much more than mitigate the situation if some are onboard, and do cause issues.

Here is the full note from the US Department of Transport and IATA

What to do if you have an incident

If you have a Dangerous Goods Incident, you need to report it, and usually quite quickly. The FAA info page is here to help.

Lithium Ion battery **fires are extremely hot and burn incredibly fast**. If you think you have LI onboard that might be compromised, get that airplane on the ground as quickly as possible, and get your passengers off.

Want to read some more?

- EASA have a video you can watch
- The NBAA have some good guidance about it too

Going Viral: The non-Covid nasties to watch out for

OPSGROUP Team
29 June, 2021

With Covid running rampant across the globe, other risky diseases have been forgotten somewhat, but there are a fair few out there which can pose a threat to crew on layovers.

So here's a quick round up on **the regions where you might need to cover up, dose up, or just be extra cautious** during your international flight operations, split into sections based on the active travel health alerts that the CDC and other health authorities have out at the moment.

Red Warning Level 3: Avoid all non-essential travel

Guinea – Ebola

They had a serious outbreak earlier in 2021. Actually, cases have reduced significantly and the US has just removed their travel restriction which required travelers coming from Guinea to enter the US via 6 main airports only. Caution is still very much advised though if traveling in the country.

Venezuela – Infrastructure

Not a specific disease caution here, just a warning that their healthcare infrastructure is breaking down and if you are taken ill here you may not be able to access treatment. One to think about if you ever have crew on a layover here.

Amber Warning Level 2: Extra caution

Fiji – Leptospirosis

This really prevalent in Fiji at the moment, particularly rural areas. It is caused by a bacteria spread around by animal pee, and can get into water and soil and live there for months. The main guidance is to avoid swimming or wading in water that could have had infected animals in it. Wear protective clothing and footwear and cover any cuts and scratches with waterproof bandages.

Haiti – Rabies

Haiti currently has a big problem with rabid dogs. The bigger issue is that there is an extremely limited supply of treatment drugs in Haiti, so the recommendation is to get vaccinated before you head there.

Avoid dogs, and cats for that matter – even the cute baby ones. You can catch it if you are bitten, scratched or even licked, and treatment is only effective if administered early. Once symptoms present themselves it is often fatal. Plus, getting bitten by anything is never pleasant.

Polio – Africa and Asia

Everyone should be vaccinated against this. If you are not, get vaccinated (or don't travel) because this is continues to be very prevalent in African countries and there is always a risk.

Nigeria – Yellow Fever

Consider getting vaccinated if you head here regularly, and try to prevent mosquito bites (also, because they carry loads of horrid stuff).

International flight crew generally are required to have had Yellow Fever Vaccinations – if you have not then take care because some countries will not allow crew (anyone) to enter who does not have a vaccination booklet if they have traveled to a Yellow Fever region recently.

What else to watch out for

Malaria

Malaria is a parasite carried around by mosquitos. There are actually four types of it, and it is in a lot of places!

The big risk here is it can take a while for symptoms to show. They reckon you're most likely to have **symptoms between 10 days and 4 weeks** from being infected, but it could take as long as a year. The little beasties also like to loiter around in your liver, popping out at random times when you're run down, and so can cause recurring illness for as long as 4 years after infection.

Where?

According to the CDC it is **found in warmer regions**, which doesn't narrow it down an awful lot – basically anywhere hot and humid where there are places for mosquitoes to breed and grow. Just after rainy season is likely to be the worst, and rural areas will be more risky.

We have borrowed the CDC map because it is easier than trying to list everywhere to watch out.

How to prevent it

If you are going to a Malaria riddled area then you can take preventative medicine, but watch out! Not many are approved for operating pilots because they can have some nasty side effects. Malarone is the

most commonly approved (and generally has the least side effects) but **we ain't no doctor so check with an AME** from your licensing state before taking.

The other option is to slather yourself in deet and wear long clothing to prevent the little nippers from getting at you in the first place.

The Symptoms

- Fever, sweats ad chills
- Muscle ache
- Nausea and sickness

So, basically generic symptoms of about a thousand other possible diseases.

If you have been to a malaria area and are thinking **"I got chills, they're multiplying"**, don't write them off as a random cold – tell a doctor so you can get tested because it can get very serious!

Dengue Fever

Another one to blame on the pesky mosquito, Dengue is **common in over 100 countries**, and over 400 million people catch it every year, 100 million getting sick and 22,000 dying. Dengue Fever is **Malaria's bigger, badder brother**, and there is no specific treatment.

Like Malaria, there are also different strains of the virus meaning you can get different sorts, multiply times.

Where?

Outbreaks are coming across the Americas (including North America, although the mosquitoes aren't there, people just head in already infected), Africa, the Middle East and Asia, and the Pacific Islands. It is most prevalent in **tropical and sub-tropical areas.**

There is currently a growing outbreak in Reunion.

Brazil has the highest rate of Dengue fever in the world.

How to prevent it

Best plan, don't get bitten. Insect repellent is smelly, sticky stuff but it works. Here's what the CDC recommends:

- DEET
- Picaridin (known as KBR 3023 and icaridin outside the US)
- IR3535
- Oil of lemon eucalyptus (OLE)
- Para-menthane-diol (PMD)
- 2-undecanone

There is a vaccine but it is only given to people who have been infected before and have a risk of getting

severe Dengue, and for kids between 9-16 who live in a Dengue area.

The Symptoms

The early, mild ones tend to get confused with other diseases so again, ff you've been somewhere with Dengue, don't assume it is something else. **Go get tested.**

Initial symptoms usually appear within 4 to 10 days:

- Nausea and sickness
- Rash
- Aches and pains, especially behind the eyes and in bone joints and muscles

These last around a week, unless you develop serious Dengue fever, which 1 in 20 do:

- Belly pain
- Vomiting (a lot)
- Bleeding from nose and gums
- Lethargy

Zika

This one made the news a few years ago as it can cause serious birth defects. The symptoms for most tend to be fairly mild though.

It is also transmitted by our old friend the mosquito and there is no particular treatment so your preventative tricks are the best – don't get bitten!

Chikengunya

Transmitted by mosquitoes, this has very similar symptoms to Dengue Fever and Malaria, and is found in all the same spots.

There is no treatment for it and no vaccine to prevent it, so preventing bites is really important.

There are currently serious outbreaks in Brazil, and in Asia (Vietnam, Philippines)

Ebola

This is a nasty one, often deadly, and **causes lasting damage.** They don't really know where it comes from but it possibly started with monkeys and apes and was passed onto us human folk.

It is spread through direct contact with all the gory stuff that comes out of sick people.

Where?

Guinea had a major outbreak in 2021, but cases have fallen again. The US previously restricted travelers from here, and from the DRC, only allowing entry through 6 specific airports.

In 2020, the DRC (formerly Zaire) had a major outbreak.

It is most common in African countries, particularly the central African countries, and along the north west coast.

How to prevent it

It is spread through bodily fluids so avoiding contact with these is important. You also should avoid contact with animals that live in Ebola regions. Bats, primates, forest antelope all carry stains of the virus. **So don't eat them.**

There is a vaccine but it is only used in areas where an outbreak is occurring. There is medicine for treating it, and the do help survival rates. You also need medication to support blood pressure, to manage the fever etc, so this really is a serious disease which you do not want to catch

The symptoms

These can appear between **2 and 21 days of infection, usually around the 8 day mark**. The main symptoms are:

- Fever
- Severe aches and pains
- Sore throat
- Loss of appetite
- Gastrointestinal symptoms
- Unexplained hemorrhaging, bleeding and bruising

Yellow Fever

This is **pretty rare nowadays**, but still on to watch out for across Africa and South America. It gets its name from the fact it generally causes jaundice.

Insect repellant works well. It is transmitted by the mosquito (again)

There is also a vaccine. It has been used for 80 years and it pretty well tested, safe and effective, with 1 dose providing life long protection. In fact, many countries require travelers to have had the vaccine if they are entering from a country (or have visited one) where there are high incidences of Yellow Fever.

Meningitis

This is serious – it makes your brain and spinal cord membranes swell up which sounds horrid and painful. It can be **bacterial, viral, parisitic, fungal, amebic**… so there are a bunch of different sorts all with varying degrees of nastiness.

Good news though, there is treatment for most, and vaccines. You have likely had some already, it is another one that flight crew are often vaccinated for because this can be caught from all over the place. Bacterial in particular can be in food.

General travel recommendations

The CDC has good guidance for flight crew which you can read here.

Many international airlines require their crew to have the following vaccinations, and they are often

recommended in general for any traveller:

Cholera – Africa, Asia, Central America and the Caribbean

Diphtheria – Africa, south Asia, former Soviet Union. This protects you against Diptheria, polio and tetanus

Hepatitis A – Africa, Asia, Middle East, Central and South America. This is common in places with poor sanitation and hygiene and can be picked up a lot of ways.

Hepatitis B – Africa, Asia, Middle East, Central and South America. This is spread by bodily contact generally.

Japanese Encephalitus – Common in rural areas of Asia with a tropical climate, after the rain season. It is also found in western Pacific island and near Pakistan, China and Australia. Actually, it is rarely found in Japan because they did a mass immunization program years ago. There is a tick borne version too. Also with a vaccine available.

Typhoid – the Indian sub continent, south and south east Asia, South and Central America, Middle East

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Belarus: A closer look at their aviation industry

OPSGROUP Team
29 June, 2021

Belarus is in the spotlight at the moment for their recent, controversial decision to force a foreign civilian aircraft to land under false pretences and for political reasons.

We thought we would take a look at their aviation industry, what you might experience if operating into the region, and a brief review of what it will mean if other countries ban use of their airspace.

Who is 'Belarus'

The Republic of Belarus is a landlocked country in Eastern Europe. They border Russia, Ukraine, Poland, Lithuania and Lativia. The capital is Minsk. Before gaining their independence in 1991, the country was known as Belorussia, or 'White Russia', and was a small Slavic Republic included in the Soviet Union (along with Russia and the Ukraine.)

The are considered a developing country and rank pretty high on the Human Development Index. They are a member the UN and have a decent bilateral agreement with the EU, but are not a member of it.

Tell us about their airports.

The main international airport is **UMMS/Minsk:**

- 13R/31L 11,946ft/3641m ILS CAT I
- 13L/31R 12,139ft/3700m ILS CAT III / CAT I

It is a decent airport with good facilities and no major threats for operating in.

Aside from UMMS, you also have the following airports with customs facilities (although none of them have a runway longer than 9000ft)

- **UMBB/Brest** (not to be confused with Brest, France) with an 8596ft/2620m runway 11/29
- UMGG/Gomel also known as Homiel/Gomel/Pokalubichi with an 8428ft/2569m runway 10/28
- UMMG/Grodna with a 8399fr/2560m runway (limited taxi and apron space) 17/35
- UMOO/Mogilev offering a 8419ft/2566m runway 13/31 (there is one taxiway off the runway so 180° turns and backtracks required here, and very limited facilities)
- UMII/Vitebsk why 8550fr/2606m runway 05/23 (also very limited)
- **UMIO/Orsha** opened in November 2020, offering a new cargo hub for the country. Runway 05/23 is a decent 9846ft/3001m with a CAT II ILS

Tell us about their airspace.

The airspace is what most operators are really interested in. Belarus is a fairly decent sized country which is the main airspace between Russia and Poland, and Western Europe (unless aircraft want to route further north through Lithuania and Latvia).

Above FL275 in the UMMV FIR is Free Route Airspace meaning you can plan directs between Entry and Exit points (AIP ENR 4.1)

Several authorities are currently banning their operators from routing through Belarus Airspace. This means significant detours to the north for aircraft routing to Russia.

The Ukraine borders Belarus and Russia has multiple airspace warnings and restrictions preventing many operators from overflying their airspace, so Belarus is a fairly important trade route for aircraft routing from Western Europe to Russia.

Using Minsk as a connection to Russia can have some customs issues though. Reports suggest Russia considers flights between the two as domestic (leading to cabotage issues with Russian customs), and so

most operators seem to opt for **EYVI/Vilnius or EVRA/Riga** instead.

Tell us about their infrastructure.

Belarus' infrastructure is a relatively aging ex-Soviet one. However, they have focused on improving their aviation infrastructure over the last decade or so. The major airports all offer at least a CAT I ILS landing system, and their en-route navigation facilities meet ICAO standards.

In 2020, the Belarussian government announced they would offer **Minsk as a Fifth Freedom hub**, allowing foreign operators to layover in Minsk, and fly onto other long-haul destinations.

The Aviation Market in Belarus was (pre-Covid) outpacing the growth of the wider Eastern and Central European market, with short haul carriers such as Wizz looking to increase flights to the country.

Tell us who to talk to if we want to fly there.

You need overflight and landing permits if you are a private or commercial operator. Easiest way is to fill out Form 2 and send it by AFTN direct to the authorities. They need 3 days notice if you're heading to an international airport, and 5 if you want to fly to a domestic one.

The email for the Belarus CAA is ops@ban.by
AFTN: UMMDYAYX +375 17 222 5517

If you want to get in touch direct with someone at UMMS/Minsk airport then their admin number is +375 17 279 1436 or you can try one of the main handling agent, Belavia at +375 17 220 2555.

The Belarus AIP is available online http://www.ban.by/AIP/Belarus210715/html/index.html

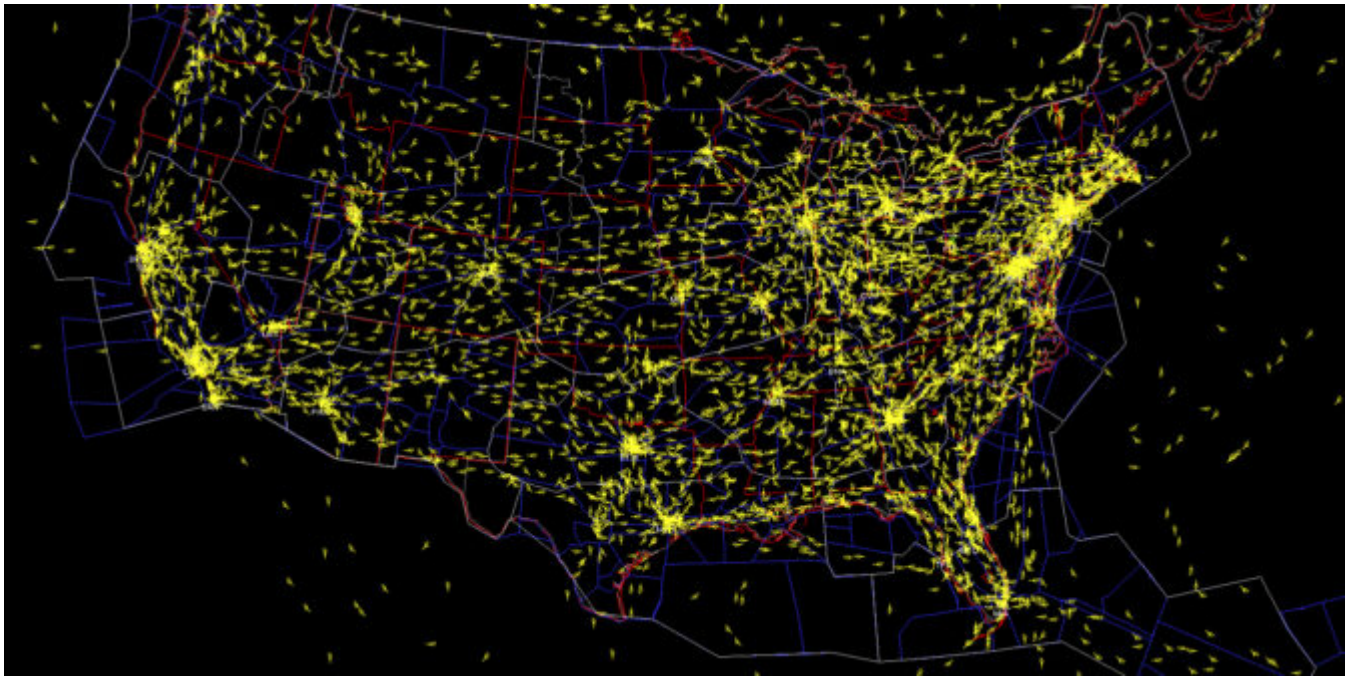
Anything else to tell us?

Notam O0401/21 is in force from Apr 30 to July 31 closing runway 13R/31L at UMMS

For updated information on current airspace advisories and restrictions, check out our article on the current events surrounding Belarus.

The Gateway to the Skies

OPSGROUP Team
29 June, 2021



If you have not heard of the IFP Information Gateway then here is a little summary for you. It is the Instrument Flight Procedures Information Gateway which is, according to the FAA who run it, ***your centralized instrument flight procedure data portal.***

It's a handy site because it provides you with a single-source, one-stop-shop, first place to visit if you need info on any of the following:

- Charts
- The IFP Procedures plan
- IFP Coordination (forms and things)
- IFP Documents
- IFP Request form – this is where you can submit a request or query on an IFP. SO if you fly somewhere and think an IFP needs creating, amending or cancelling, you can do it here!

And this **isn't just for US pilots** – it is pretty handy for anyone flying into the US who flies IFR procedures.

The Optimisation Project

This is a major project that the FAA are undertaking. They are **reviewing their entire inventory** of equipment and procedures as part of a plan to modernize the National Airspace infrastructure – to improve airspace and airport efficiency and safety.

The NAS covers an area of something like **30 million square miles**, so it is a big project.

What is the plan?

The **introduction of PBN (performance based navigation)** is a big part of the modernization. If you fly into the US then you need to know about this, because it is going to mean **changes to routes and procedures, airspace and equipment** required.

Charts are being updated to remove unnecessary clutter. In 2020 they cancelled 1,000 procedures and

took out things like circling minima on charts that no longer needed it. You need to know about this because it will **impact chart validity, and things like minimus** are airports you might use.

As for the inventory check – they are reviewing all the procedures at airports and deciding which to keep, which to cease, and which just plain old need updating. This will start with the **decommissioning of any ancient VORs and NDBs** which no longer support the operations network. You need to know about this because there will be ongoing changes to the approaches available at airport.

Give us some more details on the inventory checks

The FAA are going to review all procedures.

Why?

Well, because having looked over some data they reckon at least **20% of current IFPs have pretty limited benefits** to the NAS. If procedures are not being used then retiring them means lower admin, maintenance and training costs. It also means more efficient and effective airspace management, which means improved safety and access.

Take **KSEA/Seattl**e for example. They have an RNAV RNP approach and a GPS approach for runway 16L. The RNAV RNP was **only flown 17 out of a whopping 191,448 IFR arrivals.**

It has higher minimum and an identical flight path to the GPS approach so there is really no reason for this approach to exist.

RNAV (RNP) Z RWY 16L

SEATTLE-TACOMA INTL (SEA)

APP CRS	Rwy Idg	11901
164°	TDZE	433
	Apt Elev	433

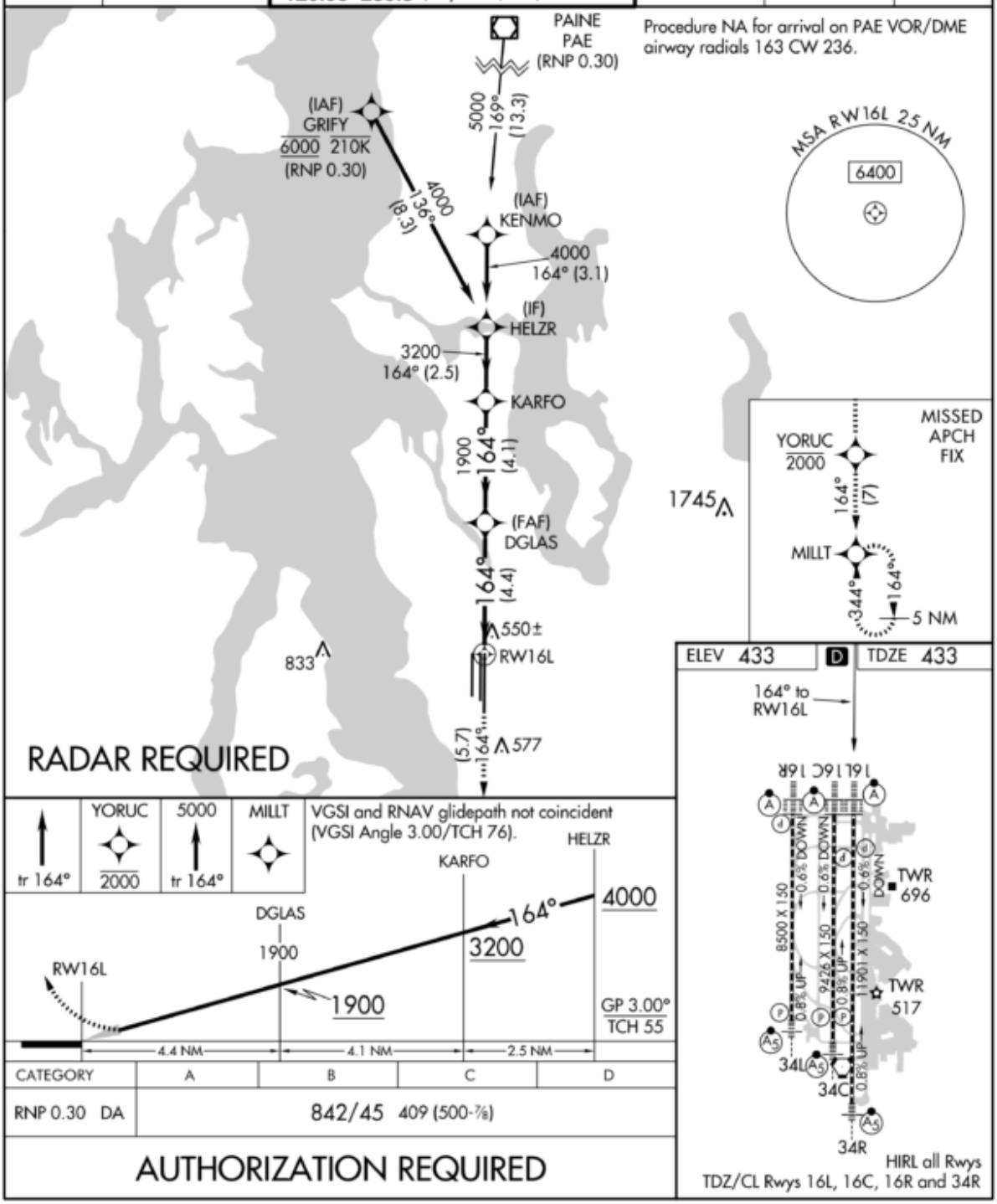
For uncompensated Baro-VNAV systems, procedure NA below -6°C (22°F) or above 54°C (130°F). Simultaneous approach authorized with Rwy 16R. GPS required. Use of FD or AP providing RNAV track guidance required during simultaneous operations. For inop ALS, increase RNP 0.30 all Cats visibility to 1⅜ mile.

ALSF-2

MISSED APPROACH: Climb on track 164° to cross YORUC at or below 2000, then climb to 5000 on track 164° to MILLT and hold, continue climb-in-hold to 5000.

D-ATIS	SEATTLE APP CON	SEATTLE TOWER	GND CON	CLNC DEL	CPDLC
118.0	133.65 273.45	119.9 239.3 (Rwys 16L, 16C, 34C, 34R) 120.95 239.3 (Rwys 16R, 34L)	121.7	128.0	

Procedure NA for arrival on PAE VOR/DME airway radials 163 CW 236.



CATEGORY	A	B	C	D
RNP 0.30 DA	842/45 409 (500-⅞)			

AUTHORIZATION REQUIRED

NW-1, 20 MAY 2021 to 17 JUN 2021

NW-1, 20 MAY 2021 to 17 JUN 2021

KPAE/Paine Field is another one worth looking at. It has a **VOR-A approach which was only flown 95 times out of 10,348 IFR arrivals.** It is under-utilized, costs a bunch to maintain and there are plenty other options. So it is a good one to chop.

What about **KSBA/Santa Barbara** airport and their VOR or GPS approach runway 25? This was also significantly under-utilized, being **flown just 1,732 out of 17,174 arrivals**. However, it is the most commonly used approach for GA traffic, and is the only one available when the wind is favoring that runway. Not such a good one to delete.

The IFP plan won't just review data and statistics, it also engages with the folk using the IFPs to make sure changes are benefiting those it needs to benefit. Santa Barbara won't lose the procedure just yet, although they might get itself a nice new space-based one out of this at some point.

Comments and feedback

If you fly into airports and have comments or feedback on IFPs then get in touch, either by filing in the form, or emailing at 9-AMC-Aerochart@faa.gov. This project is a long, ongoing one, but one that will benefit any operator who flies in or out of the US, and there are **opportunities there to provide input.**

Check out the info

- You can watch the full Stakeholder Presentation here if you want some more info on it.
- You can visit the official FAA IFP site here.

May 2021: Israel Airspace Risk

Chris Shieff
29 June, 2021

Update May 23, 2000z:

- The ceasefire between Israel and Hamas in Gaza agreed on May 21 is continuing to hold.
- Israel has now removed its Notam advising caution to operators in the LLLL/Tel Aviv FIR.

Update May 15, 1200z:

- The Israeli CAA have now published a Notam advising caution in the LLLL/Tel Aviv FIR due to the ongoing conflict between Israel and Gaza. Operators can contact the Israel Airports Authority for operational info: contactus@iaa.gov.il.
- Militants continue to launch rockets and drones at towns in central Israel, while the Israeli Defense Force continue to target locations in the Gaza.
- LLBG/Tel Aviv airport will be closed all day tomorrow, May 16.
- The US has updated its Travel Advisory for Israel, increasing the level of advice to "Level 3: Reconsider Travel".

Story from May 12:

Flights at LLBG/Tel Aviv Airport were temporarily suspended on May 11, with some diverting to Greece and Cyprus, **as the city was bombarded with multiple long range rockets** launched by militant groups in Gaza. No damage has been reported at the airport, although some airlines have cancelled flights this week.

Israel has an Air Defense System – "Iron Dome" which protects populated areas of Tel Aviv from rocket attacks by launching interceptor missiles to ensure rockets detonate prior to reaching the ground, minimizing damage. However, the sheer number of rockets launched resulted in **several impacting the city**.

Sporadic rocket attacks in Southern Israel are not unusual but don't often target Tel Aviv itself, and

certainly not on this scale. One look at the footage of the attack and you will begin to see just how dangerous the skies of Israel became on Tuesday night.

> pic.twitter.com/aZBc7xgNul נתב"ג הלילה
>
> — איתי בלומנטל Itay Blumental (@ItayBlumental) May 11, 2021

The conflict has been escalating throughout the month of Ramadan, which coincides this year with the significant religious Jewish event Shavuot.

Earlier on Tuesday, a series of Israeli airstrikes in Gaza led to the collapse of a residential building and the reported deaths of several people. Militant groups in Gaza immediately retaliated by unleashing a large-scale rocket attack on Central Israel, forcing the temporary suspension of flights at LLBG/Tel Aviv Airport as air defence systems were activated around the country.

It marks a major escalation in the conflict which **may present a new risk to aviation.**

Are there new airspace warnings?

EASA have published a warning, available via the Eurocontrol homepage:

12/05/2021 16:15
Considering the heightened tensions in Israel, including exchange of rocket fire
and retaliatory airstrikes, air carriers operating within Israeli airspace and
to or from Ben Gurion International Airport (LLBG/TLV) in particular, should monitor closely these developments and adapt their operations according to Israeli Authorities aeronautical publications. Several NOTAMs are already in place for FIR Tel Aviv (LLLL) and its commercial aerodromes rerouting

civilian
aviation flight paths as necessary to ensure safety and security of the air operations. Due to the unstable regional situation, these publications may be more restrictive within short notice. The situation in the region remains a matter of high concern for commercial aviation – It is recommended to exercise
caution by taking into account any relevant information, alongside available guidance or directions from your national authorities as appropriate.

So just a warning for now – no firm restrictions on flights. The most recent incident of major rocket fire from Gaza against Tel Aviv was in 2014 during the Gaza War. Back then, **the US FAA** responded quickly by imposing restrictions at LLBG/Tel Aviv airport for a two day period, and **EASA** advised that operators should suspend flights, which ultimately resulted in 30 airlines cancelling flights.

What are the risks?

There are parallels between the situation in Israel and similar rocket attacks carried out recently on Saudi Arabia's major cities. Previously issued guidance on those and the threat which they pose to civil aircraft may also be relevant here.

The major risks identified from rocket attacks were:

- Misidentification or miscalculation by air defence systems.
- Falling debris from air defence activities.
- Ballistic impact while on the ground.
- Short notice airspace closures.

Where to from here?

We're likely to see further rocket attacks on Israel and Israeli air strikes on Gaza. From an operator's perspective, perhaps the most significant development here stems from the fact that militant groups are now showing **renewed ability and intent to mount major aerial attacks on Tel Aviv.**

Keep an eye on the SafeAirspace.net page for Israel where we will report changes as they happen, and **continue to monitor the situation if planning to operate within the LLLL/Tel Aviv FIR** – the events of this week have shown us just how quickly quiet skies can become active conflict zones.

Helping you fly when it's Hot & High

OPSGROUP Team
29 June, 2021

Here's a look at some of the hottest and highest airports out there, and the challenges you might want to think about if operating into them.

Airplanes like to play it cool

What is it about hot and high airports that our airplanes don't like? The obvious one is the air density – engines like their air cold for better performance, and wings like air nice and thick for better lift.

What can you do to keep them happy?

- **Think about how you start the engines** – If it is hot out, the air is thin, and you start throwing things like tailwinds into the mix, then it is going to be a recipe for some grumpy engines
- **Consider towing** – move to a different start point for better air flow
- **Check that ground power unit** – You might want to ask the engineer to see if two might be better (they can over heat too!)
- **Check that take-off performance** – and check it early. If it is limited you're going to have to throw some passengers or cargo off, or put less fuel on to keep the weight down
- **Watch you altitude constraints** – If you are particularly heavy your climb performance is going to suck and where the airport is high, there is often other high stuff to think about too
- **Once you're in the air** – if you are struggling to meet restrictions then keep the speed back, make sure you're using all the thrust available to you and if that still don't work – let ATC know!

People like to play it cool

People get grumpy when they are stuck in a jam-packed, sweaty tube. And I am not just talking about your passengers. **Think about the poor F/O too.**

If you've sent them out into the sweltering heat to do the walk around then it might be kind to have an APU running and some cool air blowing for their return. It will help with the rest of the flight too – you probably don't want to be sat next to someone who is sweaty up a stinky storm for the next however many hours.

Jokes aside, it can be a safety thing too. A performance study by NASA showed operators in temperatures of **80°F (27°C) made approximately 5 errors an hour,** 29 errors over 3 hours. At **90°F (32°C) this increased to 60 in 1 hour** and 138 in 3 hours. So 1 mistake a minute. If you consider how many critical tasks a pilot carries out in that hour on the ground prior to departure that's concerning.

When your environment heats up above 95°F usual cooling methods like radiation and convection stop working. Your body's only option is to pump blood to the skin to release heat and get you to perspire. Up to 48% of your blood is pumped to the surface level, which means useful things like your brain which are less close to the surface are getting nearly 50% less than normal.

Brakes break

High OATs means hotter brakes, and longer cooling times. But it is the high elevation that really causes issues here because your groundspeed is going to be much greater for the same IAS. The result is much more work for your brakes which have to slow down that big hunk of metal.

If you are lucky enough to have brake fans then switch them on as soon as possible. If you don't, then **keep an eye on those temperatures**, especially during the taxi out.

How long it will take your brakes to cool down is dependent on your type of brakes, type of aircraft, how hot it is outside, how hot the brakes actually got. Aircraft will have their own max temperature for takeoff limit which is important because retracting your gear with hot brakes is an increased fire hazard, and aborting the take-off with already hot brakes is an even bigger hazard.

A (very) general rule of thumb is something like **2 degrees every minute** (at 15°C OAT) will give you a (very) rough estimate.

Energy Management

Make sure you have some coffee and a snack. Oh, sorry, the airplane energy. Also worth thinking about because it is going to be harder to slow down and cranking out the old speed brake will have less affect with thinner air because, well, something to do with drag.

This can all get really critical really fast on the approach. A higher groundspeed also means a higher rate of descent, again making slowing down tough. Plan that configuration and manage the energy early.

At very high elevation airports (especially if they have terrain around) you might be trying to reduce your speed above your flap limiting altitude so keep an eye on your minimum clean speed and your flap operating limits.

FLARE!!

A higher ROD, reduced lift, turbulence from thermals can all mess with your flare. We aren't here to tell you how to fly, so will leave it at a "have a think about it before you get there" top tip. Especially if your FO is taking the sector and hasn't landed in these conditions before.

One more tip…

Celsius to Fahrenheit Formula: (°C x 1.8) + 32 = °F

Fahrenheit to Celsius Formula: (°F – 32) / 1.8 = °C

Which airports are highest on the list?

Topping the list is **ZUDC/Daocheng Yading Airport** which sits at a whopping **14,472ft**. ZUBD/Qamdo Bamda airport holds the number two spot at 14,216ft closely followed by ZUKD/Kangding airport at 14,042ft.

These airports are so high that the hot bit is less of a factor, but the altitude is a major one – **14,000ft is a limitation on some aircraft.**

Airports at these altitudes will have special procedures for take-off and landing and you are unlikely to be operating into them without prior training. **So, which should we pay attention to?**

The Hot and the High

FAOR/Johannesburg airport sits at an elevation of **5558ft**. Predominantly NW winds on the ground often lead to a tailwind for the approach to runway 03L/R which makes the energy management more challenging.The runways are 14,505ft and 11,171ft (so you have enough).

Johannesburg can heat up to the high twenties (80°F) in the summer.

HAAB/Addis Ababa Bole airport has an elevation of **7625ft** and also some very high MSAs in the near vicinity. There are high altitude constraints for the departure due to close in terrain, and they need to be monitored (particularly if you are heavy and it is hot out). A challenging RNAV approach makes flight path and energy management more challenging.

The radar at Addis is fairly intermittent so you are going to have watch that terrain avoidance and energy management yourself.

MMMX/Mexico City This spot has an elevation of **7297ft,** and MSAs of 19,400ft, 14,800ft and 12,100ft. The terrain surrounding the airport means some interesting arrivals and departures and the need for some accurate tracking. The tight arrival also means some low platform altitudes. The ILS for the 05 runways are slightly steeper (3.1°) adding to your energy management concerns. We've also heard that **ATC sometimes keep you fast until 5000′**, which can make slowing down last minute more tricky.

OAKB/Afghanistan I know what you're thinking – there are probably bigger threats at this airport than the elevation, but despite the security risks here, it is a fairly frequented airport. Kabul tips the big three boxes – it has an elevation of **5877ft**, an **MSA of 17,500ft** and it can get toasty warm in the summer months. The ILS for runway 29 starts from 14,000ft and the need to keep aircraft high due terrain can mean you suddenly find yourself diving down, while trying to slow down, with not many track miles to go.

You will probably want to keep you speed back on the departure to meet the minimum climb rate of 450ft per 1nm.

The just plain high

SLLP/La Paz Ok, we will add this one because its a fairly major international airport. The Bolivian airport has a **13,124ft runway which lies at an elevation of 13,314ft** making this an Overall Top Ten winner. The surrounding terrain (it sits in the Andes Mountains) means MSAs up in the flight levels – FL220, FL230 and a paltry 18,000ft.

Your **TAS here is going to be around 25% higher than your IAS.** The high elevation means it is generally cooler, but the density is still going to be low leading to lower performance.

The just plain hot

Basically anywhere in the Middle East in the middle of summer is going to tick this box.

OMDB/Dubai has been known to hit temperatures of 50°C. Hot means bumpy – you can expect some crazy thermals on the approach and an easy tendency to mess up the flare and float when that thermal catches you at 30 feet. Some airports (Dubai being one of them) temperature correct the ILS to account for the extra heat, so if you are doing height checks be aware of the discrepancy because of temperature.

OEJN/Jeddah is another spot known for getting very hot. It is also a very large airport with looooong taxis so keep a good eye on those brake temperatures for departure.

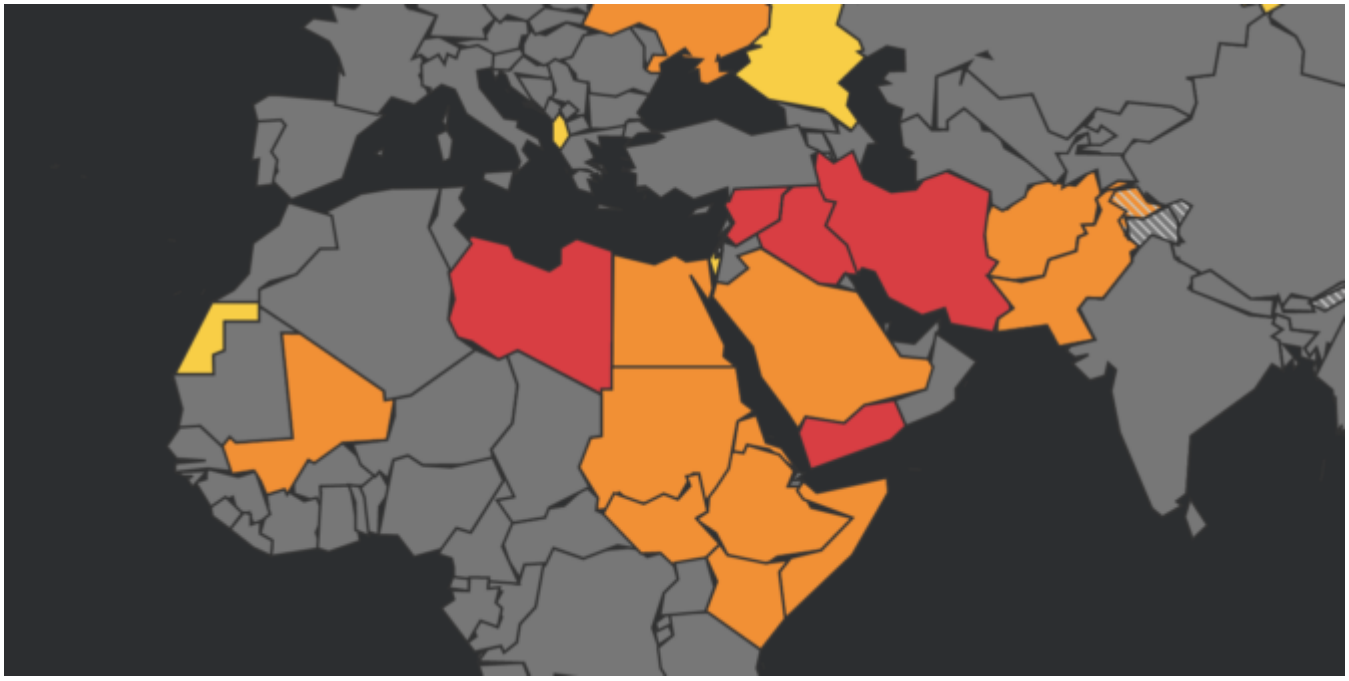
Where else?

Let us know any airports you think deserve to be on this list! Leave a comment or send us an email.

OPSGROUP members can check out AirportSpy – we have started to add Airport Lowdowns in here which cover the big threats (like hot and high!)

Assessing the Risk: Operations Over Conflict Zones

OPSGROUP Team
29 June, 2021



ICAO Doc 10084, if you have not come across it, is a sixty plus page document looking at 'Risk Assessment for Civil Aircraft Operation Over or Near Conflict Zones'. Important stuff.

But despite manuals and procedures, regulations and recommendations telling us how to watch out for, assess, mitigate and manage the risk of conflict zones, there remains a much bigger and more significant risk to safety *because of conflict zones.*

So, what is this risk, and more importantly, what can we do about it in the aviation community?

Information

The huge hindrance to maintaining safety does not lie just with the SAMs themselves. **It lies with information – the quality, quantity, reliability and promulgation of it.** The result is that risk assessments are fundamentally flawed, understanding is limited and critical information does not reach those who need it.

So, there are four big points that need considering when we look at conflict zones and their impact on airspace safety:

1. **The Bigger Question –** A risk assessment is much more than just asking "Is there a weapon down there?"
2. **Rules alone do not change the behavior of states –** Information from states is critical, but it is often not shared, or not shared very well.
3. **Are we actively seeking information, or simply waiting for it to come our way? –** The safety process does not stop at the state level, it continues (should continue) dynamically with operators and with the pilots, so understanding the situation is important.
4. **How can we do better? –** Individuals and the industry have a responsibility to ensure information and strategies are shared.

1. The Bigger Question

The bigger question is to do with **how risk is assessed**, and it is a complex process even when

information is available.

ICAO Doc 10084 lays out the risk assessment process. It's an interesting read and worth taking a few minutes to think about because understanding the background to conflicts and what the key factors at play are is the only way for safety strategies and risk assessments to continue, and continue they should – it does not stop when a Notam is released.

The process is dynamic and needs to continue with the operator and the pilots too.

What are the key factors in a risk assessment?

First up, what are we actually talking about here? Long-range Surface-to-air missiles (SAMs) can reach aircraft cruising in excess of 25,000ft (7600m). They are often linked with radar sensor systems to help identify targets, and are mobile and easily and quickly relocated.

So we need an assessment of what danger these pose to airlines and airplanes, and this means we need to know **who has them (the capability)** and also their **intent (who or what do they plan to target)**.

But it is not that simple. Where there is intent, there is not always capability; and as importantly, **where there is capability there is not always intent**. The Iranian shoot down is a clear example of this. So we also need to consider the unintentional risks as well.

The questions asked look something like this:

- Is there use of **military aircraft in combat roles** or for hostile reconnaissance (including unmanned aircraft)?
- Are aircraft used to transport troops into the area and do these routes coincide with civil air corridors, or lie close and so pose a **risk of misidentification** between civil and military aircraft operating in the area?
- What are the **politics relating to the region?**
- What are the **training levels** of SAM operators and what is the military deployment of SAMs? How reliable and credible is the information shared by the state regarding this?
- Is there a **lack of effective air traffic management** over the relevant airspace? Is the state fully in control of their own territory and do they fulfil all their ATC, coordination and promulgation (of information) obligations?
- Do civil aircraft route pass over or close to **locations or assets of high strategic importance** or which may be considered vulnerable to aerial attack in a conflict situation?

But, the risk continues beyond this initial assessment because we also have to **identify any ongoing consequences** of an event. If a major airport is targeted, the impact is not only with the initial damage – if that initial damage is to the ATC systems required to maintain control and separation of aircraft then now we have reduced safety in the airspace and **a much larger level of disruption.**

So, we must think about the overall severity, and with that the tolerability of an infrastructure or operation. **We are asking both 'What can it hurt?' and 'How much it will hurt?'**

This assessment, according to the ICAO document, is thrown into a matrix and churns out a 'Risk Level' which leads to the actions taken.

Sounds simple, but there is one key point here –

This info is not easy to come by. It is rarely reliable, and there is a qualitative narrative that makes it very subjective. The information has to be promulgated from states.

Which leads us to Point Number 2.

2. Rules do not change the behavior of a state….

States are responsible for sharing info on hazards, on what mitigation strategies they have in place, and the assessed impact of the strategies they adopt.

This often does not happen, or it does not happen well. Look at Ethiopia/Tigray region situation – **misleading Notams and no guidance** from the Ethiopian authorities led to Opsgroup issuing our own warning regarding the situation.

Further to that, ICAO only mandated the reporting of hazards in notices to pilots since 2020, and some states are still failing to do so.

3. People are not seeking information, they are waiting for it to come their way

This is why SafeAirspace was created.

Information is not being shared well and risk assessments are fundamentally flawed because the information on key factors is simply not available or reliable most of the time.

What's more, people are rarely questioning whether the information they received was reliable, accurate or complete. Few proper risk assessments are taking place because those responsible are waiting for the information to come to them, and **without a proper risk assessment, mitigation strategies are not sufficient**, and are not being passed on to those who need them – the pilots.

What is the Operator's continued role in the process?

Every operator is responsible for continuing the risk assessment. It is not enough to simply direct crew to a Notam. Ensuring crew have a **full briefing on the threat and any mitigation strategies** is important.

- **Emergency and abnormal procedures should be considered in advance.** Take Mogadishu airspace where only flights on specific airways over the water are allowed. What is the strategy here in case of an engine failure or depressurization? If you operate over this region, you should have access to this information.
- **Operators are also responsible reviewing fuel requirements** – ensuring additional fuel is provided for potential diversions around conflict zones.
- If aircraft will be operating into conflict zones, then **a review of MEL items which can be deferred** is a good call – can the aircraft get out again without requiring maintenance or fueling?

What is the pilot's continued responsibility in the process?

The information and strategies we see at the operations end are things like these:

- Coordination between military authorities, security and ATS units
- Briefings of personnel

- Identification of civil aircraft by military units
- Issuance of warnings and navigation advice
- Air Traffic Restrictions
- Closure of Airspace

But this does not mean the full risk has been removed. Understanding this, understanding how the situation got to this point, and understanding the risk assessment and safety management that has taken place is vital because the process now continues with you, the pilot, and this a fundamental step in continuing to manage safety.

- The Crew, and the Commander of the aircraft are responsible for the safety of the aircraft and the passengers. Of course, we all know that, but if you are given a Notam saying "this airspace ain't great, maybe avoid it" and then you fly through it, **where does the responsibility of your operator end and yours begin?**
- Reading notams, the AIPs, AICs, and being aware of the threats of the airspace you might be asked to operate into is vital. More than that, **ensure you are aware of any mitigation strategies required.**
- **Pre-prepare for diversions and know where you can safely go.** Some diversions might take you through prohibited airspace so if you are operating in the vicinity of some, have a route ready in box two so you can easily avoid airspace when you need to.
- Be aware of security threats and hazards **on the ground**, in advance.
- **Consider the serviceability of aircraft equipment before you go** – critical equipment would be communication systems, and those required to ensure military units can identify them as civilian;
- Have an awareness of the **potential political implications if diverting** into some regions with certain nationalities onboard. If you divert there, what will happen to your passengers and crew, and why?
- **Report things.** Keep the information loop going.

4. How can we do better?

Aeronautical info from states and authorities is your first point of call. AICs, AIPs and Notams are going to contain info on advisories, restrictions and recommendations.

If you are an FAA operator, then the FAA put out KICZ notams and this page has all the current ones for airspace.

Networks and organizations such as us here at OPSGROUP try to **share relevant and up-to-date information on airspace**, conflicts and the risks that are out there.

Open sources like social media and news sites are also good – but be careful, these may come from unconfirmed or unreliable sources. We recommend checking info with other sources too, like handling agents in the area.

Finally, talk to other pilots and operators, and be sure to report information you have from operating in or through airspace.