

CONVERSATION AVIATION

#03
2023



STARTING POSITIVE CONVERSATIONS ABOUT SAFETY





**#03
2023**

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Foreword by Jesper Rasmussen EASA

As the busy summer season draws to a close, it is my pleasure to welcome you to this 3rd Edition of Conversation Aviation.

As Flight Standards Director, my role is primarily to manage the operational safety activities within the Agency.

Ahead of the summer season, the Agency worked closely with the industry to identify the key operational challenges that were expected. We then developed proactive mitigations to support the whole European aviation community through this challenging period. The key outcome of this work was the Summer Safety Information Bulletin (SIB) that outlined several recommendations and actions for the industry. We also encouraged industry conversations on summer safety through the EASA Safety Week that took place at the end of May and developed promotional material in the last Conversation Aviation Magazine.

The whole industry puts a lot of effort into learning the lessons from the previous year and thankfully things have gone a lot better than in 2022, even with a huge increase in traffic levels.

Being over the summer peak does not mean that all challenges are gone. The winter will bring other challenges that will be new for many staff. We have already seen this summer that climate change and unusual weather have impacted our industry. It is important that we are ready for what the winter has to throw at us.

“Winter readiness” is the theme for this edition of Conversation Aviation. Having already hosted a series of Winter Readiness Webinars in August, a lot of great lessons have been collected from airlines, airports and ground handling organisations. This information will hopefully help your organisation with its own winter planning.

This edition also covers other relevant safety topics. From the increased risks of Lithium Batteries in mobility devices as more Passengers with Reduced Mobility (PRMs) travel in the autumn, to runway lighting, laser attack prevention and cyber security risks, there are a wide range of articles with practical advice and information.

We all know that it has been a long 4-5 months since operations ramped up at Easter. It is important for leaders at all levels to support their staff, promote wellbeing and a healthy work-life balance over time. You will also find articles on the hidden impact of mental health and the role of human factors in helping everyone to perform to their best.

Also, during times of high workload, we need a positive and open culture in all aviation organisations where staff are encouraged and certainly not penalised to report occurrences and hazards they see in routine operations. In the end, when your organisation has done something to fix the problems, it is important to communicate this so that way staff feel their efforts in reporting are taken seriously.

Recruiting and retaining of staff is on everybody's lips. We need to take seriously how we are perceived by the wider society and not least the younger generations. The future success of our industry relies on our ability to keep being an attractive career choice. Among other things, wellbeing and psychological safety are elements of attraction, which also are good for safety. The next generations also expect us to put the environment much higher on our agenda. We need to speak about it, accept the challenges and continue our efforts to improve our environmental credentials. This edition will also table how safety and the environment can play well together.

I hope you will find the content interesting and I wish you a safe and healthy transition into winter operations! ■



Safewings



Are you Winter Ready?



From EASA - John

As the European aviation sector recovers from the COVID crisis, while dealing with a range of new challenges the Agency's focus is to ensure that safety is not compromised. EASA continues to work closely with the National Aviation Authorities and the wider industry to ensure that we are well-prepared to identify and mitigate all potential safety risks.

Our introductory article for this 3rd Edition of Conversation Aviation will update you on some important leadership changes at the Agency, the key elements from both the Annual Safety Review and the Recommendations Review, what's happening for the rest of the year and an outline of some of the key challenges we expect the industry to face as we head into the winter.

Changes at EASA

The position of the EASA Executive Director (ED) comes with a 10-year term and on 31 August we said goodbye to Patrick Ky who reached the end of his term. During his time as Executive Director the Agency has undergone a considerable transformation that brought together the rulemaking and standardisation activities for each domain to form the Flight Standards Directorate. The Strategy and Safety Management (SM) Directorate was also created to lead areas such as safety programming (EPAS and other planning activities), safety intelligence and international cooperation.

As you hopefully have read in Patrick's introduction to the last edition of Conversation Aviation, he has been at the forefront of guiding European Aviation through challenges including the Germanwings accident, the Boeing 737 Max and the COVID-19 pandemic. The past 10 years has also seen huge advancements in technology and under Patrick's direction the Agency has implemented comprehensive rules for Drone operations across Europe, the certification framework for future air mobility and the AI Roadmap. In other areas of aviation, the General Aviation and Rotorcraft Roadmaps have helped to focus efforts on these domains as well.

On 1 September, Patrick was succeeded as ED by our current SM Director, Luc Tytgat who will lead the Agency while the recruitment for Patrick's successor is completed.

In other exciting news, on 1 October, EASA welcomed Maria Rueda as the new SM Director. Maria was previously the Managing Director of CAA International and has also held senior positions at Deloitte and in the Airport side of the industry.

Annual Safety Review

At the start of August, EASA published the [2023 Annual Safety Review \(ASR\)](#). The review is published every year and looks at the safety performance of the European aviation system in the previous year and compares that performance with the previous 10 years.

The ASR, along with other analyses EASA does in collaboration with the National Aviation Authorities (NAAs) and industry supports the decision-making that is reflected in the European Plan for Aviation Safety (EPAS).

The report provides an analysis of accidents, serious incidents and other occurrences, based on the definitions in ICAO Annex 13. The source of that data is EASA's occurrence database, complemented by the European Central Repository (ECR), which contains the reports collected under [Regulation \(EU\) No 376/2014](#).

The main ASR provides the key statistics for each Domain. Then in the Appendices of the Review is a more detailed analysis of the safety issues, human factors and airworthiness aspects. The detailed analysis of the safety issues then feeds into Annex III of the EPAS, from which the strategic safety actions are then identified.

You can download the full ASR from the EASA website or the Air Ops Community and you watch the podcast where I interviewed our Air Ops Domain Safety Risk Manager Aigars Krastins, about the Review and its main conclusions.



As we head into October, the summer feels like a distant memory. It was great to finally see the increase in traffic that we had all been waiting for since the COVID-19 pandemic. The aviation industry coped well with the various challenges that were thrown at us. We had difficult weather conditions in some parts of Europe and this has heightened our awareness of the impact of climate change on the aviation system so we can continue to deal effectively with adverse weather events. There were various airspace closures due to the continued war in Ukraine and instability in Niger and Sudan adding to the existing situation in Libya. The industry has also seen the publication of a report by the European Cockpit Association and Baines Simmons about challenges that flight crew face with managing fatigue and the reporting of such events.

Statistical Overview CAT Aeroplanes



Globally, there were **10 fatal accidents**, only one of which involved an EU operator

There were also **175 fatalities**, an increase in 2022 compared to 2021



In 2022, there were **14 accidents** and **51 serious incidents** involving EASA MS operators



In aerodromes and ground handling, the number of accidents and serious incidents per million aerodrome movements decreased in 2022 down to 2.3



Are you
Winter Ready?



[EASA SIB 2023-05](#) which highlighted the most important focus areas for the summer. In this SIB, there were a number of key actions for organisations covering topics including safety risk management, flight time limitations, operational staffing considerations, planning, airport collaboration, training and cyber/ security risks.

Whatever type of airline you are, it's important to reflect on the summer and see where you could improve. Consider how you lived up to the concepts of being Ready, Resilient, Responsive. Where were your gaps? Maybe you had insufficient staff in certain areas or perhaps there were challenges with key pieces of

equipment or software that you use.

While you might have made it through this summer without any major incidents, it's important to remember that good past performance doesn't mean that you have identified all your key risks, or that you have managed them effectively.

If you don't ask difficult questions, you will never know what you don't know (I know – confusing, right!).

Ready for winter...

The next thing to do is to look ahead and prepare for the winter season ahead. This will certainly bring more unpredictable weather and the need to focus on topics like icing, snow clearance and ensuring your staff have the right equipment to perform to their best when things are cold, wet or snowy. Shorter days and dark evenings will bring additional risks that you will need to be prepared for. See the Safewings article that follows for more information on some of the risks that you should be thinking about.

Back in August we teamed up with IATA, Easyjet, Ryanair, Menzies Aviation and some other organisations to host a series of Winter Readiness Webinars where different organisations shared their experiences from last year and discussed lots of great safety tips for the months ahead.

This edition of Conversation Aviation is focused specifically around the various winter challenges you might expect. There are also some year-round topics as well. Hopefully you find it helpful for your operation.

Fly safe and let's be ready for all the challenges that the winter has to throw at us. ■

Annual Safety Recommendations Review

The EASA [Annual Safety Recommendations Review 2023](#) was also published in August. This review covers the very top of the reactive part of the safety iceberg. When accident investigation boards finish their investigations, they normally make safety recommendations to different authorities and organisations in the aviation system.

The EASA Recommendations Review specifically provides information on the activity carried out by the Agency in the field of accident and incident investigation and follow-up in 2022. The Review also highlights a range of safety issues and Agency safety improvement actions that come out of these safety investigations.

The 16th edition includes the following – you can find out more about EASA's role in accident investigation in John's podcast with Head of Accident Investigation, Alessandro Cometa:

- General statistical data on the safety recommendations addressed by Safety Investigation Authorities to the Agency in 2022;
- Information on the replies that the Agency has provided to safety recommendations in 2022;
- The main safety issues that have been addressed and the actions taken.

The importance of reflecting on the summer

At the start of the summer, we launched our safety campaign during the [EASA Safety Week](#) under the banner of being "Ready, Resilient and Responsive." The campaign included



Safewings Winter Readiness

From the Safewings Head of Safety – Nuno



As we head into October, the summer feels like a distant memory already. We can all be proud of everything we have achieved over the busy summer period. There were new staff to integrate and get up to speed, new routes, new aircraft and things were a lot busier, both on the ramp and in the air. The fact that we got through the summer without a major occurrence is a great achievement of which we can all be proud.

Continue with the positive safety conversations

Here at Safewings, we always remember that a safe past means nothing if we are not continually identifying and managing the risks in our operation. We have worked really hard to create a positive culture of reporting that enables everyone to share information on any new hazards with the safety team. They then work with the different operational departments to properly identify and assess our risks so that we can take action to improve things when we need to.

The key actions are:

- Whatever your role, please continue to raise a safety report whenever there is an incident or if you find a new hazard.
- For managers, we have a just culture to make sure we always know where our risks are. Even when something bad happens, the focus should always be towards supporting those involved and finding out where we can improve and manage our risks.

To help us see things differently, from 1 November we will be renaming “Safety investigations”. They will be called “Learning Opportunities” to help us focus our minds on their real purpose. When we use the word investigation it makes you think of the police and bad things happening.

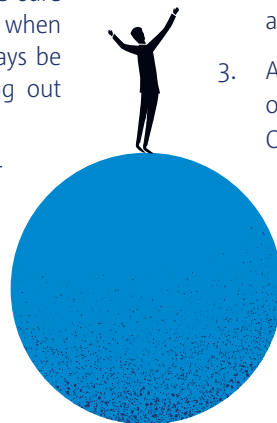
Our goal is to encourage positive conversation about safety, every day. Here at Safewings, we live to be “safe by name and safe by nature.”

Our ability to perform relies on our wellbeing and feeling psychologically safe – every day

This summer has been long, busy and hard work for all of us. At times it has felt like running a whole marathon but in lots of 200 metre sprints. Not even the greatest athlete could be expected to manage that. The same is true for everyone here at Safewings. Keeping our operation moving asks a lot of us all so its important to remember the three key things to consider when it comes to your personal wellbeing:

1. Look after yourself - like our aircraft, humans also perform to their best when they are well maintained.
2. Look after each other – look out for your colleagues, and offer support and help whenever you can.
3. Ask for help – our peer support programme isn't open just to pilots but to everyone at Safewings. Our “Safe and Well” program provides all sorts of support continually, not just when you really need help.

We also work hard to try and create a psychologically safe workplace that enables you to speak up and trust the reporting system. Whenever you submit reports, you will get feedback from the safety team throughout the process of the “Learning Opportunity” and you can always check in our MS Software what is going on.



Safewings
Winter Readiness



Wellbeing and effective human performance – like a coin, a partnership between you and the organisation

Positive wellbeing has a huge impact on our ability to perform to our best. There are two sides. The first is our commitment to you from Safewings as your employer. The second is from you as it's a team effort.

Balancing safety and operational effectiveness – the hardest conversation of all

At Safewings we live to be “safe by name and safe by nature”. The hardest, but perhaps one of the most important conversations we need to continually have is the balance between safety, operational effectiveness and costs. The challenge is to operate in the “Safety Space” so that we manage our risks while also understanding how and where we can minimise our costs. It is only by having open conversations about this can we make informed decisions. Whenever we identify new risks and hazards, we should identify the costs involved and find the most effective solutions. It is in all our interests to have these types of conversations for the good of our long-term future.

Ready for winter – some of our main challenges...

As the winter approaches there will be lots of operational challenges to deal with. As always, continually talking about them in our operational teams is vital. Share experiences through the reporting system and the safety team will provide regular updates through operational managers, via the intranet, roadshow and any other way they can.

**Our side of the coin
– managing psycho-social risks**

In February we held our first review of psycho-social risks in the company. This helped us to identify things that make working life more difficult and stressful for us all. Based on your occurrence reports and the follow-on discussions we identified challenges such as excessive and unrealistic workload, lack of clarity in your job role/function, lack of involvement in routine decision-making, poor communication and lack of trust between workers and the management. We continue to learn in these areas. They are all important for us to continually discuss in our teams throughout the summer and beyond. You can use the reporting system to raise any risks you identify and check on the intranet for the full list of psycho-social risks already identified and the actions ongoing to improve them.

**Your
side of the coin**

We also rely on you to do as much as you can to look after your own wellbeing. You can find lots of great tips on the [Safewings Wellbeing Hub](#). The hub covers areas including Activities, Diet, Exercise, Mental Health, Relationships, Skills and Sleep. In each area, there is information on the impacts on your wellbeing and then practical objectives you can do to help improve your wellbeing. You will also find lots of useful resources as well.

There is no such thing as bad weather – just the wrong clothing

One of the most practical things is to make sure you wear the right clothing for whatever conditions you are likely to face. If you are working outside on the ramp, doing walkarounds, performing maintenance or anything else like this, the aim is to provide you with the right clothing and equipment to do your job effectively. If there are any problems with the clothing you have, let your team leader or operational manager know.



Run Down Ice



Ice strips



Safety Topic 1 –

Communication

- **Operational Events:** Activities such as deicing starts before the aircraft is not configured for deicing and the flight deck give clearance to approach the aircraft.
- **Risks:** Ingestion of fluid into aircraft systems such as the APU, which has in some cases led to smell events or in the worst case, fire caused by glycol liquid or an APU overspeed. This could also lead to AOG with delays and cancellations.
- **Key Learnings:** If the flight crew are on board, there should be clear communication to confirm that the aircraft is configured for deicing and the flight deck is ready.

Safety Topic 2 –

Incorrect Deicing

- **Operational Events:** Fluid contamination of no-spray areas of the aircraft such as flight deck windows, pitot probes and static ports.
- **Risks:** Critical aircraft systems do not function as expected.
- **Key Learnings:** There should be no direct spray of sensitive areas and check static ports and windows for build-up of fluid.

Safety Topic 3

Assessment of the Aircraft Condition in Poor Weather

- **Operational Events:** Forming ice ridges in front of probes, snow or ice remaining on the wing on in other critical locations of the aircraft.
- **Risks:** Unreliable airspeed or disruption of air-flow on major critical surfaces. In the worst case this could lead to airspeed inconsistencies and loss of lift. This has led to accidents.
- **Key Learnings:** Aircraft inspections during the contamination check and post de-icing check are vital in identifying where ice or snow remains on the aircraft. The location of any specific areas with contamination should be clearly described to the de-icing team by the crew and de-icing staff understand how to properly conduct the post de-icing check.



In summary

Reporting and routine safety conversations are vital to keeping on top of the winter risks we will face. Fly safe and let's enjoy the delightful colours and views that the winter season will help us enjoy.

For further information check the [Traficom Finland Winter Operations Bulletin](#). ■

View from the Flight Deck

Rachel's take on winter movies

In case you don't know her, Rachel is one our Captains on the Airbus A330 and fleet training manager.

Winter is on its way! It is time to dig out those woolly warmers and toasty thermals. But you might want to pick up the winter ops manuals for a refresh too, because winter means some challenges which can have chilling consequences if you're not ready for them. To help with all that, here is a guide to the top winter movies of the season to help you feel less "Brrr!" and more "BRRR!" (that's 'Being Ready, Resilient and Responsive') about it all.



Frozen

▶ *Once upon a time, uncontrollable icy powers cast an eternal winter across a kingdom, trapping the lands in its wintry grip. But then came a heroine, an iceman and a snowman who teamed up to save everyone. There might have been a reindeer in there somewhere too.*

When you reach the aircraft and see the glistening sheen of frost around the fuel tanks, and icicles hanging from the static wicks then you know it is going to be a long day full of challenges, threats and potential hazards. Enough to send a shiver up your spine! De/anti-icing is an unavoidable event of the winter season, but it doesn't have to be a challenging one.

They key is good old workload management, which starts with a bit of planning like getting yourself into the de-icing queue with an early call. You can also use the time being sprayed to do things like your briefing so you aren't rushing beforehand and missing anything.

It's important to work closely with the de-icing crews on the ground and particularly to talk to each other so that everyone knows who is doing what and when.

We've heard many a 'rule of thumb' in our time, but relying on 'x' sized patch of ice to melt-off in 'y' amount of time is less a recipe for tasty winter desserts, and more a recipe for

disaster as you 'desert' all common sense (last terrible pun, I promise). Using a 'Keep it clean' policy is by far the safest option (you can do localised de-icing as needed). Don't forget it might apply to your engines as well - check your aircraft manual and policy, and make sure you know when ground ice shedding is needed and what it involves.

Die Hard

▶ *Christmas party festivities are ruined by bad people and Bruce Willis has to save the day.*

De-icing and anti-icing are all about making sure you don't, well, *have an accident*. Remember to check your HOT carefully for the conditions. If you exceed your minimum HOT and there is still precipitation, then you might be able to do a pre-takeoff check (usually within 5 minutes of takeoff) but it doesn't extend your HOT, and if you look and the fluid has failed then start over.

If you've used Type IV, then you can't re-coat yourself in it. You need it removed first (a two-step procedure), and keep in mind that if you reject a takeoff at a lower speed, your fluid isn't going to fly off, so you might need to think about restarting the process again.

Remember - keeping it 'McClane' is the best policy when it comes to contamination (sorry, I lied about it being the last pun).



The Polar Express

- ▶ *A journey to the North Pole filled with self-discovery and wonder.*

If you are journeying to some of the more northerly airports of the world this winter, then rediscovering things like GRF might be a good idea (applicable anywhere actually). The Global Reporting Format has been in place for a while now but is still worth a review on what it means for braking actions and what you can expect. You can check out the [material from EASA on this topic on their Air Ops Community](#). Look out for any 'SPWR's - this means a specially prepared runway where the temperature is -15°C or below, covered in compacted ice or snow and treated. It will generally have a RWYCC 4 rating.

We all get mixed up with what snow grains, pellets etc actually are, so don't worry. What you should check is the codes for these though because aircraft shouldn't operate in large hail conditions (as someone discovered on a flight out of Milan not so long ago). These are generally reported in a SPECI but you might see HLSTO (hail stones) on an FAA TAF/METAR. GS is for small hail or snow pellets, GR can also be used for small hail (less than 1/4 inch, or 5mm). UP is sometimes used for 'unknown precipitation' so watch out for that one and see what else is around to provide context.

The Snowman

- ▶ *A boy builds a snowman that takes him flying to the North Pole.*

Contaminated runway ops can be a risky business so checking your performance carefully, knowing your procedures, being cautious about any MELs or issues related to braking and deceleration devices and above all ensuring you *take things slowly* is the key to safe flying.

Slow means methodical. It also means slow during the taxi, slow (well, stabilised) on the approach, and slow as in not putting yourself under time pressure during adverse weather ops because rushing is one of the quickest ways to a bad flight.

Ground Hog Day

- ▶ *A weatherman relives the same day again and again and again...*

You might have flown there one hundred times before. You might have seen the same weather *a thousand times* before... but don't let yourself get complacent about the threats winter can bring. Briefing the challenges and threats of the day is key to making sure you properly identify and can mitigate them.

View from the Flight Deck Rachel's take on winter movies

A Christmas Carol

▶ *Scrooge is visited by the ghosts of Christmas Past, Present and Yet to Come in order to teach him a valuable life lesson.*

Having a review of past events from previous years is one of the best ways to make sure they don't happen again this year. Whether that means resharing old safety reports or asking a colleague their experiences of a specific airport - practical learning from your operations and combined experience is the best way to learn.

Jingle All the Way

▶ *A workaholic tries to make it up to his son by finding the hottest toy of the season and learns the real meaning of Christmas.*

Many a pilot can be heard singing the well-known mantra "hot to cold, don't be bold" on a wet and wintery night, but what does this really mean? Well, it means cold temperature altitude corrections.

We sometimes don't apply these because we forget (or just don't really know exactly how). This makes it important to review and brief them in advance and ensure we understand them because cold temperatures can have a big effect on your terrain clearance margins. At 1000' in a temperature of -10°C you can be as much as 100' low.

If you are flying an RNAV type of procedure, check it is within the temperature limits as well. So, make sure you know what cold temperatures really mean.

Cool Runnings

▶ *Things go downhill fast on ice! A team of bobsleighters dream of competing in the Winter Olympics despite never having seen snow. It leads to a whole load of challenges, but teamwork and practice prevail.*

Visible moisture, less than 10 degrees... we all know this stuff, but every year three top in-flight icing issues continue to occur. Cool fuel, rough running engines and severe icing conditions that send flight downhill fast.

First up, fuel. Jet A1 freezes at -47°C, Jet A at -40°C (and if you fly to some other parts of the world you might need to check because they use other names). A general 'rule' is if you use 90% or more of one type, use the freezing temperature for that, otherwise use the lowest (or highest, you know what I mean).

Those wind and temp charts in the briefing pack (*the ones we usually skim through without paying much attention*) are actually very handy to review. It will vary from type to type, wing to wing, but getting an idea of the temperatures at altitude that might lead to cold fuel is worth doing in advance because if you get cold fuel in-flight, the only options (unless you're in something well-equipped like an A380 which automatically swills the fuel about for you) are generally to speed up or descend - both of which burn more fuel.

Engine icing can occur anytime, not just in winter, because regardless of the season it is always chilly up at altitude. If you're in icing conditions then look out for rough running engines and make sure you've put the engine de-icing on. Have a think about a prolonged idle descent and what that might lead to if you're not careful too.

The same goes for ground ops in icing conditions. We mentioned it already, but thinking about ground ice shedding and checking taxi in times is important. So is monitoring your oil temperatures for start-up and takeoff if your aircraft has limitations.

Finally, severe icing conditions. Not many aircraft anti-icing systems are designed to handle these. Take a good look through your TAFs, METARs and SIGMETs because you don't want to fly yourself into those sorts of conditions by accident. If you think you have, request assistance and make sure you report it to help other pilots avoid it as well.

The Nightmare Before Christmas

▶ *Bored by the usual routine, Jack Skellington accidentally stumbles upon a new world and plots to bring it under his control with his own designs on what Christmas should look like. It all goes wrong, but the townsfolk work together to fix it.*

There are some rules on what you can fly in. They prohibit things like intentional flight (including takeoff and landing) into known supercooled large-drop icing conditions (freezing drizzle and rain).

Knowing these, and knowing your aircraft limitations and company policy is important, but the real point is if you do accidentally get yourself into it then request priority handling immediately to help get out of it. Get help when you need it and know there is a team out there to assist.



Miracle on 34th Street

▶ *An old man claiming to be Kris Kringle is taken to court and forced to prove he really is Santa Claus.*

Yeah, you usually meet the climb restrictions no problem. That doesn't mean you will when your airplane is stuffed with weighty luggage filled with Christmas presents, and has the anti-icing systems running on their highest settings. Prove to yourself (before you get airborne) that you will meet the climb restrictions. The same goes for your takeoff and landing performance. These need checking even if you did do it yesterday and the day before...

It is worth thinking about the descent and energy management too - some aircraft need a speed increment for icing conditions, and others fly faster and descend and decelerate worse with their anti-icing on, so plan this out, don't assume it will go the same it always does and make sure you have the *proof* to back yourself up if things do go wrong.

Home Alone

▶ *Sneaky mischief makers cause chaos for a boy home alone over Christmas, resulting in numerous humorous incidents and a happy reunion at the end.*

Sickness rates tend to head upwards in winter. It can't be avoided, especially for flight crew. The conditioned air and high altitude inside aircraft dries you out which means all those sneaky bugs in the air get into your nose, throat and lungs far more easily. Combine it with tiredness and it all adds up to more colds and sickness.

Flying with blocked ears, or when just not feeling well, is not a good idea and you owe it to yourself, your team and your passengers not to do it. But have a think for the poor crew control and schedulers who often find themselves short crewed and if you can be, try to be flexible. An airline without crew can't fly, after all.

Elf (and safety)

▶ *A man is accidentally transported to the North Pole where he doesn't fit in. He travels back to the human world in search of answers and chaotic results occur.*

Winter and people don't mix well so thinking about your safety, your passenger's comfort and safety and that of the

whole team is important. Cold conditions reduce blood flow to the brain making you think less clearly, and cold cabins mean cold passengers so get the hot air on early. Take extra precautions out on the ramp to avoid slipping on ice, and report anything you see that could be a hazard.

Planes, Trains and Automobiles

▶ *A control freak trying to get home for Christmas gets re-routed due to an extreme snowstorm and has to find an alternative way home, which starts to test his sanity through a series of comedy mishaps.*

Diversions, or rather a plan for diversions means more than "we'll land there if we have to". Asking questions (and having some plan for how to answer them) is key - things like what will you do with your passengers there? Smaller airports might have runways long enough, but do they have terminals big enough to accommodate your passengers, or will they be sat on a rapidly cooling aircraft? Is there transport, accommodation, maintenance and tech support?

Your usual airports (especially if crossing challenging places like the NAT) might not meet your planning minima so you could find yourself using secondary alternates and as unlikely as a diversion might be, making sure you have some support in case you do head there is important, and making sure you have an idea of what the threats and challenges are before you head in could really help the situation.

The Shining

▶ *"All work and no play makes Jack a dull boy!"*

Winter isn't all doom and gloom. It also brings some good things like Christmas and holidays, impressive Aurora displays (*pretty, but we know there are negative to this too*), less traffic, better performance (*our aircraft like the cold weather*), stronger jet streams so quicker flights (*ok, that works both ways*), less thunderstorms, really pretty views, skiing holidays, tasty mulled wine at festive markets...

But the biggest one is of course family time. Look after yourselves and each other, and take care this winter because by working together to face the challenges, it will make for a better season for all. ■



The Hidden Impact of Staff Mental Health

From our Safety First Officer Claudio

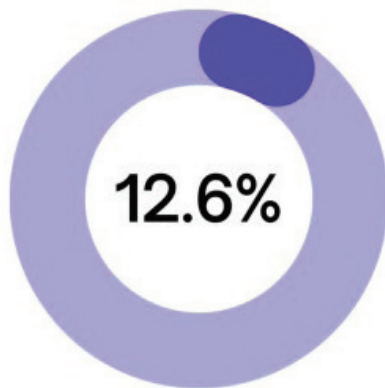
Aviation as a profession demands a lot from all of us. Being a pilot often means crazy financial situations to get qualified, long hours, working outside your normal circadian rhythm, and being separated from loved ones, all while being one lingering health problem away from losing your entire career. Doesn't sound like a recipe for great pilot mental health, does it?

In addition to this, mental health in aviation is still overlooked way too much, way too often, and has been consistently downplayed by pilots, other aviation staff themselves and employers.

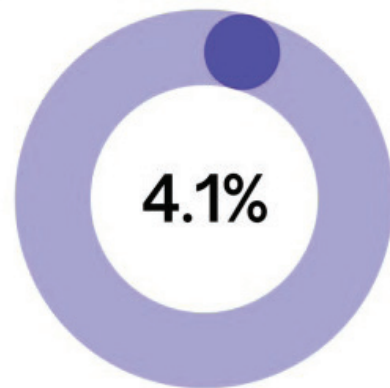
Some troubling results were revealed in two recent studies on commercial airline pilots in 2016 and 2017. These studies looked at how common burnout and mental health issues are among pilots. This is what they found:



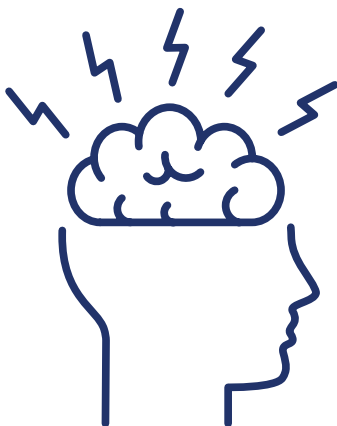
Experiencing high-levels of burnout



Met the threshold for clinical depression or displayed major depressive disorder symptoms



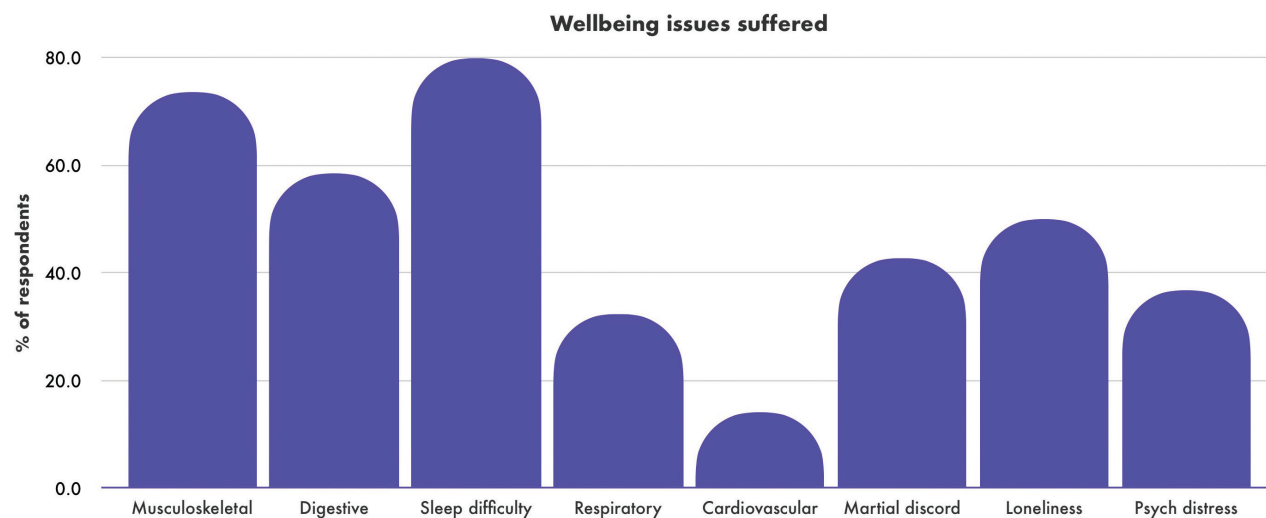
Having suicidal thoughts



As you can see, almost half of the pilot work workforce are experiencing high levels of burnout, with over 1 in 10 pilots meeting the threshold for clinical depression and 1 in 25 pilots having suicidal thoughts... If you apply those figures to a random airline with 3000 pilots, you get some worrisome numbers.



A further [study](#) asked 1059 pilots what wellbeing issues (if any) they suffered from during their job. Here's what was found:



Do you recognise or experience any of the following as well? Although psychological distress was one of the least reported issues, it's still more than 1 in 3 pilots that suffer from it according to the data!

However, a number of the other reported issues can contribute to or cause mental issues, we'll discuss this later on.

These pilots were tested using a psychological assessment, which indicates how severely someone is psychologically affected based on the reported symptoms. Here are the results:

- While only 2% showed symptoms indicating a severe form of depression, 40% were scored "mild", which can still have various negative effects in the flight deck. Keep in mind that even just 2% is still a lot of pilots based on the number of pilots flying around globally.

Who's to blame? We all are!

There are a lot of reasons why this issue is so hard to tackle. Open conversations are hard when pilots are concerned about appearing weak, losing their job, or aren't even aware of how bad the state of their mental health is in the first place!

We all had a wake-up call when Germanwings Flight 9525 crashed in 2015. The First Officer deliberately crashed the plane and killed all 150 people on board. When the investigation revealed that he had a history of mental health struggles, it blew up the conversation and finally got people asking some of the harder questions. Questions such as: How can we develop better ways to support the mental wellbeing of pilots and other personnel?

Mental health doesn't just impact pilots and we will explore the impact mental health issues can have on flight safety. How can we identify and address mental health issues early on, and what are the ways in which we can all support ourselves and each other? What are the best resources out there to get confidential support? Let's answer all of these questions and more!

The Biggest Mental Health Challenge

The biggest problem with addressing the issue of mental health in aviation is that the current culture can make it hard to raise issues. It's comparable to getting a medical exam for your licence: are you looking forward to telling your AME about that health issue you experienced? Of course, you're not, it might be the end of your career!

Openly talking about mental health issues could make us feel ashamed, worried, anxious, and most of all: judged. Whatever we do in aviation, we worry about a lot of things, but we all sure like to pretend we don't. We need to break this stigma.

The solution is similar to what we have already (mostly) done as an industry in regards to admitting mistakes, filing ASR's, and reducing judgement when someone screws up. When we read accident reports, we (well, most of us) don't think "Hah, look at that idiot!", and instead think "that could've been me, let's listen and learn from this".

This same shift will need to happen in mental health. When someone shares a mental struggle, they might be experiencing, we need to stop judging that person and instead offer support while trying to learn from their experiences. It could happen to anyone.

The Hidden Impact of Staff Mental Health



How does Mental Health impact Flight Safety?

The problem with keeping mental health a taboo (like making mistakes used to be, and in some places still is), is that it will turn into a latent threat: An underlying safety issue that will get ignored. Organisations likely won't even be aware of the threat in the first place! Does that sound like an environment that takes flight safety seriously?

Mental health issues can impact flight safety in so many ways. Take burnout for example. Chronic fatigue plagues all staff, pilots are now chasing part-time rosters to cope with the amount of mental energy being spent on the job and with shortages of engineers, ground handlers and other staff – the situation is tough for everyone!

This is not a mental space you want to be in while having to make decisions that impact flight safety. But this is only the tip of the iceberg. Trying to concentrate on things that require attention on the flight deck, while navigating through intrusive thoughts about your last or upcoming proficiency check, your partner's cancer results, or even why Jimmy over at Planning called you a **** last week, is **NOT** conducive to a safe flight.

When you wake up in the morning, you have a finite amount of cognitive energy to spend that day, until you recharge properly.

This can be really tricky though in situations where you are distracted, or if you're simply not in a great mental place.

Human factors are still the biggest cause of aviation accidents. It's our brain and way of thinking that can make things worse. This risk becomes far greater if that same brain is being distracted with negative emotions and thoughts during flight.

Recognising Mental Health Issues

So how can you detect the signs of your mental health deteriorating before it goes too far? Here are the biggest indicators:

1. **Changes in mood or behaviour:** Are you showing signs of being happy one moment, and feeling intense negative thoughts a short moment later? Intrusive thoughts or a distracted mind can have various negative impacts on how you feel from one moment to the next. Of course, we all experience sadness, happiness, and everything in between throughout our lives. But try to ask yourself if the swing from happy to sad takes time, or if it happens very abruptly. If you're very grumpy all the time when you're usually a very positive person, have a think about what's really going on in your mind.

If you're irritable at work or snap at people for no good reason, try to take a step back and assess how you're really feeling.

2. **Difficulty concentrating:** Dealing with difficult thoughts or personal issues can all distract from what needs attention in the flight deck. This can very easily get worse if you choose to ignore them or try to down-play them. It usually comes back in an uglier form. Some people find that it becomes impossible to not think about "X". If you really feel that way, it's helpful to realise you might need to take some time to properly process your feelings.
3. **Physical symptoms such as headaches or fatigue:** Having a busy, negative mind is exhausting and draining. It costs a lot of energy to keep our biological computer running, especially if it's overclocking and trying to sabotage itself. If you're constantly fatigued or "need coffee to function properly", you might need to take a step back. It could help to have a look at how well you're taking care of yourself, your sleep, and your emotions, and if your physical symptoms come from poor lifestyle choices or constant negative thoughts.
4. **Substance use to cope or to 'fall asleep':** An all-too-common way to deal with problems for many people. Lots of people feel the urge to 'have a few drinks to fall asleep' or 'need' to get drunk during their time off in order to feel better and forget about their problems. However, this could mean there's more going on under the hood than you might realise. Being aware of your urges and reflecting on how they could be impacting you negatively, can help with addressing the negative effects on your mental health, and figuring out why you have those urges in the first place.
5. **Isolation and withdrawal:** For many there's a natural urge to separate ourselves from the world when we're feeling down. The problem is that this can make things worse. Interacting with others, sharing our feelings, venting, and learning from other perspectives can have massively positive effects on our mental health. Doing the opposite has, well, the opposite effect. This can very easily turn into a vicious cycle that can be hard to break. If you're feeling fed up with your circumstances or people around you, for some it becomes tempting to try to escape or run away from daily life. This could result in isolating yourself more and more over time.
6. **Feeling overwhelmed:** Does everyday life or challenges you normally wouldn't struggle with make you feel like all hope is lost? This might be an indication that there's more going on than just the issue you're trying to deal with. Negative thoughts that constantly linger in the background require mental energy. If you're not aware of the fact it can drain you it could manifest into long-term mental fatigue. If you're mentally fatigued, even the smallest decisions or acts can feel huge and too much to deal with.



8 Proven Ways to Cope with Mental Health Issues

Dealing with or fixing mental health challenges is a lot easier said than done. The most important focus should be making sure you take care of yourself. This might sound vague, so let's break down what exactly this could mean for you.

We all recharge in different ways, some of us need a few days off to ourselves, others need a night out with friends, and some need time with their partner. However, these are the main proven methods to help:

1) Exercise: This has been a proven way to improve your overall outlook on life, increase confidence, and reduce stress. It can even act as a mindful way to process intrusive thoughts and other things that might trouble you.



[A recent study in the US](#) proved that individuals who exercise have a 43% reduction in the number of days they experience poor mental health.

2) Proper Sleep: If you're one of those people who seem to think they can get away with 5 hours of sleep a night and still perform, think again. The book 'Why We Sleep' by [Matthew Walker](#) (a very clever Neuroscientist) explains exactly how sleep ties into a happy, fulfilled, healthy life.

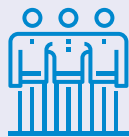


The research done by Matthew proved that the amount of people who can function properly on 5 hours or less, is 0% if you round it down to the nearest percent (it's 0.4%).

Sure, that's still a lot of people on a planet with 8 billion people, but it's still a very small chance that you're one of them. Sleep will directly impact our mood, thoughts, emotions, and energy levels. All of these can make dealing with mental issues either very doable or extremely challenging.

Make sure you give yourself at least 8 hours of opportunity to sleep. Even if that means laying awake, it will pay dividends in the long run.

3) Social Interaction: Isolation can aggravate mental health issues. The voice in your head has an easier target if you don't interact with the rest of the world. Isolation has been proven to negatively impact already existing problems in our lives. The opposite is true if you can talk through problems or even day-to-day stuff with close friends or family.



If you find it hard to connect with people, just try to reach out to whoever you feel most comfortable with. Sharing how you feel could feel scary and can leave you feeling vulnerable, but it will pay dividends in the long run as long as you trust the other person.

4) Healthy Diet: Processed foods, sugar, fast food and other foods that lack proper nutrients have been linked to negative emotions, lack of motivation, and poor general health.



The opposite is true if you feed your body well. Not only will this help with staying in shape, but food intake heavily influences the brain in both positive and negative ways, depending on your diet.

Night shifts and long-haul flights are notorious for lots of snacking, and eating during times when your organs normally get a break from constantly having to work (i.e. sleep). Be conscious of how you eat while working outside your circadian rhythm and see where you can improve.

5) Hobbies: Spending your time in ways that make you feel happy, engaged, and in the zone, is a good way to improve your mental health. Not all of us have this luxury, and it really does depend on what your lifestyle looks like at the moment.



However, see how you can make time for things that matter to you and make you happy. We all have busy lives, but setting time aside for this is crucial to recharge and go into work with a sound mind.

6) Mindfulness / Meditation: Meditation or simply taking time to be mindful and in the moment has been proven to drastically reduce stress, anxiety, intrusive thoughts, and racing minds. It can also help with feeling more in control of your life.



While this might sound like a load of hocus pocus to some of us who are not really into spirituality or religion, please know that meditation doesn't have anything to do with religion. It's simply taking care of your brain, and therefore your emotions, thoughts, perspectives, and ways of thinking about the world.

If you don't like the sound of meditating, try keeping a journal. At the end of a day full of difficult decisions or thoughts, it can help to write it all down and get it out of your head. Especially knowing you can always come back to reflect on it later.

The Hidden Impact of Staff Mental Health



Actively processing your thoughts and taking time to support a healthy mindset, is a proven method to improve mental clarity, mood, emotions and overall performance in life.

7) Safeguard a healthy work/life balance:

This might sound like a no-brainer, but it's actually really surprising how many of us get obsessed with our jobs (especially if they have side activities within a company).



Do you safeguard your time off? Do you check emails while at home? Do you think about work while spending time with your partner or kids? If the answer to any of these is yes, it might be helpful to be more conscious of how work infiltrates your life at home.

Here are the main ways to safeguard a healthy work/life balance:

- Set boundaries, take breaks, and become conscious of how much actual rest you get while not at work
- Talk to your employer to see if bespoke roster patterns are an option
- Keep a journal on how you spend your time while not at work, what your time off look like, and how long it lasts. Is it enough to recharge properly?
- Consider going part-time
- Create a routine that helps with managing your personal time in an efficient way

8) Professional help: If all these are not enough and you still find yourself struggling with thoughts that you find hard to cope with, it might be best to seek professional help.



This sounds more invasive than it has to be. It doesn't mean you need to get hooked up to some scary machine to see what's going on in your brain. It could just mean simply talking to someone who is actually qualified to help navigate challenging mental perspectives.

While talking to a friend or family member can be really helpful for a lot of people, you're still expecting help from someone who might not have a clue on how to actually help you properly (other than simply providing support). In either case, don't be afraid to reach out, it will help massively.

What are the benefits of taking care of your mental health?

So, what are the benefits of doing all of this? Well in one short sentence: The opposite effects of mental health issues! Let's look at the most notable ones:

1) Increased job performance and flight safety: When you are rested, calm and happy, you are both safer and more productive. Whether it's decision-making, Crew Resource Management, teamwork, or memory. All safety-dependent traits will improve if mental health is taken care of.

Taking care of yourself mentally and physically, benefits flight safety, efficiency, teamwork, monitoring, communication, and most other things that are crucial on the flight deck, on the ramp or in the hangar.

2) Improved relationships at both work and home: All work in aviation requires cooperation, teamwork, communication, leadership, and understanding. Anything that requires human interaction, from flying an ILS approach, to maintaining complex equipment, leans on two or more humans working together efficiently. Team performance can benefit from healthy relationships, whether long-term, or just a colleague you fly with for the day and never see again.

3) Increased vigilance/monitoring/alertness: The biggest impact of negative thoughts and emotions is distraction. Distraction is the main threat when it comes to a vigilant aviation professional monitoring or performing other complex tasks on the ground or in the air.

Detecting mistakes, cross-referencing data, and providing unbiased perspectives are only possible when you're able to completely focus on things that are going on, in the moment.

4) Better sleep: Sleep is an interesting one. A healthier mind means better sleep, better sleep means a healthier mind. It's a catch-22 if one of them is missing, but you need to start somewhere. Sleep hygiene and being aware of how sleep works is a crucial first step to a healthier mind, we covered this in our [previous article](#) on sleep.

5) More job satisfaction/fulfilment: Being able to be in the moment and enjoy what you worked so hard to do for a living, is a luxury not many people will ever be able to experience. Unfortunately, if you're dealing with mental health issues, none of those positive thoughts might ever be able to reach the surface.

Dealing with mental health issues can bring those feelings of joy and satisfaction back to some who haven't felt fulfilled in their job for years. If you're feeling like the job isn't for you anymore, please don't make any career-related decisions before addressing what might be influencing those feelings.



How can Employers help?

While at the end of the day, we need to take ownership of our own thoughts and emotions, employers (and regulators) should also feel invested in promoting good mental health. Especially within any profession where safety is the building block of the operation.

What are the best ways they can get involved? Well, here are the most beneficial factors towards healthy mindsets within an organisation:

1) Promote a just culture: What is a just culture? James Reason defined it as:

“an atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour.”

We need to contribute to a culture where mistakes can be openly discussed and learnt from. Of course, there is a line, also known as gross negligence, where you can't expect to not be held accountable.

However, raising your hand and being able to say 'I screwed up, let's talk about it' is essential for a continuous improvement in aviation safety.

2) Provide mental health resources: Companies should have at the very least an independent/external service for aviation professionals to talk to someone about confidential issues. Since the adoption of EASA rules in this area, airlines and operators are required to offer peer support programmes or other initiatives that allow pilots to deal with and process challenging situations – a very essential tool that helps us go in the right direction!

Where can you get Support for Mental Health?

If you feel you want some help in overcoming poor mental health, there are some (mostly free) options available. A full list is available on the EASA Wellbeing Hub on the Air Ops Community.

Ideally, organisations should also extend this service to all staff, not just pilots.

If your company doesn't, use the Wellbeing Hub of the EASA Air Ops Community Site and try to get involved or sign up to a peer support project.

3) Train management and supervisors properly so they can recognise and deal with mental health issues amongst their staff. There are still a lot of managers in the world who preach the 'don't be a **** and shut up' mentality.

This achieves nothing. In fact, it usually makes things worse and usually comes down to a lack of leadership or management training, or simply people who should not have made it to that point.

4) Offer flexible/bespoke scheduling: Pilots and other staff are on the verge of burnout, especially in the airlines after a long and busy summer. Anecdotally this particularly impacts pilots who are between 20-30 years old and are getting ready for their command upgrade.

They've likely sacrificed the last 10 years of their life to aviation, and their passion can be a double-edged sword when it comes to mental health and overall work/life balance.

Airlines should be aware of this, having someone in the flight deck that's on the edge of burning out is not something you want to be testing the results of.

5) Have more limited FTL schemes than the regulator requires to protect pilots more and **only use commander's discretion as an exceptional measure.** Like the discussion on recency vs competency, just because an FTL scheme is legal, doesn't mean it actually contributes to a rested pilot. Operators with high sickness levels should ask themselves what they're really asking their pilots to do year after year.

Conclusion

Prioritising mental health is not only crucial for ensuring safe and successful flights but also for the overall health and wellbeing of all aviation staff.

By taking proactive steps to support staff mental health, airlines, airports, ground handlers, maintenance organisations and other stakeholders in the aviation industry can create a safer, healthier, and more productive workplace for all of us.

If you're struggling yourself, or know someone who is: we hope this article can be a valuable source of support and information. Feel free to reach out to either one of us if we can help in any way, our contact details are on the 'About Us' page.

Stay safe, and try to be that positive influence someone out there might need! ■

The Role of Human Factors and Aviation Psychologists

from Gunnar our HF Expert/ Aviation Psychologist

We have a new member of the Safewings Team to introduce you to. Welcome to Gunnar, who is our Human Factors (HF) Manager. He plays a key role in helping us to operate safely and effectively so we thought it would be good to explain a little about why Human Factors are important, the role of a HF Manager and what skills he brings to our organisation.



What are Human Factors and why are they important?

Aviation continues to be extremely safe. In 2022 there were 9.3 million flights in Europe that carried around 2.0 billion passengers. Of these, there was only one fatal accident involving an EASA Member State operator. Statistically, aviation has become continually safer. However, in a challenging, ever-changing world, there are still risks, challenges and emerging issues to be dealt with as we discussed in previous articles.

The aviation system is very complex and a safe flight involves many different people who are continually interacting with each other and working together. Human Factors, or HF, is the term used to tie together these different interactions. In fact, understanding the factors that impact human performance in all the different activities our Safewings staff carry out every day allows us to develop effective strategies to mitigate associated risks that might jeopardise our ability to operate safely and effectively. At the same time, this understanding allows us to make the best use of all HF-related principles and strategies to further enhance the system's resilience by identifying the things that work well and building upon them.

It's also important to stress that HF isn't just about you as individuals but also how you interact and, importantly, how our organisation helps you to perform to your best every day.

The role of a Human Factors Manager

Gunnar's role as HF Manager is to integrate Human Factors thinking into our operations. It covers some traditional aspects of HF such as selecting new colleagues who fit into our organization, improving the way we cooperate and communicate as well as new areas of expertise such as user experience and usability engineering in our aircraft and any supporting equipment we buy.

The HF Manager helps us to continually improve our communication so that despite working with different people

and different shifts, we can always come together and perform effectively as a team. He advises Safewings leadership on key activities that can impact human performance such as our Fatigue Risk Management Systems, the Management of Critical Incident Stress & (mental) Well-Being, as well as the use and continued development of systems, procedures, and associated training.

As an accredited Aviation Psychologist, he also helps with the management of the mental health aspects of all the things we do. The overall aim is to ensure psychological safety at all levels. Thanks to the work of the European Association for Aviation Psychology (EAAP), there is now a competency-based framework for Aviation Psychologists and Human Factors practitioners in the same way as other key roles in aviation. This framework recognises people like Gunnar who are either Aviation Psychologists (AVPSYs) or Aviation Human Factors Specialists (AVHFS) and the unique skills they bring to our organisation.

Last but not least, Gunnar strives for a continuous development of his expertise. In fact, attending relevant courses and conferences in order to further enhance his skills and knowledge has been a fundamental aspect of his career path since the very beginning. He also shares his expertise with EASA to support the agency in HF-related safety issue assessments as well as in developing corresponding mitigation strategies with colleagues from all over Europe and even from overseas.

The evolving view of Human Factors

As with everything else in aviation, how we think of HF has changed a lot over the years. Between the 1940s and 1970s, the focus was on reducing workload to prevent people being overloaded, particularly pilots during key phases of flight or during emergencies.

From the 1970s to the 1990s, things shifted to thinking more about increasing situational awareness, so people were less



likely to make inadequate choices or decisions because they didn't fully understand the situation they were in or what was happening.

More recently, things have further evolved to consider the wider role of the organisation in helping people perform to their best. In other words, this development puts more focus on the way people's performance, whether that is flying an aircraft, operating ground equipment, or performing important maintenance, can be influenced by the systems that encompass it, such as an organisation's culture and habits for example.

Views of Human Error and Resilience Engineering

You may have heard of a man called Dr James Reason. He is often considered to be the father of the academic study of human error in aviation and is famous for his 'Swiss Cheese Models'. In his work from 1997, he highlighted two ways of looking at human error.

The first is based on the individual and focuses on people making errors and/or violating procedures. This approach then leads to the second, which is corrective actions directed towards people themselves. However, we know from experience that, while it helps to see where we can improve on an individual level, there is a risk that this approach fails to address the systemic, organisational factors that create the situations in which things go wrong. It may thus also fail to create opportunities to set up the error defences we need to prevent accidents. According to this second perspective, human error can be seen as a symptom of trouble deeper inside a system.

A complementary framework to human error is that of resilience engineering, which aims to create psychologically safe working environments and thus promote overall sustainability by enhancing an organisation's resilience at all levels.

This is where our HF Manager comes in. He helps us to understand these interactions and most importantly to focus on how we can perform to our best as individuals, work together as teams and create the organisational processes,

practices, and culture that help each and every one of us perform to our best.

Some examples of how people and HF help to create safety and ensure safe operations

We rely on you, the staff of Safewings to create safety in our day-to-day operations. Sometimes you can be under pressure, facing difficult conditions and challenges with resources. By having an effective HF strategy, we reduce the emphasis on peoples' individual errors and focus our efforts on building systems that better manage our risks.

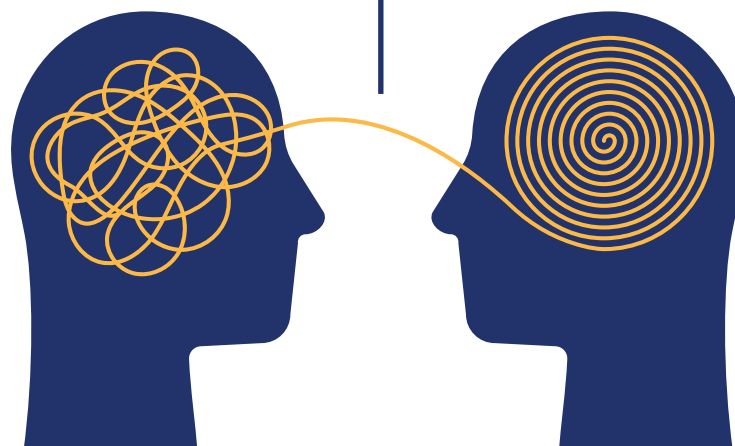
Some examples that another famous HF expert, Sidney Dekker highlighted in this context include:

- Developing memory aids.
- "Buying time" in our operational processes to relieve pressure on staff.
- Employing buffers, routines, heuristics, tricks, double-checks and shortcuts to simplify a task.
- Looking for feedback loops and feed-forward mechanisms to increase situational awareness.
- Developing fall-back procedures so that contingencies involve less uncertainty.
- Anticipating forms and pathways that lead to failure.
- Tailoring tasks more closely to capabilities.

Our HF expert – supporting you, the staff

Hopefully, this article has helped you to understand the value that having an HF Manager brings to our organisation. Gunnar loves talking to people and is always happy to hear about new challenges that need solving or risks that could be better managed while learning about peoples' adaptive capacity and skills. Especially the latter – once shared – will help all other colleagues to develop and grow in a psychologically safe environment, which benefits the whole organisation.

Gunnar follows the philosophy 'if you want to get things right in bad times, you need to build up trust and promote in good times'. ■



“I feel the need, the need for...
Knowledge Skills and Attitudes (KSA)”

Origins of Flight Education

Since the invention of powered aerodynamic flight by the Wright Brothers in 1903, many of us have been inspired to pursue the wonders of aviation. With this demand to take to the skies, educating aviators became a vital undertaking and continues to be so today. With the evolution of education in wider society, how do we ensure that aviation training remains the best that can be provided? This article will explore the rationale for the addition of competency-based training to aviation and explain the continuing need for knowledge, skills, and attitudes education.

This article was developed by CAE

The first aviation educational establishment formed was the Royal Air Force's Central Flying School (CFS), which opened in May 1912. Only one month later, a Flanders monoplane crashed at Brookland's Aerodrome in Surry UK, killing both occupants. As aviation grew into a commercial operation, the public demanded assurance for the safety of aviation. Statistics gathered from May to October 1919 revealed that over 4,000 flight hours, 52,000 passengers were carried, and only ten had sustained injuries. Public perception of aviation was significant to the regulators, as the first Controller General of Civil Aviation, Mr. Sykes, quoted this statistic as: *"For every 5,200 passengers carried only 1 has been injured"*.

Unfortunately, during the above dates, there were also two pilots killed and a further six injured. Straight from the outset of aviation safety analysis, hours of flight were a convenient measurement to which to ascribe expertise.

Traditional Training

It is a logical and realistic assumption to say that *"we get wiser as we get older"*; and therefore, the more experience someone has, the better they are likely to be in any given field. It is easy to see a captain's number of flight hours in an incident report, and immediately make assumptions of their ability based upon those numbers. This is in effect the foundation of traditional flight training: Pilots were trained, and their progression marked by the number of flight hours that they had achieved.

UK and EASA regulations set the hours of flight instruction required to be awarded each license, with additional duration given for theoretical education to ensure pilots have the knowledge base to support their hours of flying experience. This traditional flight training addresses both the *knowledge* and *skills* required to safely operate the aircraft. Despite the use of hours to equal expertise, it is also accepted that some pilots may take longer to reach the standard. However, there is limited comprehension of this factor - as in these cases, someone with more flight hours may actually be the weaker pilot.

COURSE	HOURS
PPL	45
ATPL ground school	650
Pilot in command hours building	910
Night rating	25
Multi engine course	6
Multi engine instrument rating	45



With an impending global aviation workforce shortage, the industry must make the training pipeline as streamlined as possible, whilst also protecting the highest standards of safety. We must therefore consider whether the traditional educational framework is optimal. In essence, whether the current approach to learning is effective, efficient, and economical.

Training to Competence

At the turn of the millennium, educational philosophers began to research the gap between educational practices and industry requirements. Even today, a common complaint of high school education, is the absence of teaching about tax returns or changing a car tyre, and instead focusing on topics that seem far detached from what is useful and needed for adult life. Herein lies the concept of teaching to mastery level for a task, job, or function. Instructional system designers seek to identify what knowledge and skills are needed to perform a job to a set standard and then focus all training on those objectives.

In this educational methodology, areas of required learning can be grouped together in categories named 'competencies'. A student will progress when they reach a mastery level of knowledge or skill, rather than just being based upon arbitrary hours, and only then are deemed competent. This is known as *competency-based education (CBE)*, or when combined with an assessment tool, *competency-based training, and assessment (CBTA)*.

Competency at performing a job specific task can also be referred to as 'Hard Skills,' or 'Technical Skills.' Technical Skills are easily definable and measurable in terms of success. Technical Skills could include a manually flown coordinated climbing turn, with success criteria involving rate of climb, rate of turn, and timing. That said, stick and rudder skills are not the only marker of a good pilot: Knowledge and skills are not enough!

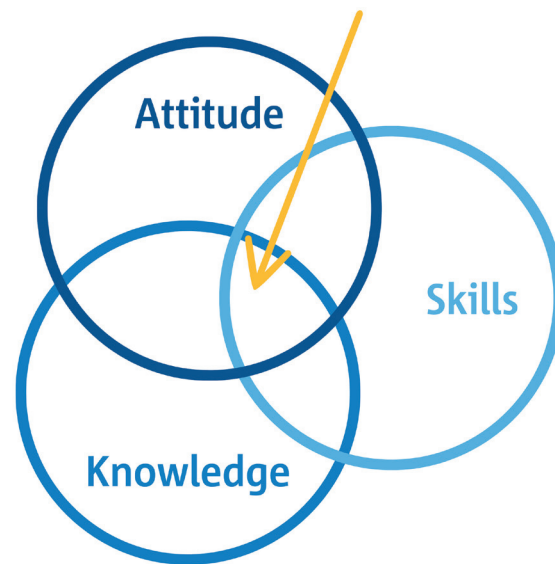


Knowledge Skills and Attitude (KSA)

A subtle differentiation can be made between competency for job-specific technical skills and the personal competencies that relate to the individual characteristics of the person doing the job. Personal competencies are also sometimes called 'Non-Technical Skills' (NTS) or 'Soft Skills.' Rather than solely describing how the job is to be performed to the standard, personal competencies go on to describe the *attitude* of the individual.

However, in the traditional method of training, building the attitude for competence was left to trial and error at best, or at worst only found by luck. To define what a good pilot

Competence



looks like, all three areas of *knowledge, skills, and attitudes* (KSA) are required. It is the combination of these three elements that form competence.

This appears a simple concept to grasp. However, there are many psychologists who would assert that you cannot teach attitude! Fortunately, what we can do instead, is to teach required behaviours. Each competency in a CBTA framework is defined by a group of associated behaviours that trainees can be taught to perform, and which can be readily observed by instructors.

The transition to a CBTA methodology will not greatly impact upon how instructors go about their work: In general knowledge and skills should be straightforward to define, teach and assess. They are taught and practiced within the allocated (and often regulated) hours and students must still pass proficiency tests at certain milestones. The huge benefit of CBTA is however that it addresses all the elements of KSA in a coherent and clear way for instructors to identify whether a behaviour was seen to be present or whether it is absent. With tighter definitions of the attitude element of competence, instructors can more effectively provide accurate and relevant feedback to students. This results in the overall objective of the quality of training being improved.

The last word is to emphasise that CBTA and KSA are not educational fads that will pass in time: Both bridge vital gaps in the traditional approaches to aviation education and training and human performance will be enhanced as a result. ■

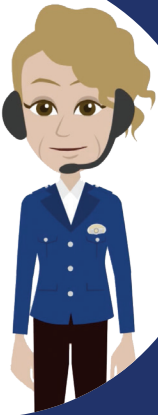


Why safe, efficient communication in aviation is a **SHARED** responsibility

from Cate the Air Traffic Controller at Rheinufer Airport

In aviation, English language problems are a significant risk to safety. An ICAO review of 28,000 incident/accident reports found that communication was a factor in over 70% of the occurrences.

In 2008, ICAO introduced the Language Proficiency Requirements to improve aviation safety. They aim to ensure that all pilots and controllers working in an international environment are able to communicate clearly in English. These English language requirements apply to all personnel - including native English speakers, which sometimes surprises people.



Much of the burden of language proficiency has fallen on English as a Second Language (ESL) speakers. They have had to invest considerable time, money and effort into improving and maintaining their level of English. They have been required to pass Aviation English exams in order to retain their right to work, with the majority having to be re-tested every 3-5 years.

Native-English speakers, by and large, have been unaffected. But ICAO did not intend this to be the case. The *Manual on the Implementation of ICAO Language Proficiency Requirements* states:

"...native and other expert users of English can acquire strategies to improve cross-cultural communications..."

Native speakers in particular have *"an ethical obligation to increase their linguistic awareness"* and *"...focus on strategies that aid comprehension and clarity"*.

There are good reasons for ICAO to suggest that native-English speakers should take their share of the responsibility. The comfortable assumption made by many native-English speakers is: "English is my first language therefore I speak it perfectly; if you don't understand me, it's not my problem".

So, ESL speakers continue to improve their language skills to improve safety. Unfortunately, the same cannot always be said for native English speakers. Leaving aside questions of ethics and fairness, how well is this working? Are native English speakers really a problem? The straightforward answer is - yes!

Here are some comments from different operational staff.

"I see these communications breakdowns at work every day", Maria, Spanish controller

"I think every non-native English speaker has had difficulty communicating with native English speakers", Vasil, Bulgarian controller

"I have experienced these problems many, many times in my aviation career", Stefano, Italian pilot

"I understand non-native speakers more than the native ones because the non-native speakers speak slowly and make short sentences", Andres, Colombian Pilot

In 2022, Mayflower College in the UK asked 1,974 pilots and controllers from 112 countries:

*"Do you think that aviation **safety** is ever compromised because of the way native speakers use English?"*

65% said YES.

*"Would it be useful to provide **TRAINING** to help native English-speaking pilots and controllers communicate more effectively, especially with non-native English speakers?"*

89% said YES.



The main things that native English speakers could focus on are as follows:

1) Using Standard Phraseology

Standard Phraseology is intended to simplify communication through the use of a controlled vocabulary and grammar which all aviators are trained to understand. To achieve effective communication in international aviation, the Americans, British, Australians, etc. need to restrict themselves to Standard Phraseology whenever possible.

When non-routine situations arise which are not covered by standard phraseology, 'plain English' is required. In this case, native English speakers need to learn how to use plain English appropriately, using words and phrases which are likely to be understood by members of the international aviation community. An article follows on this topic next in the magazine.

2) Speak more slowly

The Mayflower College results are corroborated by other studies. In one study, fast speech by air traffic controllers was shown to be the cause of communication breakdown in 28% of misunderstood call signs and 42% of misunderstood level changes.

So, how fast do native speakers speak?

ICAO explicitly recommends speaking at 100 words per minute, which is approximately equal to **4.1** syllables per second (sps).

However, studies show that American air traffic controllers speak on average at a rate of **6.1** syllables per second (sps).

Compare that to the speech rate in American movies where the average is **5.1** sps and to American news programs where the average is **4.7** sps.



Another study shows that when speech is delivered at the typical rate of an American air traffic controller (6.1 sps), non-native speakers cannot recognise 20% of the words.

In other words, it seems that native English-speaking aviators may be speaking 50% faster than ICAO recommends.

To make matters worse, they are of course mainly speaking over the radio, where international pilots and controllers have no non-verbal cues to help the communicative process.

3) Unclear Speech - Try not to speak with a strong accent/pronunciation.

According to ICAO, aviation personnel (including native English speakers) must *'use a dialect or accent which is intelligible to the aeronautical community'*. It is incorrect to assume that because English is your first language, your pronunciation is automatically intelligible to everyone.

There is evidence that even native-English-speaking personnel cannot understand each other if they are from different countries, because their accents are unfamiliar and difficult to comprehend. This is even more of a burden for ESL speakers.

4) Have more patience

Safety is a shared responsibility; and a vital component is empathy, the ability (or at least the willingness to try) to understand what the other person is experiencing.

Unfortunately, it seems that many native English speakers lack empathy for the challenges faced by non-native English speakers.

Why is this?

- They haven't been trained adequately – the assumption is that “English is our language so we must be good enough”.
- They may not be aware of the problem. *“I've been doing this work for 20 years and never had any complaints”*. But except after the most drastic of situations, there is no routine feedback loop for foreign aviators to explain that native-English speech is problematic.
- Native-speakers have a poor record of learning foreign languages and as a result can find it difficult to put themselves ‘in the shoes’ of someone working in another language.
- The native-speakers educational systems probably rewarded the use of “clever, sophisticated” language. In aviation R/T however, *simple* and *clear* are much better than *idiomatic* and *nuanced*.

Effect of communicating under high cognitive load

All these communication problems are compounded by cognitive load - the amount of information the brain has to deal with at a particular time. The greater the cognitive load, the harder it is for the brain to process language effectively. This applies to native speakers as well as those who speak English as their second language. Language proficiency is not the main issue here – this is about the way that human brains work.

In radiotelephony, the most critical information is generally given during the most demanding phases of flight (take-off, level changes, final approach, landing). It is precisely at these stages that clear communication is most important - the brain has little “spare capacity” for language processing.

In conditions of high workload, the brain processes verbal information differently than the way it does during conditions of low workload. This makes mistakes more likely and is compounded if native speakers do not speak clearly and deviate from standard phraseology.

The well-known advice: “Aviate – Navigate – Communicate” breaks down when there is high workload. “Communicate” is supposed to be the final stage of a particular flight task but in reality, has to be done at the same time as the other 2 parts of the maxim, increasing cognitive load.

What can be done?

Experience shows us that native English speakers will not VOLUNTEER for training to show them how to improve their English skills when communicating with non-native speakers. In fact, many will resist the need for the training altogether, believing the sole responsibility lies with ESL speakers to improve their English. This is to miss the point.

For change to happen ICAO, national regulators, airlines, ATS providers and manufacturers will need to make training mandatory. Native English speakers have a vital role to play in ensuring safe, effective communication takes place.

“The single biggest problem in communication is the illusion that it has taken place”, George Bernard Shaw. ■





Standard phraseology in the aviation environment

From our Safety First Officer Claudio

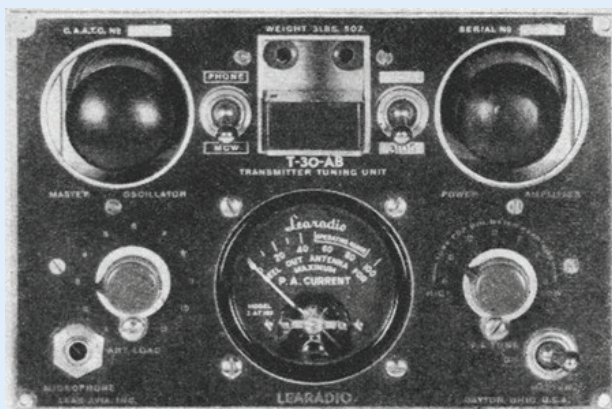


Just a few years after the Wright Brothers made their historic flight at Kitty Hawk, radio was first used for flight communications. It allowed pilots to share information about the weather and flight conditions, their position and much more. The developing aviation community saw radio as a way to improve safety and efficiency in air travel.

It did not take long before they went on experimenting and working on radio technology. The earliest examples of radio-in-flight communication came from the military. In 1917 morse code was replaced by voice, making communication much more effective and quicker. Imagine being able to say what you want instead of translating it into morse code, and for the receiver to translate it again. A lot of room for error!

Instead of learning morse code to communicate everyone followed the course radio telephony. This is basically English in an abbreviated format focussed specifically on aviation terms to ensure clear and efficient communication that everyone can understand. As a new pilot, you start by feeling nervous talking on the radio but quickly it becomes a basic skill like your native language.

However, as a basic skill, it's important to come back to regularly to make sure we don't drift into doing things differently that might prevent others from understanding it.



What we learn about radio telephony skills?

So, what compels a student pilot to learn these basic skills? At a basic level, the EASA regulation for Aircrew in FCL.055 says this about language proficiency:

Aeroplane, helicopter, powered-lift and airship pilots required to use the radio telephone shall not exercise the privileges of their licences and ratings unless they have a language proficiency endorsement on their licence in either English or the language used for radio communications involved in the flight.

The applicant for the endorsement shall demonstrate the ability to:

1. Communicate effectively in voice-only and face to face situations
2. Communicate on common and work-related topics with accuracy and clarity
3. Use appropriate communicative strategies to exchange messages and to recognise and resolve misunderstandings in a general or work-related context;
4. Handle successfully the linguistic challenges presented by a complication or unexpected turn of events which occurs within the context of a routine work situation or communicative task with which they are otherwise familiar; and
5. Use a dialect or accent which is intelligible to the aeronautical community

The minimum level you need is the operational level (level 4), if you have level 4, it is valid for 4 years, then you need

to be endorsed again, for level 5 (extended level), you have 6 years of validity. However, when you have level 6 (expert level) you are home-free and will be proficient for the rest of your life.

The importance of standard phraseology and how things change

Aviation communication is done using a certain format that has been agreed at a global level and everyone who communicates in the air and on the ground learns that format. It is vital so that everyone knows what's going on. But over time there is often a drift from the standard phraseology. Sometimes this can be local and sometimes this can be due to the change in language in the wider world. If we start developing (and accepting) a dialect or slang or however you want to call it, the risk increases for miscommunications. Some examples I have heard include:

1. When a controller informs there is traffic on final or gives wind information the pilot replies "That is copied". (I myself made that mistake until a colleague pointed it out, it should have been "ROGER". Remember you can be unaware of your own errors).
2. When a controller informs you about traffic and the pilot informs "WE HAVE ON IT ON TCAS". Although it is a great technological feature, the correct way should be "TRAFFIC IN SIGHT", which means you have visual contact and this relieves the controller from his responsibility to maintain a certain separation.
3. At Amsterdam airport "SCHIPHOL GROUND" is called "GROND". The Dutch word for ground. This raises the question how far do you go at your local airport? I would say a hello or goodbye is the limit. The rest should be in the agreed language.
4. A controller separates messages between two aircraft by using "BREAK". This has a different meaning. The correct one is "BREAK BREAK". It is completely logical that in a busy environment, a controller tends to say it only once, and pilots accept it. But what is next to accept?

These are just some examples, but there is much more to consider. Is one of the communicators tired, at the end of their shift, maybe distracted by colleagues when you are transmitting your information? Remember there are numerous ways to interfere with the transmission. This is why confirmation is so important. This is something I have experienced that controllers or pilots do not always correct a wrong readback.

For example: ATC clears aircraft X to FL 310, Aircraft Y blocks out aircraft X and reads back this clearance. Because ATC can see what FL pilots select, ATC corrects aircraft Y later

on. However, this should have been corrected straight away. Another: ATC clears aircraft X on a certain departure with a specific exit point. The pilot does not readback the exit point. ATC does not confirm.

Mistakes are made easily and unintentionally. In pilots and controllers, you need to be on top of your game all the time. If we start accepting slang, dialect, wrong or incomplete readbacks safety could be compromised, what is certain is that risk will increase. It is important to keep each other sharp, like my colleague who pointed out my error. There is no shame in making errors, there is shame however if we do not point those errors out when we see them.

The importance of continually thinking about the words we use and how we say it

I discussed already that if you have EXPERT LEVEL 6, you are home-free and will never have to do any refresher training on language proficiency. However, as you will see from the earlier article on the challenges that native English speakers can bring into our communications, what we say and how we say it is something everyone needs to think about and continually work on.

Here at Safewings, we have refresher courses available for everyone and we encourage everyone to refresh themselves in this important topic. The same is true also for controllers and people working on the ramp who need to communicate using standard phraseology.

Roger not Copied





Standard phraseology

Now is a great time to revisit the key parts of standard phraseology from the ICAO manual on radio telephony. The good thing to know is that there is a standard, but in some cases (non-standard emergency) you need to revert to plain language. Remember you are required to be able to *Communicate on common and work-related topics with accuracy and clarity.*

Word/Phrase	Meaning
ACKNOWLEDGE	"Let me know that you have received and understood this message."
AFFIRM	"Yes."
APPROVED	"Permission for proposed action granted."
BREAK	"I hereby indicate the separation between portions of the message." Note: To be used where there is no clear distinction between the text and other portions of the message.
BREAK BREAK	"I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment."
CANCEL	"Annul the previous transmitted clearance."
CHECK	"Examine a system or procedure." Note: Not to be used in any other context. No answer is normally expected.
CLEARED	"Authorized to proceed under the conditions specified."
CONFIRM	"I request verification of: (clearance, instruction, action, information)."
CONTACT	"Establish communication with..."
CORRECT	"True" or "Accurate."
CORRECTION	"An error has been made in this transmission (or message indicated) The correct version is..."
DISREGARD	"Ignore."
HOW DO YOU READ	"What is the readability of my transmission?"
I SAY AGAIN	"I repeat for clarity or emphasis."
MAINTAIN	Continue in accordance with the condition(s) specified in its literal sense, e.g. "maintain VFR".
MONITOR	"Listen out on (frequency)."
NEGATIVE	"No" or "Permission not granted" or "That is not correct" or "Not capable".
OUT	"This exchange of transmissions is ended and no response is expected." Note: Not normally used in VHF communications
OVER	"My transmission is ended and I expect a response from you." Note: Not normally used in VHF communications
READ BACK	"Repeat all, or the specified part, of this message back to me exactly as received."
RECLEARED	"A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof."
REPORT	"Pass me the following information..."
REQUEST	"I should like to know..." or "I wish to obtain..."
ROGER	"I have received all of your transmission."
SAY AGAIN	"Repeat all, or the following part, of your last transmission."
SPEAK SLOWER	"Reduce your rate of speech."





STANDBY	“Wait and I will call you.” Note: The caller would normally re-establish contact if the delay is lengthy. STANDBY is not an approval or denial.
UNABLE	“I cannot comply with your request, instruction, or clearance.” Note: UNABLE is normally followed by a reason.
WILCO	(Abbreviation for “will comply”)
WORDS TWICE	<ul style="list-style-type: none"> a) As a request “Communication is difficult. Please send me every word or group of words twice.” b) As information: “Since communication is difficult, every word or group of words in this message will be sent twice.”

It’s important to note, that the phrase “GO AHEAD” has been deleted, in its place the use of the calling aeronautical station’s call sign followed by the answering aeronautical station’s call sign shall be considered the invitation to proceed with transmission by the station calling.

(or in other words, If you want to start a communication without immediately stating your intentions you say “CONTROLLER123, PILOT123” and the controller replies by saying “CONTROLLER123, PILOT123”.

Threats that come with non-standard phraseology

What is the most probable thing that can happen? It is miscommunication that needs to be corrected. We all know the communication “HAVE THEY CLEARED YOU INTO RAMP”. I think I don’t have to say more, if you don’t know, here is the link: <https://www.youtube.com/watch?v=ShdkQGGyBWg>

This correction is time-consuming and may be annoying for the one who is trying to send the message. Miscommunication happens a lot and normally does not pose an immediate threat. Usually, it is solved in less than 10 seconds. This is not the case with the example above. Hence the annoyed controller.

Another threat is midair collision. If you think you are cleared to a certain flight level but you are not, you may have an increased risk of midair collision.

With runway incursion, there are multiple examples of aircraft that misunderstood their clearance, and miscommunication plays a major role. An example of that is in this case: <https://www.youtube.com/watch?v=ol2rJhdvq> In this case, DAL300 did not read back to hold short, they only read back their gate number. So, two errors here: DAL300 did not read back the complete clearance and ATC did not correct them after not reading back the complete clearance.

Another example is non-standard phraseology. The receiver may misunderstand or not understand at all what you are trying to communicate.

Using different languages

A last threat I want to mention is the use of different languages. If the common language is English and controllers and pilots start to speak a local language, the other pilots in that area who do not speak that language will lose part of the mental picture they have of the traffic around them. It may be considered a low risk but it can be annoying for the ones who do not speak that language. Imagine you are at dinner having a conversation and some of the people start talking in a different language you don’t understand. Not very nice to do, so why do we do it in the air?

Key points to take away

1. Use/know standard phraseology.
2. As airlines consider refresher courses/material for standard radio communication.
3. Think about the other one when there is miscommunication, before becoming angry, try to understand why the message does not come across.
4. Verify the message is understood.
5. If you hear an error being made, point it out to your colleague. There is no shame in making errors, but there is in accepting them.



“Claudio OUT”
(or “OVER” if you want to give feedback) ■



Understanding Cyber Security Risks

For the past few years, you will have seen many reports in the news about cyber attacks on the aviation industry. Such attacks come from various different sources including:

- Cybercrime actors: Those seeking to commit crimes to make money through fraud or extortion.
- Hacktivists: Those wishing to use cyber as a weapon to promote a specific cause.
- State actors: Countries wishing to do harm to the transport infrastructure of others.

The number of cyber attacks is continuing to grow and with that, the cyber threat landscape that we face is continually changing. The tools that our adversaries are using can do more damage than ever and at a fraction of the cost in the past. Cyber-attack technology is more automated, which enables more people to become a risk to our systems because they need fewer skills and training.

All this poses a big challenge for our operations. With the new EASA Regulations in Part-IS, there is now a structure to identify and manage cyber risks in the same way we manage traditional safety risks.

What Type of Risks are we Talking About?

Aviation is full of interconnected systems. We rely on all these systems to keep our operation running safely and effectively. The image below highlights the types of risks that we are talking about.

We rely on these systems for all sorts of things. Keeping our aircraft airworthy from a technical perspective, knowing where they should fly and keep safely apart from other aircraft, enabling communication with ATC, our Ops Team and other aircraft, providing information and services to our passengers and many more.

Given our reliance on these systems, at a fundamental level, cyber-attacks pose risks as basic as safely keeping aircraft in the air, keeping aircraft at the correct separation in the air and taking off/landing safely.

From Safety Notion to Security for Safety Notion.

Before we talk about how we manage our Cyber Risks effectively, it is useful to think about the need to shift our mindset toward these types of risks. In the traditional safety way of thinking, we design reliable systems that do what they are supposed to do. When we start looking at things from a security for safety point of view, we need to go a step further and ensure we have secure systems that do what it is supposed to do **and nothing else**.

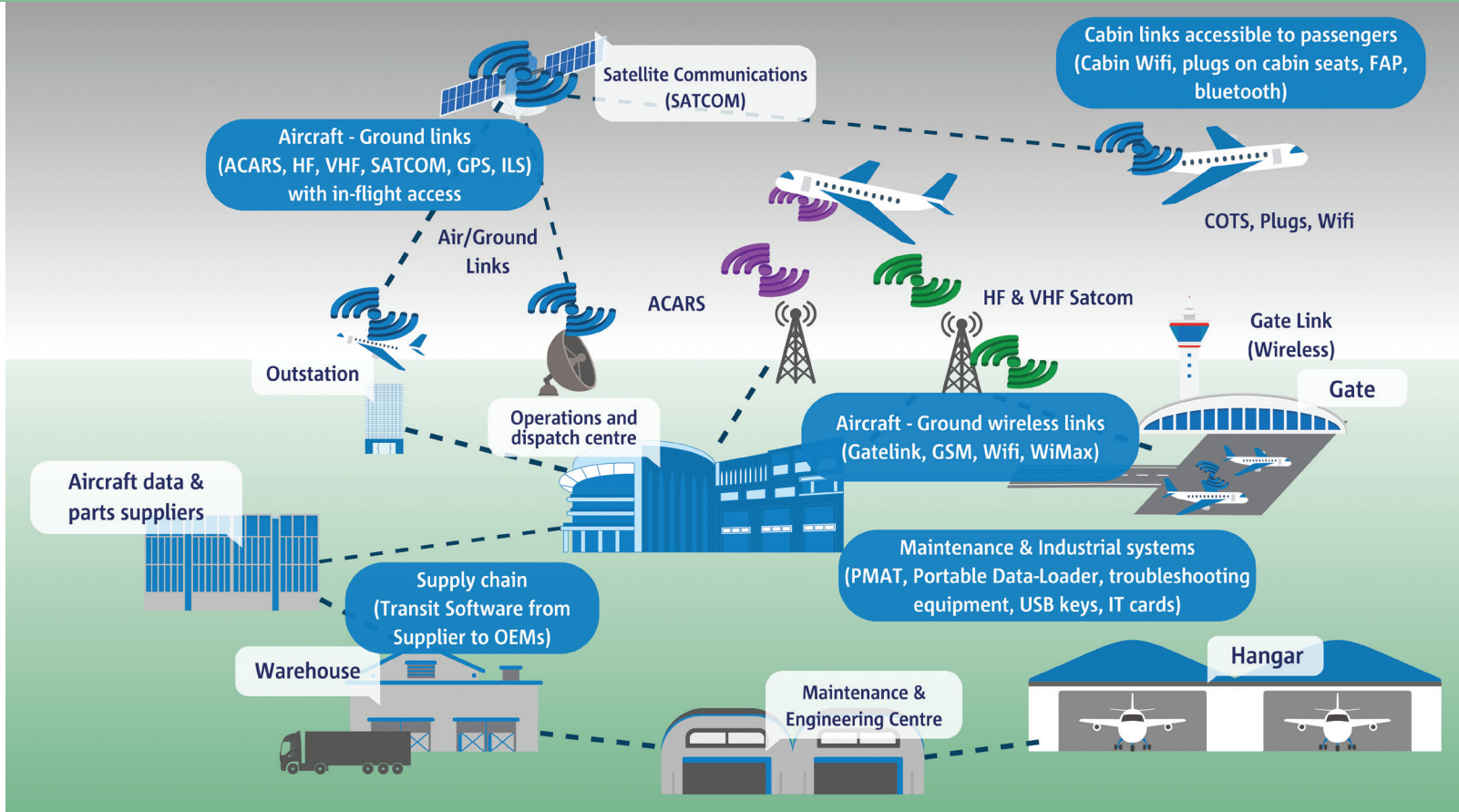
As systems become more interconnected, the architecture should ensure that each system is able to protect itself against individual risks. The level of protection of each system must include all the interacting measures, this means we have a security architecture layer in every system that is in addition to the functional architecture of what the system actually does.

Think about how many different systems we have at Safewings. In reality, they are a system of interconnected systems and we have to protect them all from potential threats coming from any source, including many different people intentionally trying to do us harm. This is even more challenging when you consider how many systems of other companies and organisations we interface with. This is why having common regulations like EASA's Part-IS are so important.

Cyber Security Framework – A 5-Step Process

We manage our cyber risks using the 5-step process below. It is very similar to the Plan-Do-Check-Act process that you are likely to be familiar with from your safety training.

The first step is to identify where our threats and risks are coming from. Some of these are well known already, some of these you can report in day-to-day operations (more in a minute) and others come from our collaboration at industry level through the European Centre for Cybersecurity in Aviation (ECCSA).

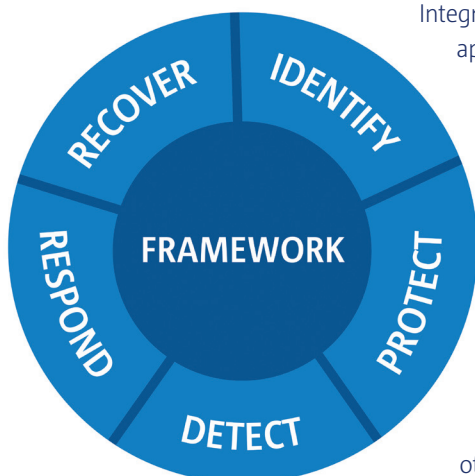


Then our greatest challenge is to protect all our systems from the potential threats that we face. With such a changing threat landscape, this is something we have to work really hard on.

Should the worst happen and an attack occur, all our systems need to be able to detect when something has happened so that we can then respond effectively and recover the system and our operation.

Who is responsible at Safewings?

Here at Safewings, we take an Integrated Risk Management approach so we manage Cyber Risks through the Safety Department under Nuno, our Head of Safety. To ensure that we have the right expertise specifically on these types of risks, we have our Security Manager, Ana, who covers both Cyber and other Security aspects.



What can you do?

There are three things you can do to help our efforts to mitigate cyber risks.

1. Firstly, please follow all company procedures when it comes to operating or maintaining any systems that you use in your day-to-day work and when it comes to the use of USB sticks.
2. Be aware of potential phishing or other possible attacks that might come to you as an individual, especially through email. Ana and her security team continually produce promotions of common threats and things you can do and these are always available on the company intranet.
3. Finally, please report any situation that you think might cause Cyber Risks. For example, if you open anything by accident in an email, please report it so we can take action quickly. The main thing is to report it, Cyber Risks are continually evolving and even the most aware people can be taken in – don't be afraid, nothing will happen to you if you report something. ■



Mitigating the Risk of Laser Attacks

As the nights get darker, the risk of laser attacks increases. It is probably not a surprise that most laser attacks take place when aircraft are over or near large centres of population. There have also been occurrences where ATC towers have been targeted by lasers. Unfortunately, it is not so easy to prevent the attacks themselves. In some cases, many laser attacks have been identified as the work of a single person and it can be extremely challenging to identify and prosecute people who use lasers to attack aircraft. For that, we must rely on the police and other authorities both to prosecute people who do this and then to publicise successful prosecutions to help deter others.

What can we do as an aviation community?

There are still lots of things you do both within your organisation/ airline and as individuals. The Together4Safety Map of the Safety World shows the 6 key areas that support safe operations.

The main areas related to lasers are:

- **Risks:** Consider where in your route network the risk might be highest – consider flagging up high-risk locations to crew so they can be extra vigilant.
- **People:** Consider providing pilots with specific training on handling laser attacks using our “Trap Danger Now” mnemonic in case you are stuck for ideas or material.
- **Resources:** Some airlines now have Laser Strike Eyewear for pilots to wear on approach to high-risk locations, consider the need for this type of physical risk management.
- **Learning:** Encourage the reporting of all laser strikes and then share this information within your airline and also with your National Aviation Authority to help build up the bigger European and global data picture within the EASA Data4Safety project.

What a laser attack looks and feels like?

Laser attacks can appear very suddenly and are very bright and distracting to the flight crew, who can suffer temporary

loss of sight following an attack. However, the latest research suggests that permanent eye damage is unlikely due to the lower power levels of handheld lasers.

The key characteristics of a laser attack are:

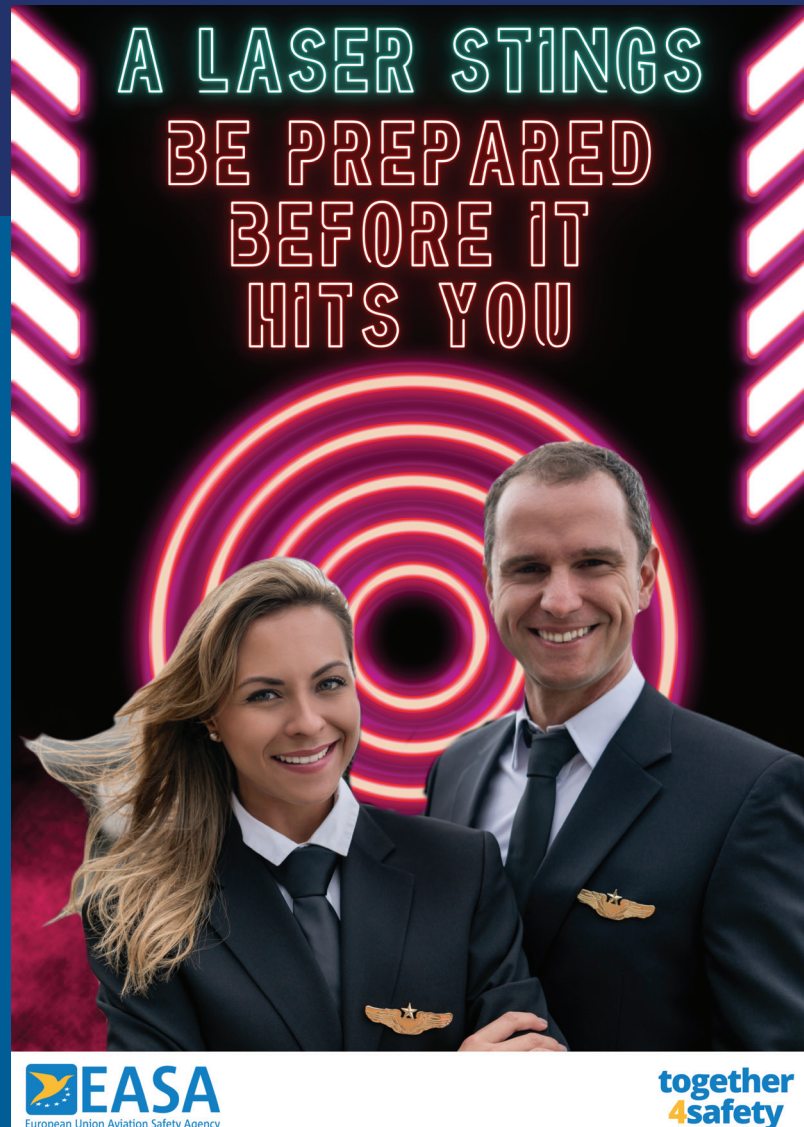
- It is always very sudden.
- It is always very bright.
- It is distracting.
- The glare may obscure many or all of the flight instruments.
- Night vision will be disrupted.
- Even if the eyes are not directly illuminated there will be a temptation to look into the beam.
- For some time after the attack there is likely to be retinal ‘after images’ or even short-lived blindness.

Advice and Mitigation Strategies

Advice on how flight crews and ATC personnel can be more prepared for laser attacks has been produced by a number of different countries and organisations. Additionally, the FAA and USAF have jointly produced a training video for pilots on the subject that is publicly available¹. The key points of this advice can be easily remembered and advertised across the aviation community using the phrase **TRAP DANGER NOW:**

Before Flight - TRAP

- **Train:** At some point in a flying career a pilot's aircraft or a controller's tower will be targeted by a laser attack. Organisations should establish Laser Awareness Training and ensure that they have detailed SOPs for crews and controllers, which have a structured approach.
- **Reassurance:** Pilots and controllers should be reassured by the fact that the chances of suffering permanent eye damage from a laser attack are extremely low.
- **Anticipate:** When operating in a known or suspected laser environment, the non-flying pilot should be ready to take control of the aircraft if required. Consider having pilots wear "Laser Strike Eyewear" in high-risk locations.
- **Prepare:** Individuals should be prepared for the sudden shock that a laser attack can cause and be aware of the available advice on actions following an attack.



During and Immediately After an Attack - DANGER

- **Delegate:** If another crew member has avoided exposure, consider delegating tasks to the unexposed crew member if appropriate.
- **Aviate:** Check the configuration of the aircraft and, if available consider engaging the autopilot to maintain an established flight path. Consider executing a go-around.
- **Navigate:** If necessary, use the fuselage of the aircraft to block the laser beam by climbing or turning away from the laser.
- **Glare:** The glare of a laser is very distracting, look away from the laser beam if possible, shield your eyes and consider lowering/raising sub-blinds to reduce the effects. Consider turning up the flight deck lights to minimise the effects of further illumination.
- **Exacerbate:** Do not exacerbate the effects of a laser attack on the eyes – avoid rubbing of eyes to reduce the possibility of inducing further injury.
- **Report:**
- **Pilots:** Inform Air Traffic Control of the situation as soon as possible and in particular if a decision has been made to diverge from the cleared flight path.
- **Controllers:** Advise aircraft under your control that a laser is illuminating you.

After an Attack - NOW

- **Notify:**
- **Pilots:** As soon as possible after the attack provide ATC with as much detail as possible concerning the event so that law enforcement organisations can take the appropriate actions. If possible, include a description of the location of the source of the laser beam, its direction and colour, and the length of exposure.
- **Controllers:** Notify other aircraft so that their crews can be prepared for an increased risk of further attacks.
- **Occurrence Report:** Complete your airline or organisations occurrence report to help inform others about the event.
- **Well-Being:** Ensure your personal well-being, if any eye problems continue after an attack, visit a doctor. ■



Sustainability in action with the Environmental APS MCC

Promoting safety culture while bringing environmental considerations into the decision-making process in the early stages of training, is important in helping student pilots build environmental and commercial awareness.

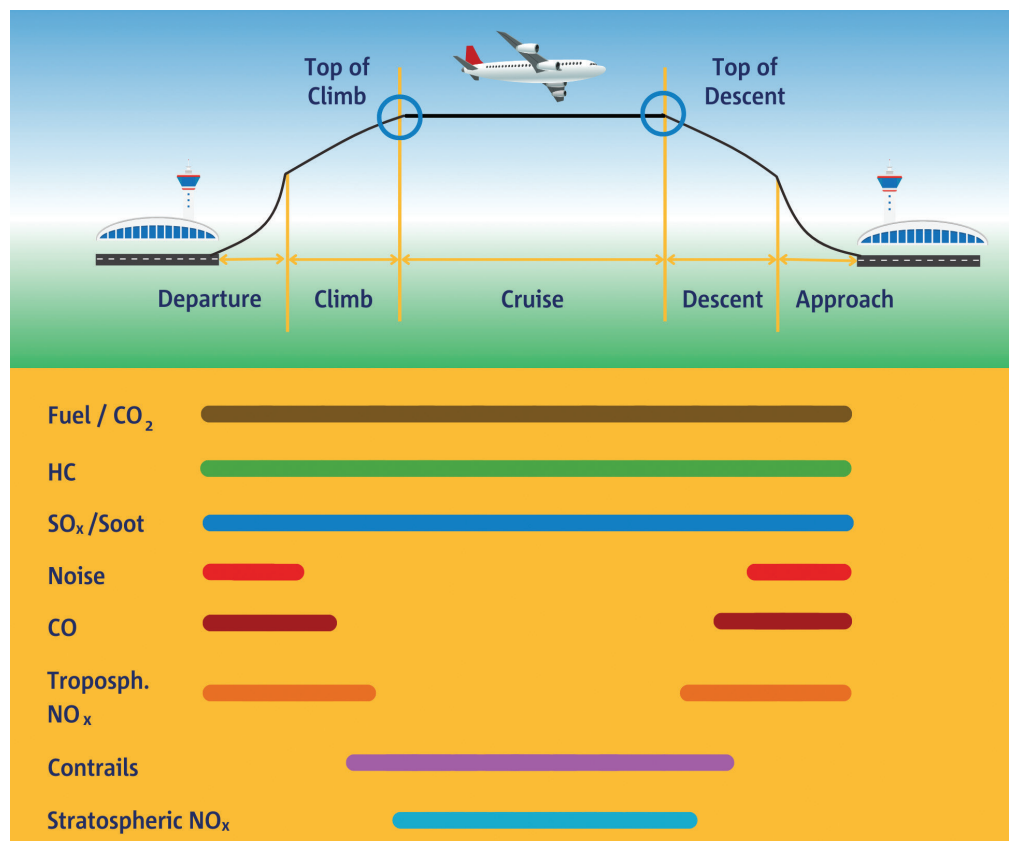
Contributors: Capt. Veronica Zunic (ATPG), Matteo Arnoldi (EASA), Allyson Kukel (Halldale Group)

Environmental sustainability is becoming an increasingly more important topic for the aviation industry. Fostering an environmentally aware pilot group is not only the morally correct thing to do but also a necessity if we are to see aviation continuing its path of development. Initiatives to reduce the environmental impact of aviation activities include, among others, the use of new engines and sustainable aviation fuel (SAF), ATM optimisation, as well as research into innovative and scalable propulsion systems and aircraft designs. Nevertheless, daily decisions taken by first-line actors, the flight crews, can have a small but significant influence on the impact of air operations on the environment.

Introducing environmental considerations into the operational decision-making process during the early stages of training allows student pilots to build environmental and commercial awareness.

The environmental APS MCC concept proposes to include environmental considerations into the decision-making process at the APS MCC stage of training with the aim of raising a more mature and environmentally aware next generation of commercial pilots.

The promotion of such considerations should, however, always be applied by having the highest regard for safety



culture in the first place. To this aim, threat and error management (TEM) principles should always be emphasised to ensure that risk-generating behaviours are eradicated from an early stage of training.

In this context, the APS MCC gives the opportunity to further develop these principles in a more complex multi-pilot training environment where students are additionally exposed to the practical application of crew resource management (CRM) and competency-based training and assessment (CBTA) principles for the first time.

Environmental considerations applied to standard operating procedures can be explained when theoretical knowledge instruction is provided, as well as during practical FSTD training sessions with scenario-based demonstrations.

In theoretical knowledge instruction, for instance, students can be educated on which chemical substances are released during a flight, their quantity, and the phase of flight in which they are generated.

Familiarisation with environmental considerations for each flight phase and their practical application during FSTD training sessions, when safe flight conditions permit, is a suggested practice.

In the following example, we consider three phases in which a mission can be divided:

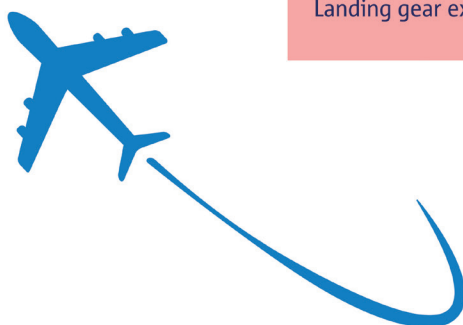
- Pre-flight operations
- Ground operations (before and after the flight)
- In-flight operations

For each of them, environmental scenario elements can be identified, and the conditions and potential benefits of environmental procedures during the application of standard operating procedures can be taught.

All of this can be supported by the introduction to the use of flight management system functionalities and further eased, when applicable, by the use of electronic flight planning software.

ENVIRONMENTAL SCENARIO ELEMENTS

PRE-FLIGHT OPERATIONS	GROUND OPERATIONS	IN-FLIGHT OPERATIONS
Fuel calculation for the planned mission and penalties for fuel-uplifting	APU usage	Continuous descent operations (CDOs)
CG position and impact on in-flight performance	Engine out taxi	Continuous descent arrivals (CDAs)
Full thrust take-offs versus variable thrust take-offs	Use of intersection departures	RNAV procedures
Reduced flap setting		Reduced flap setting
Fuel-efficient versus noise-efficient departures (NADP1)		Landing gear extension
Effect of cost index selection on performance		
Optimum altitude		
Optimum RNAV routings		





The competency-based framework of the APS MCC allows a smooth integration of environmental considerations when evaluating how competencies are applied during scenario-based training sessions.

Indeed, it is easily possible to relate the competencies and the associated observable behaviours to the environmental

scenario elements, taking into consideration threat and error management principles.

In the example below, emphasis is put on the application of knowledge (KNO) and problem-solving and decision-making (PSD) competencies, which are some of the primarily affected ones.

COMPETENCY	OBSERVABLE BEHAVIOURS	ENVIRONMENTAL SCENARIO ELEMENTS	
KNO	OB 0.3 Demonstrates knowledge of the physical environment, the air traffic environment, and the operational infrastructure (including air traffic routings, weather, and airports)	APU usage	
		Engine out taxi	
		Use of intersection departures	
		Full thrust take-offs versus variable thrust take-offs	
	OB 0.7 Is able to apply knowledge effectively		Fuel calculation for the planned mission
			CG position and impact on in-flight performance
			Effect of cost index selection on performance
			CDOs
			CDAs
			RNAV procedures
PSD	OB 6.1 Identifies, assesses, and manages threats and errors in a timely manner	Full thrust take-offs versus variable thrust take-offs	
		Reduced flap setting	
		Fuel-efficient versus noise-efficient departures (NADP1)	
	OB 6.5 Identifies and considers appropriate options	APU usage	
		Engine out taxi	
		Use of intersection departures	
		Landing gear extension	



After each training session, a facilitated debriefing based on CBTA principles should allow the students to self-analyse and criticise their areas of positive environmental practices and areas of improvement.

What may seem a minor and insignificant action by a singular pilot, has a tremendous impact when multiplied by several hundreds of flights in a day. Environmental impact becomes enormous when faced with the scale of flights and pilot actions. We must continue to develop environmental awareness, enhancing training and bringing it to our schools to educate our next generation of pilots. They will feel empowered when they understand how much impact their actions can have. Increased awareness of our environmental impact will translate into practical effectiveness, and early education will provide pilots entering the flight deck with better environmental awareness, preparing them to make the best use of standard operating procedures to enable environmentally friendly safe operations. ■

Definitions

CDA – Continuous Descent Arrivals

EOTI – Engine Out Taxi In

EFB – Electronic Flight Bag

GPU – Ground Power Unit

Did you know? A large LCC in Europe recently published the following statistics, which should help cement these environmental principles into our thought process:

CDA - With a continuous descent operation, rather than a stepped descent approach, aircraft can remain at higher altitudes for longer and use less fuel. Last year, this saved 80,000 tonnes of fuel.

EOTI - Close to 90% of our flights perform single-engine taxi operations between the runway and terminal, saving approx. 68,000 tonnes of fuel.

EFB - paperless cockpits cut 15kg of paper manuals per cockpit, per flight, resulting in fuel-burn savings of approx. 600 tonnes p.a.

GPU - The implementation of a GPU policy (where available) helps save up to 9kg of fuel per flight or 25,000 tonnes p.a. during start-up and shutdown.

Dynamic Flight Plans - Pilots receive up-to-date data-driven flight plans which allow for more accurate fuel planning. Digital flight plans offer more efficient connectivity of routes and provide pilots with up-to-date information like weather and air traffic data.

Special thanks to Captain Andy O'Shea and the ATPG's ATO & Sustainability sub-group for developing the white paper discussing the merits of environmental practices from the outset of aviation training.



Fly 'n' Fun-tastic



John's Winter Quiz (Not from Norwich either)



Highbrow Safety Werks made their video "Ice, Ice, Maybe" to promote icing awareness. But which famous song provides the baseline for the track "Ice, Ice, Baby" that it is based on?

Which is the most Northerly, permanent runway in the world?

Is ICY a real airport?

In what type of weather is ice most likely to accumulate quickly on an aircraft surface?

How many Runway Condition Codes are there in the Global Reporting Format for Runway Condition Reporting?

What are we reading this month?

There are so many great books about safety, organisational culture and other topics that help us and our organisations develop. Here are some great books that we've read recently.

- **The Culture Code** by Daniel Coyle: Really learn about how to build and sustain great culture in your organisation with lots of practical examples.
- **Belonging: The Ancient Code of Togetherness** by Owen Eastwood: How to build great organisations by finding your identity story, defining a shared purpose, visioning future success and converting our diversity into a competitive advantage.
- **Oops! Why Things go Wrong: Understanding and Controlling Error** by Niall Downey: Help to better manage your safety risks by learning more about human error in our complex industry through a number of excellent examples that anyone can understand.



Spotter's corner

What airport is this, looking very pretty in the snow?

Answers: John's Winter Quiz: Svalbard Airport, Norway (5km NW of Longyearbyen), Under Pressure (Queen), Yes – Icy Bay Airport is in Alaska, USA, Freezing Rain, 7 (from 0-6). **Spotter's Corner:** Helsinki Vantaa



