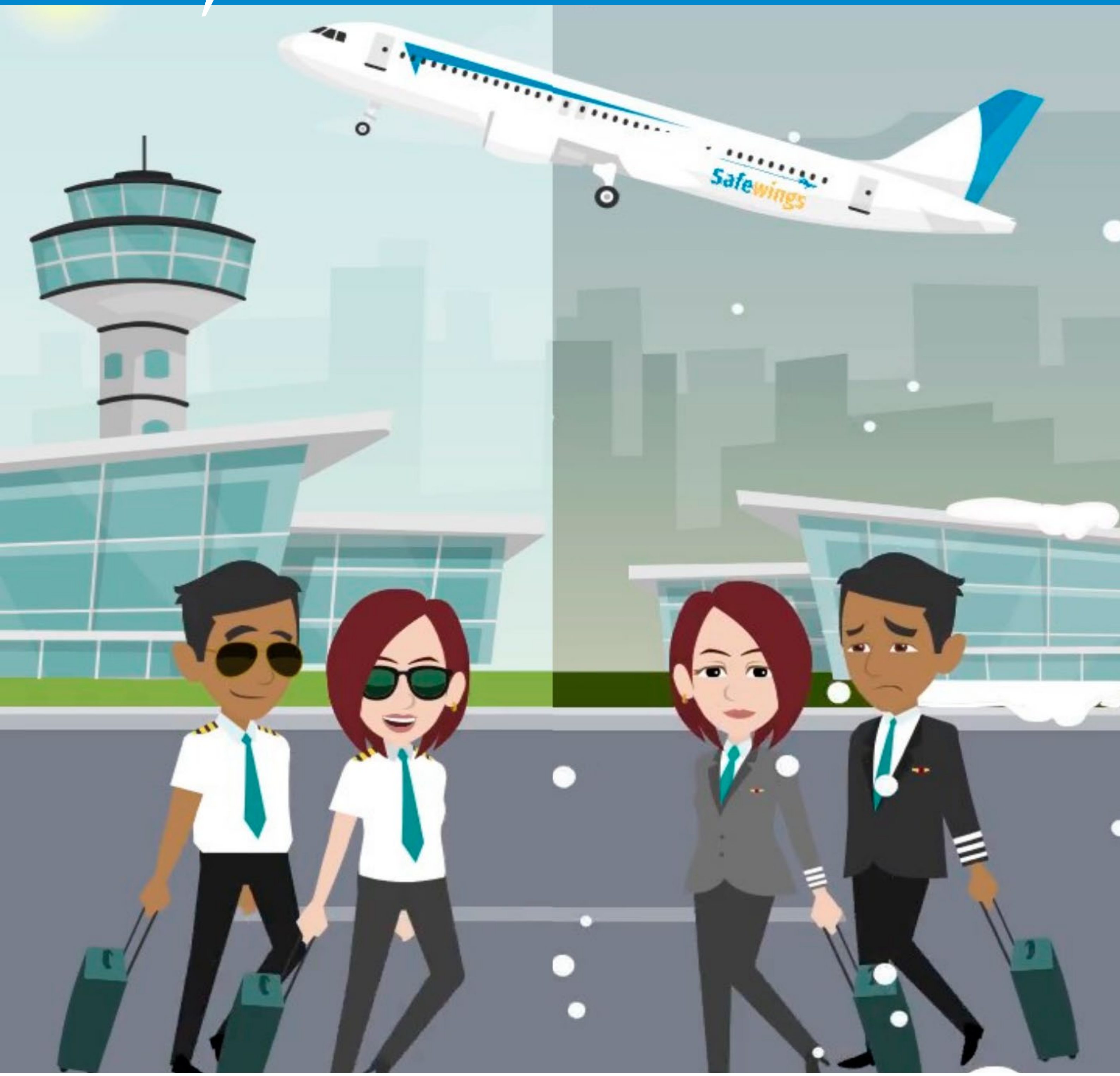
CONVERSATION AVIATION

#02 2025

STARTING POSITIVE CONVERSATIONS ABOUT SAFETY



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CONVERSATION AVIATION #02 2025

WINTER EDITION

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Guest Foreword by **Francesco Gaetani**

Flight Standards Director, EASA

Winter brings a set of hazards that we know well. Yet familiarity should never be confused with complacency. Each year, the same issues return — icing on aircraft surfaces, contaminated runways, fatigue from long nights and the strain of maintaining reliable operations in adverse weather. These are not new problems, but their persistence demands that we remain vigilant, adaptive, and proactive.

Successful winter operations begin with mindset. Transitioning from summer intensity to winter vigilance is not automatic. Shorter days, colder temperatures, and more complex weather patterns demand a renewed attentiveness.

The foundation of safety lies in how we prepare. Thorough planning, strict adherence to procedures, and the willingness to pause or adapt when conditions deteriorate are vital.

Few threats in aviation can be as challenging as snow and ice. Their effects are subtle yet potentially catastrophic. The industry has invested decades of effort into improving anti-ice systems, de-icing techniques, fluid technology, and holdover guidance, yet icing remains a leading hazard each winter. Additionally, the introduction of the Global Reporting Format (GRF) for runway surface conditions has been a major step forward, giving pilots clearer, harmonised data for decision-making. But this tool is only effective when all stakeholders — aerodrome operators, ATC, and flight crews — use it with precision and discipline.

Crews must understand not only the procedures but also the principles. Why we de-ice, how holdover times are calculated, and what limitations exist. Ground staff need the right equipment, the right fluids, and the right training to apply them effectively. Regulators, airlines, and airports must work together to ensure that protection against icing is applied consistently and with full situational awareness.

On the ramp, the risks are just as real. Cold, wet, and dark conditions make slips, trips, and vehicle incidents more likely. De-icing fluids tracked into the cabin create hazards for crew. Protecting ground staff with proper equipment, safe procedures, and adequate rest breaks is not just a matter of compliance — it is a matter of respect for the people who keep operations running.

Winter also takes a toll on human performance. Short daylight hours and long duty nights contribute to fatigue and low alertness. Sound rostering practices, rest policies, and support for mental health all contribute directly to operational safety.

Behind each of these topics lies a common thread: the effectiveness of an organisation's safety management system. An SMS cannot be a paper exercise or a regulatory checkbox. It must be a living system with a clear purpose — to detect hazards, assess risks, implement risk controls and enable learning before accidents occur.

For winter operations, this means integrating lessons from the past into present planning, sharing information openly across departments, and creating an environment where staff feel empowered to report concerns. It also means aligning production goals with protection goals. Safety and efficiency are not opposing forces; they are mutually dependent.

As we face another winter, let us remember - we cannot control the weather, but we can control how we prepare for it. By maintaining the right mindset, protecting our people, caring for our equipment, respecting compliance, recognising risks, and committing to continuous learning, we ensure that winter is not just endured, it is mastered.

Safety is a choice, renewed each day, by every person in the system. ■

A MANAGEMENT SYSTEM WITH PURPOSE:

Moving Beyond the Illusion of Safety

From John, the Regulator

If you ask most aviation professionals whether their airline has a safety management system (SMS), the answer will be a confident yes; but, if you ask them why it exists and who it's really for, the answer might be less certain. Reflecting on this paradox, some uncomfortable truths emerge from across the industry.

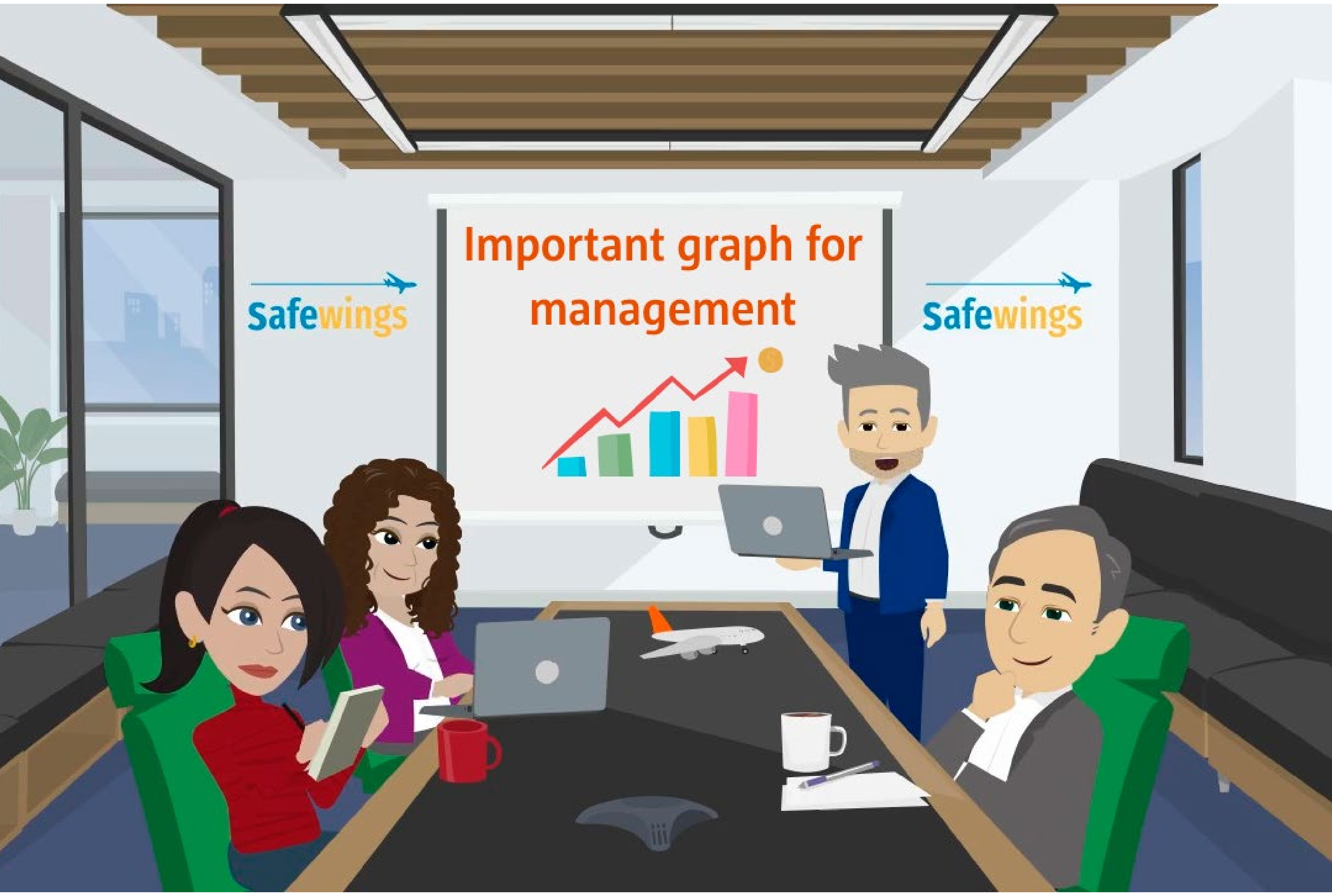
At Safewings we see many of examples where the SMS has become more about satisfying the regulator requirement than it does about protecting an organisation's people and the passengers that the aviation system serves. Many safety reports get filed, but the root causes never [very rarely] see daylight. Similarly, risk assessments tick all the boxes but change nothing. Alarmingly, organisations appear siloed, never stopping to think about the interfaces with other parts of the aviation system.

It's simply not enough to have a management system; as individuals, organisations and an industry, we need to know the purpose of our respective SMSs and be focused on discussing and managing the risks we face to an acceptable level.

The Pitfalls We Must Avoid

From discussions with industry experts, several common problems emerge in how we actually do things as organisations and what this means for our organisational culture:

- **Fear of Speaking Up.** Without legal protection and trust, staff can be reluctant to report events or near misses. Could this reluctance be masking trends and risks?
- **Transactional, Not Transformational.** Changes are often prompted by regulatory and/or commercial drivers instead of being proactive actions to reduce identified risk(s).
- **Production Over Protection.** Operational performance metrics can dominate daily decisions, but could that be at the expense of safety? "The numbers", outputs, deliverables, throughput… call them what you will, but operational performance metrics can often dominate daily decisions. Could pursuit of the numbers reduce adherence to protocols?



- **Normalisation of Deviation.** Risks we'd never accept in theory can become tolerated in practice - until the buffer is gone. Could undue pressure be driving the wrong behaviours?
- **Hubris and Complacency.** Past safety success can lead to overconfidence and reluctance to challenge the status quo. Could complacency be masking another problem?
- **The Illusion of Safety.** Whilst SMS processes exist on paper, their impact in real world scenarios can be minimal without sufficient safety barriers, cross-checks and the ability for individuals to challenge and be challenged.

What a Purpose-driven SMS Looks Like

A strong, purposeful SMS must always do the following:

- Integrate with daily operations and engage all staff rather than sitting on a shelf for audit season.
- Focus on identifying lessons to benefit future activities, not apportion blame. Learning, documenting and discussing the how and why of a system failure is more important than identifying who might have made the error.
- Support an open and just culture, in turn, encouraging the team to speak up without fear of career or reputational harm.
- Make risk tolerance visible: when everyone knows where the real boundaries lie, the risk of transgression can be reduced.
- Use data wisely, going beyond basic performance indicators to measure and act on operational safety precursors. Similarly, showing the organisation how the data is being used promotes a greater understanding of why that data is being captured.
- Be reviewed regularly, not only incorporating received feedback, but also the direct input from all parts and levels of the organisation not just the safety team and the executive

Safety Pillars Summary

Mindset

A management system is a tool for safety improvement, not a compliance trophy. Each report and risk assessment is an opportunity to learn, but it's also important to be proactive and look for risks in your operation. Identifying, discussing and reporting risk is an opportunity to promote that activity and make the operation safer.

People

Staff engagement is essential. A reporting culture built on trust will always outperform a fear-driven one. Operational staff make safety decisions every day, the safety team should support that and not be totally separated from their reality.

Equipment

Make sure that the systems and tools you use to support your management system are easy to use, accessible and fit the operational environment, especially when it comes to reporting. Don't forget to have and actively promote a feedback loop.

Compliance

Meeting regulatory requirements is the baseline - not the goal. We measure success by reducing and mitigating risk, not by completing paperwork or using the right words without understanding what value they bring to the safety of individuals, the operation and/or the wider system.

Risks

A hollow SMS creates false confidence, hides emerging threats and misses opportunities to intervene before incidents occur. Where risks interface with other organisations, embrace open discussion - Just Culture applies equally between organisations (...including regulators).

Learning

If we're not analysing weak signals from normal operations, we're only learning from rare events - and that's often too little, too late. These weak signals include the things we do well.

Final Word

Effective safety management is about ensuring everything is in place to keep people safe. It is not solely a reactive activity (Safety I) or solely a proactive activity (Safety II) - but simply "safety" that mixes elements of both.

A management system with purpose mustn't just exist - it must work. The best management systems connect strategy with the frontline, turn reports into actionable change and keep the organisation's safety ahead of the curve. In the winter season, when operational pressures and environmental hazards peak, it's not the illusion of safety that will protect us - it's the reality of a living, breathing SMS. ■

Keeping operations safe when the temperature drops and risks rise

Winter brings a different set of operational pressures. Shorter days, colder temperatures and unpredictable weather mean every part of the airline - from crew scheduling to line maintenance - needs to be on alert.

At Safewings, our industry reports and accompanying data identify six recurring winter safety issues that demand extra vigilance.

1. **Aircraft Icing - From Gate to Cruise**
   - *Where It Happens.* On the ramp during pre-flight, in climb-through cloud layers, and even at high altitude with ice crystals.
   - *Risks.* Increased drag, reduced lift, engine flame outs and inaccurate air data from pitot tubes.
   - *Best Practice.* Never rush pre-flight de-icing; if in doubt, apply anti-ice early. Monitor for subtle icing effects during the flight.

2. **Runway Contamination**
   - *Where It Happens.* Snow, slush, ice, or standing water.
   - *Risks.* Poor braking, longer take-off/landing distances and reducing steering control on airport surfaces.
   - *Best Practice.* Use the Global Reporting Format (GRF) to make data-driven decisions; reassess conditions after snow clearing or temperature drops.

3. **Ground Crew Exposure and Ramp Safety**
   - *Where It Happens.* Aircraft turnarounds, baggage loading, fuelling and pushback.
   - *Risks.* Slips, trips, frostbite and vehicle incidents in low visibility.
   - *Best Practice.* Ensure PPE is rated for the weather conditions. Enforce slower vehicle speeds. Give crews adequate warm-up breaks.

4. **Turbulence Injuries**

- *Where It Happens.* Over mountain ranges, in jet stream crossings and/or near frontal systems.
- *Risks.* Injuries to unbelted passengers or standing crew.
- *Best Practice.* Keep "Fasten Seatbelt" signs on longer; give clear PAs; if turbulence is forecast, secure the cabin early.

5. **Performance Planning Errors**

- *Where It Happens.* Dispatch and flight deck.
- *Risks.* Incorrect take-off/landing calculations if contamination or temperature effects are misapplied.
- *Best Practice.* Double-check inputs in snowy/icy conditions. Confirm runway condition codes. Be aware of de-rated thrust limitations in cold soak conditions.

6. **Fatigue and Reduced Alertness**

- *Where It Happens.* Across all operations during shorter daylight hours.
- *Risks.* Slower reaction times, poor decision-making and checklist drift.
- *Best Practice.* Manage rostering to reduce consecutive night shifts. Promote fatigue reporting. Encourage daylight exposure.

Winter Safety Issues - Safety Pillars Summary

Mindset

Winter operations demand anticipation - plan for disruption, don't just react to it.

People

Protect ground and flight crews from the elements and operational pressure. Keep morale and alertness high.

Equipment

Cold affects everything: brakes, hydraulics, batteries, GPUs and door seals. Ensure winterisation checks are up to date.

Compliance

Follow seasonal SOPs for de-icing, contaminated runway operations and turbulence procedures.

Risks

Most winter events are repeat offenders - the same hazards will return each year, often in the same scenarios.

Learning

Past winters show that rushing turnarounds, skipping steps and underestimating weather are the top contributors to incidents. Prevention is about discipline, not luck.

Final Word

Winter hazards don't sneak up on us - we know they're coming. The safest airlines are the ones that treat every winter like it's their first, with fresh eyes, sharp discipline and zero complacency. ■

Cold, Wet, Dark, It's Time to Recalibrate: Switching to a Winter Mindset

It always surprises me how fast the transition from Summer to Winter hits us. One moment we're managing the intensity of a packed summer schedule, the next we're staring down icy taxiways, short daylight windows, and crews wrapped in winter gear. The change from summer to winter operations is more than just incorporating additional procedures - it's about resetting how we think. It's about **mindset**.

So, before we get stuck into specifics like holdover times or snow clearance that this edition of Conversation Aviation will focus on, I want to talk about what it really means to switch to winter mode - across our teams, our tech, and our thinking.

From Nuno, our Safety Manager

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Mindset: Change the Mental Model

At times, summer can feel like a marathon, dressed up like a sprint - it brings lots of challenges but - thankfully - most of them are predictable; but what worked in July doesn't necessarily fly in January.

Winter is a part of the year that requires a lot of thought. With reduced visibility, freezing precipitation and contaminated surfaces, margins for error reduce. Small errors and/or mistakes can subsequently have a more significant contribution to the escalation of safety events.

This isn't about being negative, it's about being **deliberate**. Safety isn't just about reporting and counting the number of incidents, it's about equipping every staff member with the tools to effectively identify and manage risks in our operation.

Start every day by asking yourself these questions:

- *What does today's conditions mean for what we're about to do?*
- *What operational procedures are applicable for the operating conditions that we are likely to encounter today?*
- *Do we need more time to complete the required tasks?*
- *What are the little things that could go wrong? How can my role in the team help in timely identifying and mitigating likely threats?*

Winter ops require **more planning, more patience and more communication**. Although trust in other stakeholders is inherit to our operation, it is prudent to not assume and instead obtain confirmation when in doubt.

People: Being Ready

Cold weather can affect us more than we think, physically and mentally. When it's freezing, there may be an unconscious tendency to rush. Our ability to focus can be impacted with the increased potential for things to slip - both literally and figuratively.

Take the time that you feel is needed to operate safely. Don't skip checks or briefings. Speak up if conditions make you feel uncomfortable or unsafe. For shift leads and managers, keep checking in. For people on the ramp at our bigger bases, we've added hot drink points and identified new shelter zones across our network this winter, use them. Look out for colleagues who seem withdrawn or fatigued. Winter is harder on people, especially during long nights and early starts on cold mornings.

Being **fit for duty** doesn't just mean turning up - it means being alert, engaged and aware.

Equipment: Operating in Winter Weather

You know how we say "trust your tools"? In winter, your equipment behaves differently.

- Aircraft, vehicles and equipment don't always like cold starts - monitor systems closely and report issues to maintenance control.
- Ground vehicles and aircraft can skid - use slower, more cautious movements.
- Jet bridges can freeze or misalign - double-check docking.
- Walkways and aprons become slip zones - **never** assume they've been treated.

Report any equipment that's not coping - it's better to fix a heater or GPU now than when it's -5°C and blowing sideways.

Compliance: The Rules Get Sharper in Winter

There's no seasonal exemption from EASA rules. If anything, winter operations **amplify** the importance of compliance.

We have updated procedures for de-icing, contaminated runway ops, minimum visibility criteria and more on our company network. If you're not sure, ask. If you feel pushed to cut corners - stop. We're never chasing on-time performance at the expense of safety.

Remember: **compliance is not a box-tick - it's a shield**. Stick to it and you protect everyone, including yourself.

Risks: New Season, New Threats

Here's what tops our winter risk radar:

- **Slips, trips and falls** on icy surfaces.
- **Contamination** on aircraft wings and control surfaces.
- **Runway excursions** due to braking degradation on slippery surfaces.
- **Fatigue** contributed to by the longer nights and hours of darkness.
- **Reduced situational awareness** during darkness and low visibility.

Think of winter risks as sneaky. They don't always come with loud alarms. They build up quietly, until they don't.

Learning: From Past Mistakes to Future Wins

We've had our winter wake-up calls. Last year, we had a near-miss when de-icing was rushed at an outstation. Another incident saw a baggage loader slip while pushing a cart that hadn't been gritted for. Both events led to simple but powerful changes: better holdover time training and improved apron treatment checklists.

Every incident is a chance to level up. And this season, we'll be capturing and sharing weekly winter safety insights via Wingsafe. **If you see something, report it; more importantly, if you learn something, please share it!**

Start your personal winter preparations as early as possible. It's particularly important to **know where to find all the applicable procedures** that you're going to need.

Let's start winter with the right frame of mind. Slow things down, speak up and stay sharp. We've got a full season ahead and, together, we'll handle it like pros. ■

De-Icing and Holdover Times: What You Need to Know

If you're standing at the gate on a frosty January morning watching glycol mist swirl into the air, you might think: "we do this every year, why the big fuss?" As we review reports and data, however, it becomes clear that **de-icing and associated topics remain one of the biggest risks to winter operations.**

From the Safewings Safety Team

So, in this article we are going to offer a timely reminder on some of the most important aspects of de-icing. We'll walk through the **why, how,** and **what to look out for** when it comes to de-icing and give you tools to manage cold-weather essentials safely and effectively.

Why Do We De-ice and Anti-ice at All?

The short answer: **contamination kills lift.** Even a thin layer of frost or snow on an aircraft's surfaces can:

- Disrupt airflow.
- Increase drag.
- Reduce lift.
- Change stall characteristics.

And you won't necessarily see it from the cockpit. The aircraft might *look* ready, but accidents continue to highlight that even apparent minor patches of frozen contamination can tip the balance.

Deicing and Anti-Icing: Turning Chemistry Into Safety

Winter operations are a battleground between physics, meteorology, and operational discipline. At its heart lies a simple truth: even a thin film of frost, a dusting of snow, or a glaze of clear ice can turn a serviceable aircraft into a machine incapable of flight. The Clean Aircraft Concept demands a spotless wing, but reality demands more than ideals. To bridge the gap, aviation turns to engineered fluids, meticulous procedures, and sharp crew judgment.

The Fluids – Four Families, Different Purposes

- ***Type I – The Quick Fighter***
  Orange, thin, and always applied hot, Type I fluid is the frontline soldier of winter ops. It is a Newtonian fluid—its viscosity doesn't change under shear—meaning it flows easily off the wing under gravity. Heated and sprayed at high pressure, it blasts snow and ice off the airframe. For anti-icing, its strength lies in residual warmth left in the structure, not in its chemistry.
  But its protection is short-lived. Taxi delays, long queues, or moderate precipitation can overwhelm it. In practice, Type I is best in light conditions, short taxi times, and when the crew is confident of departing quickly.
- **Type II and IV – The Shield Bearers**
  Straw-coloured Type II and green Type IV are non-Newtonian. They contain polymers that thicken at rest but shear-thin under airflow during take-off. This allows them to cling to wings on the ground, then shed cleanly when the aircraft accelerates. They create a physical barrier, absorbing precipitation and preventing adhesion.
  Their advantage: longer holdover times (HOTs). This makes them suitable for longer taxi routes, heavy precipitation, and airports with complex de-icing procedures.
  But there is a trade-off. Fluids can accumulate in aerodynamically quiet zones, dry out, and later rehydrate into a gel when exposed to for example rain. Some operators have reported cabin smells and control difficulties due to fluid residues. Thus, "always using thickened fluids" isn't necessarily the best solution, it's about matching fluid to scenario.
- **Type III – The Middle Child**
  Rarely mentioned for use on heavy aeroplanes, although designed for smaller regional aircraft with lower rotation speeds. For the operation at SafeWings, it is largely irrelevant.

The Procedures – One Step or Two?

- **One-Step Deicing/Anti-Icing**
  A heated, usually diluted spray removes contamination, while residual fluid (and heat) provides short-lived protection. The catch: the holdover clock starts at the beginning of application. In congested airports, a significant portion of HOT may be used up before the aircraft even leaves the pad.
- **Two-Step Deicing/Anti-Icing**
  Step 1: hot Type I (or diluted thickened fluid) removes all contamination.
  Step 2: thickened fluid (II/IV) is applied as a protective coat.
  Crucially, the holdover time starts at the second step. This maximises the "practical HOT" and is often the smarter choice in heavy conditions or long taxi scenarios.

The decision between one-step and two-step is operational: it weighs **treatment time, taxi duration, ATC delays, and precipitation intensity.** Crews must think ahead, "Will I still be within HOT at the runway threshold?"—not just "Is the aircraft clean right now?"

Fluid Failures – When Protection Disappears

No fluid lasts forever. Failure occurs when precipitation dilutes the fluid beyond its design limit. Signs include:

- Fluid losing its glossy, transparent look, turning **opaque.**
- Inability to see rivets, seams, or surface features beneath.
- Embedded contaminants appearing to “sit” in the fluid film.

Failure can look different depending on the contaminant: drizzle, freezing fog, or freezing rain each leave different visual cues. This is why lighting, angles, and vigilance matter. And when in doubt? **Tactile checks** and/or **re-treatment** are mandatory. Assumption is the enemy of safety.

LOUT – The Cold Barrier

Every fluid has a **Lowest Operational Use Temperature (LOUT).** Below this, it cannot provide protection, either because it thickens too much to shear off or because it reaches its freezing point.

- For **Type I**, LOUT is freezing point + 10°C.
- For **Type II/IV**, it’s freezing point + 7°C.

Operationally, if **fuel temperature is colder than OAT**, the lower (colder) value must be used to validate LOUT. Failure to do this can have dangerous consequences.

Case Study

An aircraft was treated at with Type I 30/70 mix based on OAT (+1°C), but the fuel was –6°C. The true LOUT wasn’t respected. Result: residual frozen fluid remained on wings post-flight. The error lay in referencing OAT instead of fuel temp, proving again that fluids are chemistry bound by physics, not paperwork.

Holdover Times (HOT): What You Really Need to Understand

HOT are a window, not a Guarantee. HOT defines the expected protection window, but it is guidance, not a promise.

Factors influencing HOT include:

- **Precipitation type & intensity** (snow absorbs less than freezing rain).
- **OAT & wind** (lower temps shorten HOT, high winds accelerate fluid run-off).
- **Aircraft configuration** (flaps extended reduce HOT by ~25%).
- **Surface conditions** (smooth metal vs. rough composites).

HOT tables give ranges, e.g. 35–65 mins. Where does reality fall? Often at the shorter end, especially with heavy precipitation, wind, or poor visibility. Crew judgment fills that gap.

What Pilots Need to Do

- **Know your** HOT before leaving the stand.
- Understand **start/stop triggers**: HOT begins at *the start of the last anti-ice application*.
- **Communicate clearly** with ATC if HOT is about to expire.
- Make use of **de-icing checklists** and **monitor ground coordination** actively.
- **Speak up** if anything seems rushed or unclear.

What Ground Ops Need to Know

- Follow **fluid application protocols** - type, coverage, sequence.
- Use **communication phrases** precisely (e.g., "de-icing complete," "anti-icing complete, HOT begins now").
- **Confirm contamination removal visually** - no guessing.
- Don't be afraid to **pause or recheck** if weather changes rapidly mid-procedure.

Winter De/Anti-icing: Safety Pillars Summary

Mindset

Treat every winter departure as a contamination risk. Don't assume "light snow" means low risk - **ice hides in plain sight**.

People

Train and retrain. Everyone - from loaders to captains - has a role. Encourage flight crews to double-check ground crew calls, and *vice versa*.

Equipment

De-icing trucks, fluid storage temps, hoses and nozzles all degrade with wear. **Inspect and maintain regularly.**

Compliance

Use the current season's HOT tables. **Outdated tables = invalid safety margins**. Follow operator SOPs precisely.

Risks

Key threats include:

- Late or misjudged HOTs.
- Fluid applied incorrectly or incompletely.
- Assumed clearance without confirmation.
- Communication breakdown between flight crew and ground crew.

Learning

Each de-icing incident helps refine our system. Keep reporting - even near misses.

Occurrence Highlight: When HOT Went Cold

Last winter at our Northern Hub, a Boeing 737 was de-iced with Type I and Type IV fluid. The crew received a HOT of 22 minutes. A short delay during taxi pushed them to the 20-minute mark. No reassessment was requested. The aircraft lined up-but as it rotated, a buildup of residual snow was seen trailing from the wing. Further investigation revealed that there had been light contamination had accumulated at the wing root.

Thankfully, it didn't impact the aircraft's performance, but the follow-up investigation found:

- A miscommunication between the ground team and crew on **exact HOT start time**.
- An **overreliance on a conservative estimate** rather than a real-time update.
- The **weather intensity had increased slightly**, reducing the actual HOT without being noticed.

Since then, we've introduced:

- More frequent HOT reminder checks in ATC channels.
- Updated crew/ground checklists with HOT calculation prompts.
- A digital HOT countdown tool integrated into our Wingsafe app.

Final Word

Don't let the glycol mist fool you - this is serious work. Proper de/anti-icing is your lifeline in winter operations. Respect the fluids, respect the clock and keep the mindset sharp. If anything feels unclear-**speak up**. Better a delay on the ground than a frozen surprise in the air. ■

Safety on the Ramp and Into the Cabin

Protecting our people, our passengers, and our performance in winter

From Val, Ramp Worker

Winter doesn't just affect aircraft, it affects **people.** Nowhere is that more obvious than on the **ramp**.

Whether it's ground crews handling baggage or cargo in sleet, or cabin crew dealing with slippery galley floors and steps, the cold season brings a unique mix of operational and human challenges: visibility drops; surfaces freeze; hands go numb; footwear tracks in slush at the gate; and, somewhere in the mix, **safety margins reduce**.

Let's look at how to stay sharp and safe when winter takes hold of the apron and how cold, wet conditions can affect work on the ramp and in the cabin.

On the Ramp: Cold, Wet and Working Fast

Working on the ramp always exposes crew to various risks. Add darkness, snow and sub-zero temperatures, and things can go from tough to treacherous very quickly.

Top risks to look out for:

- **Slips, trips, and falls** on icy surfaces, especially around belt loaders, steps, and containers.
- **Reduced spatial awareness** due to poor lighting, snow cover, or heavy hoods/hats.
- **Vehicle skids or collisions,** braking distances increase dramatically in the cold.
- **Fatigue and physical stress,** handling heavy items in bulky gear slows people down and wears them out.

Ahead of the winter season, we've updated our ramp risk picture, and our analyses led to the installation of new **anti-slip matting** and **handrail zones** at key positions; but, procedures only work when people follow them.

▶ *Ramp leads: check lighting, grit status and safe walk paths every shift.*

▶ *Ground staff: speak up if you notice untreated areas or vehicle access issues.*

→

From Ramp to Cabin: Tracking the Risk Inside

One winter-specific issue that's often overlooked: **passenger transfer of de-icing fluid** and melted snow or water into the cabin.

It sounds minor, but it can cause:

- **Slippery galley floors** increasing injury risk to crew and passengers.
- **Unpleasant odours** in the cabin.
- **Damage** to cabin materials or electrical systems if glycol gets into vents.

What's happening? Often, de-icing overspray lands on steps, jet bridges and/or footwear zones. Passengers walk through it and then bring it into the aircraft.

Cabin crew have flagged several cases where:

- Cabin mats became soaked with glycol.
- Trolleys slipped during service due to unseen wet spots.
- Cabin crew sustained minor injuries from slipping in door areas.
- Customers have slipped on passenger walkways/ steps and/or in galley areas.

What Can We Do?

Ramp Teams

- Control spray direction to avoid overspray, avoid excessive use of fluids and report any observed passenger walkways congested with fluid after treatment.
- Monitor fluid pooling near aircraft doors and jet bridge interfaces.
- Clear glycol puddles before boarding begins.

Cabin Crew

- Inspect entry mats and galley areas before PAX boarding.
- Use **absorbent mats** at entry points.
- Report any glycol smells or residues to flight crew and ground staff.

All Staff

- If you see fluid tracking into the aircraft **log it, report it, fix it**.

Winter Ramp & Cabin Safety - Summary

Mindset

Winter conditions demand **more caution and more communication.** Don't assume the ramp is safe, verify it.

People

Winter PPE slows people down and increases fatigue. Schedule rotations, add breaks and ensure all staff are trained for cold-weather ops.

Equipment

Maintain grit spreaders, snow shovels, lighting towers, handrails and tugs. All it takes is **one failed grip** to cause major damage, injury or delay.

Compliance

Ramp and cabin winter checklists must be followed fully - especially contamination checks, boarding door inspections and walkaround criteria.

Risks

Biggest threats:

- Ice on walking/working surfaces.
- Reduced awareness during dark shifts.
- Wet tracking from outside to inside.
- Cabin slips leading to crew or passenger injury.

Learning

Reporting of minor slips and overspray issues has led to:

- Better jet bridge alignment training.
- Revised anti-slip mat positioning.
- Updated fluid application techniques.

Occurrence Example: Slippery Situation in the Rear Galley

During a snowy morning departure at a mid-size airport, de-icing fluid pooled near the rear steps and was tracked inside by boarding passengers. The rear galley floor became slick. A cabin crew member slipped while preparing service and sustained a sprained wrist. The aircraft returned to stand due to crew unfitness and encountered a short delay.

The incident review revealed:

- No floor mats were used at the rear entry.
- The de-icing team had not directed fluid away from the steps and had not reported the pooling of fluid once the treatment was completed.
- No one performed a cabin entry check before boarding started.

Outcome:

- Mats are now provided for use at both entry doors.
- De-icing SOPs updated to include direction of spray and bridge monitoring.
- Cabin checks added to the pre-boarding checklist during winter operations.

Final Note

Winter is beautiful, but operations in winter can be brutal if not taken seriously. It tests our people and our processes. So, let's stay sharp, support each other and keep the **ramp and cabin safe**; cold weather is no excuse for warm complacency. ■

Why braking is just the beginning

If there's one winter challenge that keeps pilots, dispatchers and airport ops awake at night, it's this: contaminated runways. Operations on contaminated runways means reduced friction, possibly associated with reduced visibility, increased stopping distances and the potential for a quick reduction in safety margins in case of errors or omissions.

From Claudio,
Pilot First Officer

Contaminated Runway Operations requires a good understanding of aircraft systems (such as autobrakes, use of reversers, anti-skid) and the effect of the contaminant on aircraft performance. That's where the Global Reporting Format (GRF) comes in.

Let's break it down.

Understanding the Global Reporting Format (GRF)

Introduced in November 2021, the GRF is now the ICAO standard for assessing and reporting runway surface conditions in winter and is designed to:

- Provide uniformity across the world's airports.
- Improve pilot decision-making.
- Reduce misinterpretation of runway conditions.

The core concept? The Runway Condition Assessment Matrix (RCAM) is used to assess and report runway surface conditions, assigning Runway Condition Codes (RWYCCs) from 0 to 6 based on contaminant type and depth. This matrix helps pilots and operators determine the actual braking performance of an aircraft on contaminated runways, using data like rain, snow, ice, or slush, to enhance safety during take-offs and landings.

▶The Runway Condition Code (RWYCC)

Each third of the runway (i.e. TDZ, mid, end) is assigned a numerical code based on the observed surface conditions from 6 (dry) to 0 (nil braking).

The RWYCC essentially represents the slipperiness of a specific third of a runway and provides a standardized "shorthand" for reporting this information. A RWYCC of 0 corresponds to an extremely slippery runway and 6 corresponds to a dry runway. RWYCCs serve to enhance all pilots' situational awareness of where the slipperiest runway conditions and contaminants are located on a runway, and they can be used by pilots to make a time of arrival landing performance assessment.

Code	Description	Surface Condition	Braking
6	Dry	-	Good
5	Damp or frost	Slippery when wet	Good
4	Wet	Standing water	Good to medium
3	Slippery wet	Slush, wet snow	Medium
2	Compacted snow	More than 3mm	Medium to poor
1	Ice	OR wet ice, dry snow over ice	Poor
0	Nil braking	Wet ice, slush over ice	Nil

The RWYCC usually aligns with the type/depth of contaminant as displayed in the below illustrated Runway Condition Assessment Matrix (RCAM), however, the GRF methodology requires the runway assessment to take into account local measurements, observations and expertise in order to provide the most accurate information to the flight crew. Therefore, the RWYCC can be downgraded (and upgraded under certain criteria) when compared to the normal type/depth allocation. The lowest RWYCC is always used as reference for performance calculations, regardless of the runway third from which it is recorded.

For example, a runway where the first third has slush, the middle third compacted snow and the final third wet ice, the RWYCC would be promulgated as "3/2/1".

Airports' Reports

Airports' reports will include the following elements:

- The RWYCC for each third of the runway.
- Type, depth and coverage of the contaminant for each third of the runway.
- Temperature.

▶ What Pilots Receive (and Must Act On)

Via the Runway Condition Report (RCR), pilots get:

- RWYCC (6-0).
- Contaminant type, coverage, and depth.
- Braking action reports (if available).
- Time of the last assessment.

Before take-off or landing, flight crews must:

- Appropriately use the RWYCC and/or contaminant type/ depth to calculate applicable performance data. Be aware of how to use the GRF to calculate landing dispatch, in flight landing and take-off performance calculations.
- Accurately review and discuss the impact that increased required distances have on used flap settings, autobrake settings, reverse thrust use and V speeds.
- Be aware of crosswind limitations, which are affected by the RWYCC.

Risk Areas in Contaminated Runway Ops

▶ Landing Distances

What may feel like a safe touchdown and adequate braking action in the initial part of the runway may rapidly change in the next third. Remain vigilant until safely parked on stand as a false sense of security in combination with varying runway condition states can quickly escalate to runway and/or taxiway excursions.

▶ Crosswind Limits

Most aircraft have specific crosswind limits tied to RWYCCs. A Code 2 surface may drop the allowable crosswind by over 50%.

▶ Runway Thirds Can Differ

You might land on a "3", then roll through a "1", plan accordingly.

▶ Surface Condition Changes Fast

Snowfalls vary in intensity. GRF gives a snapshot, but runway conditions can degrade rapidly. Keep ATC updated if you encounter worse than reported conditions.

People & Procedures: the Human Side of Snow

For Flight Crews:

- Know how to use the GRF in calculating aircraft performance for take-off and (dispatch) landing performance.
- Dedicate appropriate time to discuss current and potentially changing meteorological conditions and runway states using the RCR, NOTAMs, METARs and TAFs.
- Take time to discuss the threats associated with contaminated runway operations during the arrival/ departure briefing. Review the importance of using reverse thrust, optimum use of autobrake settings, effectiveness of anti-skid at low speeds and recovery actions for when things do not go to plan.
- If anything feels off, go around - don't risk it.

For Ground Ops & ATC:

- Ensure snow clearance priorities match operational flow.
- Communicate clearly using standard GRF phraseology.
- Don't delay assessments during changing weather.

▶ Example GRF Report Breakdown

Runway 08/26

- **RWYCC:** 3/2/1.
- **Contaminant:** Wet snow (25%), compacted snow (50%), ice (25%).
- **Depth:** 3mm/6mm/patchy.
- **Temp:** -4°C.
- **Last updated:** 08:45 UTC

Your decisions:

- Depending on the type of performance calculation use RWYCC 2 and/or the type and depth of contaminant.
- Review current and forecast weather conditions (is the depth likely to increase?).
- Review the likelihood for any arrival/ departure delays,
- Be ready for degraded braking on rollout.
- Ensure selection of a suitable take-off and/or destination alternate

Winter Runway Ops - Safety Summary

Mindset

Never assume a runway is "okay" just because it's open. Think dynamically: crew should anticipate realistic degradation or aggravating factors that could affect takeoff/ landing operations. Determining the threshold at which a safe landing can still be performed is a way to manage uncertainty and remove a potential element of surprise should conditions evolve before landing.

For example, if it is snowing and the latest airport report states RWYCC – 5 (equivalent to less than 3 mm (⅛ inch) of snow), crew should consider if the contamination may exceed the critical depth of 3 mm (⅛ inch) by landing time as this will reduce the RWYCC. An assessment can then be made to determine if the landing will be safe if the RWYCC is reduced to 3 due to 4 mm of snow on the ground.

People

Train for GRF interpretation. Not only pilots, but dispatchers, ATC and safety teams also need a shared understanding of the codes and what they mean.

Equipment

Braking action depends on tyres, spoilers, autobrake settings and reverse thrust. Review suitability of operating to/from contaminated runways with any such declared inoperative item.

Compliance

Be diligent in the use of operating procedures and don't over rely on previous experiences. Conditions may change rapidly and minor errors/ lapses can rapidly lead to significant safety events.

Risks

- Runway excursions during landing rollout due to the perception that the aircraft brakes satisfactory and subsequent cancellation of REV MAX and autobrake (before entering a section of reduced braking action).
- Rejected take-offs on slippery surfaces.
- Overrun or sideload due to crosswind misjudgement.
- Taxiway excursions due to excessive speeds on rapid exit taxiways that are not cleared to the same extent as the runway (in combination with anti-skid possibly not being active at low speeds).

Learning

After-action reports from winter events regularly show:

- Inadequate GRF interpretation.
- Miss selections based resulting from previous experiences (for example selecting REV IDLE instead of REV MAX).
- Missed crosswind/RWYCC interaction.

Occurrence Example: "We Landed on a 3 But Rolled Through a 1"

A Safewings A321 landed on Runway 26 during light snow with a reported RWYCC of 3/3/3. During rollout, braking felt weaker than expected and thrust reversers had to be deployed at full. A post-flight review showed that a late snow burst hit the last third of the runway and updated runway conditions were only received after the aircraft had passed the runway midpoint.

Findings:

- The crew did not review the *latest* RCR before final approach.
- The runway condition changed within 10 minutes.
- The braking report was not passed by ATC in time.

Lessons:

- Always request the most recent RCR, especially in changeable conditions. Calculating a limiting RWYCC prior to starting the approach allows for a prompt review of landing performance
- ATC and flight crew communication protocols need reinforcement during snow periods.
- Ops now require a final pre-landing RWYCC reconfirmation if the last update is >15 mins old.

Final Word

Snow-covered runways are part of winter aviation. Understanding the GRF, preparing your team and making timely, informed decisions are how we stay one step ahead of the cold.

GRF isn't paperwork, it's your grip on reality. ■

Clean Aircraft Concept: A Cornerstone of Winter Flight Safety

In aviation, some principles are so fundamental that they transcend procedure—they are matters of survival. The **Clean Aircraft Concept** is one such principle. It states simply: an aircraft must not take off with frost, snow, slush, or ice contaminating its critical surfaces. While obvious in theory, its operational importance cannot be overstated.

History provides sobering lessons

Accidents have shown that even a thin layer of frost can wreak havoc on performance. The reasons are straightforward: contaminants increase weight, disrupt airflow, reduce lift, and add drag. The results are often unpredictable—performance margins vanish, stall speeds change, and safety erodes, sometimes dramatically.

Manufacturers may have different definitions for **critical surfaces**, although for aircraft in the SafeWings fleet, **critical surfaces** are defined as the wing leading edges, upper wing surfaces, stabilizers, slats, flaps, and all control surfaces. These must remain spotless. Only two exceptions exist: a film of hoarfrost so thin that markings remain visible, and up to 3 mm of frost beneath the wing tanks due to cold fuel. Even here, limits are tight. For example, Cold Soaked Fuel Frost, sometimes misunderstood as acceptable, is **not permitted** in our procedures. This can differ for your type of aircraft and it is therefore essential to be aware of what is allowed under the Clean Aircraft Concept ahead of winter.

How does the crew ensure compliance?

It begins with the **walkaround**. The exterior inspection in winter is not just routine, it is a contamination check. Surfaces must be observed from angles that reveal their condition, sometimes requiring non stand vantage points (such as the rear steps or other suitable platforms). Crews must remain alert: frost can form even above zero degrees Celsius if humidity and cold fuel are both present.

Next comes the post-de-icing/anti-icing check

Standards and practices demand de-icing service providers to explicitly declare: *"Post de-icing/anti-icing check complete."* This confirmation is not administrative, it is the assurance that the aircraft is clean and appropriately treated.

The importance of the pre-take-off check

But conditions evolve. If precipitation persists, a **pre-take-off check** becomes essential, typically from the cockpit, by examining representative surfaces. These must be unheated, clearly illuminated, and observable on both sides of the aircraft. When holdover times expire or doubts creep in, vigilance intensifies into a **pre-take-off contamination check**. This is the last line of defence, conducted immediately before the take-off roll.

One internal case study underlines the stakes

Following de-icing at a remote pad, an aircraft taxied for departure as heavy snow reduced visibility to 800 meters. From the cabin, contamination was spotted across both wings. No valid holdover time existed for those conditions. A catastrophic outcome was averted only because the contamination was caught in time. The aircraft returned to stand and was retreated prior completing an uneventful departure.

***The lesson is stark:* shortcuts can be fatal in winter. The Clean Aircraft Concept is not paperwork, it is physics. It is the Commander's responsibility, but every crew member shares the duty to ensure a safe departure. If any contamination is noted by a crewmember, the commander shall be informed.** ■

Managing the risk of challenging weather

As winter tightens its hold across Europe, let's talk about the regulations designed to keep airports, crews, and aircraft operating safely in **low-visibility, snow-covered, or otherwise degraded conditions**. These rules fall under the EASA All-weather Operations rules and apply to **take-offs, approaches, landings, taxiing, and ground ops** in winter-specific scenarios.

In 2022 EASA revised the then existing legislation on All Weather Operations (AWO). As the upcoming months are associated with an increased likelihood of low visibility operations, this article aims to review why this regulation was changed and what the changes meant for our operation at SafeWings.

It then provides an overview of wider aspects of what are termed AWO.

Why did EASA decide to change All Weather Operations?

The explanatory note for the EASA decision to amend All Weather Operations highlights that innovative technologies on board aircraft are considered to have the potential to increase the level of safety through enhanced situational awareness, thus reducing the risk of loss of control. These new technologies offer operational benefits in terms of reduced RVR, lower DA/H values and/or compensation for downgraded, failed, or unavailable ground equipment. The regulations were changed to accommodate these benefits and improve operational flexibility.

What were some of the more significant changes applicable to us?

Separating approach design from flight operations

Technological developments have resulted in the ability to fly approaches using different techniques (for example the ability to fly a "conventional" VOR approach with both lateral/ vertical guidance using FINAL APP or Fail-Operational Landing Systems (FLS) on aircraft in our fleet. To allow operational credit for this (and other) technological developments, flight operations and approach design were separated from each other:

- Approach design is based on system minima divided into Type A (>= 250') and Type B (< 250') approaches.
- Flight Operations are divided into 2D (without vertical guidance) and 3D (with vertical guidance) operations

This was already introduced by ICAO prior to the latest update on EASA All Weather Operations, though has now been formalized. With this formalization, depending on what type of operation is used (2D/3D), benefit can be gained in terms of for example visibility requirements for certain procedures.

What is AWO?

The term **All-weather Operations** refers to activities conducted **when visibility is reduced**, or **when runway/taxi conditions prevent normal visual reference**, such as during snow showers or when parts of the manoeuvring area are obscured from tower visibility.

Key components include:

- **Low-visibility procedures (LVP).** When runway visual range (RVR) drops below approximately 550 m (threshold dependent), or ATC no longer has full visibility.
- **Reduced Aerodrome Visibility Conditions (RAVC).** Conditions where pilots or controllers cannot visually monitor certain movement areas.

Authorities now require operators and aerodromes to coordinate tightly to manage all-weather conditions with a shared set of procedures and responsibilities.

Why This Matters in Winter

- **Snow, ice and/or poor lighting** can significantly reduce visibility.
- **RVR below 550 m or partial loss of tower visibility** triggers the activation of LVP/RAVP protocols.
- **Operational coordination** between airlines, dispatch, ATC, aerodrome operators and safety teams becomes more critical than ever.
- **Human factors such as communications and teamwork** become even more important to ensure everyone has the same mental model of what is going on, particularly when lots of people are relying on automation to aid decision-making.

CAT III classification and minima

As the terms “precision approach” and “non-precision approach” have disappeared with the above explained separation between approach design and flight operations, the CAT III classifications have also been revised for some parts of our fleet. The main change is that CAT III operations are now divided into CAT III with DH and CAT III NO DH. A further related change in the EASA update was that CAT III operations with a DH 50>=DH<100 now have an RVR of 175m instead of 200m before the change. The table provides an overview of the changes.

ILS CAT 3	NO DH	75m
	DH<50	75m
	50>=DH<100	175m


European Union Aviation Safety Agency
SAFETY MATERIAL
RMT.0379
‘All weather operations.’
SPT.0101
‘Promote the new European provisions on AWO’
AWO IMPLEMENTATION MANUAL
V1.3
According to: ORO.FC, CAT.OP.MPA and SPA.LVO.
together 4safety

Alternate Planning minima

Planning minima for destination alternate and fuel enroute alternate aerodromes have also been updated. Ensure awareness of these when selecting a suitable alternate.

Preparing for All-weather Challenges

Who Is Responsible for What?

- **Aerodrome operators** maintain necessary lighting, runway markings, and ensure ground movement can be monitored or safely controlled during low visibility.
- **Air operators (including SafeWings)** must have documented LVP in their respective operations manuals, including decision-making rules and crew qualifications.
- **Flight crew** must respect minima derived from LVP; cross-check visual cues with RVR and AIP data.
- **ATC/Apron services** need shared situational awareness and must coordinate closely with ground and flight crews.
- **Everyone** has a shared responsibility for positive communication (with lots of cross-checking) and close teamwork to ensure safe operations.

EASA All-weather Ops - Safety Pillars Summary

Mindset

Assume winter weather can trigger formal **LVP activation.** Stay aware. Ask yourself: is this operation still compliant under LVPs?

People

Everyone needs training on the following things, but it is important to make it relevant (at the right time of year when the information is useful) and engaging:

- GRF/RAVC criteria.
- LVP.
- Reduced visibility taxiing and runway ops.
- Use of vision systems like EFVS or autoland where applicable.

Equipment

AWO rules require:

- Functional runway lighting, SMR and stopbars.
- Augmented equipment (e.g. EFVS and HUD).
- Aircraft systems certified for low-visibility ops as per CS-AWO.

Compliance

Strict minima apply:

- RVR below threshold must trigger LVP.
- Pre-departure checks for visibility.
- LVP phases must be declared, complied with and logged.
- Use approved checklists and SOPs.

Risks

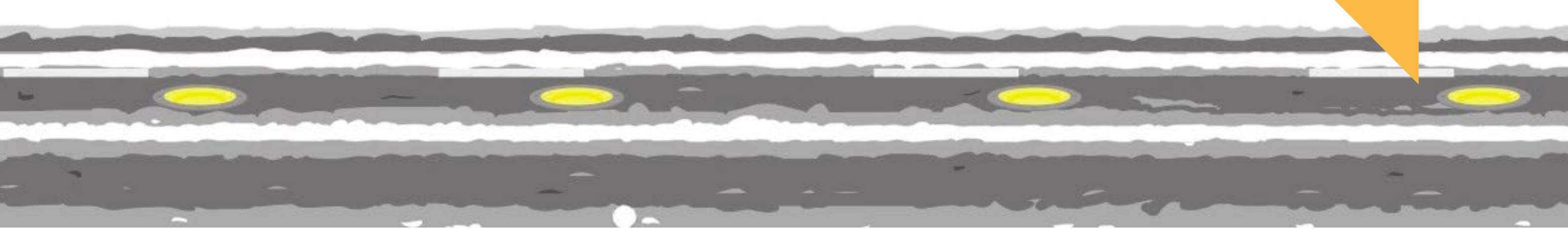
Non-compliance carries high risk:

- ATC and crew misalignment during taxi or approach.
- Misinterpretation of RVR or visibility status.
- Runway incursions or mis-taxi in low visibility.

Learning

Post-season debriefs should include:

- Were LVP consistently followed?
- Any confusion during changing visibility needs documenting.
- Observations on new EFVS use or manual adaptation at less-equipped airports.



Key Concept of AWO: A Total-system Approach to Safety

We now must think beyond aircraft and pilots. **AWO** requires alignment of multiple systems:

- Certification standards (CS-AWO) now cover aircraft, crew, aerodromes, training and procedures.
- Use of **advanced vision systems** (such as Enhanced Flight Vision Systems (EFVS), autoland and Ground Based Augmentation System (GBAS)) is explicitly allowed to enhance performance and lower minima at airports lacking traditional navigation infrastructure.

These changes mark a shift toward **risk-based performance rather than technology-based rules**. A coordinated and collaborative **human factors** approach.

Occurrence Example: Taxi into the Mist

A Safewings A320 crew departed during deteriorating visibility. RVR dropped from 600 m to 480 m during taxi. LVP should have triggered but was not declared. The aircraft taxied combining visual cues and some electronic assistance. During its turn onto the runway, the aircraft came within 10 m of a stationary tug.

Findings:

- ATC did not activate LVP quickly enough.
- Crew was not explicitly briefed on LVP status.
- No standard procedure to halt the aircraft until RVR confirmation.

Actions:

- Safewings added cockpit and dispatch protocols when RVR <550 m.
- ATC coordination now includes dual confirmation protocols in reduced visibility conditions.
- Training sessions on LVP triggers repeated across ramp and flight crews.

Final Word

Winter brings visibility limits, and safe operations rely on everyone working together as a system-wide team. This takes proper planning, robust procedures and joint awareness across **airline, crew, aerodrome and ATC.** As a collective, we can keep operations safe even in the fog and snow.

Think system-first and let the rules and procedures guide every winter move. ■

Icing in the Climb and Cruise: The Invisible Threat

Why what you can't see at FL330 still deserves your full attention

When most people think of aircraft icing, they picture the frosty buildup during taxi or take-off, but some of the **most dangerous forms of icing** happen far above the ground - **in the cruise, well after the seatbelt signs are off.**

Modern jets operate in high-moisture, high-altitude environments where **ice crystal ingestion, probe icing and undetected airframe accumulation** can all threaten flight safety. And the tricky part? **It's often invisible.**

✈ Supercooled Liquid Droplets: the Classic Climb Threat

During climb - especially in layered frontal weather systems - aircraft can encounter **supercooled water droplets**. These remain liquid below 0°C and **instantly freeze** upon contact with cold aircraft surfaces.

Risk areas:

- Wings and stabilisers.
- Engine nacelles.
- Pitot-static probes and AOA vanes.
- Windscreens and wipers.

Even small accumulations can change stall margins, affect autopilot behaviour and/or degrade engine efficiency.

❄ Ice Crystal Icing at Cruise: a Modern Jet's Quiet Enemy

At higher altitudes, above weather systems and well below freezing, aircraft can still experience icing. But it's different.

These are **ice crystals**, not supercooled droplets:

- They're dry and don't adhere at first.
- Once inside hot engine parts, however, they melt, refreeze and accumulate.

This can cause:

- Engine rollback.
- Flameout.
- Surge or stall.
- Sensor misreads (e.g. incorrect N1/N2 or SAT).
- Autopilot or automation misbehaviour due to probe icing.

Warning Signs of High-altitude Icing

- Erratic **SAT readings** or **air data** fluctuations.
- **Unusual EPR/N1/N2 mismatches.**
- **Autothrottle hunting** or throttles "stuck".
- **Ice detection system alerts** without visible ice.
- Reports of **engine rollback** or flameouts in nearby airspace

➲ It is **important to remember** that these symptoms can appear **without visible moisture** because ice crystals do not show up on surveillance systems like typical cloud moisture can.

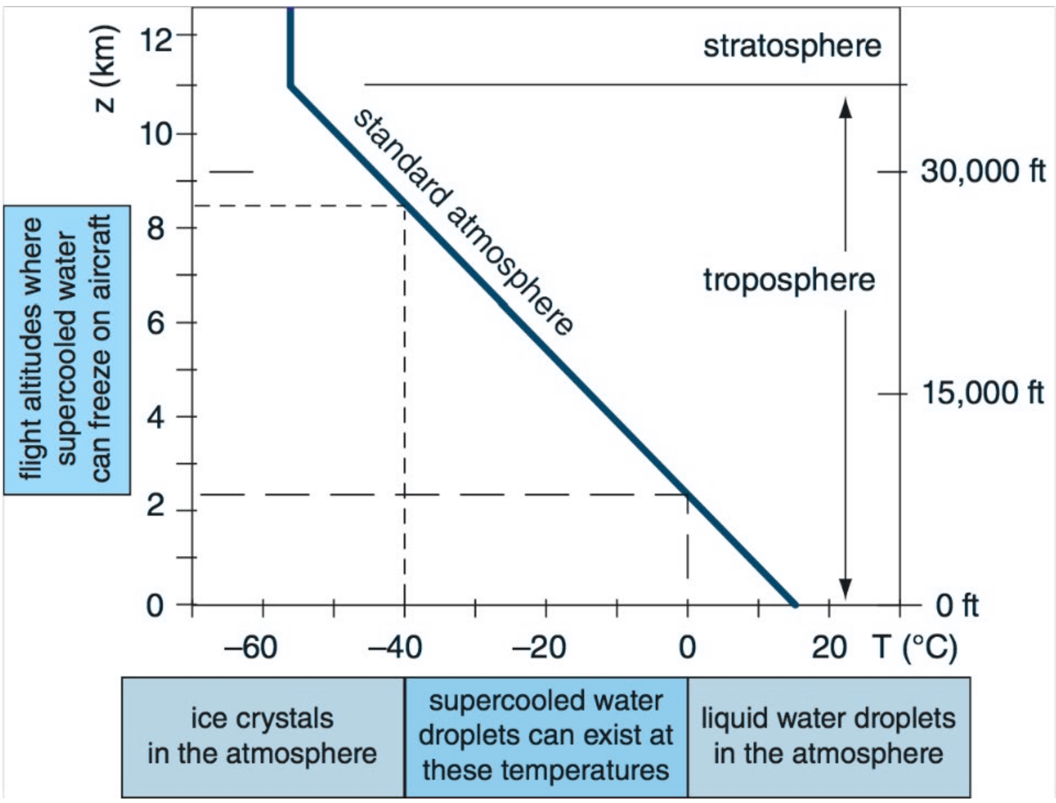
✪ System Protection - When It Fails

Modern aircraft are equipped with:

- **Engine anti-icing.**
- **Wing anti-ice** (bleed air).
- **Pitot and probe heat.**
- **TAT probes with self-heating elements.**
- Some aircraft even have **automatic icing detection.**

But:

- Crews sometimes **delay activation** of anti-ice until "visible moisture" is confirmed.
- Icing **may form before systems are turned on manually**.
- **Late activation** of engine anti-ice may be ineffective in ice crystal zones.



Case Study:

Some snow was forecast on our arrival with a cloud base not far from minimums. Moderate icing was forecast in the area of the approach. Extra fuel was carried in case of delays or a possible missed approach.

As we approached the destination, the weather looked about as expected but it was possible to commence an approach. On checking in with the approach controller we learnt that the cloud base was below that needed to make being visual realistic. We decided to delay the approach and monitor for improvement.

Whilst holding we suddenly started to pick up some moderate ice. Anti-icing was immediately switched on and we asked ATC for a climb. Vectors were given and, during the climb, ice rapidly started to build up to the point where we felt we were in severe icing. We got into VMC at FL160 and reported the ice to ATC. The engines and airframe seemed normal, even with a couple of engine accelerations to be sure. At this point, the ice was visible on our winglets, and around windscreens.

There was no improvement in the weather so whilst out of icing conditions we decided to initiate a diversion. En-route we encountered more icing conditions and decided to climb a further 1000ft to try and get back to VMC. Shortly after initiating the climb, we were reminded of what 'startle factor' is.

Nothing could fully describe the sound the crew described. There was an incredibly loud noise, and the airframe was vibrating to such an extent that it was hard to focus on anything else. An alert was triggered: ENG 1 high vibration with higher vibration indicated momentarily on engine 2 as well.

Our training kicked in and we went back to basics, fly the aircraft! We levelled at FL170 and actioned the QRH, suspecting ice. This was not successful at reducing the vibration levels so Engine 1 was run at idle (vibrations around 5 units). Engine 2 had normal vibration levels by this point without any intervention needed. Shortly after, fumes were perceived with a burning plastic smell, so we donned our oxygen masks, declared a MAYDAY, and completed the Smoke / Fumes / AVNCS Smoke checklist.

Pack 1 was suspected to be the source, so this was turned off. The crew eventually completed a single engine approach and landed uneventfully, although the event was a strong reminder of the challenges that winter operations, and in flight icing in particular, can pose.

High-altitude icing is silent, invisible, and can be quickly unforgiving. It respects no cruise altitude and no aircraft generation. But with the right **anticipation, detection, and action**, we can manage it before it becomes a threat. When being familiar with associated checklists such as the engine vibration and/or smoke/ fumes checklist we can further manage any escalation to a safe outcome.

Low Temperature Corrections

As the winter months are approaching, this section aims to review the effect that low temperatures have on true altitude and highlight how this can be corrected for.

Altimetry

ATC is responsible for providing altitudes corrected for temperature when under radar control, although flight crew retain the responsibility to ensure that all clearances issued by ATC are safe in respect of terrain and obstacle clearance (considering non-ISA conditions). Our chart supplier for example provides 2 MRCs for GVA to accommodate for this responsibility: one for temperatures between -8 degrees Celsius and 1 degree Celsius, and one for temperatures of 2 degrees Celsius and above.

When to apply corrections and how

Temperature corrections should be applied when the surface temperature is -10°C or below. Unless otherwise specified, the elevation of the aerodrome in use is taken as the elevation of the altimeter source. Pending the use of approved automated cold temperature corrections by the FMS, when conducting an instrument approach and when required, these corrections must where applicable be applied to:

- To Decision Altitude (DA) and Minimum Decision Altitude (MDA).
- Minimum altitudes after passing the Final Approach Fix.
- To the Final Approach Fix. ATC must be informed when temperature corrections are applied at the FAF to ensure vertical separation with other traffic.

Ensure adequate knowledge on when to apply temperature corrections, pending the equipment on board your aircraft and the available approach type.

✔ Decision-Making Under Uncertainty

Winter flight planning often includes vague icing alerts that can lead to complacency or overreliance on surveillance system returns.

Best practice:

- **Don't wait for visual confirmation** - make decisions based on the conditions and likelihood.
- Use PIREPs and recent sector data.
- Monitor SAT, TAT, and EPR/N1 trends actively.
- Be ready to **descend, deviate and/or isolate** engines if signs develop.

High-Altitude Icing - Safety Pillars Summary

Mindset

Icing at cruise isn't fiction. Trust the data and reports, not your eyes. Stay proactive, not reactive

People

Brief the crew on likely icing zones and handover strategies if automation becomes unreliable. Empower FO/PMs to call out anomalies without hesitation.

Equipment

Keep anti-ice systems tested and active when required. Verify probe heat and air data stability regularly. Post-flight reports can help maintenance pinpoint subtle icing effects.

Compliance

Follow SOPs on anti-ice activation based on temperature and moisture forecasts - not just visual indicators. Refer to QRH actions promptly if any signs of engine or probe icing arise.

Risks

- Engine rollback or flameout.
- Erroneous probe readings leading to instrumentation/automation confusion.
- Stall margin degradation from airframe contamination.
- Unrecognised icing onset due to misinterpreted instruments.

Learning

Several past incidents (real and fictional) show that misreading or delaying anti-ice activation led to emergency descents, engine shutdowns and/or automation disengagement. Most scenarios were recoverable; critically, all were preventable.

Final Word

Icing is silent, invisible, and unforgiving. It respects no cruise altitude and no aircraft generation, but with the right **anticipation, detection and action**, we can manage it-before it becomes a threat.

If you're unsure, switch anti-ice on. No-one ever got in trouble for being too early. ■

Managing people when daylight is short, nights are long, and energy is low

In winter, safety challenges don't just come from snow and ice, they also come from inside the crewroom.

From Gunnar, HF Expert

Fewer daylight hours, long night shifts, irregular rosters and colder temperatures can all combine to sap energy and motivation. For some, the effect is subtle - a little more tiredness, a bit slower to react. For others, it's more serious, triggering fatigue, low mood and/or even Seasonal Affective Disorder (SAD)..

When fatigue meets a safety-critical job, risks multiply fast.

❄ Why Winter Makes Fatigue Different

- Short daylight hours disrupt circadian cues, making it harder to stay alert in early morning or late afternoon.
- Long night duties increase sleep debt - especially for those who struggle to rest during daylight.
- Cold weather reduces physical comfort, encouraging crews to stay indoors between duties and limiting exercise.
- Holiday schedules can lead to roster compression, shorter rest periods and more back-to-back shifts.

The result? Crews may meet legal duty limits but may still feel drained - mentally and/or physically.

✶ Mental Health in the Dark Season

Mental health risks also rise in winter:

- SAD can lead to low mood, lack of energy and/or difficulty in concentrating.
- Prolonged fatigue can erode decision-making quality and situational awareness.
- Reduced social contact (due to bad weather, long shifts and/or isolation away from home base) can increase stress.

For many, these symptoms build gradually and can go unnoticed until performance is clearly affected.

✍ Practical Countermeasures

For rostering teams:

- Limit successive early starts in winter months.
- Avoid unnecessary split duties where possible.
- Ensure minimum rest is not just legal but meaningful.
- Consider daylight exposure opportunities for crews on multi-day trips.

For crew members:

- Use light therapy lamps during morning briefings or at home to simulate daylight exposure.
- Keep consistent sleep/wake patterns on days off.
- Schedule brief physical activity - even short walks - to reset circadian rhythm.
- Monitor personal fatigue levels honestly and report concerns early.

Turbulence - Safety Pillars Summary

Mindset

Fatigue is not something to push through and hope you can cope with, it's a shared safety risk that needs to be managed together by the organisation and individuals. Speak up before it becomes a hazard.

People

Crew well-being is a safety investment. Rostering, training and peer support all play a role in prevention.

Equipment

Use available tools - such as, fatigue risk management systems (FRMS), alertness testing apps and light therapy devices - to counter seasonal effects.

Compliance

Follow rest requirements and FRMS protocols strictly. Avoid self-extending duties or "just pushing through" when fatigued.

Risks

- Reduced reaction time.
- Poor decision-making under pressure.
- Communication errors in the cockpit or on the ramp.
- Increased irritability and interpersonal conflict.

Learning

Several winter safety reports have shown fatigue-related errors during routine operations, including taxiway misidentification and checklist omissions. Whilst the many crews involved felt "functional", they later admitted to being mentally drained.

Occurrence Example: Slow to Respond on Final

On a late-evening arrival after three consecutive night duties, a Safewings crew flew a stable approach but did not respond immediately to a sudden ATC instruction to go around due to a runway incursion. The delay was only a few seconds, but it was enough to require an evasive manoeuvre from another aircraft.

Post-event analysis showed:

- Crew had legal rest but disrupted sleep patterns.
- Both reported high fatigue levels after the event.
- The reaction time of the Pilot Flying (PF) was slowed by approximately 2-3 seconds compared to simulator baseline.

Actions taken:

- Revised night-duty rostering policy during winter.
- Increased promotion of fatigue self-reporting without penalty.
- Added mental health awareness module to annual recurrent training.

Final Word

Winter fatigue is silent, cumulative and every bit as dangerous as ice on a wing. The safest crew is the one that arrives alert, rested and mentally ready, which takes planning from not only rostering teams, but also individuals. ■

Why staying seated and secured matters more in winter skies

From Sven,
Cabin Crew

Turbulence is one of the most common causes of in-flight injuries - and winter is its prime season.

Jet streams intensify, frontal systems sharpen and mountain wave activity increases. Even with today's weather forecasting and detection systems, turbulence remains unpredictable, especially when it's clear-air turbulence (CAT).

At Safewings, we've seen turbulence incidents affect passengers, cabin crew and even cockpit crew. The injuries range from mild bruises to broken bones; all such injuries are avoidable when the right precautions are taken.

Why Winter Increases Turbulence Risk

- Jet stream shifts: faster winds aloft create stronger shear zones.
- Frontal activity: rapid pressure changes produce unstable air masses.
- Mountain wave amplification: cold, dense air enhances wave strength.
- Convective surprises: even in cold air, small but violent convective cells can develop.

Practical Prevention Measures

For Flight Crew

- Keep "Fasten Seatbelt" signs on longer than you think necessary during winter sectors unless you can see that the weather is clear.
- Make early, clear PA announcements about keeping seatbelts fastened when seated.
- Use available turbulence forecasts, SIGMETs and pilot reports (PIREPs), and request updates while en route.
- If conditions worsen, coordinate with ATC for altitude and/or route changes.

For Cabin Crew

- Prepare for the unexpected - Always secure carts and equipment that are not in use.
- Prioritise your own safety - if you can't move safely, don't.
- Communicate quickly to the flight deck if turbulence starts before warning signs are given.
- Turbulence felt in the cabin can sometimes be different from the front of the aircraft to the rear, so it's important for cabin crew communicate between each other.

For Passengers

- Always keep your seatbelt loosely fastened when seated - even if the sign is off.
- Secure loose items, especially hot drinks and heavy electronics.

❄ Key Risk Factors

- Injuries during unexpected turbulence when crew are standing.
- Hot liquid burns from service items.
- Cabin disorganisation during unexpected jolts, leading to secondary hazards.

High-Altitude Icing - Safety Pillars Summary

Mindset
Turbulence is not just discomfort; turbulence is a safety hazard that can cause serious injury in seconds.

People
Protect cabin crew by giving them time to secure the cabin. Educate passengers so they understand seatbelt use is for their safety, not just compliance.

Equipment
Ensure carts are well-maintained so they can be secured quickly. Verify galley latches and seatbelt condition.

Compliance
Follow SOPs for turbulence management, including the pre-emptive suspension of cabin service when in high-risk areas.

Risks
Delayed sign illumination, slow service stowage and/or assuming that clear skies mean smooth air.

Learning
Past events show that injuries happen most often when turbulence arrives without warning and crew or passengers are unsecured. Many such injuries could have been prevented with earlier cabin preparation and passenger briefings.

Occurrence example:
Unforecast mountain wave activity.

A Safewings A320 encountered severe turbulence over the Alps at FL350, with no SIGMETs in place. Two cabin crew were in the aft galley preparing service. Both crew were thrown against the ceiling and sustained shoulder and neck injuries. Passengers reported hot drink spills, and one sustained a minor burn.

Investigation findings:

- The “Fasten Seatbelt” sign was off.
- The captain had no indication of mountain wave activity from ATC or weather radar.
- After the incident, procedures were updated to leave the sign on when crossing the Alps in winter unless smooth conditions are well confirmed.

Final Word

Turbulence may be invisible, but its consequences aren’t. Staying secured, alert and ahead of the risk are the best ways to keep winter flights injury-free. ■

Why skipping just one step can start a chain of errors

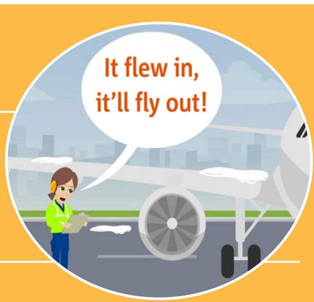
It's minus five degrees on the ramp, the wind is cutting through your gloves and your pen won't write. In these conditions, it's tempting to speed things up - and that's when checklist drift creeps in.

Checklist drift is the gradual - often unconscious - habit of skipping or rushing checklist items because conditions make them uncomfortable or seem "less urgent." In cold weather, the risk spikes.

❄ Why Cold Changes the Game

- Frozen fingers make fine motor tasks slower and more frustrating.
- Crews shorten callouts or skim over items to get back inside quickly.
- Ramp noise and winter clothing can make communication harder.
- Tasks that *look* complete (like doors closed or covers removed) may not be verified properly.
- The danger? Small oversights in pre-flight or post-flight checks can snowball into operational safety issues.

Preventing Checklist Drift



Mindset

Cold isn't an excuse; cold is a reason to be more methodical.
The harsher the conditions, the greater the need for discipline.

People

Pair up effectively. Cross-check each other's items even more rigorously when working in cold, dark and/or noisy conditions.

Equipment

Use gloves that allow dexterity for switches and writing. Keep checklists laminated or in cold-resistant covers to prevent sticking or tearing.

Compliance

Follow the checklist as written. Avoid combining or skipping steps, even if they might seem obvious.

Risks

- Unlatched panels.
- Incomplete de-icing inspections.
- Pitot covers left in place.
- Mis-set controls.

Learning

In January, a Safewings crew skipped a full control surface check because "the gust lock was in" and it was "too cold to stay outside." On taxi, the elevator felt heavy. The gust lock had not been fully disengaged. The aircraft returned to stand. A safe ending, but a delayed departure and a lesson learned.
Cold weather makes you hurry. Your checklist exists to make you slow down and be methodical - always. ■

READY FOR WINTER?

European Union Aviation Safety Agency

together 4safety