

# The Seven Deadly Things

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Have you ever taken a look at a report listing the distribution of Accidents by Accident Category? There are apparently more than **40 possible ways an accident can be categorized**, but there are **7 that seem to pop up way more often than any other**.

Airbus took a look into all fatal and hull loss accidents which occurred between 2009 and 2019 and the results are shocking in that a lot of those accidents just should not have happened.

**P** is for...

Yep, pilots. We are a big problem. We mess up a lot. That is what seems to be said in the media anyway...

But, it isn't always our fault, (sadly some of the time it also is), and we all know that the news reporter's favorite phrase "pilot error" (or "human error" if they are feeling particularly generous about it) is rather meaningless, and very unfair. It removes all the context of the why's and the how's of what led to a pilot making an error, and **it is rarely ever as simple as "they just messed it up."**

There are usually countless small things that lead up to any incident, and many a CRM course has been spent discussing and brainstorming how we can better avoid all of these little things and so avoid it ending up in a "one big thing" event.

**So, why are these big events still happening?** And what can the pilot in the equation do to prevent them? (Because the vast majority of these definitely are preventable).



#### CONTROLLED FLIGHT INTO TERRAIN (CFIT)

In-flight collision with terrain, water, or obstacle without indication of loss of control.



#### LOSS OF CONTROL IN FLIGHT (LOC-I)

Loss of aircraft control while in flight not primarily due to SCF.



#### RUNWAY EXCURSION (RE)

A lateral veer off or longitudinal overrun off the runway surface, not primarily due to SCF or ARC.



#### FIRE

A fire which occurs while an aircraft is airborne.



#### ABNORMAL RUNWAY CONTACT (ARC)

Hard or unusual landing, not primarily due to SCF, leading to an accident.



#### SYSTEM/COMPONENT FAILURE OR MALFUNCTION (SCF)

Failure or malfunction of an aircraft system or component, related to either its design, the manufacturing process or a maintenance issue, which leads to an accident. SCF includes the powerplant, software and database systems.



#### UNDERSHOOT/OVERSHOOT (USOS)

An Undershoot/Overshoot of a runway occurs in close proximity to the runway and includes offside touchdowns and any occurrence where the landing gear touches off the runway surface.

Taken from the Airbus report

## 1. Loss Of Control In Flight

This is the **single biggest cause of fatal airplane accidents** in this period, accounting for a scary 33%, and 12% of hull losses. We are not talking about situations where something major has broken or failed – we are talking about times where aircraft have somehow managed to get into a situation they shouldn't be in, and the crew have not been able to safely get them out of said situation.

Air France Flight 447 is one of the most discussed examples of this occurring.

All these accidents no doubt had other factors involved – it was not just the pilots not knowing how to fly. There were things like startle factor, bad weather, other warnings, other traffic...

But a large number of **these could have and should have been recoverable**.

So, what can we do about this? Well, ICAO took an in-depth look at why these kept happening, and they came up with a great and simple thing – UPRT.

### Upset Recovery and Prevention Training

When they say simple they really mean it – all you really need to know is **PUSH, ROLL, POWER, STABILISE** (and maybe have had a few practice goes in the sim).

This is the recovery though. It is the point when everything has gone wrong and all you have left is fixing it.

Luckily, we pilots do have a few other tools in our toolbox which we can pull out earlier at a time when prevention might still be possible. Things like **good monitoring, situational awareness, an understanding of startle factor**.

In fact, we have a post right here if you're up for some more reading on the old startle thing.

There is also that Other thing we can do. It might be one that makes a few palms get a little sweaty at the thought of it – but we can **disconnect the autopilot and actually hand-fly** now and then.



Thanks for the photo, AIN. Not a nice sight to see, but rather in a sim than real life...

## 2. Controlled Flight Into Terrain

Second on the list of the '7 Deadly Things' is Controlled Flight Into Terrain. Again, not because something has broken, but because a crew have just totally lost their situational awareness. These account for 18% of all fatal accidents, and 7% of all losses reviewed in the 20 year period.

The Korean Air Flight 801 accident report offers more insight into how these occur.

Again, other things factor into this – distractions, visual illusions, somatographic illusions – and these can be tough to handle because they are one of **the few things a simulator cannot realistically simulate.**

We have **backups** though. GPWS for one. Although this really is the final layer of the safety net. If this is going off then you're out of the prevention and well into the recovery and mitigation part of the accident curve.

There is good old **Situational Awareness** again though – this is the stuff of heroes. It is something you can gain, or regain, with a simple briefing. A "What if... then what will we do?" chat. **Briefing threats is important, but briefing how to avoid them is even better.** Get a bit of CRM in and ask the other person next to you what they think you should be looking out for.

Situation Awareness is knowing where you have told your plane to go but, most importantly, it is knowing if it is **actually going there** (and this means vertically and laterally).

## 3. Runway Excursions

These account for 16% of fatal accidents, and a whopping great 36% of hull losses. No failed brakes or issues with steering involved, just big old "oops, didn't check the performance properly" type situations.

We have mentioned this before. It is one of the biggest “that just shouldn’t have happened” types of event.

Actually, the biggest thing that leads up to runway excursions is generally **unstabilised approaches**. These are something we can definitely avoid and IATA has some great tips on how. Cut out the unstabilised approaches and you’ll probably cut out a big proportion of runway excursions right away.

There are a few things to help us here too – if you are flying an Airbus then lucky you, because these have a great system on them called **ROW/ROP** that squawks at you on the approach, and on the landing roll, if it reckons you’re going to go off the runway. But if you don’t have this, then **checking your performance properly and managing that approach well** are going to be what saves you from an embarrassing call to your chief pilot.

There is also a big change to runway friction reporting coming in on 4th November 2021 – The Global Reporting Format, or ‘GRF’ as he is known to his friends. **Griff will standardize how runway surface conditions are reported worldwide** and with better reporting will hopefully come better awareness of the risks.



Being aware of what you’re landing on is pretty important!

### **That was the Top 3. What about the others?**

The other four are lumped together into ‘Other’ which makes up the remaining 33%. (Actually, 11% of that is ‘other’ others!) Combined, our final four account for 22% of all fatal accidents and 22% of hull losses.

These are:

- **Fire**
- **Abnormal Runway Contact**
- **System/Component Failure or Malfunction**
- **Undershoot/ Overshoot**

Now, I know what you’re going to say – fire probably isn’t your fault (unless you dropped your phone under your pilot seat and then ran over it repeatedly with your chair trying to hook it out again).

**But there are still things a pilot can do to help lower the impact of these.**

How? Well, by knowing our **fire procedures** (the what to do if something Lithium Ion powered in the flight deck does start smoking), and by knowing the **comms procedures** needed to help support our cabin crew

if there is something going on down the back. We can also prepare in flight – be ready with something in the **secondary flight plan** in case we need to suddenly divert.

As for system and component failures, well, the 737Max accidents of the last few years account for a big proportion of this, however, in all cases having a **strong systems knowledge** and preparing for those “what if?” situations might help save your life one day.

You might have noticed a shift in the training paradigm in the industry, and with good reason – the days of focusing on practicing specific failures in the sims are vanishing and in its place is **Evidence Based Training - training that focuses on building the skills needed to handle any situation**. If that all sounds newfangled to you then think of it this way – a pilot is there just not to push buttons, but to manage the flight, and these skills are the tools which will enable us to do that.

**Fancy reading some more?**

- A full report from IATA on LOC-I can be found right here

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## Mothballs & Maintenance: The Risks of Long Term Storage

OPSGROUP Team  
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It's a strange time for aviation right now: closed countries, fewer passengers, and a lot of aircraft being moved into hangars – not to see the sky again for some time. The long-term storage of aircraft is leading to some unforeseen issues...

We reported on some these before, but we thought now might be a good time to give another quick summary because **aircraft are starting to fly again** – in particular the 737 Max which is back in the skies of Canada, the US, and soon Europe as well.

## The Dangers of Long-Term Storage...

There have been a lot of incidents attributed to aircraft coming out of long-term storage. Wizzair fell foul of some bugs in 2020, an Aeroflot had a bit of a mishap after it was only partially ready to go back flying...

Both the US and EASA safety regulators have **raised concerns about certain issues for aircraft coming out of long-term storage**, so in case your airplane is currently stashed away, read on.

### Nesting Nasties

We mentioned this one before, but with Covid dragging on, we figured it might be worth a reminder.

It sounds nightmarish, but insects have been known to build lairs deep inside aircraft probes, where even the most eagle-eyed walk-around check might not spot them.

And these critters have led to an alarming trend of **airspeed problems for aircraft new out of storage**.

Check out our earlier article on the risks of this here, and be sure to do an **in-depth check** of your aircraft's nook and crannies before taking to the skies again.

### Batteries Not Included

Aircraft with **Nickel-Cadmium batteries** (which is most of them, unless they have newer lithium ion ones) are suffering from **premature power loss**.

Embarrassing for the batteries, and dangerous for the pilots.

When disconnected, these batteries can lose their capacity, and when they are plugged back in again, they might not regain it – leading to **a lot less time of usefulness** that you think you have.

A battery not providing the performance you are expecting on that already bad day when you drop down to emergency power levels, is going to make it a really, really bad day...

**What can you do?** Well, EASA recommend that aircraft approval holders work with battery manufactures to check out this new found phenomenon, but in the meantime – if you are waking your airplane up from a long term hibernation, make sure its ticker is ticking properly with **a full maintenance check**, before you head out for a spin.

### Clean as a Whistle

**Disinfecting** is big right now, what with this old pandemic thing. But a lot of the cleaning agents that can kill Covid, can also **damage your airplane**.

Damage to screens, fogging and misting from liquid pooling in out of sights areas, and some alcohol based substances 'crazing' up windows (alcohol crazes most of us up, but on windows it can cause fine cracks, and permanent damage) are all risks of using the **wrong cleaning fluids**.

There is also a chance long-term use of certain cleaning agents might start to corrode parts and **increase the flammability of the interior**, and even cause some shorting of the circuitry.

So, the FAA and EASA have issued guidance suggesting you **check which disinfectants are suitable for your aircraft type**. That seems sensible. Their recommendations on how to clean are here, and you can find links to anti-Covid approved cleaning agents that you can check with your aircraft manufacturer before spritzing your plane.

## Check your flappers

Back in July 2020, the FAA issued an airworthiness directive for 737 Classics and NGs because, when stored for just 7 days, they can start to suffer from **corrosion on the Bleed Air 5th stage check valve**.

What's the risk here? Only a little case of **double engine failure**, according to the directive. Thankfully, they also recommend a fairly straight forward check to confirm your valve and its flapper plate are flapping as they should.

## What else can you do?

EASA recommend operators carry out **extra checks when bringing an aircraft back into service**. These include engine runs, flight control manoeuvrability and brake checks.

To be safe, they suggest you do it on **20% of your fleet**, and to be extra safe, they suggest you consider flight checks on **the first 10% returning to the skies**. Don't rush these checks. It takes 3-5 days to ready an aircraft for long term storage, so it probably takes the same to bring them out again.

**And don't forget about your pilots!** Pilots don't fare much better in long term storage either. Like their aircraft, they need consistent use, and without it, you're going to have to spend a bit longer getting them airworthy again. (We would suggest you let them clean themselves though, and it's probably best not to ask how their flapper valve is functioning ☹)

## Some other stuff to read

- IATA Operations Info
- FlightGlobal Airworthiness concerns