

# THE BIRDS AND THE BRAINS



**Captain Rudy Pont**



As the aviation industry pushes toward autonomous flight, we must ask ourselves: are we ready to fully trust machines, or should we ensure that humans remain in control? **Captain Rudy Pont** reflects on the value of human judgment and adaptability in his encounter with a flock of birds during take-off.

## KEY POINTS

- **Human qualities:** Human pilots possess adaptive, creative, and ethical decision-making skills that current automation cannot replicate, particularly in unpredictable situations.
- **Human control:** While technology has significantly improved aviation safety, it is not infallible. Pilots have to intervene when automated systems behave inappropriately and resist over-reliance on automation.
- **Joint cognitive systems:** Rather than focusing solely on reducing human error, the aviation industry should aim to optimise the joint cognitive system of human operators and automated systems.
- **Tacit knowledge and know-how:** Replacing human pilots with automation could lead to the loss of valuable tacit knowledge and experience. Frontline professionals often make small, unreported adaptations to ensure safety. This nuance could be lost in fully automated systems.



*"Wind 060, 12 knots. Cleared for Take-Off Runway 04R."*

With the toes on the brakes, I push the thrust levers slowly forward. Reaching 50% N1, I release the brakes and push them into the TOGA/FLX detent. *"MAN FLX 63, SRS, RWY."* My First Officer confirms with a simple *"Checked."* The aircraft starts to accelerate. 60 knots, 80 knots... What's that greyish cloud just above the runway? Are they...? *"One hundred."* Yes. Birds. Not one. Not ten. But dozens of small birds right in the take-off path...

If we perform a regular take-off, the birds will be ingested by both engines. If I hit the brakes, we should still be able to stop the aircraft, but a rejected take-off in the high-speed regime always involves risk. There's still some room underneath the flock... *"V1, rotate!"* Slowly, I get the wheels off the ground, but I deliberately stop the rotation and keep flying just a few feet off the ground. We pass underneath. Once clear, I continue the rotation and initiate a right turn to avoid the hills ahead and resume the published SID. *"Positive climb." "Gear up."* Without exchanging a single word, my First Officer understands the plan and gets us back into the standard routine.

The question is: would automation have reacted the same?  
I am afraid not.

A quick search of academic articles featuring the keyword "AI" reveals that the interest in artificial intelligence has risen exponentially over the last six years. This does not come as a surprise. You probably use AI tools in your daily life, either knowingly or unknowingly, in many different web-based services. This is the digital or technological revolution. It's progress. It makes life easier, and increases efficiency and profitability.

Technology and automation have helped the aviation sector to obtain an enviable safety record. From (e)GPWS, TCAS, WX radars over enhanced monitoring systems, autopilots, FMGC, GPS, etc.,

progress has been slow but sure. As aviation professionals, we are sceptical of disruptive changes, because we work in a high-reliability sector. Mistakes cost lives. We say that *"standard operating procedures are written in blood"*. When accidents and incidents happen, we learn from them and integrate the learning in our SOPs, training and technology. Little by little, we change things for the better, but we make sure we stay in the loop.

Unfortunately, competition is fierce and profits are thin. And the 'new' wave of digital optimism and technological developments has triggered some aircraft manufacturers to turn away from the axiom of staying in the loop. Based on the premise that technology will solve everything, some propose to remove the human from the equation. Huge investments are being made in initiatives like eMCO (extended Minimum Crew Operations) – a euphemism for Reduced Crew Operations (RCO), in itself a euphemism for Single Pilot Operations (SPO) – and autonomous flight.

I am not anti-progress. As well as a pilot, I am an engineer and an amateur developer. I love technology. But what strikes me is the obsession with seeing people as the source of all evil. Yes, humans are fallible. But at the same time, we are also adaptive, creative, conscious, and we have a sense of ethics... We do a lot of things that aren't always visible to make sure the day ends well. As organisational theorists Karl Weick and Kathleen Sutcliffe put it, *"Safety is a dynamic non-event. When nothing is happening, a lot is happening."*

As humans, we understand very well, when and how we screw up. But this underlying war on 'human error' – although nowadays sometimes nicely packaged in a just culture wrapping – keeps the idea alive that we should focus on the human element alone to make things safer. In my opinion, we should take a holistic stance and look at the joint cognitive system, i.e., the combination of technology and the human.





In 2021, I assisted in the qualitative analysis of an ECA survey asking pilots one simple question: when did you have to deviate from procedures or turn off the automation to ensure a safe outcome? From 1428 replies, 77% referred to inappropriate automated system behaviour, 12% to operational issues and 11% to inappropriate procedures. Many pilots explained how they intervened when either automation 'went rogue' or when procedures were not fit for purpose. Often – but not always – pilots had reported what happened, but were unaware whether any action had been taken to address the issue. Front liners (pilots, ATCOs, maintenance personnel, dispatchers...) don't always report when they need to adapt to a situation. After all, this is what you do as a professional. You spot an issue, you tackle it and you carry on. Small adaptations often sit in the tacit knowledge and the experience of frontline staff, remaining hidden from those more distant to the work. There is no need to report, this is part of the job. But what happens if you replace the human with automation? Knowledge and abilities get lost.

I doubt if any autonomous system would have avoided the birds like I did. To do so, an automated system would need to see (sense) the birds, risk assess the different options, then choose the ideal path. In case of a known scenario or one where we have enough data to 'teach' an AI system, this might still be feasible. The only problem is: in this complex world we don't know what challenge we will be facing next. And even when we are able to anticipate them, solutions aren't always readily available.

My plea is simple: let's look at humans as an essential resource, more than as a liability. Let's understand when and how frontliners save the day and how we render things safe and efficient with and without technology. Yes, the digital revolution will continue and systems will become more advanced. And maybe, one day, we will have enough confidence to entrust these systems with our lives. But until then, let's keep the human in the loop.



## REFERENCES

Weick, K.E., & Sutcliffe, K.M. (2007). Managing the unexpected. Jossey Bass Ltd.

**RUDY PONT** is an Airbus 320 Captain with MSc degrees in electro-mechanical engineering, air safety management and safety sciences. He chairs the Air Safety Committee of the Belgian Cockpit Association (BeCA) and is a part-time lecturer at the University of Antwerp. Rudy is an active member of the EUROCONTROL Just Culture Task Force and vice-chair of the Belgian Just Culture Platform