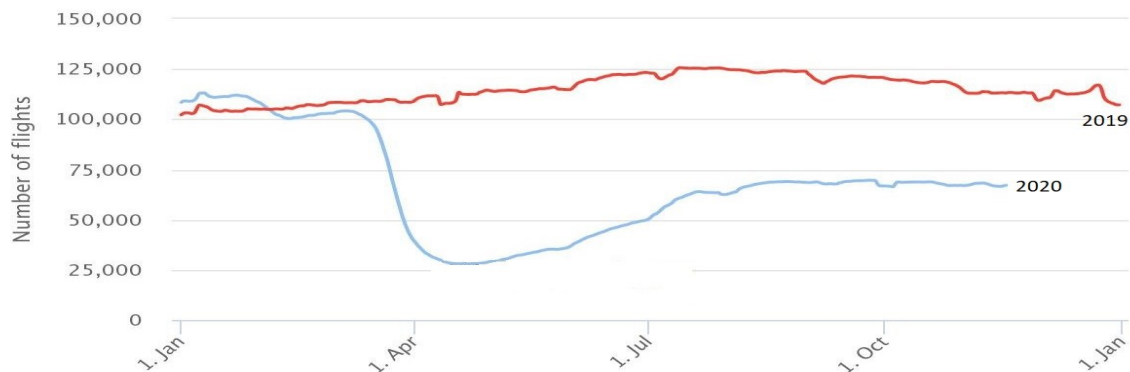


HUMAN FACTORS NEWS

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DECISION MAKING

2020 — Phew!

This is the number of commercial flights per day, tracked by Flightradar24 in 2019-2020:



Hopefully, 2021 will see a return to viable aviation.

Charles Darwin's Big Decision

In July 1838, Charles Darwin, best known for his contributions to the science of evolution, sat down to make a decision that would alter the course of his life. The decision he was wrestling with was should he marry Emma Wedgewood?



Darwin's method for making this decision was to compile a list of pros and cons. Under the heading "Not Marry" he noted the benefits of remaining a bachelor, such as enjoying the conversation of clever men at clubs, and having more money for books; under "Marry" he contemplated the joy of sitting with his wife on the sofa with a roaring fire and listening to music.

Even though Darwin's values are dated, the journal

entry is remarkable for how familiar the process still feels. Almost two centuries later, the pros-versus-cons list remains one of the most regularly used techniques when pondering a complex decision.

The limitation of the pros versus cons list is that we only consider our existing understanding of the decision at hand and do not see it with fresh eyes. We simply can't draw up a list of things that would never occur to us. To overcome this, it is helpful to diversify the group of people who are contributing to the decision.

When faced with a difficult decision, (and time is available), draw on other people for ideas. You may get some fanciful proposals, but you may also get some valuable insights. For example, older colleagues may be able to highlight particular advantages of a discontinued method; young staff may bring the benefit of contemporary training; complete strangers from the world wide web may pioneer a novel solution.

(History records Darwin had a loving marriage which produced 7 children.)

Should I Go Around?

Several studies indicate that pilots in an unstable approach persevere with the landing more than 95% of the time.

Deciding whether to go around is one of the most gripping dilemmas pilots regularly face and it is odd that so many ignore SOP's and proceed with an unstable approach. Possible explanations for this are:

- Pilots may view the procedures as simply guidance which doesn't necessarily apply to them right at that moment.
- The more often a pilot lands successfully after an unstable approach, the more likely they will be comfortable with doing it again.
- Because flying an approach is a dynamic process of continuous correction and decision making, there is always the option to initiate a go-around later so the decision is deferred.
- Being visual with the runway is a strong motivating factor in influencing a decision to continue, especially if the pilot is stressed.
- Commercial pressure and professional pride can influence the decision to continue or to go-around.
- If pilots are not confident they can execute a go around well, they may delay a decision to go-around until they see it as unavoidable.

At the time a go-around decision is required, a rapidly changing situation is very likely. This will occupy a large part of a pilot's attention and cognitive capacity and reduce their ability to either recognise a go around decision is

required or to make that decision. As time evaporates, this decision will become increasingly harder.

Situational awareness is a prerequisite for a pilot to judge risk and then to make a decision to maintain compliance and safety in light of that judgment. A Flight Safety Foundation study (<https://www.skybrary.aero/bookshelf/books/3808.pdf>) found that pilots who chose to persist with an unstable approach scored lower on all nine measures of situational awareness compared to pilots who chose to go around. They were also found to be less compliant with checklist use and standard calls, thought it unlikely to be reprimanded for non-compliance with go around policies, and generally believed company go around criteria to be unrealistic. In short, the study found that better pilots are more likely to go around.

For a chilling examination of a fatal unstable approach, have a look at:

<https://www.youtube.com/watch?v=67Yw8713Atw&feature=youtu.be>

Threats to look out for which may prompt a go around decision include a late runway change, variable wind speeds, tight traffic spacing, and unexpected runway conditions. Also, be cautious when feeling rushed, fatigued or stressed. Any of these conditions should trigger an automatic alert for pilots to be more attentive than normal during the approach and be primed to make a go around decision.

For a recent Tasmanian example of a late go around decision, refer to Investigation AO – 2018-008 on the ATSB website

<https://www.atsb.gov.au>

Improve your odds

Annie Duke, former professional poker player and author of *Thinking in Bets*, talks about bias — if a decision turns out to have a favourable outcome, she says we think we made a great decision. However, it may be survivor bias — we survived, therefore we must have made a good decision. Well, maybe.



Duke explains that we tend to equate the quality of a decision with its outcome. So for example, if we descend an aircraft below IFR minimums on approach and make a successful landing, it's tempting to tell ourselves we made the right decision.

Did we though?

Conversely, a less-than-ideal result doesn't necessarily mean our decision-making process was flawed. For example, instead of attempting an IFR approach, we divert to another airport, only to discover that the ceiling lifted after we departed for the alternate.

Was that the wrong decision? With the information at hand, it was likely a prudent call.

We often make decisions based on probabilities. Managing risk in this manner comes with inherent uncertainty. A better way to improve our odds is to stick to procedures.

Memory and Planning

In "Time Pressure, Skill, and Move Quality in Chess", published in *The American Journal of Psychology* (1988), the authors showed that the proportion of poor moves made by chess masters was basically the same regardless of whether the games were played using regulation time (40 moves in 90 minutes) or blitz conditions (5 minutes total for the game). However, mediocre players showed a sharp increase in poor moves when under time pressure.

Two mechanisms play a principal role in skilled chess-playing decision making:

- recognition of cues that prompt the expert's memory about possible moves.
- planning by looking ahead at possible moves and responses.

The chess-based model of expert decision making, emphasising a combination of memory and planning, has been used to explain expertise in other domains, such as pilot performance. Expert decision makers can quickly access information they have memorised through training and experience.



Flying With a Clear Head

Good aeronautical decision-making requires planning ability, frustration tolerance and the ability to regulate one's emotions and being able to react to stressful situations with clear-headedness.

If you are one of those motivated enough to work not only on stick and rudder skills but on judgment skills as well, the best place to begin is to confront and attend to your own patterns of irrationality. That irrationality can come in the form of an excess of attention to details (losing the forest for the trees) or missing the trees altogether because you are distracted by the wonders of the forest.

It can involve looking at the extent to which your own conceit or bull-headedness may interfere with your life, or, on the other hand, your *lack* of confidence which may cause you to retreat or panic in stressful situations.

Your judgment may be affected by how quickly you become angry or where you fall on the optimism spectrum. You may be overly optimistic, such that you are likely to wishfully think the weather will improve en route, or overly pessimistic, leading you to believe you won't be able to handle an easy crosswind.

Your judgment can also be affected by how well you stand up to authority figures, perhaps leading you to being passive and fearful of declaring an emergency or refusing an inappropriate ATC directive.



Visual flying requires constant scanning outside the aircraft. Instrument flying demands searching inside the cockpit. Decision making when flying requires looking inside ourselves and developing an ability to reason with a calm and rational head.

When you are trying to come to terms with a frustrating situation, focus on the thoughts and actions that you can control, don't waste time and effort on the things and people you can't control.



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