

games

A new study aims to use pilot psychology to tackle go-arounds in the business aviation sector, as **Chris Smith** reports



“The culture and leadership philosophy within a company can profoundly affect the psychology behind pilot decision making”

Interior of a G500 simulator. The G500 is one of the models the FSI/Presage Group study will look at
FlightSafety International

Flying a go-around is one of many manoeuvres that pilots are trained to initiate in a matter of seconds, relying on ingrained procedures that are regularly practised. Used when landing would not be the safest option, the go-around involves abandoning an approach and attaining a safe altitude by climbing away from the approach path. Yet despite this well-structured and rehearsed

procedure, avoidable approach and landing accidents (ALAs) occur.

Determining why preventable events happen can be tricky. A pilot may choose to perform a go-around for a variety of reasons. These include being unable to see the runway at the decision altitude on a manually flown approach, or an air traffic controller detecting a separation violation with an aircraft on the runway and instructing the pilots to go-around. In such

cases, the decision to land or not to land is clear and leaves little room for ambiguity. This should still be the case when the aircraft trajectory is outside of the prescribed speed and profile tolerances, which occurs when an approach is classified as 'unstable'. Data suggests that while 97% of commercial flights end in a stable approach, a similar percentage of unstable approaches end in a landing, raising the question of what else the

industry can do to reduce the frequency of the go-around manoeuvre.

Reliance on the pilot mindset

Other than in very low visibility, the landing manoeuvre is entirely manual, as is the deployment of flaps and landing gear. Flight crews are taught to be resilient and to deal with the unexpected, but could these traits be detrimental when faced with a poorly managed approach and a 'I can fix it' mindset? Understanding this enigma requires a better understanding of pilot psychology during the approach, as well as how suboptimal decision



focused on multi-crew pilot operations in Gulfstream business jets.

A pilot first and foremost

The Presage Group was established in 2005. CEO and co-founder Dr Martin Smith pursued a PhD in Psychology after working as a flight dispatcher and airline pilot, studying clinical psychology and focusing on personality traits and pilot characteristics. His doctoral thesis examined more than 1,000 pilots over a

that aviation is still his passion and considers himself to be a pilot first and a psychologist second. Presage turned its attention to approach and landing risk management about a decade ago, following an enquiry from independent non-profit the Flight Safety Foundation, which felt a scientific solution was required to address such a serious safety issue. The company now assists in the implementation of operational transformation and works with "a couple of dozen airlines," its CEO said.

"Pilots of privately owned jets are likely to have a close relationship with the aircraft owner, which may create pressures that are uncommon on an airline flight deck"



five-year period and led to the "backbone" of what is known as Presage Intellectual Property (IP), the tool the company uses with its customers. The IP, according to Smith, is about "hunting" and "unpacking" non-compliant events. He explained: "It only needs to find a compliance requirement, then we overlay the error conditions with our IP."

While the solution has been rolled out across sectors as diverse as food manufacturing and utilities, Smith admits

Past experience as data

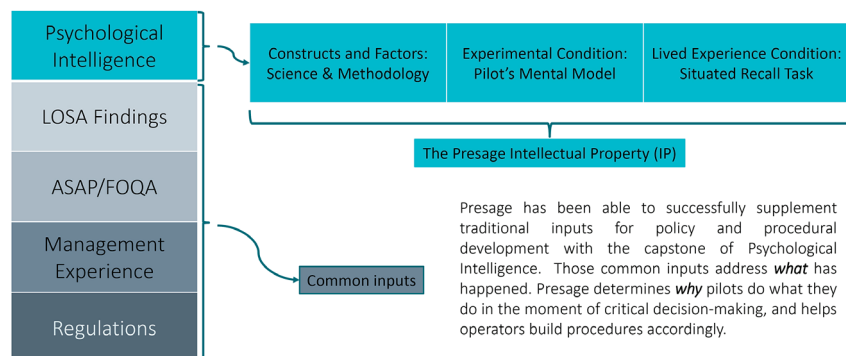
The process is entirely dependent on accurate data and at the heart of the data sampling process is a detailed questionnaire sent to pilots. Kept confidential and anonymous, it takes about 30 minutes to finish and "leaves no stone unturned", Smith said. It even poses similar questions in a variety of styles, allowing some data points to be validated for accuracy. The questionnaire delves into participants' past experiences, asking them to recall when they previously flew an unstable approach and what happened as a result. Smith emphasised that the Presage Group's solutions are tailored to each client, adding a light-hearted "don't try this at home" caveat.

making can develop and be influenced by impaired situational awareness.

Software specialists the Presage Group and aviation training and flight simulator supplier FlightSafety International (FSI) have collaborated to identify and mitigate risk for business aviation pilots during approach and landing. Presage, a Canadian firm, assists businesses in identifying and reducing human-induced error in procedure-driven workplaces and has collaborated with FSI on two studies. Initially, a partnership was forged with the Citation Jet Pilots Owner Pilot Association (CJP), which concentrated on risk reduction in a single pilot environment, while the second study



When developing policy and procedures, let's ask why...



He noted that if two operators operated similar types and were based in similar locations, risk profiling similarities would likely fall short of 60%, with the remainder influenced by company culture. Understanding such culture and the leadership philosophy within a company, which can profoundly affect the psychology behind pilot decision making, is of great importance. Data retrieval also relies heavily on flight data monitoring (FDM), which captures flight path trajectories and provides a detailed overview of operational habits and trends during approach and landing.

Pilot insight

In addition to the questionnaire and FDM, Presage forms working groups with pilots of all levels of experience to discuss and outline ideas and suggestions for changes to standard operating procedures (SOPs). Such gatherings are thought to be extremely effective at making pilots feel valued and empowered to contribute to meaningful procedural change.

Piyush Gandhi, VP for operations and business development at Presage Group, said he had witnessed insightful exchanges in which inexperienced airline cadets shared meaningful and creative ideas for developing SOPs. At the same time, he acknowledged that it can be

a "very humbling experience" for high-level management to admit they have a problem with procedural compliance. In this environment, the Presage Group has the potential to effect change, he said, although for some in key management positions, letting go and allowing a third party to potentially uproot long-standing procedures can be a daunting prospect.

Smith added that the company has carved out a niche within aviation in which no competitor can use a comparable "empirically validated measurement tool". Unlike some educational institutions, which may create surveys, no other organisation can take data collection a step further and build procedural transformation for operators, he stressed.

The Gulfstream study

For many years, FSI has been a leader in Gulfstream pilot training, and the study makes use of both privately owned aircraft and aircraft used commercially by charter operators.

The research will focus on the G500, G600, and G650 models. The latter, according to Richard Meikle, executive vice president, safety and regulatory compliance at FSI, is the only type in the trio with a traditional control column, as opposed to the more modern sidestick controller. As column movement is replicated and clearly visible to the monitoring pilot, the traditional control column gives the monitoring pilot a much better understanding of the type and magnitude of inputs made by the flying pilot. Since the flying pilot's sidestick inputs are not replicated on the controller next to the monitoring pilot, this creates what Meikle describes as a "lack of visual feedback". The two cockpit design styles are naturally expected to produce some nuances in the research study, allowing data to be compared.

Pilots from the three types that train at FSI will be invited to participate in the study, with a 2,000-strong pool of participants expected.

Gandhi stressed that they would need at least a 30% uptake to generate enough statistical data for the IP system

to properly assess. Data streams from the questionnaire and FDM monitoring will run in parallel, meaning that a pilot's questionnaire data can still be used even if no FDM data from flights operated by that pilot is captured.

According to Meikle, the addition of the business aviation sector now complements the Presage Group's pool of existing customers and "fills the void". Business aviation is home to a unique set of operational threats that do not exist in the airline environment. For example, there are no route networks that can instill the same degree of airport familiarity; airfields are frequently remote and host limited navigational aids, creating a very different operating environment. Furthermore, pilots of privately owned jets are likely to have a close relationship with the aircraft owner, which may create pressures that are uncommon on an airline flight deck. Meikle noted that several Gulfstream operators who are FSI customers have volunteered to be a part of the study.

Future disruption

Gandhi described the Presage Group as a disruptor, and there is no doubt that disturbing the stubbornly high rate of ALAs will be warmly welcomed across the wider aviation sector. The CJP study is expected to be completed in the summer of 2022 and the Gulfstream study findings published in the fourth quarter of 2022 or the first quarter of 2023.

If FSI customers wish to use it, a new training programme will be developed and deployed. Meikle was confident that recurrent training to revalidate crew licences would not necessitate the addition of additional simulator slots, and that new training techniques could be integrated into existing training schedules. **AI**

Checking In

Have you experienced a go-around, either as a pilot or a passenger? Tell us about it!

Share your view at airinternational@keypublishing.com under the subject heading *Checking In*.



CLOCKWISE FROM LEFT:

Classroom matrix training from FSI "empowers aviation professionals with the calmness and composure needed for all situations", the firm says FlightSafety International

Richard Meikle, FSI's executive vice president, safety and regulatory compliance FlightSafety International

With a background in aviation, Presage Group CEO and co-founder Dr Martin Smith considers himself to be a pilot first and a psychologist second Presage Group

Interior of a G650 simulator FlightSafety International

A schematic presentation of the Presage IP model Presage Group

Exterior of FlightSafety International's Savannah Learning Centre, which houses the Gulfstream simulators that are used in the study FlightSafety International