CAE Safety Promotion

Practical, relevant insights as seen in training performance

Purpose

This document is intended to be a practical safety bulletin pertinent for business aviation operations based on top safety threats identified by the IATA and NBAA and how training data for your aircraft type is trending in a particular threat area. The data in this document is brought to you courtesy of CAE Rise™. CAE Rise™ stands for Real-time Insights that assist Standardized Evaluations. In this document, the CAE Rise™ data presented is global and type-specific data. We hope you find the type-specific data very relevant for your training as well as operational profile as observations were made based on real Pilot/peer insights.

CAE Rise™ is a tool to help expand perception through analytics. When authorized, CAE Rise™ provides you and your instructor with a confidential, individual and objective assessment of your performance for debriefing purposes. If we can all collectively contribute to enhancing our awareness of operational risk, we can also reach our goal to enhance aviation safety.

The collected data has been correlated to operationally relevant training data. Events where pilots were instructed to meet ACS standards as opposed to using their own discretion on a visual landing. This filtered training data is presented in this manner to most closely represent how you operate the actual aircraft.

In this context, we hope you take the time to consider the brief takeaways in each of the top aviation safety threats from 2020 and the actual CAE Rise™ data for your aircraft type into consideration. Point being, train like you fly and fly like you train.

CAE

Top Aviation Threats

1 Runway / Taxiway Excursion

Runway excursions remain the highest distribution of non-fatal accidents globally.

Background

With any accident, there are underlying latent conditions and flight crew errors that lead to undesirable aircraft states, which can lead to an accident. In addition to top reasons of what went wrong, identified by IATA , crew should concentrate on appropriate countermeasures.

1. **2016-2020 Accident Category Frequency & Fatality Risk[1]:** loss of control in flight, runway/taxiway excursion, in-flight damage, hard landings, CFIT
2. **2016-2020 Aircraft Accidents – Top-flight crew errors[1]:** Manual handling errors, SOP adherence, failure to go-around, missed callouts, and pilot communication
3. **Countermeasures[1]:** overall crew performance, monitor/cross-check and in-flight decision making/contingency management

[1]IATA Safety Report, *https://www.iata.org/en/publications/safety-report/*, 2016-2020 Aircraft Accidents – Accident count

Have You Ever?

As pilots we all seek the perfect landing but, at what cost? Have your landings been floating farther beyond the TDZ over time? Do you treat landings differently in poor weather conditions? How stable are your approaches?

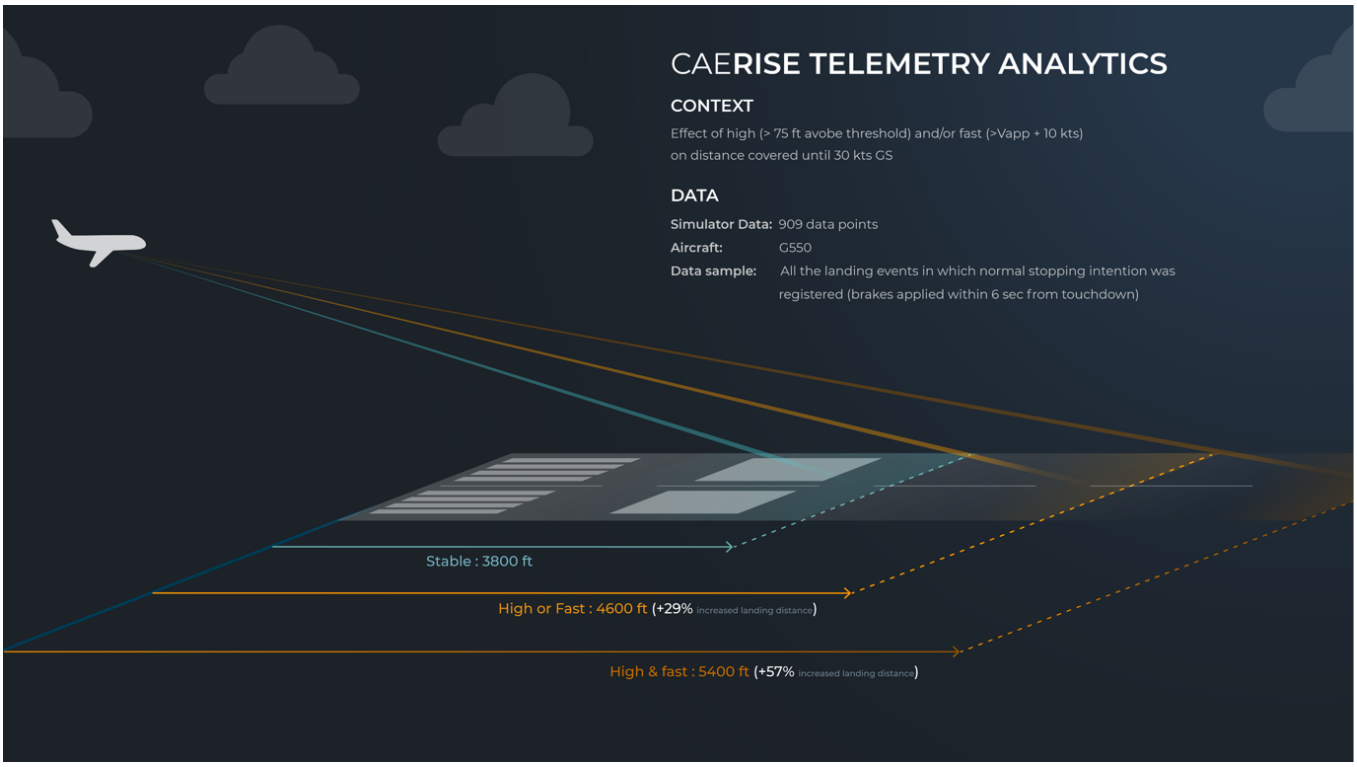
Unstable approaches often lead to unstable landings. When was the last time you conducted a go-around due to an unstable approach? The Flight Safety Foundation stated, "recent studies from Airbus and the FAA have shown that although unstabilized approaches are rare – only 3-4% of all approaches; only 2-3% of the unstabilized approaches end in a go-around.[2]" Business aviation pressures are real and add to the latent conditions of not conducting a go-around during aircraft operations.

Data shows every 10 kts over V_{REF} on a dry runway can lead to an additional 300 ft to your landing distance and 500 ft for a wet runway. Imagine a scenario where you are arriving fast and floating on a wet runway and you'll be able to understand why runway excursions are in the top-tier of aircraft accident cause from 2016-2020.

[2]Flight Safety Foundation, https://flightsafety.org/asw-article/the-rare-go-around/, The Rare Go-Around

Long Landings and Unstable Approaches

Regarding the threat of runway excursions, let's analyze global training data on your aircraft type regarding **long landings and unstable approaches**.



Key Takeaways:

Parameters. Pilots were briefed prior to approach that the landing was to be flown to ACS. The runway was dry runway, the crosswind was normal and light , and there were no extraneous circumstances on the approach (no malfunctions). Based on those parameters, the majority of pilots were on-speed and profiled for a normal landing. For those who were not on-speed, the following analytics were captured:

- ➔ Pilots who were high **OR** fast on the approach experienced 29% increased landing distance.
- ➔ Pilots who were **BOTH** high **and** fast experienced a 57% increased landing distance.

Operationally, considering wet runways, late braking, and operations where you are flying with shorter runways, the CAE Rise™ data suggests that pilots who were 75 ft over the threshold or V_{app} +10 should consider the additional landing distances observed on over 909 different training events in the G550.

Our goal is awareness. We hope you consider this topic prior to your next training event to emphasize the importance of a stable approach and landing consequences.

2 Mismanaged Go-around

In comparison to airline stable approach campaigns and no-fault go-around policies, business aviation pressures lead to a fraction of go-arounds in live operations globally. *When was the last time that you conducted a go-around outside of a training environment?*

Background

As business aviation reaches more diverse airports with varying navigational services, the topic of non-precision approaches and go-around is a safety topic to explore. With the global trend heading toward the Continuous Descent Final Approach (CDFA) (FAA AC120-108) procedure for managing non-precision approaches, the difference between a Decision Altitude (DA) and Minimum Descent Altitude (MDA) has real-world terrain consequences.

When you make the decision to go-around, your training should lead to a safe outcome. But, how close to the standard operating procedures was the go-around on-aircraft?

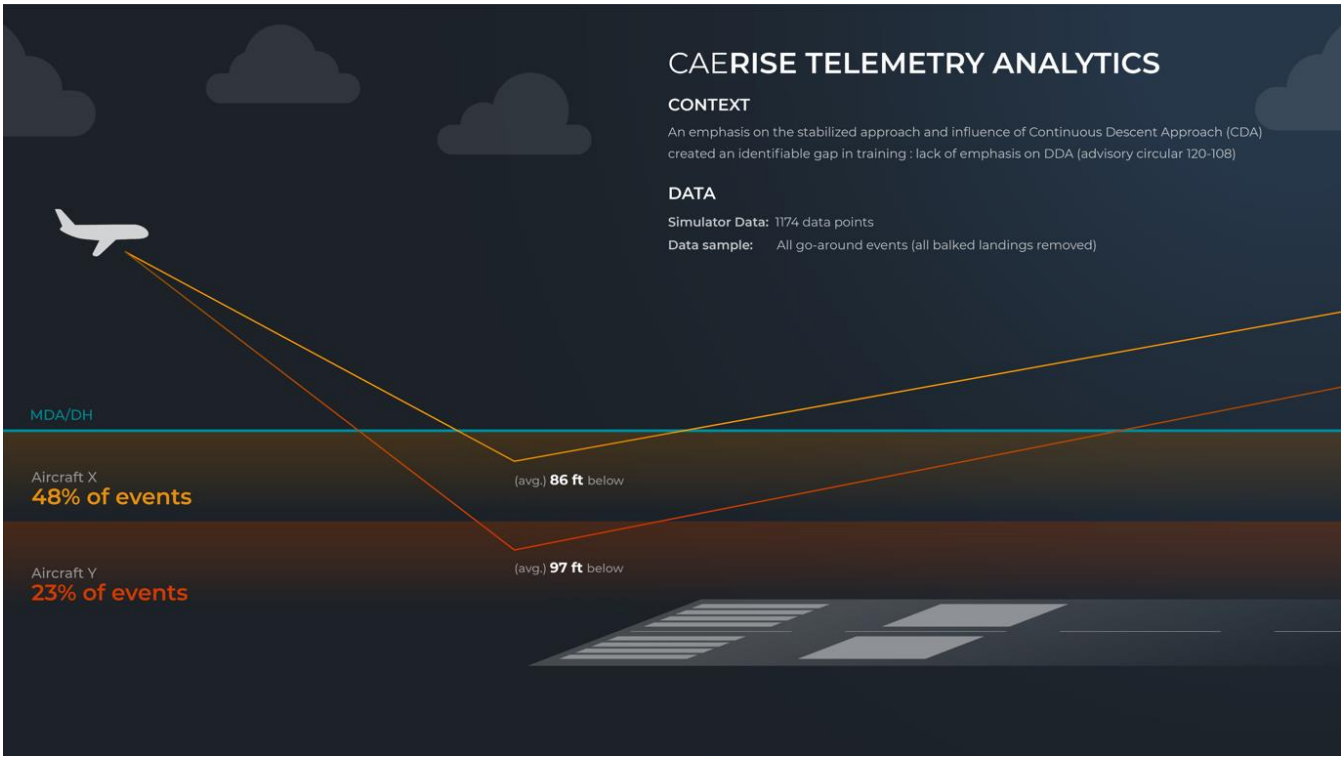
Are you familiar with the term Derived Decision Altitude (DDA)? Pilots must not descend below the MDA when executing a missed approach from a CDFA. As per FAA AC 120-108, "Operators should instruct their pilots to initiate the go-around at an altitude above the MDA (sometimes referred to as a DDA) to ensure the aircraft does not descend below the published MDA." "FAA *AC120-108,* 01/20/2011, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-108.pdf"

Here's a quick refresh on the difference between MDA & DA(H) as per the FAA Handbook (H08083-16B, Chapter 4):

- MDA—**the lowest altitude**, expressed in feet MSL, **to which descent is authorized** on final approach or during circle-to land maneuvering in execution of a standard instrument approach procedure (SIAP) **where no electronic glideslope is provided**.
- DA—a specified altitude in the precision approach at which a **missed approach must be initiated if the required visual reference** to continue the approach **has not been established.**
- DH—with respect to the operation of an aircraft, means the height at which **a decision must be made** during an ILS, MLS, or PAR IAP to either continue the approach or to execute a missed approach.

"It is imperative to recognize that any delay in making a decision to execute the Missed Approach Procedure at the DA/DH or MDA/Missed Approach Point will put the aircrew at risk of impacting any obstructions that may be penetrating the visual obstacle clearance surface." "FAA Handbook" *Chapter 4,* *https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/instrument_procedures_handbook/media/faa-h-8083-16b_chapter_4.pdf*

Let's analyze global training data on your aircraft type regarding **mismanaged go-around.**



Key Takeaways

- ➔ Approaches were flown CDFA; however, a decision to go-around was made at MDA, which caused a lag in thrust/performance and flight below MDA.
- ➔ Had pilots implemented a DDA, the performance lag would have been compensated for, which would have avoided flight below MDA.
- ➔ The percentage of events and fleet type comparison generates awareness. What will you do differently to avoid this trend during your next training event?

The purpose of highlighting trends and safety events is to generate a change in behavior. What are the SOPs pertaining to CDFA and MDA for your company's aircraft?

Our goal is awareness. We hope you consider this topic prior to your next training event to re-calibrate global trends of descent below MDA on go-around.

3 Loss of Control In-Flight (LOCi)

LOCi has been a recurring threat to the aviation industry. With automation reliance, distraction high and startle, loss of control in flight remains the #1 reason for aviation accidents across civil and business aviation.

Background

With any accident, there are underlying latent conditions and flight crew errors, which lead to undesirable aircraft states causing an accident. In addition to top reasons of what went wrong identified by IATA , crew should concentrate on appropriate countermeasures. Specifically for loss of control in flight, you may consider:

1. **Top fatal accident threats:** Meteorology, aircraft malfunction and poor visibility.
2. **Top flight crew errors:** SOP adherence, manual handling and pilot-to-pilot communication.
3. **Countermeasures:** Overall crew performance, monitor/cross-check and in-flight decision making/contingency management.

[1]IATA Safety Report, *https://www.iata.org/en/publications/safety-report/*, 2016-2020 Aircraft Accidents – Accident count

Have You Ever?

Have you gotten slightly slow at high-altitude from remaining in vertical speed mode while you were distracted? Maybe you selected an initial altitude that was too high for your weight and noticied a speed-decay?

Crews who have experienced mountain-wave, an increasing tailwind, a sudden increase in ISA or turbulence may find themselves in a low-energy state when flying outside the performance charting in their AFM. Increasing power (when already at >95% N1) may not be sufficient if you are on the backside of the power curve. Descent may be the best or only option and swiftly before speed decay leads to a low-energy, potential stall situation.

Upset Prevention and Recovery Training (UPRT) programs are comprised of two components: prevention first, then recovery. Understanding aerodynamic fundamentals are the cornerstones in both prevention and recovery and there are many programs available to professional aviators that are offered either on-aircraft or ground training only.

Our goal is awareness. We hope you consider this topic prior to your next training event to ensure that LOCi statistics retreat and aviation safety advances.

Elevate your training experience.

CAE delivers the ultimate flight training experience for business aircraft pilots. With safe operations as the top priority, our training programs utilize experienced instructors and highly advanced simulation technology.

CAE Rise™ is a product that provides pilots and instructors with personalized insights into training performance. The enhanced insights contained in CAE Rise™ are designed to collectively benefit safety enhancements within the industry along with the capability of providing individualized insights to CAE trained pilots on their performance.

By providing a consolidated assessment of business aviation's greatest operational threats on an annual basis as well as insight on CAE trained pilot performance, our goal is to enhance safety through safety promotion.

Resources

- NBAA resource for more information on LOCi – https://nbaa.org/aircraft-operations/safety/in-flight-safety/loss-of-control-in-flight/resources/
- NBAA safety resource - https://nbaa.org/wp-content/uploads/2018/04/2017-loci-safety-overview.pdf;
- IATA 2020 Safety Report - https://www.iata.org/en/publications/safety-report/
- Ever consider conducting on-aircraft Upset Prevention and Recovery Training (UPRT)?
  - https://trainwithcae.com/upset-prevention-and-recovery-training/
- ICAO Document 10011, First Edition - https://www.icao.int/Meetings/LOCI/Pages/Upset-Prevention-and-Recovery-Training-Provisions.aspx
- More information on CAE Rise™ - https://www.cae.com/defence-security/what-we-do/training-systems/cae-rise/