CALLBACK

From NASA's Aviation Safety Reporting System

Issue 498 July 2021

AIRCREW RESILIENCE

Pilots and Aircrews have exhibited resilience to varying degrees since the early days of manned flight. Recently, the concept of improving Aircrew Resilience has gained widespread popularity in CRM and training environments. Many definitions of resilience exist, and much research is being done to characterize and quantify the subject with regard to aircrew performance. Generally speaking, Aircrew Resilience comprises qualities and attributes exercised by a pilot or crew that enable one to rebound and recover from inflight disturbances or adversities, particularly those that demand a high degree of resourcefulness, anticipation, creativity, or situational awareness, and then return to stable, desired flight parameters and aircrew performance in an acceptable period of time.

Inflight adversities may be unanticipated and unrecognized, and they can originate from most any source. Out-of-box thinking is a must if situations develop where emergency or non-normal procedures are limited or non-existent.

This month, *CALLBACK* shares reported incidents that reveal the resilience displayed by aircrews at multiple levels. At face value, these incidents might appear as ordinary, routine problems that aircrews face daily. Notice how these crews' decisions and actions in response to specific threats and stimuli reveal and characterize their ability to rebound and recover.

Cleared for Takeoff

When this normal takeoff became non-routine, the Captain was surprised. Fortunately, the First Officer (FO) had recognized the threat and anticipated what would soon be needed.

■ *My FO and I set up for departure as normal, with a dry runway at approximately 49,000 pounds.... Our flap configuration was for flaps 8. I don't recall the winds, but I believe them to be mostly calm, not requiring crosswind correction. We were close to full and tankering fuel.... While we were awaiting takeoff, a group of aircraft began to collect in line on [a downfield, crossing] taxiway. These aircraft had previously landed and were awaiting taxi to their gates. They were holding short of [our assigned] runway while other aircraft departed.... There were...four, maybe five aircraft in line to cross, while all of them were of comparable size to A321s or B757s.*

We completed our pre-departure checklists as normal and accepted a "line up and wait" clearance. We were advised that traffic would be crossing downfield.... More than a mile down the runway from us, traffic downfield was then cleared to cross. I never did actually see where the traffic lined up after crossing on the way to their gates, but at some point after crossing, the first aircraft stopped.... I believe they all joined the taxiway and became blocked from continuing. Because of the size...and...number of the aircraft, the last aircraft was only able to clear the runway, but not make the turn onto [the parallel] taxiway. I saw the aircraft cross, but did not notice anything besides that at the time.... Later my FO told me he did notice that the aircraft, a B757, did not turn left after crossing and remained...close to the runway, though he appeared to be clear of the hold short lines.

While holding the brakes, the FO put the power above 70 percent, then released the brakes and said, "Set thrust." The takeoff roll happened normally, and while I watched outside as well as inside during the takeoff roll, I did not look as far down as the B757. However, once again, my FO did notice that aircraft and later told me that he anticipated this problem. My eyes were inside our aircraft as I called, "V1, rotate." As the FO began pulling the yoke back, the B757 on the taxiway powered up for the purpose of taxiing, and we caught his jet blast right at rotation. Our rotation speed was approximately 142 knots. The FO, having been aware that this could happen, reacted immediately with a quick and hard left aileron. He did not use the rudder. After the FO's hard correction, we still banked to the right. I believe his correction to be approximately 40% of the aileron travel for a half second before immediately returning to center. The aircraft was physically moved sideways off of the centerline by a couple of feet as we rotated. Immediately after the jet blast hit, I looked up, back, and left to see what caused the aircraft to move the way it did, thinking we ran over something. It was at that time that I saw the B757 moving to its left onto [the parallel] taxiway. The FO and I confirmed verbally that it was the jet blast shortly after rotation, and we continued on with our normal callouts and takeoff profile.... I informed the Tower Controller that we had received jet blast at rotation from the taxiing traffic. The Tower acknowledged my communication, and we continued on with our day without further incident.

I…believe the anticipation and quick reaction by the FO potentially avoided a wing strike…. The left wing definitely came upward as if we ran over something. I am not sure if the nose wheel was still on the ground or not at the time…. I did not anticipate this problem. I specifically did not notice that the B757 had not made the turn after crossing…. The only preventative measure to this being a bigger problem than it was, was the experience, anticipation, and quick reaction by the FO.

Initial Operating Experience (IOE)

This line check airman hints of a peculiar IOE threat and chronicles an unwise decision during an IOE. The result could have been worse, but a subsequent good decision and the crew's resilience allowed the aircraft to land safely.

■ *I was flying as the Line Check Airman and PM. While conducting new Captain IOE, we were setting up for an autoland on Runway XXL. The arrival and approach were briefed to include known and anticipated threats. We were vectored around for the approach and cleared for the ILS [Runway] XXL. The approach mode was armed and the second autopilot (A/P) engaged. Just prior to intercepting the glideslope (G/S), the gear was lowered, and flaps 5 was selected. We were in VMC with the runway in sight. The touchdown zone altitude was set as we continued the approach. The 1,000-foot call and 500-foot call were made by me acting as PM. The responses to "Set missed approach altitude, cleared to land" and "FLARE armed, stable" were made respectively by the IOE student. After [passing] 500 feet [AGL], we received GPWS alerts for "TERRAIN," and as we approached the runway threshold, a "PULL UP" warning was [received]. After observing that we were in normal landing position, I made the ill-advised call to continue. As the A/P began to enter the flare, we realized that we were still at flaps 5 and not configured to land. I immediately called for a go-around, and the go-around… was executed. We advised ATC and were vectored around for a second approach for [Runway] XXR. We executed the approach and landed without further incident.*

Upon arriving at the gate, we debriefed our errors as well as the breakdown in CRM, Threat and Error Management (TEM) monitor and crosscheck, and SOP. We also debriefed our failure to adhere to the GPWS warning. The combination of limited currency, outside…distractions (COVID, displacements), and a long duty day may have created a moment where we…lost focus. The decision to go around saved our poor performance from becoming an accident.

A Slippery Slope

A B777 Captain details chasing a glideslope and beginning controlled flight toward terrain. The crew's CRM and resilience trapped the error and mitigated the threat.

■ *The flight was…on a right base for Runway 09L at Heathrow. The A/P was on. We were level at…4,000 feet.… We were given an intercept heading of 070 degrees and cleared to intercept the localizer. I armed the localizer and made the callout to my crew. Shortly thereafter, ATC told us, "Descend on the glidepath, cleared for the ILS 09L at Heathrow." I pushed the approach button to arm the G/S and saw the G/S armed on the Flight Mode Annunciator. I called this out, and the First Officer said something muffled that I took to mean that he agreed. I heard nothing from the International Relief Officer (IRO).*

The localizer broke case and started to come in. I glanced out the window to the one o'clock position to try to visually acquire the runway environment, but the early morning sun was making it difficult.… I glanced down to the Flight Management Computer to check my distance to the runway, but I was distracted to see the G/S was about 1 dot low and dropping. Wanting to acquire the G/S now that the localizer was captured, I temporarily set 1,000 feet in the [Mode Control Panel (MCP)] altimeter window and announced, "Flight level change." To assist with the descent, I partially deployed some speedbrakes. I made the announcement that we were high, and the First Officer asked what altitude we were descending to. I replied that I was descending to the G/S, but during this discussion, we were now almost 2 dots low. The First Officer commented that he thought we were on a false G/S as the G/S was climbing up again. The IRO said he thought that ATC cleared us to 3,000 feet. I set 3,000 feet in the [MCP] altimeter window as I leveled off and retracted the speedbrakes. To that, the First Officer and I replied that we did not hear that clearance.

On the localizer at 3,000 feet, (no lower), I disengaged the A/P and hand-flew for a few seconds. Now that we were on the localizer and properly positioned to intercept the G/S from below, I reengaged the A/P, called out and pushed the approach mode button, and confirmed the G/S was armed. Both crewmembers agreed. Approach…turned us over to Tower, and they told us, "Maintain 3,000 feet until the G/S was captured, follow the G/S." A few moments after that, Tower cleared us to land on Runway 09L. The A/P flew down the localizer and glideslope normally. At 1,000 feet I disengaged the A/P and…flew the jet to a normal landing.

ASRS Alerts Issued in May 2021	
Subject of Alert	**No. of Alerts**
Aircraft or Aircraft Equipment	2
Airport Facility or Procedure	12
ATC Equipment or Procedure	4
TOTAL	**18**

498

A Monthly Safety Newsletter from

The NASA Aviation Safety Reporting System

P.O. Box 189 Moffett Field, CA 94035-0189

https://asrs.arc.nasa.gov

May 2021 Report Intake	
Air Carrier/Air Taxi Pilots	3,437
General Aviation Pilots	1,356
Flight Attendants	787
Controllers	319
Military/Other	270
Mechanics	230
Dispatchers	155
TOTAL	**6,554**