

CALLBACK

From NASA's Aviation Safety Reporting System



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The **COLD**, Hard Facts of **ICE**

The elements of winter approach once again. Cold weather operations loom ahead, and all the usual suspects will make their appearances. Fast changing weather, cold temperatures, dangerous precipitation, and complicated procedures all produce significant hazards to flight. Aircraft performance, ground and flight visibility, and friction between aircraft tires and airport surfaces can be severely reduced. In the cockpit, complexity and workload will increase.

Ice is a predominant cold weather threat that can place an aircraft in many precarious situations. Aircraft structural icing can negatively affect weight, balance, instrumentation, engine operation, pilot visibility, and flight characteristics such as stall speed and control effectiveness. Ice on airport surfaces has negative effects on aircraft ground maneuvering as well. In a perfectly good aircraft, these conditions could have serious consequences. In an aircraft less robust, the risk increases. Discipline and good judgment are essential to mitigate the threats and ensure flight safety.

This month, *CALLBACK* shares reported incidents that occurred during Part 121 operations, each involving ice in a different phase of flight. Garner the lessons unspoken, cherish the wisdom revealed, and keep up your guard.

At the Gate

This A320 Captain encountered a deicing situation while the aircraft was at the gate. Communication and coordination might have prevented the ensuing hazard.

■ *This aircraft had flown through moderate mixed icing between 5,000 and 2,000 feet into ZZZ.... The pilots landed and elected to put the flaps up without knowing if they still had ice on them. They sat on the ground about 30 minutes waiting for their gate to open. We were the outbound crew for this aircraft, and the pilots told us, when they deplaned, that they had flown through the icing, but believed most had melted off on the ground. The temperature was around 28 degrees Fahrenheit. When we boarded the plane, the APU was running and powering the aircraft with both electricity and air. We started to smell fumes and realized the ground deice people had started to deice without coordinating with us or the outbound [ground] crew. The aircraft was not configured for deicing, and we believe the fumes were from*

the deicing fluid entering the bleed system. We called [the ground deice people] and told them to stop deicing until we configured the aircraft [properly].

Taxiing for Takeoff

An observant, proactive A319 Captain realized that the company's deicing procedure appeared to exhibit a potential flaw. The crew's actions may have averted a tragedy.

■ *Conditions on preflight went from overcast and dry to moderate snow in a matter of minutes. Deicing...was thorough and routine, [using] Type I and Type IV [fluids], just off the gate with a 20-foot-deep pushback.*

This year's procedure calls for flaps up on the Pre-Deicing Configuration checklist. This is a change from years past. The Reconfiguration checklist [was] performed appropriately. After a short taxi...for departure, I as the Pilot in Command, decided to do a cabin check to be conservative. Our holdover time was...30 to 35 minutes, so this cabin check was not required.... Moderate snow was falling, and we were well under our holdover time.

Upon viewing the aircraft wings, there was fully 1 inch of snow on the flaps, which had been lowered after deicing. Snow was accumulated on the entire length of the wingspan on the normally stowed section of the flaps. The flight returned to the gate to reassess conditions and deice a second time with the flaps selected down.

Quite simply, the event occurred due to new procedures requiring the flaps to be up during deicing. Thus, the flaps are not treated while the rest of the wing is being treated. In the case of moderate snow or greater, snow will collect on the flaps in violation of the clean control surface requirement for takeoff. It was shocking to me how fast snow was able to build up on the flaps in this incident. While deicing a second time, we noticed several aircraft from other air carriers deicing with the flaps down.

If I had not been proactive and accomplished the pre-takeoff cabin check, which is by its nature uncomfortable for the passengers, there could have been serious consequences. I highly recommend [the company] readopt a flaps down deicing procedure, at the very least, during active frozen precipitation.

Pre-Takeoff Engine Run-up

An A319 crew recounted their pre-takeoff engine run-up in icing conditions with ice on the runway. The crew responded admirably, new insight was gained, and wisdom increased.

From the First Officer's report:

■ *After deicing the aircraft, we taxied to [the runway]. Upon completion of all of our checklists, we requested time on the runway to do a 30-second engine run-up for the A319. [The runway] had just been plowed of snow before we taxied onto the runway. The Captain was the Pilot Flying and began to increase the thrust. At about 55% N1, the airplane began to slide and point away from centerline. The Captain tried to steer the airplane using the tiller with great difficulty. The aircraft rolled forward about 1,000 to 1,500 feet. I called Tower and notified them that we had a steering problem and requested to exit the runway. We decided to return to the gate to have the aircraft nose wheel inspected. The runway, although recently plowed, played a significant factor in our situation. Also, the recommended 70% N1 engine run-up per our [operating manual] is a lot of power to control in icing conditions on the ground. I think that the engine run-up procedure approved by Airbus can lead to a problem when operating on surfaces during icing conditions.*

From the Captain's report:

■ *...I ran up both engines symmetrically to 70% N1 [following the SOP]. It was then that the right main gear lost traction and the aircraft turned aggressively to the left. I immediately retarded both throttles to idle and used nose wheel steering to regain the centerline. There was nose wheel scrubbing felt. ... Factors [included] the unprecedented... weather. Although the runway was freshly cleaned and we were the first aircraft to use it, there were obviously ice...spots that were hard to see at night. The light takeoff weight of 116,000 pounds, coupled with the high power-setting for the run-up, played a role in the incident. Although I had operated two previous flights in and out of [that airport] that day, the runway conditions changed rapidly. I felt that the runway had been freshly cleaned moments before I took...the runway and that it would be suitable for the run-up. I will continue to be vigilant in inclement weather conditions. I have gained a newer understanding for the power of the engine on an A319.*

Landing

This B737 First Officer (FO) landed successfully in stressful, icing conditions. Late in the landing when all appeared well, aircraft control was lost in an instant. Valuable experience was acquired, and wisdom increased once again.

From the Captain's report:

■ *While on Initial Operating Experience, ...the First Officer made a normal and successful IFR ILS approach and landing. The Runway Condition Code (RCC) received was 6, Dry, Good, and weather reported winds of 040/9, Visibility 1 NM, -FZDZSN BR, 600 overcast, temp -5/-7. ... During the approach, Tower directed the flight to [exit the runway] at the end of the runway. Discussion included...confirming the RCC for the runway via ACARS. After landing, [transfer] of...aircraft [control] was completed. While taxiing less than 20 knots... approaching the departure end of the runway, ...brakes were applied with no effect, including control input using the tiller.*

Prior to pavement departure, the nose wheel was centered. ... The aircraft came to rest [to the] right of the overrun in the grass. Notifying Ground Control of the situation, coordination proceeded for rescue through both the Tower and company Operations. The Flight Attendants (FAs) and [all] passengers were notified of the situation, remaining in their seats until further information was available. Dispatch and the Chief Pilot were contacted. Engines were shut down following APU start, and with Maintenance concurrence, the Cockpit Voice Recorder (CVR) circuit breakers were pulled and documented in the logbook.

With outstanding support from Rescue and after deicing a path, deplaning began [in groups] at a time, due to shuttle size, using the Captain side, rear entrance [door]. Five shuttles were eventually used for...transportation, making round trip runs. The aircraft Shutdown checklist was accomplished and the crew left last after inspecting the aircraft for remaining passenger items. No injuries [were] reported during the event. One oversight was not completing the logbook oil and fuel entry prior to leaving the aircraft.

From the First Officer's report:

■ *After the landing...by the FO, the aircraft slowed as expected with normal speedbrake extension and thrust reverser deployment. At approximately 60 knots, [aircraft] control was [transferred] from the FO to the Captain. Just prior to an expected turnoff..., instructions from Tower were received to "taxi to the end." By that point, the aircraft had slowed and had to complete a long taxi to the end of the runway. Approaching the end of the runway, the Captain began the turn onto the taxiway, but the aircraft did not respond to brake or tiller inputs and slid into the grass at the intersection of the runway and taxiway. ... Braking action at the airport had been reported by ATIS as 6. The runway appeared to have good braking until the very end. The only thing that could have prevented this was for airfield management to report possible icing conditions on other parts of the airfield.*

ASRS Alerts Issued in September 2021	
Subject of Alert	No. of Alerts
Airport Facility or Procedure	12
ATC Equipment or Procedure	8
TOTAL	20

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 Newsletter from
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September 2021 Report Intake	
Air Carrier/Air Taxi Pilots	4,052
General Aviation Pilots	1,514
Flight Attendants	792
Controllers	330
Military/Other	303
Dispatchers	169
Mechanics	158
TOTAL	7,318