CALLBACK

From NASA's Aviation Safety Reporting System

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The perennial perils of winter weather are upon us once again. Seasonal weather, consisting of low temperatures and visibilities, freezing rain, ice, drizzle, snow, and fog, brings many additional challenges to flight operations. Hazards exist everywhere, and may not be clearly evident. Degrading conditions, changing schedules, unpredictable situations, complex procedures, ambiguity, confusion, task saturation, and fatigue can all increase the seasonal risk.

The FAA has taken many safety related actions to improve the safety of aircraft that encounter icing conditions on the ground and in flight.[1] Carriers and crews are equally invested. De-icing and anti-icing procedures are routinely modified each year and get dusted off with the same regularity. Strict discipline, adherence to procedures, keen vigilance, and superior situational awareness are all integral to safe operations, and occasionally, some ingenuity is necessary to avert an incident. The ability to perceive and act on potentially imperceptible threats can be critical.

This month, *CALLBACK* examines reported incidents attesting to the wide range of hazards associated with icy winter weather. We look predominantly at events stemming from air carrier de-icing operations, but the hazards are equally pertinent to all aviators.

Carbs and Calories

This General Aviation pilot departed on an IFR flight in instrument conditions. He suspected that carburetor icing resulted in a partial power loss and an unplanned landing.

■ *[We] departed on an IFR flight plan to our home base with four souls on board.... The takeoff was normal, in rain, [with] low visibility and ceiling. [I was]...cleared to 7,000 feet. All [was] normal until approaching 5,000 feet when [the] engine was not developing climb power. [I] turned on the carb heat with no noticeable change, then turned it off after four to five minutes. [I] turned on [the] electric fuel pump, changed tanks, and adjusted the mixture, [all] with no change. I did not check the magnetos. [I] was able to hold altitude at this time but [with] little or no climb. I told ATC that we had a problem and wanted to return. He replied that the weather had deteriorated at [our departure, but another airport] had better conditions and was closer. I accepted that recommendation, and he began vectoring us [for the] ILS.... I turned on the carb heat again, but engine power continued to worsen. I couldn't hold altitude or airspeed, [and the] controller advised [us that] he didn't show any roads or fields near our position. I broke out at about 400 feet AGL and landed in a farmer's plowed and very muddy field. [There were] no injuries, and no damage occurred to the plane. No cause has been determined at this time, but I think carburetor ice could be a likely reason. Perhaps I missed signs and should've turned it on earlier or left it on longer, or perhaps the carb heat didn't work as designed.*

The De-Icing Communications Vacuum

A Captain's attempts to communicate were apparently unsuccessful, and his message was not "heard." As a result, a ground employee got a surprise when he approached this A321 to begin de-icing procedures. The threat might have been mitigated had the Captain's message been "received."

■ *[We were] dispatched with an inoperative APU due to APU inlet icing while operating in freezing rain. [We] proceeded to the de-ice pad and contacted Snowman on the assigned frequency. [We explained] our APU problem and notified them four to six times that we had both engines running.... [We were] informed, as we entered [the de-ice] pad, to shut down the number 1 engine for de-ice and anti-ice fluid application. As we [set] the parking brakes and prepared to shut down the engine, Snowman informed us that de-ice personnel had approached the aircraft too soon and had [a] headset sucked into the number 1 engine. After ensuring [that the] employee was safe and unharmed, we contacted ATC, Operations, Maintenance, and Ramp, and returned to the gate.*

Specifications More like Guidelines

This air carrier Captain had his aircraft treated with Types I and IV de-icing and anti-icing fluids. He was then perplexed when the Type IV fluid did not perform as specified.

■ *[We] requested de-ice and anti-ice fluid treatment after pushback.... Station personnel sprayed the aircraft with Type I and Type IV fluids.... After being sprayed and commencing taxi to the runway, ATC advised us of a ground stop to our destination, so we returned to the gate. While sitting at the gate for some time, the First Officer and I both noticed snow accumulating on top of both wings after only approximately 45 minutes since the commencement of the application of*

the Type IV fluid. We pointed out the snow accumulation to the station personnel…to make sure that they understood that the Type IV fluid was not holding up to the minimum holdover time. After our release by ATC, we had the aircraft de-iced and anti-iced again in the same manner and departed without delay to our destination.

The First Officer and I both reviewed the holdover tables for the Clariant fluid, making sure that we were looking at the proper table and reading it correctly. I don't know why the Type IV fluid underperformed its holdover time.

Missed Trim and Mis-Trimmed

This B737 crew experienced considerable difficulty getting their aircraft properly de-iced before departure. The de-icing procedures produced distractions that resulted in an abnormal configuration for takeoff.

■ *[The] first push was on time. A significant delay occurred waiting for [our] first de-ice attempt…. A cabin check was made, and frozen precipitation was observed on the cabin side of both engine nacelles…. We were deiced a second time. We did another cabin check, but the aircraft still had frozen precipitation in the same locations. Because of the extended ground time, we taxied back to the gate…. We spoke with the Supervisor at the gate, [who]… said that an experienced crew would do the [next] de-icing procedure. They also requested that we trim the aircraft full nose down…to de-ice. As our procedure calls to de-ice in the green band, we had the [trim] as far forward as possible, but remaining in the green [band]. This did result in having to note the trim setting not being [set to] the proper [value] in the Before Push Checklist. We…mentioned the need to reset the trim after de-icing. This time, we decided to do a cabin check at the point of de-icing…. Once again, we did not have a clean aircraft. Another call was made to Ops to de-ice again. Engines were shut down and we again described the location of the snow and contamination…. This fourth and final de-ice procedure was conducted with radio communication directly with the de-ice truck. They did a double check of each problem area and stated that they could see there was no contamination. The Captain did a cabin check and confirmed [that we now had] a clean aircraft.*

Post de-icing checklists were done, and we were finally at [the runway]…. We were cleared by Tower for takeoff and I taxied slowly onto the runway due to the ice and snow present and fair braking reports by other aircraft. After lining up and confirming the runway, I gave control of the thrust levers to the First Officer. As he advanced the thrust levers, we got a takeoff warning horn. I took control of the aircraft and quickly determined…that the trim, although it looked in the front edge of the green, was clearly not at the [correct] takeoff setting and was the source of the horn. We told Tower we needed to clear the runway.

Better Late Than Never

This B737 Captain was distracted with his wing anti-ice configuration during takeoff. The result was unintentional, but a significant deviation to the takeoff procedure occurred.

From the Captain's report:

■ *[It was a] flaps 1 takeoff on compacted snow. [I] began the takeoff roll with engine heat and wing anti-ice on. After the "V1" call, [I] became distracted by the [wing] anti-ice configuration, causing [me] to miss the…"Rotate" call. [I] rotated approximately 35 to 40 knots late.*

From the First Officer's report:

■ *The Captain became distracted by the [wing] anti-ice on configuration right at the point I was making the "Rotate" call, requesting that I turn the wing anti-ice off. (The Wing Anti-Ice Switch was in the ON position with the blue valve position lights illuminated, indicating [the valves] had closed as designed.) I repeated the "Rotate" call two more times in quick succession, and the [Captain] rotated late.*

Sliding into Home

An A320 Captain encountered a snow covered ramp while parking his aircraft at the gate. Normal precautions and procedures proved ineffective, so he reverted to his instincts to bring the aircraft to a stop.

■ *[As we approached] the gate, there were no personnel to guide us in. The taxi-in line was covered in snow. After a few minutes, rampers appeared in tugs and on foot. The ramp was slippery as indicated by a ramper falling down…. The tugs were sliding as well. We waited a few more minutes to be marshalled in. Finally the marshallers showed up, and we proceeded into the gate indicating 1 knot on the ground speed readout. I was purposely very cautious on the taxi in. We were given the [normal] stop signal, and [I] set the brakes. The aircraft continued to slide forward even though the brakes were set. The residual thrust at idle was enough to move the aircraft on the ramp under these conditions. The aircraft was not going to hit anything or anyone, but I was helpless at this point. I indicated to the marshaller to get the chocks in. He didn't have any!!! I turned on the yellow pump and decided to shut down the engines in hopes [that] the loss of the residual thrust would help. It did. The aircraft stopped sliding. What a helpless feeling…. We were lucky that nothing was touched or damaged. Fortunately the jetway was very far away from its normal position.*

1 *https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=10398*

ASRS Alerts Issued in September 2016	
Subject of Alert	**No. of Alerts**
Aircraft or Aircraft Equipment	12
Airport Facility or Procedure	3
ATC Equipment or Procedure	2
Company Policy	1
Other	1
TOTAL	**19**

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September 2016 Report Intake	
Air Carrier/Air Taxi Pilots	4,335
General Aviation Pilots	1,183
Controllers	616
Flight Attendants	422
Military/Other	265
Mechanics	211
Dispatchers	111
TOTAL	**7,143**