

# CALLBACK

From NASA's Aviation Safety Reporting System



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## The "Whether" of Winter Weather



Winter weather produces a diverse set of conditions, concerns, and potential dilemmas for all aviators. While conditions may be common to all, not all pilots or aircraft are affected equally. Aircraft are designed with differing capabilities, and pilots bring a wide range of experience to the cockpit. Regardless the type of aircraft you fly or your experience level, winter weather operations demand diligence. Knowledge, strict adherence to procedures, planning, and sound judgment are required to operate safely, and under some conditions, operations are ill-advised or prohibited.

*CALLBACK* recounts ASRS reports that focus on basic, universal issues as applied to cold weather operations. In these reports, unanticipated weather phenomena, incomplete knowledge, and details that were overlooked all contributed to decisions that had significant consequences. The actions and consequences stemming from those decisions reveal some good lessons and cold weather wisdom.

### Clues Amidst the Mist

A Cessna 208 pilot took quick action when confronted with conditions that were not as expected. Light rime ice experienced in the descent was no longer present, but a more hazardous environment had developed.

■ *I had been assigned a charter to fly...early in the morning... I departed...without incident or concern, and shot the RNAV approach...at [my destination]. In the descent, I picked up some light rime [ice], right on the leading edge, but nothing that was incredibly significant. I broke out...approximately 50 feet above minimums, in 8 to 9 miles visibility, and landed without incident.*

*After removing the ice, we taxied back [for takeoff]. As I was turning around and taking off, I noticed...some mist moving toward the airport off the hills toward the south. During climb out on the Obstacle Departure Procedure (ODP), everything began as normal, but quickly the plane decelerated from 105 knots to 90 knots during climb out. Upon reaching 300 feet AGL, the plane was climbing at 100 feet per minute with significant ice buildup behind the protected area. I knew that, at the current rate of ice accretion, we would never reach where the tops were*

*(3,000 feet). Even though I could not [advise] ATC due to low altitude and poor radio reception, I had to [evaluate conditions] myself. Looking back, I could still make out the airport and the hill beside it, and made a snap decision to turn back and land. We landed without incident.*

*[This] is absolutely the fastest I've ever seen ice accumulate. The only suggestion for myself is that, if I see some sort of light mist...like that again and the temperatures are close to or at freezing, I may delay takeoff.*

### VFR Requires VMC

A C182 pilot diligently checked the weather and devised a plan to conduct this VFR flight. The plan did not progress as expected, and a situation developed that typically results in additional hazards during cold weather operations.

■ *This mission was to transport a...client to ZZZ. Also onboard was a non-pilot friend. I had been studying the weather the night before and realized fog was predicted by using my ForeFlight App.*

*Before departure, I reviewed the weather again. The forecast had improved slightly, with Marginal Visual Flight Rules (MVFR) expected [later] at ZZZ. My hopes were that clouds would be at least broken by the time I reached the arrival area with ceilings at 2,500 [feet]. We departed expecting a 2 hour, 10 minute flight, thus arriving...as conditions were improving. I contacted ATC and initiated Flight Following after hand-off from [the departure airport].*

*Upon passing [an airport] I noted broken clouds ahead and mostly overcast to the east. I chose to fly slightly west to stay on the margin where clouds were broken.... I began a VFR descent to 2,500 feet MSL to get under the deck. Initially, the base of the clouds was 2,500 feet MSL, which I reported to ATC upon request.... ATC was monitoring and communicating throughout this event.... They asked why I had gone off my direct course to ZZZ, and I responded, "To get under the deck."... They updated me on ZZZ weather and obtained a PIREP [from me] indicating that the airport (whose name I do not recall now) in the vicinity was indicating better weather than ZZZ. ZZZ was reporting a 1,500 [foot] ceiling and I believe 5 or 7 miles visibility prior to my descent.*

After about 10 minutes proceeding directly toward ZZZ, the ceiling lowered to about 1,500 [feet]. In the vicinity of [a wildlife refuge], it lowered further. At first I thought this was a brief “sag” in the clouds and would return to 1,500 [feet]. After about 15 to 20 seconds in IMC and no longer able to see the ground, I executed a climbing standard rate left turn in order to return to VFR on top. I used my Garmin G5 to fly this segment in IMC. Just prior to this, ATC had warned of an obstruction at my 2 o’clock, which I noted on my ForeFlight display as well; hence the left turn. During the ascent, ATC asked if I was IFR rated and wanted an IFR clearance. I responded, “Negative.”

Once VFR on top, I completed a 360 [degree] turn and headed west toward [another airport], which ATC suggested as a VFR airport. ... I notified ATC and terminated Flight Following with the airport in sight.

## Rote, Understanding, Application, or Correlation?

This B737 Captain described heavy icing conditions. Practical and philosophical questions were pondered regarding aircraft icing intensities and the accurate reporting of such to ATC. Lessons learned are implied between the lines.

■ On climb out, passing about 25,000 feet with a [temperature] of about -4, we picked up enough ice to almost completely obscure the forward window. I sent an ACARS Flight Ops report message to Dispatch for “heavy ice.” Dispatch sent back a message that we needed to use the terms “moderate” or “severe,” as “heavy” was not a term used as a PIREP.

Knowing that “severe” would have a major operational impact on our system, I wanted to make sure I was following the correct narrative, so I opened the Aeronautical Information Manual (AIM) I had downloaded in ForeFlight. “Severe” icing was described as an accumulation rate that exceeded the ability of the aircraft’s systems. As we had placed the engine and wing anti-ice on, I had looked outside to see if we were getting the leading edge clear, and it appeared we were. To be honest, I’d never seen such icing buildup in [many] years of flying, and while I thought we could handle it, I was worried about other aircraft with deicing boots or military aircraft with no wing deicing.

This left me with a question. In reality, when would a 737 Next Generation (NG) ever experience the true definition of severe icing? If we did, could we tell? The side windows give very limited visibility to the wing, and if we had ice buildup aft of the leading edge, could we tell from the cockpit? I had my doubts. What about our ice accumulation on the vertical

and horizontal stabs? If our engine and wing icing could deal with this level of ice accumulation, would there be any level they couldn’t handle?

I ended up reporting “moderate” icing, since that seemed to correspond to the AIM definition that we had. Still, for some reason, the experience left me a little worried that something in our guidance may be missing.

## Are We Good to Go?

This B737 Captain was immersed in the multitude of pre-departure duties that occur during cold weather operations. Weather was changing and all seemed complete, but a detail was overlooked that affected the legality of the flight.

■ Upon arriving at the gate, I was informed that our [Company Computer] was down system-wide. While we waited for Dispatch to get a release and weather for our flight, the weather deteriorated and made for an ugly afternoon. The ATIS had three types of freezing precipitation falling: light freezing rain, ice pellets, and snow (-FZRAPLSN). I was discussing our situation with Dispatch and awaiting an email with our release and weather package. According to the Ice Pellet Allowance Time Table Reference Card, we were unable to depart with three types of freezing precipitation.

After about an hour and thirty minutes, we had received our Dispatch Release and weather package via email. ATIS information came out with two types of precipitation: light freezing rain and ice pellets [-FZRAPL]. With the new ATIS, I made a call to Dispatch and received the OK to proceed with pushback and deicing. We had to complete a manual weight and balance, as the Gate Agent had no way to load and send us our final numbers. Once our Deice Crew started the Type IV deicing process, we had 19 minutes to get airborne. After we configured and did our appropriate checklist, we taxied out to [the runway] and departed with 18 minutes on the clock and one minute to spare. I thought we had all our i’s dotted and t’s crossed. However, on climb out as I was monitoring the company frequency, I heard a company aircraft say they had to go back to the gate due to three types of precipitation on the ATIS.

I requested the latest ATIS over the ACARS. Yankee was now current and it did, indeed, state, “light freezing rain, ice pellets, and snow,” [-FRZRAPLSN]. The time stamp was during our taxi out. I failed to get an update prior to takeoff. Our flight was not legal for takeoff. Neither Ground nor Tower advised us of the change and I did not think to check the ATIS, as I was focused on taxiing the aircraft safely in the poor weather conditions, remaining vigilant of my surroundings.

ASRS Alerts Issued in November 2019	
Subject of Alert	No. of Alerts
Airport Facility or Procedure	1
ATC Equipment or Procedure	4
Hazard to Flight	1
Other	1
<b>TOTAL</b>	<b>7</b>

480  
 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>

November 2019 Report Intake	
Air Carrier/Air Taxi Pilots	5,195
General Aviation Pilots	1,285
Flight Attendants	742
Controllers	448
Military/Other	291
Mechanics	252
Dispatchers	143
<b>TOTAL</b>	<b>8,356</b>