CALLBACK

ASRS

From NASA's Aviation Safety Reporting System

Number 234 December 1998

The Ice Cometh

This is the time of year when many pilots are gearing up for the increased likelihood of encountering in-flight icing. Our first reporter believed that an airplane "certified for flight into known icing" could handle a routine IFR flight.

■ *[On arrival], prior to cloud penetration, all [anti-ice] systems engaged. I continued checking the leading edges of wings and spinners—no significant accumulation noted. Level at 3,000 feet at about 140 knots, the airplane began to buffet, elevator response became mushy, and it appeared the plane was ready to stall. When I reached to add more power, the airplane nosed over and began to turn. I went with the turn, trading altitude for airspeed, and cycled the deicing boots. I declared an emergency with Approach Control. With the increased power and resultant airspeed, and continuous cycling of the boots, I got the plane stabilized. Approach Control provided vectors for the ILS approach at XYZ. We experienced no further difficulty flying the approach.*

[On post-flight], there was about one-quarter inch of ice remaining on the nose, spinners, upper portion of the tail and other unprotected areas. I assume significant ice was shed while descending. I have become an even more cautious flight planner. I now know first-hand that icing conditions are unpredictable and how severe localized icing can be—it can quickly overpower a "known icing" aircraft.

Ice-Bound

Loss of aircraft control due to the weight of ice and the disruption of airflow over the wings and elevator surfaces is only one part of the icing story. Ice accumulation can also cause jamming or malfunction of controls and components, as an air carrier First Officer reports:

■ *I was flying the aircraft on autopilot. The flight had been normal and uneventful. During approach, ATC gave us a descent, a turn, and a speed reduction. After establishing the descent and turn, I extended the speed brakes to start slowing. The speed brakes felt stiff going past one-third extension, so I retracted and re-extended, and they felt normal the second time. The autopilot did not appear to roll out. I watched it closely and by 5 degrees prior to heading, I was sure it was not going to roll out. I disconnected and attempted to manually roll out. It took considerable force to move the yoke. With more force and about two-thirds deflection (considerably more than normal), the controls appeared to break free. After this, the aircraft responded and flew normally. We landed uneventfully.*

Maintenance inspected, detected, and removed ice from the control cables and pulleys.

The reporter surmised that the previous night's rain and wind had blown water into the control unit housings, where the water froze, causing the controls to jam.

"Get-There-Itis"

A General Aviation pilot debated filing an IFR flight plan for a pleasure flight in mixed VMC/IMC. The reporter even considered canceling the flight because of the weather, but admits that "my judgment was clouded by 'get-there-itis' combined with beckoning patches of blue sky."

■ *After considering the options, I decided that flying VFR would allow me the freedom to find a hole in the clouds and get on top in clear air. As we climbed toward the blue patches, it seemed harder and harder to find a hole large enough to climb through. Since it looked like we only needed to climb about another 100 feet to clear the tops, I decided that I would plow on through. Things got worse.*

At first the sun poked through occasionally, beckoning us on. Then it started getting darker, and we picked up a trace of rime ice. Just as I was deciding that we would have to turn back, the engine started surging. I thought carb ice, but carb heat didn't help. As I was trouble-shooting the engine, another aviation demon was sneaking up on us. It turned out that the pitot heat was inoperative, and the pitot tube had frozen over. As we were climbing, the airspeed indicator was falsely reading a higher and higher airspeed, and I was gradually compensating (unaware) to stay at Vx indicated airspeed. The plane then began to porpoise, indicating an imminent stall. Just as the stall broke hard, the scenario came together in my mind. We banked at least 90 degrees, and I pushed the yoke forward... I pulled the throttle back to idle, and recovered from the stall in solid IMC. I did a 180 turn and headed for VMC. We broke out in a few minutes and landed VFR.

The pitot tube didn't thaw out until we got below the freezing level... I am convinced that the surging engine was due to the high pitch attitude.

The reporter points out several lessons to be learned from this incident: Check the pitot heat before any flight which has the potential to be in IMC, and carefully monitor weight and balance for aft-of-limit conditions that may hamper stall recovery. Finally, avoid the beckoning lure of those "blue patches" between clouds.

ASRS Recently Issued Alerts On...
BA-32 hydraulic pressure loss
CL-601 brake failure on landing
Restraint procedures during air transport of prisoners
Cargo door failure and rapid decompression on a DA-20
TCAS II alerts attributed to a transponder on a Texas building

A Monthly Safety Bulletin
from
The Office of the NASA Aviation Safety Reporting System,
P.O. Box 189,
Moffett Field, CA
94035-0189
http://olias.arc.nasa.gov/asrs

October 1998 Report Intake	
Air Carrier/Air Taxi Pilots	2035
General Aviation Pilots	798
Controllers	65
Cabin/Mechanics/Military/Other	168
TOTAL	**3066**

En-Gulf-ed

Communications between pilots and controllers is secondhand when aircraft are beyond the range of ATC's radio coverage. The middleman in the process is a commercial radio service (also known as General Purpose radio), which uses the high frequency ranges. A Center controller working the Gulf of Mexico describes the confusion that can result when communication is indirect:

■ *[I] was working air carrier A at FL350. The oceanic controller received a message from commercial radio that air carrier B was past fix at FL350. We had no information on aircraft B. I asked aircraft A to say coordinates—26˚08' / 88˚15'. I expedited a climb to FL370 for aircraft A. Aircraft B checked in, also with coordinates of 26˚08' / 88˚15'. I expedited aircraft B to descend to FL330. Two minutes later, aircraft A reported [climbing through] FL360 and aircraft B reported [descending through] FL340. These aircraft were non-radar in the Gulf of Mexico. Based on coordinates, they were approximately 40 miles apart and converging when we became aware of the situation.*

A number of pilots also report communications difficulties in the Gulf and on Oceanic routes. An air carrier Captain, enroute to the U.S. over the Gulf of Mexico, credits TCAS for providing information when ATC couldn't:

■ *Foreign Center A handed us off to Foreign Center B. We made numerous calls to Center B and although we could hear them conversing with [another air carrier], we couldn't get them to respond to our calls. We continued to call every 2-3 minutes. As we approached fix, our TCAS system annunciated, "Traffic, traffic." Air carrier Y passed our 12 o'clock position at 8-9 nautical miles, co-altitude. It wasn't a near mid-air, but certainly was closer than it should have been. TCAS is a godsend.*

Both pilots and controllers can help minimize confusion and misunderstandings by following good basic radio procedures. In addition, when the usual communication methods fail to get a response, relaying position reports and other information via another aircraft may be an option.

Custom-airy Service

Inability to establish communications was equally distressing for a General Aviation pilot, who learned the consequences of altering the flight-planned flight without verifying the change with the appropriate authorities.

■ *Returning from vacation in the Bahamas. We were on a VFR flight plan, direct to XYZ for Customs. I started calling FSS without success. I could hear voices of other aircraft, but could not transmit or receive acknowledgment of my transmission. The flight across 200 miles of uninterrupted ocean in a single-engine aircraft has a sobering and sometimes frightening effect. I was confused and upset by my failure to arouse FSS.*

ABC has been my home airport for 20 years, and has recently introduced Customs and Immigration on the airport. So I flew directly to ABC [instead of XYZ]...and taxied directly to the Customs facility to report the incident. We were notified by an officer at Customs that we were to remain in the airplane until investigators arrived. We were questioned for approximately two hours by Customs agents, the airplane was searched, and I am advised it was dismantled in part, after which we were released. I did not have approval for landing at ABC or any other airport, and was required by the rules to land at XYZ.

The Entry Requirements Section of the Aeronautical Information Manual explains the procedures for entering the U.S. and clearing Customs. Pilots must land at the Customs location they list on their flight plan, or provide advance notice directly to Customs regarding the location of intended arrival.

Managing Cockpit Interruptions and Distractions

■ *Snowing at [airport]. Taxiing to Runway 6R for departure. Instructions were: taxi to taxiway B, to taxiway D, to Runway 6R. As First Officer I was busy with checklists (and) new takeoff data. When I looked up, we were not on taxiway D but taxiway W. ATC said stop.*

This pilot's report of a taxiing mishap was one of 107 ASRS incidents recently reviewed by human factors scientists at NASA Ames, as part of a research study on why flight crews are vulnerable to errors caused by preoccupation, distraction, and interruptions. The results of the study are summarized in an article that appears in the latest issue (#10) of the *ASRS Directline* publication, available from the ASRS Web site:

http://olias.arc.nasa.gov/asrs

In a large majority of the ASRS incidents reviewed, pilots became distracted or preoccupied with competing tasks. These tasks fell into four broad categories:
(1) communications (among crew or via radio); (2) head-down work (programming the FMS or reviewing approach plates); (3) searching for VFR traffic; (4) responding to abnormal situations.

The authors of the NASA study identify preventive actions and strategies to reduce flight crew vulnerability to distraction and preoccupation. Their article also includes a down-to-earth explanation of the two systems humans use to perform tasks–the conscious and automatic systems–and why some cockpit activities (conversation, for example) may demand more conscious effort than others.