

MITIGATING WEATHER RISKS

Weather is a contributing factor in 35 percent of general aviation accidents, and 75 percent of those mishaps involve fatalities, according to both the FAA and NTSB. So, it is clear that aviators – especially single pilots of business aircraft – should take steps to mitigate the risks of having an unfortunate encounter with nasty weather.

“You have to look at aircraft capability and your skill, especially for lower-performance aircraft,” before heading into the weather, said Mike Graham, director of flight operations, safety, security and standardization at Textron Aviation. “You look at the accident data, and [it’s clear that] items are being overlooked. There’s a lack of recurrent training, higher risk tolerance or a disregard for precautions.”

Single pilots are flying technically advanced props and jets, everything from Cirrus SR20s to Embraer Phenom 300s. That’s a wide range of aircraft with vastly different performance capabilities. Because of their investment, some owners are determined to get the most out of their aircraft, even when conditions are borderline.

During annual Part 135.293 reviews, there’s a significant emphasis placed on meteorology – recognizing severe weather, turbulence, icing and thunderstorms. While continued training and testing isn’t required under Part 91, Section 103 of that regulation requires that pilots “become familiar with all available and relevant flight information” and to “ensure meteorological conditions permit safe operations for the specified flight.” It also requires pilots to have a contingency plan for the flight. Graham suggests that aviators should ask themselves, “If the weather changes, what’s my out?”

THOROUGH FLIGHT PLANNING, REFRESHER TRAINING

Mitigating weather hazards begins with thorough flight planning.

“There are many tools out there,” Graham said. “With all the weather apps available, there’s no reason not to do good preflight planning.”

For many trips, Graham recommends planning a week ahead. By reviewing daily forecasts, pilots can spot trends, which may lead them to conclude that the weather risks involved with flying a particular mission can be mitigated by simply leaving a day earlier or later. Nevertheless, risk assessment must continue all the way up to departure time and throughout the flight because weather can quickly change.

“Good judgment is needed,” said Graham. “Sometimes you just need to say we’re not going today.”

Other experts believe that refresher training is key to mitigating seasonal weather hazards.

Refresher training for a given season – an icing course in the fall, or a convective weather course in the spring, for instance – will help pilots make informed weather decisions, said Andrew Battleson of the CAE Embraer Training Center.

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ANDREW BATTLESON *CAE Embraer Training Centers*

SIMCOM’s Tom Goonen supports mandatory training for icing, especially for operators of turbo-props, and pressurized singles and twins. The FAA’s Advisory Circular 91-74B comprehensively covers icing hazards and proper flight planning.

Also, adhering to personal minimums not only reduces weather risks, it is an advantage that single pilots have over professional pilots.

Personal minimums are “the great equalizer,” said Mark Twombly of the Embraer Operators Association. “The professional is expected to



perform. They’re going to go in most cases,” while single pilots can more easily adjust plans and stick to their personal minimums.

FLIGHT SERVICE AND WEATHER DATA

Goonen suggests pilots consult with flight service station briefers because they often can provide insights not possible to obtain simply by reading published weather reports or using onboard avionics. “Flight service stations are very underused,” said Goonen. “These guys are experts and can give you a much better outlook than your radar or NEXRAD. During a flight, just tell ATC you’re going off frequency for a minute.”

When using onboard equipment to assess weather, pilots should understand how automation processes weather data. While the GPS shows your position in real time, weather information can be up to 20 minutes old because the signal takes a longer route to reach the cockpit.

NEXRAD and the data link used by weather service providers causes the latency, explained Gary Pokodner, a program manager at the FAA’s Weather Technology in the Cockpit division (WTTIC). NEXRAD and similar systems, he said, are not designed for weather navigation, only avoidance.

“NEXRAD will show pop-ups or convection behind moving fronts,” explained Pokodner. “That opening [in a storm front] you see on the screen may not be there” by the time you arrive at that location. That’s why it’s essential for pilots to know their equipment’s limitations.

The WTTIC NextGen program is researching ways to reduce gaps in a pilot’s weather knowledge and cockpit technology. One study shows when a METAR changes from VFR to IMC, many navigation devices don’t notify the pilot very well.

“There’s nothing that jumps out,” Pokodner said. Some solutions include having the METAR turn white with a black background or making the text brighter. Having the text sparkle, flash or change color are other possibilities. There are devices with good salience (easily noticed alerts), and pilots should do their research, he advised.

TECHNOLOGY SHOULD REDUCE PILOT WORKLOAD

FAA research also has found that reducing the pilot’s workload also helps mitigate weather risks. For instance, winds reported graphically are easier for

Tools to Assess and Mitigate Weather Threats

NBAA’s Risk Management Guide for Single-Pilot Light Business Aircraft and its flight risk assessment tool can help single pilots mitigate weather threats. Weather, along with other considerations – such as performance, currency and external pressures – can be assessed by the pilot and plotted on the tool’s matrix. The risk’s likelihood and severity is shown from high to low by a color code.

The Light Business Aircraft Flight Operations Manual Template is another good NBAA decision-making tool. It prompts pilots to weigh weather – at the departure point, enroute and at the destination – and discourages potentially hazardous circling approaches or risking flying into winds exceeding 25 knots.