BLIND TO THE ICE

An official FSS briefing may not be perfect, but at least it gives you a clear picture of the hazards, right? Nope. It also lacks the critical element of strategy.

It was late afternoon and time to fly home after a productive business meeting. Before heading to the airport, the pilot called Flight Service.

Most of the significant weather was along a cold front just to the north of his east-west proposed route. The briefer mentioned some light snow showers were showing up on radar near the front. There were a few pilot reports of light to moderate icing, but all of them were associated with the weather to the north. The briefer alerted the pilot to an AIRMET for IFR conditions and mountain obscuration along a portion of his proposed route, but as of yet no en route advisories for structural icing had been issued.

With no pilot reports of icing and no official icing forecasts, the pilot must have concluded that there was little or no risk for structural icing. He filed a flight plan, drove to the airport and departed on what turned out to be his last flight.

Accidents Don't Lie

This pilot's case of death by icing is far from unique. In a recent study, the NTSB examined all icing accidents from 1982 through 2000. The study determined that 81 percent of all accident pilots received some type of weather briefing prior to the flight. Of those accident pilots who got a briefing, 82 percent received their weather briefing through Flight Service.

Too often the briefer is a parrot of weather data rather than a partner in weather strategies. Draw on a wider pool of data and become your own expert.

This is not to say that Flight Service is directly at fault for any of these accidents. There are a few accident cases where the NWS took some of the heat because they failed to issue an accurate forecast. There are also accidents where the briefer dropped the ball and was partly to blame. However, the overwhelming majority of these accidents were attributed to—you guessed it—pilot error.

Pilots believe they'll acquire understanding as they gain flight experience. That's a dangerous mindset.

While a few of the icing accidents are likely the result of a pilot's cavalier attitude with respect to icing, many could have been prevented and are an indirect result from several weak links in the system. The accident pilots didn't understand the severity of the risk or misused the information given in mitigating that risk. Pilots, flight instructors and the FAA all need to look down at their own shoes—we are the stakeholders in aviation safety—but the solution ultimately rests with the pilot.

An Old Paradigm

According to Aeronautical Information Manual (AIM) Chapter 7-1-4a, "Flight Service Stations (AFSS/FSS) are the primary source for obtaining preflight briefings." This section of the AIM should be relegated to the aviation history books. Reading line after line of text to an inexperienced and perhaps poorly trained pilot is a bad paradigm that just creates a street full of open manholes.

It's easy for instrument pilots to make errors in judgment when they don't have all the information. That's hole number one. Also, instrument pilots have little or no training in applying information. The combination means errors in understanding the guidance given in any briefing and using that information in the context of an IFR flight.

You know the drill. A Flight Service specialist pages through a quick and concise translation of a bunch of coded text on his computer screen and sum-

ONLINE TOOLS FOR ICING

When it comes to avoiding structural icing, the enhanced infrared satellite image (http://aviationweather.gov/adds/satellite/) is one of the most under-utilized icing diagnostic tools available. Updated every 15 minutes, this satellite product can provide some amazing clues about the potential for structural icing, especially when combined with METARs, TAFs and NEXRAD. As a bonus, the technique also works very well at night.

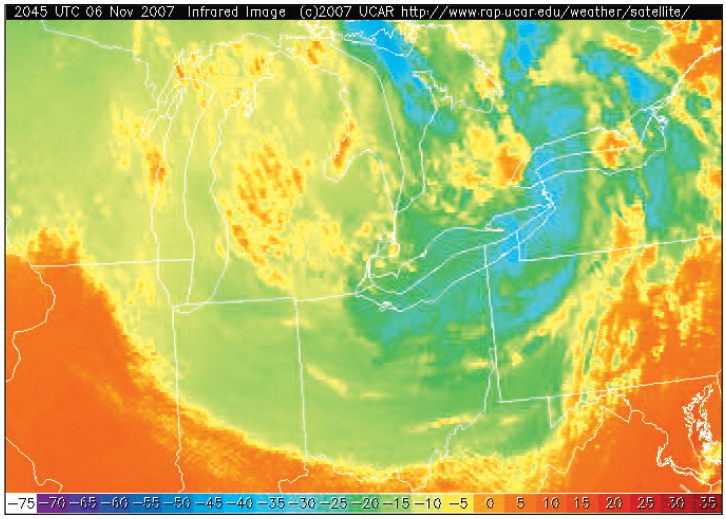
The enhanced IR satellite image identifies the temperature of the cloud top in degrees Celsius. Simply match the color with the scale at the bottom. Having the temperature in hand, use a forecast sounding (http://rucsoundings.noaa.gov), close radiosonde observation to identify the height of the cloud tops.

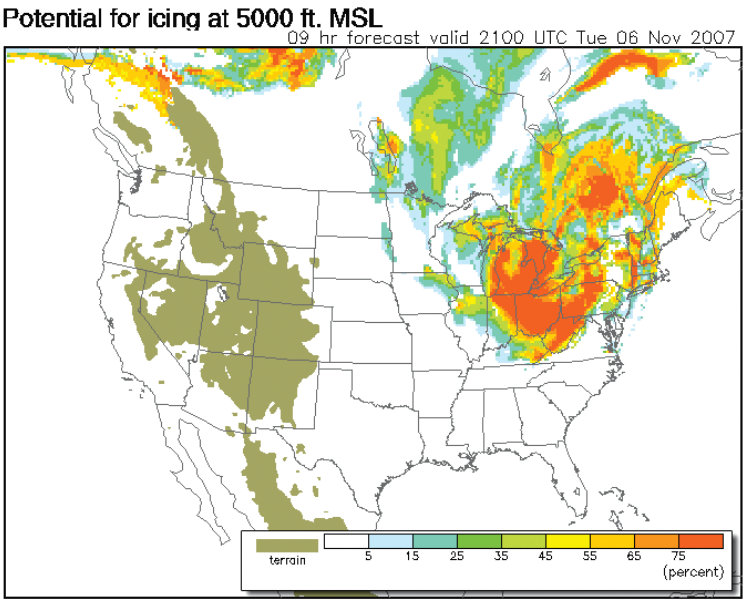
In the top image, orange shows the temperature of the ground (clear air). The temperatures in south and central Ohio are mostly pale green with a hint of yellow, which indicates the tops are about -15 degrees C. Tops are darker green and blue to the north around Cleveland, signifying colder temperatures, and therefore, higher tops. This lets you predict how high, and how cold, the tops will be.

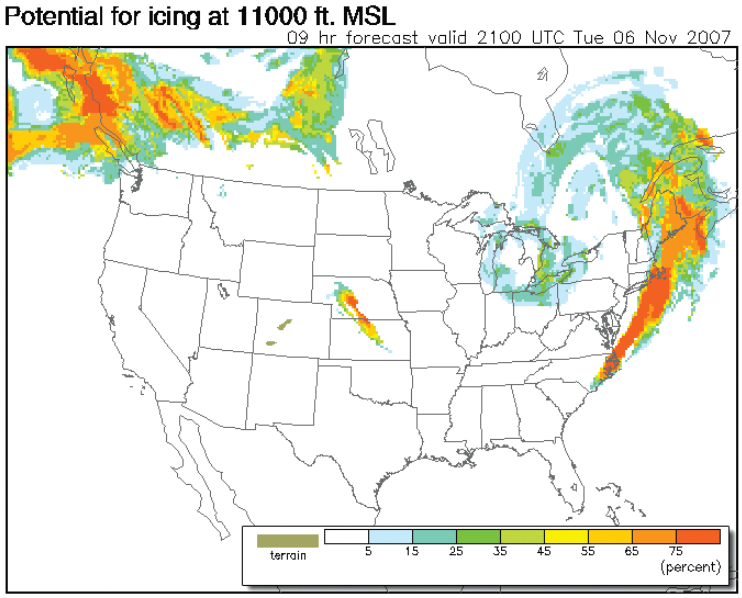
Another valuable resource is the supplemental icing diagnostic algorithms found on the Aviation Digital Data Service (ADDS) website (www.aviationweather.gov/adds). The Current Icing Product (CIP) and Forecast Icing Potential (FIP) have a distinct advantage because they are updated hourly and show any and all chance for structural icing.

The FIP for 5,000 feet shows a broad area of icing covering the Ohio Valley as well as most of the Upper and Lower Great Lakes. Flying at or near the MEAs on a direct route from Chicago to New York would be risky from an icing perspective, given the high likelihood shown here. By 11,000 feet, FIP is indicating a small likelihood of icing in northern Ohio, where the icing layer was much deeper, which is a good reason to keep a more southerly route.

Also available on the ADDS website are G-AIRMETs. They are relatively new and provide another resource that has a better temporal and spatial resolution than the traditional AIRMETs. Other advanced tools such as forecast soundings and analyses (rucsoundings.noaa.gov) can also be quite useful once you learn how to use them. Integrating these tools with area forecasts, TAFs, PIREPs and NEXRAD offers a more complete picture ... and less risk of falling into an open manhole. *—S.D.*







marizing what he sees on the radar, satellite, surface analysis and prog charts. Without any interruptions, most specialists can deliver the weather portion of a standard briefing in five minutes. Of course, some pilots take the time to ask pertinent questions and get further clarification. Some briefers go the extra mile to help integrate the data for the pilot when the weather is especially challenging. Assuming the pilot pays close attention and the briefer doesn't leave out any critical details, the pilot will hear the minimum weather data required by the FAA guidelines.

The content of a telephone briefing isn't bogus and there's no need to remove the human from the loop. However, a briefing involves the transfer of information. The quality of the briefing largely depends on how well the Flight Service specialist was able to *convey* information to the pilot.

Back when our "new" Flight Service was big news, we were teased with talk of an online portal so the briefer and pilot could see the same images and text. This would certainly offer an improvement, if it ever comes to pass. But if the data they are sharing is no more than a shoulder-to-shoulder DUATS briefing, then we're back to a 1980s-style philosophy with a 21st-century twist. Better, but not what the FAA should spend taxpayer money to build.

And what's completely missing is guidance on using this information. When the specialist says there's an AIRMET for icing over a four-state area containing the pilot's entire route of flight, what's a pilot supposed to do with that information, especially if the pilot isn't experienced enough to know ice won't be found everywhere within the AIRMET?

Education is Key

My advice is to expand your briefing beyond a simple phone call. Some internet-savvy pilots use online resources exclusively for their briefings. To some that may seem impetuous, but to place any formal briefing in context, you should

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HOLES YOU SHOULD KNOW ABOUT IN OFFICIAL WX PRODUCTS

Few pilots know that FAA imposes a hard character limit on text products such as Convective SIGMETs and the Area Forecasts (FA). The Aviation Weather Center (AWC) has a check program for the Area Forecast that counts the number of characters. On busy weather days when these forecasters have a lot to mention in the forecast, they often bust the character count. This forces them to cut from either the text or the synopsis in order to make the size fit through the National Airspace Data Interchange Network (NADIN) hubs. Often the first casualty is the ellipsis (...). Forecasters can use two periods instead of three. Another casualty is the synopsis. Of course, the last resort is to cut from the text of the FA.

Here's what you might see in the synopsis section on an especially busy weather day:

SYNOPSIS...NO ROOM

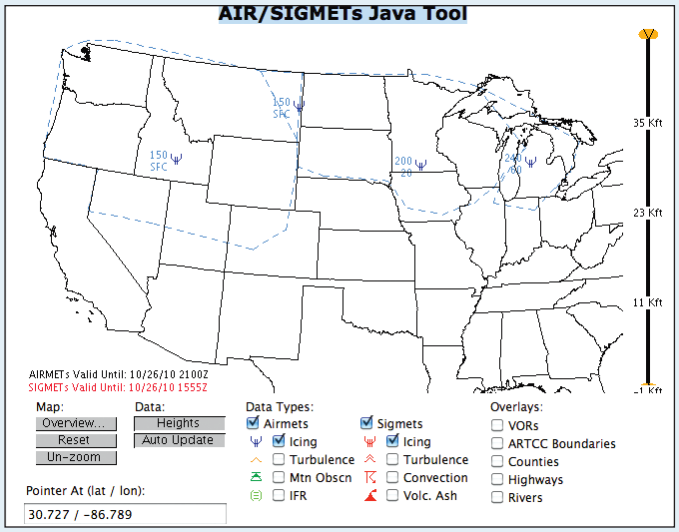
This has been an issue that you won't soon discover in the AIM or FAA handbooks. Forecasters have asked the FAA many times to increase the character limit. In fact, when I spoke with AWC meteorologist Jim Roets last summer, he mentioned, "As late as last week we had an issue with the Convective SIGMET. The character count was a little over 3000, so it was kicked out of the FAA system. The forecaster was able to combine outlook areas and cut some of the area coverage on his Convective SIGMETs, which allowed the forecast to go out."

In general, the NWS Telecommunications Gateway in Silver Spring, Md., allows them 15,000 characters per product. But when that product goes from the Gateway to the NADIN hubs, it has to be under 3000 characters or it gets rejected. The character count goes back to the teletype days but the FAA has yet to remove the restriction.

AIRMETs for icing (AIRMET Zulu) is not intended to cover all possible areas where structural icing might be likely. In fact, only 80 percent of pilot reports of icing are captured by AIRMET Zulu.

Some of the remaining 20 percent of these icing reports are due to convective icing in vertically-developed cumuliform clouds. Convective icing might be captured by a Convective SIGMET if active thunderstorms are present.

AIRMETs are also issued for widespread areas of moderate icing. If the icing isn't expected to be widespread and moderate in intensity, then the forecaster won't issue an AIRMET. This is common for a rather thin, but juicy, stratocumulus deck that often develops in the wake of a strong, late autumn cold front. —*S.D.*



year and not fly one missed approach out of necessity. You could do these missed approaches with a safety pilot, but this is expensive and in the real world ATC may not be able to let you fly the complete published missed-approach procedure.

In my opinion, the absolutely best way to maintain your IFR proficiency in general, and your ability to make safe and compliant missed approaches in particular, is by using a good flight training device or other simulator. A half-day session will fulfill the requirements for instrument currency prescribed in FAR 61.57, and you'll be able to practice far more involved (or sinister) emergencies and abnormal situations with a full missed-approach procedure each time. I think it's the most effective (in terms of time, money, safety and efficacy) approach to maintaining your IFR proficiency.

A Missed Opportunity

Maintaining your status as a safe, competent and proficient IFR pilot is your responsibility. It cannot be accomplished through wishful thinking, overconfidence or a false sense of security. You must put in the requisite work to keep you and your passengers safe. Do you want to be part of the unfortunate majority I see who do fine until they get hit with an unexpected missed, or do you want the reward of turning a surprise in demanding weather be just another part of instrument flying? It's up to you. IFR

David C. Koch has been an instructor since 1965 and holds an ATP with over 18,000 hours.

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always integrate some of what's available online. When you get that five-minute standard briefing 20 minutes before departure, you're then listening for recent updates and amendments to the forecast, perhaps getting some clarification and adjusting your plan accordingly.

Unlike our accident pilot, however, you won't be relying solely on FSS to know where dangerous icing might lie.

But it takes much more than just scouring the internet for data. Pilots often feel that they have no need for additional training in aviation weather; they believe they'll acquire understanding on their own as they gain more flight experience. That's a dangerous mindset.

Using new weather products often requires learning new analysis techniques and how to best integrate this guidance with all of the legacy weather products. To their credit, the FAA does describe some of this ancillary weather guidance in Advisory Circular 00-45G (Aviation Weather Services). The weather products discussed in this AC are all freely available online. Before your next IPC, read this AC cover to cover and spend an afternoon next to a computer with your instrument instructor learning how to use these products effectively. If you feel your instrument instructor isn't up to the challenge, find one who is.

From Data to Decisions

The last step is finding someone who can help you turn weather information into flight strategies. Ideally, our FSS briefers would do this, but that's never going to happen. You need to learn this skill from a mentor until you are able to do it for yourself. Having the right weather information without knowing how to apply it is like someone handing you a sharp ax, but not giving you any instruction on how to swing it.

A standard briefing from Lockheed Martin Flight Services can be useful when you don't have immediate access to online weather (rare these days). But when it comes to real flight hazards, such as structural icing, it will never be enough. You can make up the gap. Or you can take what an official briefing offers and hope it's enough to keep you out of the NTSB reports. IFR

Scott Dennstaedt is an IFR *Contributing Editor. His website is avwxworkshops.com.*