

NTSB MOST WANTED LIST

CRITICAL CHANGES NEEDED TO REDUCE TRANSPORTATION ACCIDENTS AND SAVE LIVES

2014

GENERAL AVIATION: IDENTIFY AND COMMUNICATE HAZARDOUS WEATHER

What is the Problem?

The overwhelming majority of aviation-related deaths in the United States occur in general aviation (GA) accidents. In 2011, there were 1,466 GA accidents, of which 263 were fatal. 444 people were killed, and the accident rate per 100,000 flight hours remains substantially higher in GA than in commercial aviation (6.51 for GA compared to 1.5 for on-demand Part 135 operations and 0.162 for scheduled Part 121 operations). Historically, about two-thirds of all GA accidents that occur in instrument meteorological conditions (IMC)¹ are fatal—a rate much higher than the overall fatality rate for GA accidents.

A frequent cause of or contributing factor to these accidents is hazardous weather. For example, on December 19, 2011, a Piper carrying the pilot and four passengers impacted terrain following an in-flight break up near Bryan, Texas. NTSB investigators determined that the probable cause of the five-fatality accident was the pilot's inadvertent encounter with severe weather, which caused a failure of the left wing. One of the issues identified in the investigation was the presentation of weather radar data in the cockpit, obtained through the pilot's subscription to satellite-based weather services.

The NTSB continues to examine the Federal Aviation Administration's (FAA) weather information dissemination practices in recent investigations as well as the consistency of National Weather Service (NWS) weather advisory products for the aviation community. While having weather information available to pilots, air traffic controllers, and meteorologists is crucial, improper understanding and misutilization of this information can prove just as dangerous (if not more dangerous) as not having that information at all. Examples include pilots gaining a false sense of confidence that may lead them unknowingly into adverse weather conditions, or air traffic controllers not effectively using the weather information they have to assist pilots in avoiding such conditions.

¹ Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than the minimums specified for visual meteorological conditions.



Photo of post-accident cockpit and engine sections of a Socata TBM 700 aircraft following its encounter with severe icing conditions near Morristown, New Jersey on December 20, 2011.

What can be done?

In the almost 50 years of NTSB accident investigations, NTSB's recommended solutions to weather issues fall into three broad areas:

1. pilot training and operations;
2. the creation of weather information and advisories; and
3. the collection and dissemination of weather information particularly by the NWS and the FAA.

The first line of defense in preventing a GA weather-related accident is the GA pilot; he or she makes the decision of when and where to fly the aircraft. Therefore, appropriate training on how to obtain and use the proper information to address hazardous weather is critical. In addition, granting pilots, as well as FAA-contracted weather briefers, access to real-time weather information through weather cameras will further enhance operators' situational awareness.

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What can be done? *con't...*

Another key line of defense is air traffic controllers who provide weather data to pilots prior to, and during flight. In order to meet these needs, controllers must have unimpeded access to critical information on key weather scenarios, such as mountain wave activity² advisories and real time lightning data. Controllers must also be trained and equipped to disseminate this critical information expeditiously. Further, because controllers are the primary recipients of pilot reports (PIREP's), the FAA must have the infrastructure and protocols in place that ensure such vital information is conveyed in the national airspace system (NAS).

What is the NTSB doing?

In 2005, the NTSB conducted a safety study to better understand the risk factors associated with accidents that occur in IMC or poor visibility. This was the fifth report on weather-related GA accidents since the NTSB's creation in 1967. The NTSB has also explored hazardous weather issues in numerous GA accident investigations. Based on this body of research, the NTSB has reached out to the various operator and user groups to identify and engage more than 20 stakeholders across several agencies, including the FAA, the NWS, the National Air Traffic Controllers Association, the Aircraft Owners and Pilots Association, Lockheed Martin Flight Services, and the Air Line Pilots Association. To date, stakeholders have held initial meetings, and progress has been encouraging.

The NTSB's continues to investigate and research ways in which hazardous weather communication can be enhanced. In early 2014, the NTSB intends to complete additional work on mountain wave activity and work addressing NWS internal and external communication and operational use of PIREP information. The NTSB is also examining the utility of LIDAR³ information in Las Vegas and the structure of retrieving and disseminating airport runway wind information in the NAS. Given the frequent role that weather plays in GA accidents, the NTSB will continue to examine weather-related safety issues.

² A mountain wave is the wave-like effect, characterized by updrafts and downdrafts, that occurs above and mainly to the lee of a mountain range when rapidly flowing air encounters the mountain range's steep front in a near-perpendicular fashion within a supportive vertically stable atmosphere (referred to as a mountain wave-supporting environment). Mountain wave activity refers to these updrafts and downdrafts, their associated turbulence, and other wind phenomena that can occur in association with a mountain wave-supporting environment, such as rotors, hydraulic jumps, and downslope wind events.

³ A method of remotely sensing atmospheric wind information by laser technology.

**Critical changes
needed to reduce
transportation
accidents
and save lives**



National
Transportation
Safety Board

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation - railroad, highway, marine and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the Federal Government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

