NTSB

SAFETY ALERT

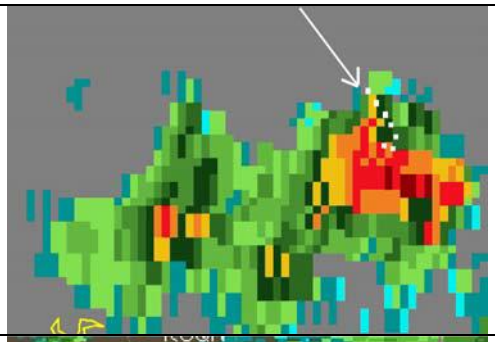
National Transportation Safety Board

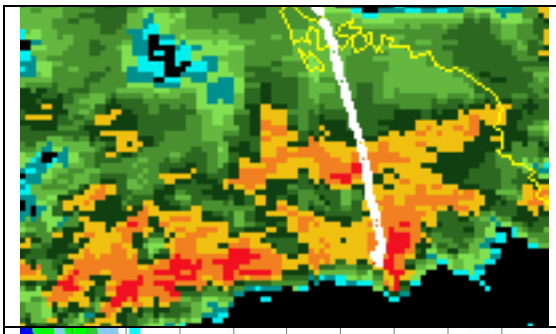
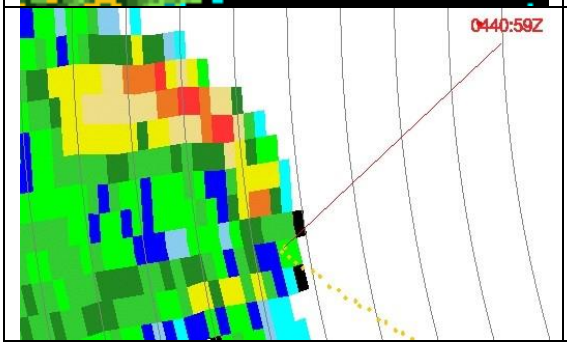
★ Thunderstorm Encounters ★

IFR pilots need to actively maintain awareness of severe weather along their route of flight

The problem

- NTSB investigations have identified accidents that appear to be wholly or partly attributable to in-flight encounters with severe weather.
- These accidents have all involved aircraft operating under instrument flight rules and in contact with air traffic controllers.
- Investigations show that pilots were either not advised about areas of severe weather ahead or were given incomplete information.
- Each pilot had readily available alternatives that, if utilized, would have likely prevented the accident.
- ATC training and briefings to controllers have not been sufficient to ensure that pilots receive the weather advisories needed to support good in-flight weather avoidance decisions.
- Examples:

	A Mitsubishi MU-2 en route to Panama City, Florida, entered radar-depicted intense to extreme cell. No ATC radar weather information issued or requested. One fatality. Argyle, Florida 9-1-2006
	A Cessna 210 en route to Manassas, Virginia, encountered intense to extreme level convective weather. The pilot requested a deviation after entering the area, but lost control of the aircraft and crashed. No ATC weather information provided. One fatality. Ludville, Georgia 4-19-2006

	A Cessna 182 entered an area of severe weather over the Gulf of Mexico. Deviations discussed with ATC, but no intensity information provided by ATC or requested by the pilot. One fatality, aircraft not recovered. Naples, Florida 6-20-2005
	A Mooney M20J encountered an intense to extreme thunderstorm and broke up in flight. No ATC radar weather information provided or requested. Two fatalities. Newellton, Louisiana 7-26-2006

How can pilots avoid becoming involved in a similar accident?

- Severe weather avoidance is primarily ***your responsibility.***
- The primary job of ATC is to keep IFR aircraft separated. When their workload permits, controllers are also required to provide additional services such as weather advisories, and, upon pilot request, suggested headings to avoid radar-displayed precipitation.
- The proper use of ATC weather advisory services may be critical to your safety when operating near areas of convective activity.
- Approach control radar systems provide near-real-time weather depiction. En route centers receive weather radar information from National Weather Service NEXRAD sites that refresh the color precipitation data on ATC displays every 4 to 5 minutes. Be aware that en route weather displays may be a few minutes behind the storm and allow extra distance from reported intense precipitation, especially in front of fast-moving convective activity. Also be aware that cockpit NEXRAD data can be 15 to 20 minutes older than indicated on the cockpit display.
- ATC radar systems depict ***only*** precipitation. Controllers cannot use radar to warn of turbulence, icing, freezing rain, or other hazards to flight. However, the presence of substantial precipitation implies the existence of thunderstorm hazards such as severe turbulence and hail.
- ATC weather advisories should include the location, extent, and intensity of radar-observed precipitation. The descriptive words for intensity were recently changed to ensure consistency across all ATC facilities. The old level 1 is now “light”; level 2 is “moderate”; levels 3 and 4 are described as “heavy”; and levels 5 and 6 are described as “extreme.” If precipitation is described to you without any reference to intensity, ask for the information so you can make a good decision about how to proceed.

- Not all ATC radar systems can provide intensity information. In such situations, you should be told “intensity unknown.”
- Some accidents appear to have involved controller uncertainty about whether the pilot was visually avoiding severe weather areas or needed radar weather assistance. The controller thought the pilot was able to see what was ahead, and the pilot thought the controller was watching out for him. It is especially important that you advise controllers if your flight conditions change from visual to instrument, and that when operating in instrument conditions you regularly request updated information on radar-depicted weather ahead of your aircraft.
- Be especially diligent about asking for updates after being transferred from one ATC facility to another. The new controller may have better equipment or be using a different radar site and have an entirely different picture of what lies ahead.
- Ambiguous use of the term “when able” has also led to confusion. Some controllers use “Cleared direct xxx when able” to mean “when weather permits you to turn safely on course,” while pilots may understand such an instruction to mean “Go direct to xxx as soon as you can navigate there.” In some cases, this ambiguity has apparently led pilots receiving ATC weather avoidance assistance to conclude that it was safe to turn direct to the specified fix, resulting in subsequent entry into thunderstorms. If you have any uncertainty about whether a course change will keep you clear of convective weather, ***ASK!***
- Give pilot reports. Controllers use them to confirm their radar weather depiction, and to obtain details such as cloud tops or the existence of icing that may not be available through any other source. Pilot reports also help controllers advise other aircraft about what to expect and what to avoid.
- The safest plan when avoiding severe weather activity is to entirely avoid the affected area or land and wait for it to pass. However, if you find yourself in need of ATC assistance, ask specific questions. Where is it in relation to my route? What does it cover? How far away is it? What intensities do you see? What looks like the best way around it?
- Make decisions about weather deviations as far in advance as possible. Controllers will have more time to respond to your needs, perform any necessary coordination, and provide you with the information you require to conduct a safe flight.
- Pay attention to weather alerts broadcast by ATC, especially SIGMETS and Center Weather Advisories, and obtain further details from HIWAS or Flight Watch if the advisory is anywhere along or near your route. Flight Watch can also supply “big picture” weather information beyond what ATC may have time to provide to you.
- Become familiar with the various on-board weather avoidance technologies available, including data-linked onboard NEXRAD weather services, and consider whether the additional information will help you to avoid encounters with severe weather.