



# Interagency Aviation Safety Alert



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**Subject:** Controlled Flight Into Terrain

**Area of Concern:** All Aviation Activities

**Distribution:** All Aviation Users

**Discussion:** In FY 2007, the Department of Interior and US Forest Service had eleven aircraft accidents. Six of those accidents (54%) involved Controlled Flight into Terrain (CFIT). CFIT occurs when an airworthy aircraft under the control of a pilot is flown unintentionally into terrain, obstacles or water, usually with no prior awareness by the crew. While most CFIT events occurring in General Aviation involve night operations or inadvertent entry into IMC, all of the DOI / FS CFIT accidents in FY 2007 occurred during daylight hours in Visual Meteorological Conditions (VMC).

Accidents resulting from Controlled Flight Into Terrain involve flight crew situational awareness. Situational awareness means the pilot is aware of what is happening around his/her aircraft in both the vertical and horizontal plane. The basic cause for CFIT is the flight crews' lack of vertical or horizontal position awareness in relation to the ground, water, or obstacles. During daylight hours in VMC, CFIT can also be attributed to fatigue, task saturation, and/or mission fixation. Simply stated, flight crews need to know where they are and maintain a safe altitude for flight. Minimum altitudes, operating airspeeds, terrain and environmental factors must be considered at all times.

Even with visibility above VFR minimums, surface references and the natural horizon may at times become obscured. White-out conditions, generally caused by fog, haze, or falling snow blending with the snow-covered earth surface, may obscure all outside references. Gray-out conditions, a phenomenon very similar to white-out conditions, is the result of diminished visibility over water, resulting in a uniform gray appearance. Flat light is an optical illusion that causes pilots to lose depth perception and visual contrast. Brown-out conditions can happen to helicopters operating in dry, dusty or smoky areas.

Our agencies are experiencing an unacceptably high number of accidents during low-level special use missions. The failure of the pilot to see and avoid terrain or obstacles too often result in a CFIT accident. Special emphasis must be placed on mitigation of hazards that contribute to terrain/ground contact, rotor strike, tree strike and poor aircraft performance that may result in damage to or loss of aircraft and crew.

**Recommendations:** The solution to combating CFIT accidents starts on the ground. Flight crew training, pre-mission planning and risk management are essential to CFIT accident prevention.

**PILOTS:**

- \* Get a current weather brief and check weather forecasts before every flight. Be alert for weather deterioration. Do not attempt VFR flight when there is a probability of weather being below FAA minimums at your destination, or in the intended operating area.
  
- \* Study and become familiar with unique geographical conditions in the area in which you intend to operate. Know your aircraft's performance capability. If you are flying in mountainous terrain, be aware of standing lenticular or mountain wave conditions. Exercise caution when winds are greater than 20 knots or when wind gust spread exceeds 10 knots. For SEAT and Type 3 Helicopter operations, stop flight operations when winds are greater than 30 knots or when wind gust spread exceeds 15 knots.
  
- \* Know your own capability. It is the pilot's responsibility to ensure that he or she is qualified for the flight, that the aircraft is properly equipped for the flight, and that the flight is flown according to the appropriate regulations and aircraft operating limitations.
  
- \* Conduct a brief operational risk assessment prior to each flight. Aircraft equipment, standard operating procedures, charts, detailed checklists, or recommended avoidance techniques will not prevent CFIT if flight crews are not adequately prepared with risk mitigations.

**Controlled Flight into Terrain is preventable. Zero CFIT events in 2008 can be achieved.**

For further information, see:

1. FAA AC 60-4A Pilot's Spatial Disorientation, 2/9/83.
2. Flight Safety Foundation at [www.flightsafety.org/cfit1.html](http://www.flightsafety.org/cfit1.html)
3. "Pressing On" Into Deteriorating Conditions: An Application of Behavioral Decision Theory to Pilot Decision Making, David O'Hare and Tracy Smitheram, The International Journal of Aviation Psychology, 5(4), 351-370, 1995.
4. FAA AC 61-134 General Aviation Controlled Flight Into Terrain Awareness, 4/1/03.
5. "Flying in Flat Light and White Out Conditions", Aeronautical Information Manual, para.7-5-13 2/14/08.
6. FAA AC 60-22 Aeronautical Decision Making, 12/13/91.
7. USFS 2008 System Safety Aviation Guide; Risk Assessment Hazards and Mitigations, Tabs 3 -9, [http://www.fs.fed.us/fire/av\\_safety/Systems\\_Safety/av\\_risk\\_mgt/index.html](http://www.fs.fed.us/fire/av_safety/Systems_Safety/av_risk_mgt/index.html)

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