

**United States Department of Agriculture  
Forest Service  
Aviation Safety Alert**

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**Subject:** Look Out Conditions

**Area of Concern:** Fire Operations

**Distribution:** USFS Aviation Operations

**Discussion:** A recent number of weather related incidents prompts us to share this information as a means of raising awareness of hazards associated with thunder storms, high temperatures, high winds, turbulence, and high density altitudes.

- 1) During a heli-rappel mission in the Idaho back-country, the helicopter was positioned in a stable out-of-ground-effect hover and ropes were let out. The crew was well aware of the high D.A. caused by near 100 temperatures. As personnel were getting in position on the skids, unexpected turbulence caused the pilot and rappel spotter to decide to abort the mission. The rappellers were brought back into the aircraft, the ropes were dropped. The severe turbulence this crew encountered was attributed to the onset of winds from a nearby thunder cell.
- 2) Two airtankers were called to a fire near Tooele, UT. Weather was checked at Pocatello prior to departure and the tankers were detained because of local weather. Weather was rechecked for Tooele before departure and conditions were good, so the airtankers launched. Light "chop" was experienced at 8000-9000 feet, upon setting up for the run to drop retardant winds at the surface were 50-60 mph. One load was dropped on the fire area, the trailing airtanker called the air operation off and returned and landed "loaded".
- 3) Jumpers were being deployed on a fire near Afton, WY in what appeared to be calm conditions, however, two cells in the proximity were showing virga. The first stick of two jumpers landed in stand-up conditions. The spotter was confident enough in the situation to put out three jumpers in the second stick, which landed without incident. When the final two jumpers were deployed a sudden onset of gusty winds resulted in hard landings and minor injuries.
- 4) An airtanker was being dispatched from West Yellowstone tanker base late in the afternoon. While doing the flight planning for the relocation the tanker Captain realized that temperature and density altitude exceeded the chart limitations in the aircraft-operating handbook. The Captain correctly denied the request to launch until conditions had returned to within the operating parameters of the aircraft.

The 2003 fire season is exhibiting a trend of extreme temperatures and afternoon thunder storms (as well as clear air turbulence) with a vengeance and aviators should take caution when observing these conditions.

**Recommendation:** There are two basic parts of the risk management equation that may be applied to weather, *probability* and *severity*.

*Probability* deals with the likelihood of an event occurring, and is typically calculated by estimating the chance that an event will occur in a given block of time and multiplying that by the period of exposure to the risk. It answers the question “*How likely is it that this weather event will happen?*” *Severity*, on the other hand, deals with worst-case scenarios. It answers the question, “*If this event occurs, how bad can it be?*”

Taken together, these two distinct parts of the risk equation give managers and operators a concrete approach to increasing the margin of safety associated with high-risk endeavors – like aerial fire-fighting during predicted weather conditions/events.

The easiest and most effective measure for mitigating hazardous scenarios is to reduce exposure to the risk. In fire aviation this can be done in three primary ways.

1. Identify the risk
2. Increase the distance from the risk.
3. Decrease time of exposure to the risk.

These three measures increase the likelihood that errors in judgment will not result in serious consequences (i.e. injuries or accidents).

Pilots and Air Attack Group Supervisors can mitigate weather induced errors by maintaining awareness of weather conditions, obtaining forecasts, and monitoring their progress throughout the day. Be aware of the onset of changing conditions and alert for local weather indicators that may adversely affect the safe completion of your mission.

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