



USDA Forest Service, Region 5

## AVIATION SAFETY SUMMARY



### SAFETY TOPIC: Clear the Line Before the Drop:

Use of aerial retardant and water drops carries significant safety hazards to firefighters on the ground as well as the aviators. While it is not an uncommon event for firefighters to be “hit” with a load of retardant or water from a bucket drop, it is imperative that the hazards are fully understood and all measures are taken to avoid being “hit”. Two recent SAFECOMs submitted in Region 5 highlight some of the dangers associated with retardant and bucket operations:



#### SAFECOM 13-0556 :

Narrative: An air tanker made a retardant drop at a height and speed that scrubbed the ground clean to bare mineral soil for a distance of ~300 ft.-400 ft., and 15 ft. wide. Brush, in some places 6 ft. high, was removed or damaged. Eyewitnesses state the plane was between 50 ft.-100 ft. high, and lower than the lead plane. The lead plane also appeared to be no more than 100 ft.-150 ft. high. Two fire fighters only had time to lie down in the drop zone, but not clear it: they were hit by the drop. Thankfully, neither fire fighter was injured. Below are pictures illustrating the force of this drop:



While it appears this line may have been constructed by heavy equipment, it in fact, was the result of a low level retardant drop. The amount of force actually uprooted some vegetation in the path of the drop.

Follow-up: The drop profile was discussed with the pilot, and it was discovered that it was first and only drop on the initial attack fire. The pilot was told the line was clear and thought with the sloping terrain, he was at a good drop height. The pilot took full responsibility for the low drop.

Lessons Learned: Be extra cautious and clear the line a greater distance than normal on initial attack fires as pilots (helicopter and airtankers) are not always familiar with the terrain they will be operating in and may misjudge the drop zone or the drop height.

#### SAFECOM #13-0535

Narrative: A helicopter was dispatched to a fire, and completed one drop, but after the second attempt, returned to the manager's location and requested the bucket capacity be configured for 70%. The helicopter then returned to the fire to engage in bucket operations. Ongoing radio traffic, indicated some confusion and concern as to the placement of the drops. The pilot requested assistance from ground forces to let him know the proper release point. The ground forces declined the request. Seconds later the pilot apparently hit the release button for the bucket and it landed in the vicinity of the fire. No ground forces were affected. Examination of the bucket showed that the bucket was blown out, indicating hard contact with the ground. After talking with the pilot the pilot concluded that it was not a mechanical failure, but an inadvertent release.



# Pacific Southwest Region

## SAFECOM 13-0535 cont'd

**Follow-up:** The incident was discussed with the pilot involved and with the owner/chief pilot. The pilot readily accepted full responsibility, and admitted there was no mechanical failure. At the time, there was significant discussion on radio regarding exact water drop placement and he became distracted.

**Lessons Learned:** The pilot sees in retrospect, that he spent too much time on the radio and too much effort trying to pin down the exact drop spot. He feels he should have gone around or orbited until radio communications were completed, and instructions understood. With the distractions, he simply selected the wrong control at a busy moment, and inadvertently dropped the bucket.

Being struck by a load of retardant or by a bucket of water, can and has resulted in injuries to ground forces. Water and retardant can dislodge trees and debris and send it rolling downhill towards firefighters. The outflow from retardant and water drops alone has literally knocked firefighters off their feet causing serious injuries (dislocated shoulders, knee, head and ankle injuries have been reported) and crushing vehicles.

**DO THE MATH:** (the following are representative examples in terms of gallons delivered)

*Even though the energy from a 18,000 lb load of retardant can be spread out over a distance, the force at which it can strike the target can be extremely forceful, and therefore, dangerous. Use Caution.*

Retardant : 9 lbs/gal X 2000 gal = 18,000 lbs  
Water: 8.3 lbs/gal x 100 gal = 830 lbs

“We are traveling at 120 to 140 knots during our drop sequence, we have to trust that when we are told the “line is clear” it is clear”. ~ Airtanker Pilot



A review of available information uncovered some common denominators in retardant/water drop contact with ground firefighters.

- Communications are not well established, or are confusing
- Frequency congestion
- Mission focus
- Uncertain/confusion regarding who is in charge of the fire
- Instructions not clear or understood in terms of what is needed
- Lined not cleared by ATGS, AT, Helicopter

Resulting in:

- Firefighters not being clear of the drop zone
- Firefighters not knowing a retardant drop has been ordered (and are surprised by the drop)
- Mis-communication by ground forces in telling the pilot the drop zone is “clear”, when it is not (result of mission focus and loss of SA)

Please review language in the IRPG, the Fireline Handbook regarding aerial operations, as well as the “10 & 18” in terms of identifying hazards. Protocols already exist for use of retardant or water drops, but when pressed by a perceived urgent situation, sometimes the established procedures are overlooked. Always be vigilant around aircraft. .

## July 2013 SAFECOMs

[www.safecom.gov](http://www.safecom.gov)

**Operational SAFECOMs out numbered Maintenance SAFECOMs for the first time EVER!** Maintenance SAFECOMs normally comprise the majority of the reports, however, this month Operational-Related Reports (23) exceeded the number of Maintenance reports (14). While some of this is circumstance, much of it can be attributed to the incorporation of SMS principles in refined SAFECOM submissions by the FS Regional Aviation Safety Council and the FS Airworthiness Branch, **but mostly to the field for being transparent and embracing the benefits of developing a “Reporting Culture” within the region. Good Job!**

Please direct all inquiries or safety related topics to: *Yolanda Saldana, Regional Aviation Safety Manager, Pacific Southwest Region; 916-640-1038*