BLUE SHEET

California Department of Forestry and Fire Protection (CAL FIRE)

Informational Summary Report of Near-Miss Incident

Hickok Fire Aviation Branch

July 20, 2009

Hickok Fire

CA-AEU-014568
CA-CNR-000032

Northern Region

A Board of Review has not approved this Summary Report. It is intended as a safety and training tool, an aid to preventing future occurrences, and to inform interested parties. Because it is published on a short time frame, the information contained herein is subject to revision as further investigation is conducted and additional information is developed.

Lookouts **C**ommunications **E**scape Routes **S**afety Zones

SUMMARY

On July 20th, 2009, at 1132 Hours, an air attack and two airtankers responded to the Hickok Fire in CAL FIRE's Amador-El Dorado Unit. The original fire was a long, narrow strip, while one of several spot fires evolved to eventually be the biggest portion of the burn. The large spot was primarily contained within a 'bowl' with moderately rising terrain on both flanks and the head, and increasingly rising terrain to the south, east, and west. Although the higher terrain was outside of the immediate fire area, it was within the operating, or 'traffic area' of the airtanker operations. This terrain feature required moderate terrain maneuvering by the airtankers such that approaches were [slightly] steeper to clear ridges, and departures were planned to follow the natural drainage of the valley. This represents a very common airtanker operating arena in CAL FIRE's initial attack aviation program.

The RAWS (7½ miles north of the fire) weather data indicated a temperature range from 95 to 100 degrees, winds southwesterly at 6 to 8 mph, and humidity starting at 19% (1100 hrs) and dropping to 14% (1400 hrs).

The fire behavior was primarily fuels driven with often nearly-vertical flame and smoke propagation. As the spot fire escalated, some topographical affect was seen, but nothing out of the ordinary.

The wildland fire chemical being delivered by the airtankers was Phos-Chek D75-F long term fire retardant which is considered within acceptable Quality Assurance limits when salt content, as determined by a refractometer, measures from 11.25% to 13% by volume (SbVol). The chemical, as mixed, stored, and delivered from the Air Attack Base, was between 11.5 – 12% SbVol. This generally equates to the thinner side of the acceptable viscosity window. Thinner retardant tends to dissipate speed sooner and have less concentrated mass upon contact with the target zone when compared to thicker viscosities (all other variables being equal). The differences in viscosity performance [within acceptable limits] can be measured in a laboratory or field-test environment, but tend to be highly subjective on real fire incidents.

During the course of flight operations, a series of incidents occurred as follows:

During a drop run on the left shoulder of the original fire, a power pole hazard was identified, discussed between the ATGS and airtanker pilot, and direction given to the airtanker pilot to account for said hazard. The resulting drop impacted the upper portion of the pole, and due to wire-slap, retardant conductivity, or both, the current in the energized lines went to ground, causing a transformer/fuse assembly to fail on another pole one span to the southeast. No injuries or secondary fires resulted.

At 1240 hrs, the same two airtankers were requested to return to the incident. During a drop run on the left flank of the spot fire (which was now the largest of all the fires—original and multiple spots), rather than dissipating its forward motion and raining downward into the brush, the retardant retained its high-speed energy as it arrived on target (estimated to be between 70 to 90 mph). The retardant trenched approximately 200 feet of 6'-8' manzanita brush with a

combination of shearing/breakage and uprooting. The final portion of the retardant load impacted a CAL FIRE bulldozer working near the left shoulder, resulting in failure of the front cab glass and left chin-window. The bulldozer operator sustained minor glass-cut injuries and a significant coating of fire retardant. Further minor injury/irritation resulted from long skin exposure to the retardant as the operator continued his fire control operations before being able to wash the retardant off.

On the third airtanker trip to the fire, while attempting to place retardant along the left flank of the (same) spot fire, the airtanker pilot, as trained, announced his target "final" approach to the air attack. The ATGS was occupied on another frequency, thus after the second "final" call, the air attack pilot announced "go around" to the airtanker pilot, which he did. In attempting this same drop run again, the airtanker pilot, after initiating the drop and releasing approximately 100 gallons, aborted his effort when he sighted numerous Fire Crew personnel in the target area.

During this second attempt, a Fire Captain on the line heard (unconfirmed source and exact wording) "line where the crews are working, tanker on final…." This attention caused the Captain to; look for, then observe the approaching airtanker; assume the "safety position"; then visually follow the airtanker's departure after discovering there had been no drop. The airtanker's departure appeared, to the Captain, to be very low as he exited the area. Further review indicates terrain, smoke, retardant load, aircraft performance, and other factors influencing the departure phase of flight resulted in a smooth, planned departure path that was not outside normal airtanker operating parameters or trained procedures.

The air attack pilot, as part of a coordinated cockpit team, exercised good judgment in stepping in to call-off the first drop while the ATGS was committed on another frequency. The airtanker pilot did an excellent job of recognizing the hazard to the crew on the ground and stopping the drop.

The final event in this sequence involves both airtankers, after being released from the fire, being approved to jettison a small amount of retardant into the interior of the burn in order to comply with landing-weight limits. This action had the appearance of a formation flight maneuver.

The ATGS sought, and received, approval from the IC to jettison 300 gallons from each airtanker into the burn. Although it is not normal to routinely perform jettison drops (for the sake of landing-weight limits) on/in fire areas, the home-base designated jettison area is under environmental scrutiny, and any effort to limit drops here extend the usable life of the jettison site. After jettison, this left each airtanker with a standard initial attack "combat load" suitable for diverting to a new incident if necessary, or landing at the home base.

When multiple airtankers are orbiting around a fire, the safest method used, and taught, is for a trailing airtanker to follow behind, outside, and slightly above the leading airtanker so as to maintain visual sight, and thus ensure safe separation from, the aircraft in front. Additionally, this orbit method often puts the pilots in nearly the same perspective during 'target description' by the ATGS, thus reducing the radio traffic by being able to brief both pilots on upcoming tactics. When several airtankers are in orbit, this 'stacking' is referred to as the "Salad Bowl" due to the imagined shape of the orbital paths.

After being cleared into the target area by the ATGS, both airtankers were in orbital position to expedite the drops and depart the area. One airtanker continued to trail behind the other as they rolled onto final approach for the drop, and starting with a higher altitude from farther up the salad bowl, the trailing airtanker ended up with a slightly faster airspeed at the desired drop height and drop point, thus was catching up to the leading airtanker. Due to the small burn area, and traveling at 176 feet-per-second, the drop-zone window was fairly small. As they approached the drop zone, the trailing airtanker had reduced power to slow down and started to move to the leading airtanker's side while maintaining a perceived [by the pilot] one-quarter mile separation.

Both aircraft dropped their jettison load in sequence—not simultaneously—with approximately 2 seconds interval between drops. The trailing airtanker remained clear of the leading airtanker's drop, and being responsible to yield the right-of-way (FAR 91.113 (f)), continued to move laterally out and 'abeam' the leading airtanker. Although there were no specific violations against the FAR's or departmental policy, this action had the appearance of a "formation flight" maneuver and was photographed and published in a local newspaper.

INCIDENTAL ISSUES/LESSONS LEARNED

1. Review departmental policy regarding minimum drop height (150') of airtankers relating to aircraft and ground safety, and relating to proper height for retardant speed dissipation for safety and maximum retardant effectiveness. Retardant is most effective against fire when the retardant speed is near zero at the top of the vegetation, and "rains" down vertically into the fuel.
2. Provide training tips to field, ATGS, and airtanker pilots reinforcing what a proper retardant drop is supposed to look like (heavy, vertical rain, **not** high-speed impact), and educate on ways user feedback should be reported to the tactical aircraft (via air attack, or your line supervisor).
3. Remind that communications discipline is more important than ever, and communications overload can have direct—and indirect—consequences to efficient and safe tactical operations. Be aware when aviation tactical frequencies with the ground are on the common ground Tac net, or on a separate frequency. Each has its own benefits and drawbacks, and line personnel need to be aware of which frequency management plan is in effect.
4. Understand that even legitimate practices conducted within internal guidelines can have significantly different interpretations by the public and media. Continually evaluate both the operational necessity and the perceived reactions to high-visibility actions. Continue to refine departmental policy regarding Formation Flights to define it better than the FAR's, provide general limitations, and when to allow it (funerals, lead-plane missions, air attack briefings on incidents, plane-to-plane damage assessment, etc.).
5. Review fire retardant chemical exposure protocols and if exposed, attempt to wash off as soon as it is safe to do so.