Green Sheet Summary

Investigation Summaries of Serious Injuries, Illnesses, Accidents and Near-miss Incidents

CA-TCU-006950

Tuolumne-Calaveras Unit
Sierra-South Region

October 18, 2000

Burn & Physical Injuries

Lookout Communications Escape Routes Safety Zones

SUMMARY

On October 18, 2000, at approximately 1300 hours, two nearly simultaneous incidents occurred on two separate divisions of a 10-15 acre wildland fire in Calaveras County. The results of these two incidents were first and second degree burns to three Firefighter-Is and a twisted knee and ankle to another Firefighter-I.

CONDITIONS

Fuels

The area has fairly light fuels, primarily cured annual grasses 6"-8" with scattered brush. The brush consists of Yerba Santa 20" to 48" tall and Toyon Berry 2" to 8" tall. There are some pockets of Chamise 3" to 7" tall and Oaks from 4" to 20".

Weather

Weather readings were not taken at the fire; however, Remote Automated Weather Station (RAWS) data was available from three stations in the Unit. Based on those observations, and information from the National Weather Service (NWS), the conditions during the incident were estimated to be:

Temps:	Upper 70s – Low 80s
RH:	Upper 20s – Low 30s
10hr FM:	6-10%
Winds:	Light and variable with up-slope gusts to 10mph.

The area was generally understood to have been under an unstable air mass.

Staffing

All engines were staffed at the minimum of 3-persons. The Unit reduced coverage at all stations to one engine per station two days before the fire and the nearest air tankers were off contract at the same time. The Unit's helicopter and five engines were committed to a VMP burn in an adjoining Unit on the day of the fire. The initial attack response to this fire was significantly less than it would have been a few weeks earlier.

Topography

Terrain: The fire's origin was located on a 30% slope approximately 450 feet above a year-round creek. The slope increases to almost 75% approximately fifty feet above the origin. The elevation of the incident goes from 1, 200' to 1,780'. There are a number of distinct rock outcroppings from about the 1,400" elevation to the top.

Aspect: The accidents were both on southern exposures.

Slope: There are three distinct slope bands across the incident. The bottom one-third was calculated at 25%-30%, the middle third at 70%-105% and the upper slope at 40%-45%. The slope levels out at the very top, with an average slope of

the incident calculated at 52%.

General: There were two separate accident sites. The first was on Division A, near the eventual center of the fire and the second site was located on Division B near the eventual East flank, at about mid-slope.

The first site was immediately below a large rock outcropping within the 70%-105% slope band at about the 1,600' elevation. The fuels in the immediate area were predominantly annual grasses with some pockets of Toyon and Oak.

The second site was within the steepest portion of the hillside with an estimated slope of 104% at about 1,480' elevation. The fuels in this area were primarily annual grasses with Yerba Santa and Toyon well distributed across the area.

The incidents occurred within minutes of each other and both groups of firefighters reported a wind gust just prior to the accidents. This is consistent with a drainage wind moving up canyon and turning up slope.

Fire Behavior: The fire originated from a line source ignition as a result of residential broadcast burning. As it moved from the gentler slopes near the residence into steeper slopes, it spread rapidly and was at the top of the ridge upon the first unit's arrival. Once the fire reached the top of the ridge, the primary spread was along the ridge slope. Initial suppression efforts from the top were effective in stopping the lateral movement on the top portion of the fire; however, the lower portion continued to spread. Witnesses stated that for the most part, flame length rarely exceeded one foot as the fire spread laterally. The fire's spread in the oak-covered grasses along the bottom of the incident did not result in a rapidly moving fire. Once the fire moved from under the oak canopy, it immediately moved into lighter fuels and picked up in intensity. As the fire moved up the slope, it would occasionally torch in the shrubs, resulting in spot fires.

SEQUENCE OF EVENTS

Division "A"

CDF initial attack Engines 4451 & 4472 arrived at Division A (right flank) and began a 1½" hose lay down hill. An additional CDF engine arrived a short time later and firefighters from that unit were instructed to support the hose lay.

Upon reaching the end of the hose lay, the personnel from the initial attack engines went back up the hill to get more hose. A Fire Captain who was also on the hose lay directed the two remaining firefighters to support the CDF hand crew assigned to Division A. Their instructions were to cool down active parts of the fire while the hand crew constructed hand line below the hose lay.

The firefighters continued the hose lay for an additional 300 feet until they attached their last length of hose, which broke. Having no more 1½ " hose, but with a pack containing 300 feet of 1" hose, a decision was made to clamp the broken hose and utilize a 1" hose line at the lateral just above the broken section. Their plan was to keep the fire in check until more 1½ " hose could be brought down.

Once the 1" hose line was charged, one of the firefighters called out a spot fire 20 feet downhill from the control line. The two firefighters made the decision to try to

extinguish the "spot fire" with the 1" hose line, but the water stream from it was not effective. The fire quickly gained in intensity and began to spread.

One of the firefighters escaped up hill into the burn, loosing his helmet in the process. The other firefighter continued to protect himself with the 1" line until the heat subsided. Both firefighters were then able to evacuate up the hill to the safety of their engine where they were evaluated for their injuries.

Division "B"

CDF Engine 4461 arrived at the East flank of the fire staffed with an FAE and three (Note: the whole line needs to be backspaced to eliminate the space) Firefighter-I's. Their initial attack decision was to extend a 1½" hose lay down the East flank. They anchored their hose lay at the top, using a ridge top road as anchor point. Fire spread was described as light to moderate with flame lengths not exceeding 6" in light grass, back burning into the wind.

During the early stages of the attack, one firefighter sprained his ankle but continued with the hose lay. After laying 600' of hose, the Engineer reported that they had run out of water. As the firefighters waited for additional water, a brush patch below them ignited and began to burn heavily. One firefighter had moved up the hill to the next coupling with two firefighters standing below, one in the burn and one in the green. As the fire activity increased, the firefighter standing downhill in the green jumped into the burn. Wearing a hose pack with 200' of 1½" hose, he covered his face with his hands and jumped through waist high flames, twisting his knee when he landed. He was the same firefighter who sustained the earlier ankle injury.

The firefighter standing furthest upslope was not aware of the increased fire activity and was slow to respond. He was also standing in the green wearing a hose pack with 200' of 1½" hose. As flame length grew from 6" to an estimated 6', the firefighter was forced to jump into the burn. Unable to see his footing, he fell and began an uncontrollable downhill roll. He threw the hose pack off and attempted to get his feet pointed downhill to stop his decent, losing his helmet in the process. He stopped his slide a short distance later and sustained a 1st degree burn to the tip of his nose and the inside of his right wrist.

All three firefighters return to their engine and received medical treatment.

INJURIES

One Firefighter on Division A suffered a twisted knee. The other suffered first-degree burns on the face and wrist.

One of the Firefighters on Division B suffered second-degree burns to the face while the other suffered a second-degree burn to his neck and first-degree burns to the face.

SAFETY ISSUES FOR REVIEW

1. The initial attack, although a sound decision, was down hill. Thermal lifts and radiant heat from the fire below always adversely affect downhill attacks.

2. All PPE should be worn properly. None of the four injured Firefighters had their goggles on or their shrouds "buttoned up". At least the two Firefighters, who lost their helmets, did not have their chin straps on.
3. Late season fires can be deceiving. Fires that appear to be, "Not doing much", can change quickly. Fuels that have dried and seasoned out all summer long can suddenly explode under the right conditions.
4. Late season fires generally have reduced staffing and equipment, adding to the problem of staffing a safe and effective initial attack.

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