

GREEN SHEET

California Department of Forestry and Fire Protection

Informational Summary Report of Serious CDF Injuries, Illnesses, Accidents and Near-Miss Incidents



Nicolaus Fire Burnover

Fire Engine Burnover with Firefighter Burn Injuries Placer County Fire Department Brush 73 & Brush 75

June 11, 2008

**CA-NEU-012363
CA-CNR-000035**

California 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.

SUMMARY

On June 11, 2008, Placer County Fire Department Brush 75 (BR75) and Brush 73 (BR73) were involved in a burnover accident during wildland fire suppression activities on the Nicolaus Fire, west of Lincoln, California. The burnover resulted in burn injuries to two CAL FIRE Firefighters and one Placer County Volunteer Firefighter. Both fire engines were destroyed by the fire.

CONDITIONS

Fire Apparatus: The fire apparatus directly affected by the burnover were both ICS Type 3 fire engines with modified staffing.

- BR73 is a two wheel drive 1992 International conventional cab with a skid-mount pump and a 500-gallon water tank. BR73 was staffed with two CAL FIRE firefighters (one Fire Apparatus Engineer and one Firefighter 1) at the time of the burnover.
- BR75 is a two wheel drive 1982 International conventional cab with mid-ship and auxiliary pumps, and a 500-gallon water tank (Model 1). BR75 was staffed with one Placer County Fire Department volunteer firefighter at the time of the burnover.

Location: The wildland fire incident occurred in the unincorporated area of Placer County, west of the City of Lincoln, California. This is in the Local Responsibility Area protected by Placer County Fire Department which has a cooperative fire protection agreement with the California Department of Forestry and Fire Protection (CAL FIRE) Nevada-Yuba-Placer Unit. The accident site was on a dirt road approximately 670 feet south of the intersection of Nicolaus Road and Airport Road (Latitude: 38° 53' 43" N Longitude: 121° 21' 30" W). The elevation at the accident site is approximately 110 feet above sea level (ASL).

Topography: Flat with the exception of an agricultural irrigation canal near the accident site.

Fuel Type: The incident occurred in grass (fuel model 1) with an overstory of Eucalyptus trees and associated ground litter. Eucalyptus trees flanked both sides of the dirt road with canopy closure over the road prior to the incident.

Fuel Moisture:

- 1 Hour Fuel Moisture: 2%
- 10 Hour Fuel Moisture: 3-4%
- 100 Hour Fuel Moisture: 4-5%
- 1000 Hour Fuel Moisture: 6%

Based on June 11, 2008 Fire Behavior Research, Missoula, MT - USFS

Weather Observations: June 11, 2008, 0955 hours from Lincoln RAWS Station (5.02 miles E/SE)

Temperature: 73 Degrees Fahrenheit
RH: 21%
Winds: 10 MPH N/NW, gusts to 23 MPH

Rainfall: January 1, 2008 to June 10, 2008 precipitation amounts reported by the Lincoln RAWS totaled 4.33 inches of rain. The average for this period is 15.77 inches of rain.

April 1, 2008 to June 10, 2008 precipitation amounts reported by the Lincoln RAWS totaled 0.46 inches of rain. The average for this period is 2.67 inches of rain.

Fire Behavior: The Nicholas Fire was burning in fuel model 1 (grass less than 3 feet in height), the recorded fuel moisture on the day of the incident was 2% or less based on the California State trend. The fire was being driven by a North-by-Northwest wind sustained at 10 MPH with gusts reaching 23 MPH. Based on the Behave Plus model, the rate of fire spread was 665.6 chains per hour (ch/h) which equates to an approximate fire spread in excess of 8 MPH. The heat produced by the fuels that were adjacent to the accident site reached an estimated output of 1415 British Thermal Units (BTU). This, in conjunction with the fuel types involved resulted in an estimated flame length in excess of 12 feet.

SEQUENCE OF EVENTS

On the morning of Tuesday June 10, 2008 the National Weather Service issued a Red Flag Warning for the Sacramento, CA area. This warning, issued at 5:00 A.M. Pacific Daylight Time (PDT) predicted "Gusty northerly wind and low humidity" for Tuesday, June 10, 2008 and to remain in effect until 5:00 P.M. PDT on Thursday, June 12, 2008. The wind was predicted to be northerly at 15 to 30 miles per hour (MPH) with gusts to 40 MPH or more.

On Wednesday June 11, 2008 at 9:49 A.M., the Emergency Command Center (ECC) for the Nevada-Yuba-Placer Unit received a 9-1-1 telephone report of a vegetation fire on Nicolaus Road, near the intersection of Airport Road. The ECC initiated a standard wildland fire response with an augmented response by the City of Lincoln Fire Department. Placer County Brush 75 (BR75), staffed with one Placer County volunteer operator at Station 75, located approximately 1.25 miles west of the fire on Nicolaus Road, responded to the fire. Placer County Engine 70 (E70) and Placer County Brush 73 (BR73), each staffed with one CAL FIRE operator and one CAL FIRE firefighter, responded to the fire from 1.7 miles east of the fire on Nicolaus Road.

At 9:52 A.M., BR75 arrived at scene and reported a 5 acre, wind-driven fire. The fire was on the south side of Nicolaus Road, burning through a field of annual grass. Unable to make access on the right (west) flank due to a drainage

ditch and barbed wire fence, BR75 continued past the fire and made access through a locked gate, east of the fire, and continued south on a dirt road lined on both sides with Eucalyptus trees. The fire at this time was burning in the field to the west and had not yet reached the dirt access road. BR75 continued south on this access road.

At 9:55 A.M., E70 arrived at scene and assumed command of the fire. E70 requested one additional water tender and one type 3 fire engine. At 9:55 A.M., BR73 arrived at scene and drove down the access road on the east side of the fire. Although this was the same road BR75 drove down, the crew on BR73 could not see BR75 due to the vegetation.

During this time, BR75 continued south on the access road approximately 750 feet. BR75 stopped when the operator observed the fire crossing the access road approximately 300 feet ahead. BR75 then backed up approximately 30 feet into a reduced fuel zone. The operator on BR75 exited the vehicle, donned his web gear and walked west across a dry irrigation canal. The operator, after observing the left flank of the fire, decided to begin fire suppression. The operator returned to the driver's side of BR75 and pulled the one-inch hose on the reel line, located behind the cab of the engine. The operator returned to the west side of the canal with a charged hose line.

BR73 arrived at BR75's location and the operator from BR75 made contact with the operator on BR73. After discussing the situation, it was determined that both units would disengage suppression tactics and back out. The crew from BR73 began assisting BR75 with rolling in the reel line. After reeling in most of the line, the operator on BR75 told the crew from BR73 to return to their engine and begin backing out, and he would finish reeling the hose.

The crew returned to BR73 and the operator of BR73 instructed the firefighter to utilize the front discharge one-inch hoseline to suppress the fire near BR73. The firefighter exited the passenger side of the cab and went to the back compartment to retrieve his webgear. The firefighter donned the webgear as he walked around the driver's side of the engine. As the firefighter was pulling the front discharge hoseline, he felt a blast of intense heat. The firefighter retreated to the driver's door of the engine and entered the cab, causing the operator to move across the seat to the passenger side of the cab. The operator began making a distress call on the tactical frequency indicating that the cab was filling with smoke and that it was difficult to breathe. The firefighter, sitting in the driver's seat, then began backing BR73 to the north on the access road. BR73 backed approximately 80 feet when a loud sound described as an "explosion" was heard and the fire engine suddenly stopped moving. The operator and firefighter recognized the fire engine was on fire and exited the cab on the passenger side to escape through the back. The operator and firefighter continued through the burn to the west and then to the north toward Nicolaus Road until making contact with the crew from E70.

During this time, the operator on BR75 was attempting to finish rolling the hose when flame impinged on his legs from under the engine. The operator dropped the hose and retreated to an unburned area on the access road to the south, in front of BR75, to wait for the fire to pass. The operator of BR75 attempted to retrieve the nozzle to protect the engine, but had to back away due to the heat and smoke. The operator retreated to the east, jumping a barbed wire fence into a mowed field. The operator walked north through the field, met with Lincoln City Engine 35 (E35) and assisted them with the extinguishment of BR73. When the operator from BR75 was notified the crew from BR73 was safe, he walked to the ambulance located on Nicolaus Road, east of Airport Road to seek medical treatment.

All three personnel were treated for their injuries and transported to the University of California (UC) Davis Burn Center. The operator on BR73 was the first transported by air ambulance. The firefighter on BR73 was transported next by air ambulance and the operator on BR75 was transported by ground ambulance.

INJURIES/DAMAGES

Injuries:

Brush 73 Operator

1st and 2nd Degree burns to the face

- A ½" band of unburned skin was observed from left sideburn area continuing under chin to right sideburn area

1st and 2nd Degree burns to the palms of both hands

2nd Degree burns to the backside of both hands.

- Left hand has deeper 2nd Degree burn

Brush 73 Firefighter

1st and 2nd Degree burns to the face and ears

2nd Degree burns to the palm of left hand

2nd Degree burns to left knee

Brush 75 Operator

1st and light 2nd Degree burns to nose

Damages:

Both BR75 and BR73 sustained major fire damage.

Preliminary inspection of the apparatus indicates that both vehicles are a total loss.

SAFETY ISSUES FOR REVIEW

1. Personal Protective Equipment
 - a. Proper utilization of FULL wildland PPE prior to engagement of a fire.
2. Fire Line Safety Policy 1734
 - a. Eighteen Fire Situations
 - i. Safety Zones and Escape Routes have not been identified.
 - ii. You are constructing fireline without a safe anchor point.
 - iii. You are attempting a frontal assault on a fire.
 - iv. You are in heavy cover with unburned fuel between you and the fire.
 - v. You notice that the wind begins to blow, increase or change direction.
 - b. 10 Standard Fire Orders
 - i. Keep informed on fire weather conditions and forecasts.
 - ii. Identify escape routes and safety zones, and make them known.
 - iii. Fight fire aggressively, having provided for safety first.
 - c. Common Denominators of Fire Caused Tragedies
 - i. In small fires or in deceptively quiet sectors of large fires.
 - ii. In light fuels, such as grass, herbs, and light brush.
 - iii. When there is an unexpected shift in wind direction or speed.
3. Engine Protection Line Policy 7070.16
4. Lookouts, Communications, Escape Routes, Safety Zones (LCES)
 - a. All components of LCES must be used, as they are interdependent. Awareness of each component and how they interact is necessary to provide the safest working environment.



