GREEN SHEET

California Department of Forestry and Fire Protection (CAL FIRE)

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

Electrical Shock – Downed Power Lines

September 25, 2010

Bodega Incident

10-CA-LNU-007420
10-CA-CNR-000042

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.

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

SUMMARY

On September 25, 2010, at approximately 1315 hours, a Bodega Volunteer Fire Company Firefighter was participating in fire suppression activities at the Bodega Fire and made contact with a downed 12 KV power line receiving a substantial electrical shock. The firefighter sustained electrical shock injuries with associated burns. The firefighter was transported to a trauma center for initial treatment and then on to a burn center.

CONDITIONS

Location: The fire was 3.5 miles inland from Bodega Bay, 15 miles west of Santa Rosa and 50 miles north of San Francisco.

Topography: The accident site was between 4 knolls. Elevation change between the accident site and knolls range between 220' and 350'. Slope was flat to 18%. There is an approximately 6' dry "V" shaped drainage ditch that was between Highway 1 and the accident site.

Fuels: Fuels in the area were annual grasses, Gorse, Eucalyptus Trees, Willows and a barn.

- Grass: grass averaged 10" deep and was matted down in areas. Grass was continuous to the south transitioning to Gorse southwest of the accident.
- Gorse: Gorse a densely branched, spiny shrub that can form thickets. Gorse can range from 2'-10' height. Its densely arrayed branches contain volatile oils that present a fire hazard[1]. Gorse created a hedge along fence line next to Highway 1 east of the hose lay with some spots where you could walk through. North and West of drainage ditch to Highway 1 and west of the hose lays, Gorse was continuous and averaged 7'. Gorse was continuous south west of the accident site.
- Eucalyptus Tress: There is a grove of Eucalyptus trees on the south side of Highway 1 and a small grove on the south side of the ditch. Average litter depth was 6" between Highway 1 and the ditch, with deeper litter in the drainage ditch.
- Willows: The Willows fuel moisture was too high to support combustion and created an unburned island west of the accident site.
- Barn: there was a small barn (approximately 24' x 24') just to the east of the accident site.

Weather: Occidental Weather Station, 4 miles north of the fire at 1259 hours:

- Temperature 84°
- Relative Humidity (RH) 27%
- Wind calm
- Between 1000 hours and 1300 the RH dropped 19%
- Winds at the fire were generally from the East 3-8mph

[1] Trees and Shrubs of California John D. Stuart and John Q Sawyer

Fire Behavior: The fire spread was slow to moderate being influenced by the wind. The wind was being affected by the terrain causing eye level winds to have an eddying effect. Personnel at scene experienced up to 180° turns in the wind direction. Grass fuel moisture was high enough that it did not burn in the shaded areas and in some of the matted down areas. The Gorse burned upslope and with the wind. Burning in the Eucalyptus was limited to the litter with the exception of some torching next to the barn. Both the grass and Gorse were highly influenced by the variable eye level wind. The fire at the accident site was generally backing or moving laterally in the grass, Eucalyptus litter and under-burning of torched out Gorse. Smoke conditions were heavy due to the fuel moisture content.

	ROS Wind 0mph	ROS Wind 1mph	ROS Wind 2mph	ROS Wind 3mph		FL Wind 0mph	FL Wind 1mph	FL Wind 2mph	FL Wind 3mph
Grass Shaded	2	4	10	20		>1	>1	1	2
Grass Exposed	4	7	16	33		1	1	2	3
	Rate of Spread (ROS)					**Flame Length (FL)**			
Gorse Shaded	1	5	10	15		2	5	6	8
Gorse Exposed	2	6	11	17		3	5	7	9

SEQUENCE OF EVENTS

On September 25, 2010 at 1233 hours, a vegetation fire near the community of Bodega California, near Highway 1 and Bodega Highway was reported to the Redwood Empire Dispatch Communication Authority (REDCOM). The initial dispatch of Sonoma County Fire and Emergency Services Department (SCFESD) and other local government resources, was made. As the fire was located in State Responsibility Area (SRA) the call was transferred at 1234 hours to Saint Helena Emergency Command Center (ECC) for dispatch of CAL FIRE resources.

Bodega Volunteer Fire Company E8782 arrived at scene at 1240 hours and E8772 arrived at scene at 1241 hours. E8782 gave the initial report on conditions to the ECC at 1242 hours indicating a half acre burning in brush, moving uphill, with one structure threatened. E8782, staffed with two personnel, took an attack mode and began to fight fire on the right flank.

E8772, staffed with two personnel, proceeded to the left flank. FF1 and FF2 initiated hoselay #1 (H1). H1 started at the power pole near Highway 1 and proceeded southeast towards the barn to protect it from the advancing fire. After advancing approximately 100 feet, the hoselay was abandoned due to changing conditions. FF1 and FF2 exited back to Highway 1.

Water Tender 8792 (WT8792) arrived 1242 hours and was initially positioned under power lines at the power pole that H1 was started from. The operator of WT8792 quickly realized the possible dangers of being under the power lines and repositioned the apparatus on the east side of E8772.

FF3 arrived in a personal vehicle with poor fitting and insufficient personal protective equipment (PPE). FF3 traded Nomex shirts with the operator of WT8792 then acquired a helmet and portable radio from FF1. FF1 remained on Highway 1 with E8772 while FF2 and FF3 advanced hoselay #2 (H2) from same power pole H1 was started from. This hoselay advanced to the south towards the black. On the south side of the drainage ditch, a second length of hose was added to this hoselay. At the end of the first length of hose, near the edge of the fire, FF2 and FF3 separated as FF3 continued to progress the charged hose into the black while FF2 stayed back to pull hose through the drainage ditch. At this same time the wind shifted reducing the visibility to where FF2 could no longer see FF3. After approximately 30 seconds, the visibility cleared and FF2 heard moaning sounds, in the direction of FF3. FF2 looked up and saw FF3 lying on the ground approximately 20' to the southwest. FF2 went to assist FF3 and received a minor shock when making physical contact with FF3 and also observed the downed power line.

FF2 started to return to E8772 to advise others on the roadway that power lines were down and of the injury to FF3. FF2 was approximately 25 feet from the engine, looked back, and saw FF3 crawling back towards the drainage ditch. FF2 returned to assist FF3 and upon reaching FF3 FF2 noticed another firefighter coming towards the hazardous area. FF2 alerted this firefighter of power lines down and to keep out of the area.

FF2 assisted FF3 back to E8772 where treatment was initiated by an on scene medic unit at the same time the firefighter that was alerted returned to E8881 which was located at the residence notified the company officer who then notified the incident commander of the power lines down. The Life Hazard Alert for Power Lines Down was broadcast at 1319 hours. FF3 was transported to local trauma center via ground ambulance at then transferred via air ambulance to a burn unit.

INJURIES/DAMAGES

FF3 received significant electrical shock with associated burns, was transported to a burn unit and remains hospitalized with multiple entry and exit burns, 2nd and 3rd degree, of various sizes and locations, totaling 5 to 7 percent of body surface area. The shock received by FF2 was insignificant and required no treatment.

SAFETY ISSUES FOR REVIEW

- All wildland personal protective ensembles shall meet with CALOSHA, NFPA and department specifications.
- All personnel and resources shall check-in and adhere to staging criteria and/or accountability processes to allow for orderly entry and proper briefing prior to engaging in suppression activity.
- Any hazard observed should be communicated to supervisor and co-workers immediately. Stay out of area until danger has passed. This includes dozers, power lines, etc. Be alert - "Lookup, Look Down, Look Around".

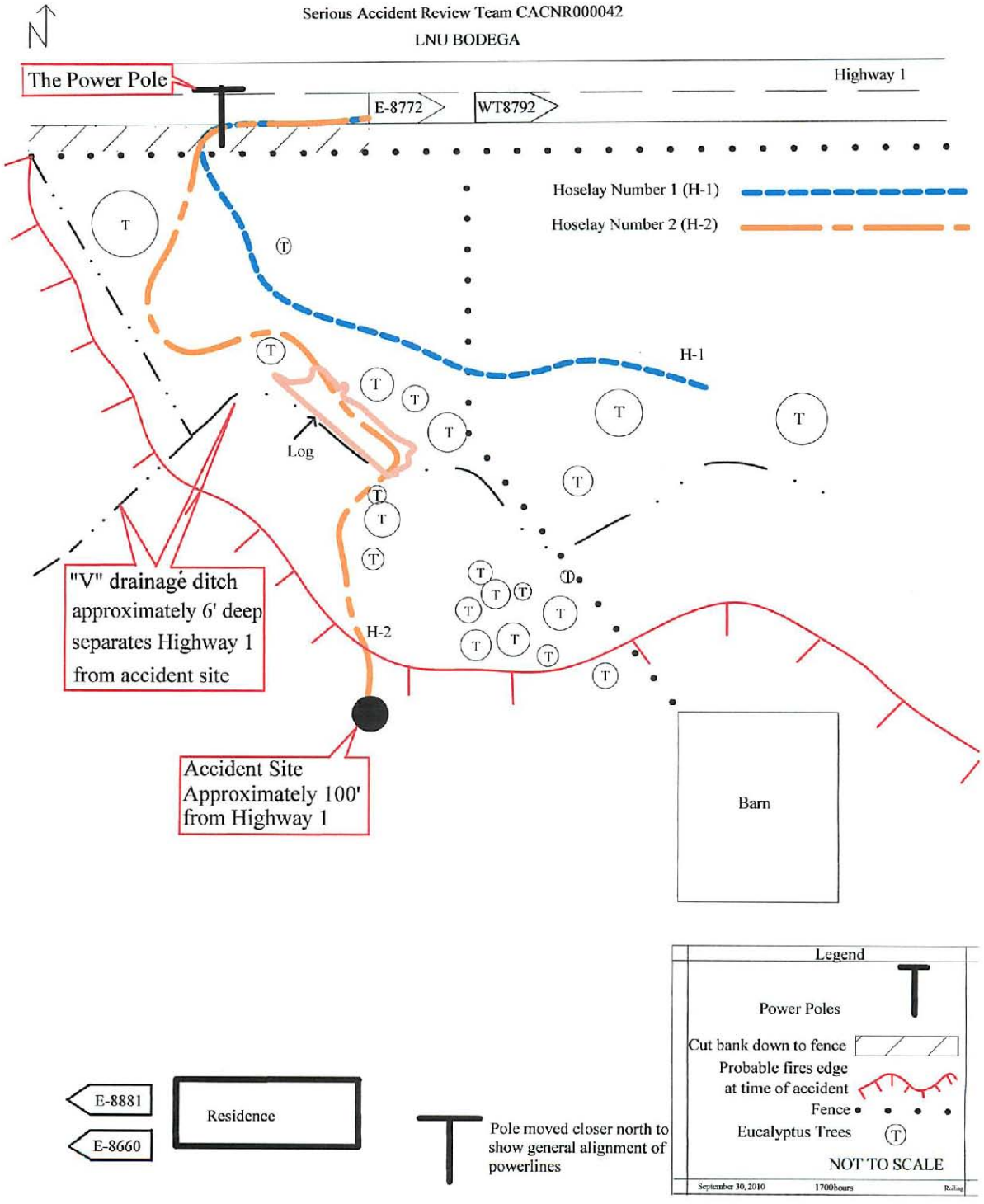
- Upon arrival at any emergency scene, the first task to be performed is size up where the possibility of electrical hazards should be considered.

- Review and adhere to local communications plans, maintaining prompt communication with your crew, your supervisor and adjoining forces.

- Confirm receipt of life hazard announcement with each assigned unit once the alert has been made.

- Incident Commanders are responsible for the safety of all incident personnel and may have to take action to protect personnel from life threatening conditions that on-scene fire personnel and other responders do not have the capabilities, tools, or training to immediately mitigate. These actions may include:
    - Immediate notification of personnel
    - Notification for ongoing or long-term life hazards
    - Methods to isolate and clearly identify the life hazard with three strands of barrier tape.
    - Assignment of Lookouts or Assistant Safety Officers when needed
    - Identification methods for remote or large area life hazards

- The clearly identifiable method to assure that fire personnel and other responders do not enter Life Hazard Zones includes the use of a minimum of three (3) horizontal strands of barrier tape that states "**Do Not Enter**" or "**Do Not Cross**," to prevent entry to the hazardous area. Three horizontal strands of any fireline tape or flagging tape between one inch and three inches with the words "Do Not Enter" or "Do Not Cross," securely fixed to stationary supports, and in sufficient locations to isolate the hazard, will meet the requirement of identifying a Life Hazard Zone. (FIRESCOPE Field Operations Guide - Firefighter Incident Safety and Accountability Guidelines, ICS 910, Section 21-4)


Serious Accident Review Team CACNR000042
LNU BODEGA
The Power Pole
Highway 1
E-8772
WT8792
Hoselay Number 1 (H-1)
Hoselay Number 2 (H-2)
H-1
H-2
Log
"V" drainage ditch approximately 6' deep separates Highway 1 from accident site
Accident Site Approximately 100' from Highway 1
Barn
E-8881
E-8660
Residence
Pole moved closer north to show general alignment of powerlines
Legend
Power Poles
Cut bank down to fence
Probable fires edge at time of accident
Fence
Eucalyptus Trees
NOT TO SCALE
September 30, 2010
1700hours