

Feather River RX Burn - Firefighter Injury Facilitated Learning Analysis



Date of Incident February 18, 2010 @ 1331

Subject: Firefighter Burned While Conducting Prescribed (RX) Fire, CA- PNF.

Note: This was reviewed using the June 2009 Facilitated Learning Analysis Implementation Guide.

Incident: On February 18, 2010 ten firefighters from the USDA Forest Service were assigned to a low complexity pile burning prescription on the Plumas National Forest, CA. During operations one firefighter suffered second-degree burns to his right leg covering approximately three percent of his body. The firefighter was transported to a burn center for treatment.

Summary: The firefighters were a collective crew from several district modules and had been burning piles for approximately four months with over 600 acres of completion. The unit was located on a 30 percent slope and the forecast called for a mostly sunny day with temperatures in the mid 60's and relative humidity in the 46% to 60% range.

0942 The crew notifies dispatch of their plans to burn within units 64 and 66/S.

1042 Prescribed Fire Burn Boss 3 Trainee (RXB3-T) notifies dispatch that they are starting ignition on unit 64.

1242 RXB3-T advises dispatch that they completed unit 64 and are moving to unit 66/S.

1304 RXB3-T notifies dispatch that ignition has begun on the piles in 66/S.

1325 Fully qualified Burn Boss (RXB2) declares a medical emergency (firefighter burned) over the radio and requests ground transport (ambulance) to meet patient at a Cal Fire station approximately 10 minutes away.

1331 Forest Service dispatcher calls Cal Fire dispatch to request ambulance and advise that patient is in transport. Cal Fire dispatches two engines, ambulance and medevac air ship.

1348 Patient arrives at fire station and is transferred to ambulance. Forest Service and Cal Fire Chief Officers convene and decide to follow interagency burn protocol and transport patient by air directly to burn center. Ambulance delivers patient to landing zone for air ship.

1425 Air ship is off the ground with patient.

1447 Air ship lands at the burn center approximately 1 hour and 22 minutes after medical emergency is declared.

Conditions:

- To the best of his recollection the injured firefighter was lighting with his drip torch upside down and over the pile with his right leg (injured leg) very close to where the dripping flame was landing within the pile. A site inspection also revealed unburned branches slanted in the direction of the firefighter's leg that could have carried liquid fuel mix to him. The site where he was standing, his work boots and fire retardant pants all smelled of fuel mix. The firefighter did remember spilling some mix on his boot earlier in the day while filling his torch.
- Fuel conditions were not conducive to lighting and required the firefighters to hold their torches in one position in order to build a heat source and allow the piles to ignite. This process brought the firing groups closer to flames for a longer period and created a flaming heat source directly under their torches. Because the injured firefighter cannot remember the exact events leading to his injury it is also possible that his torch heated up since drip torches have been known to pressurize under these conditions and allow flames to spurt or shoot in undesired directions. This may have contributed to his pant leg igniting.
- The district had been burning piles for several months and there are three approved JHA's in place. Two JHA's had been signed by only five participants and the other had been signed by some participants three months earlier. It is unclear if the injured firefighter had signed any of them, but he did take part in a tailgate safety session on the morning of the incident. All three of the JHA's in the RX plan address the spilling of fuel mix on clothing and PPE in the abatement actions.
- Element 2, the Prescribed Fire GO/NO-GO checklist was not part of the project record. The checklist contains a box asking the question, "Have all personnel been briefed on the project objective, their assignment, SAFETY HAZARDS, escape routes and safety zones."

Lessons Learned From Participants:

- I saw my coworker yelling and rolling on the ground with fire still burning his leg, I could not put it out and I even tried to throw dirt on it as the fire was starting to burn my own hands without gloves on. You kind of forget how horrific and painful the whole event can be. I would not wish this on my worst enemy.
- One of the JHA's calls for a trauma kit to be present at the site. A kit was present for a short time but was unintentionally left in the back of a utility vehicle that left the project site. At the time of the injury first responders did not have a trauma kit but have decided to incorporate a redundant system with more than one kit in the future.
- Our radio system was not working properly during the emergency, the area did not have cellular phone service and we did not have satellite phones available. In fact the district has been without satellite phones for almost two years. We had to jump on to Cal Fire frequencies to facilitate the response. Without the close cooperation of our State partners the event could have had a worse outcome.

Lessons Learned From Facilitator:

- The RX Plan Complexity Rating Worksheet describes a low complexity prescription with low fire behavior risk, minimal problems with supervision or communications and low safety risk with mitigation measures built into the plan. With low complexity, over months came the potential for low vigilance and the project has possibly become mundane. In this case some district employees have rotated out of the burning for training or days off but a fresh set of eyes from another district or perhaps chief officers consistent presence could add some awareness to the project.
- The 66/S unit had been cut and piled by contracted crews over a year earlier. The cover left on the pile had degraded over time and no longer served its purpose of providing a dry wick to light. In the future piles should be lit before this degradation occurs or perhaps our contracts could identify a durable, longer lasting cover.
- The project JHA's call for avoiding fuel on clothing or PPE. Two of the three even call for the employee to change their clothes once contaminated by flammable material. Since this is so clearly documented I would expect that a change of clothes be available in the field, this was not the case as only one participant had a change of clothes on the day of the incident.
- When a fellow worker is injured the employees rally for the emergency response and then within hours of the incident are continuing support in their roles as friends or family of the patient. The physical and emotional out pouring of all involved can be very strenuous. Leaders should not overlook the opportunity for closure through some form of critical stress debriefing.
- Documentation for the RX burn was weak and the project record was incomplete. Some National Forests use their dispatch office as the keeper of the project record and document through the RX checklist that items such as notifications, holding & contingency forces, spot WX, GO/NO-GO checklist etc. are complete and in place prior to burning.
- The District and Forest has had radio issues in the past and have filed at least one Safenet on this issue. Until radio issues are resolved on the Forest I would recommend all field units incorporate a redundant system, identify this issue in JHA's and tailgate safety sessions to include cell phones and satellite phones.
- The injured firefighter suffered second degree burns to his lower right leg at a total of 3% of his entire body. He also required four full days of care at the UC Davis Burn Center. It became obvious that managers on the ground took the employees personal welfare and long term health into consideration by seeking the best possible care available to them. In the stressful situation of emergency response, the best decision was made for our employee.

[http://fsweb.r5.fs.fed.us/program/safety/corner/FireSafety/NWCG Standards for Burn Injuries.pdf](http://fsweb.r5.fs.fed.us/program/safety/corner/FireSafety/NWCG_Standards_for_Burn_Injuries.pdf)

