Event Type: Drip Torch Burn Injury

Date: October 8, 2021

Location: Turkey Tracks Prescribed Fire
Pike-San Isabel National Forests
Colorado

The Story and Lessons from this Drip Torch Burn Injury Incident

On October 8, 2021, the Pikes Peak Ranger District was conducting a 251-acre prescribed burn on U.S. Forest Service lands in Teller and Douglas counties. A member of the engine crew was assigned to a five-person ignition team to conduct ignition operations. While conducting a drip torch refuel, the team member spilled the drip torch fuel onto his lower pant leg. The crew member was wearing the appropriate PPE for operations. The crew member did not change his pants after the spill incident occurred and continued with ignition and burning operations.

The firing operations had progressed approximately two-thirds to completion when the injury occurred. The crew member was conducting the ignition operations walking over open flame, causing the pant cuff to move around the fire boots. The crew member stepped over open flame when the ignition of the pant occurred. The crew member was burned on the inside of the pant leg, causing first and second degree burns to the lower leg—approximately the size of a hand in several places.

After an investigation, it was identified that the crew member was wearing the proper PPE flame-resistant pants for the operation being conducted. The crew member spilled the drip torch fuel onto his lower pant leg, allowing the fuel to soak through the pant. The movement of the pant leg while walking allowed a fuel air pocket to form inside the pant leg. Once the crew member walked over an open flame it ignited the flammable fume vapor pocket, causing a fire inside the pants.

While the overall integrity of the PPE flame-resistant pants did function properly, the fuel vapor and oxygen inside the pant was not allowed to ventilate through the pant leg due to the construction of the material. (The brand of flame-resistant pant was not identified as of the writing of this RLS.)

Providing the Patient with the Highest Level of Care

After the Incident Within an Incident (IWI) was initiated and patient care was being implemented, it was determined by U.S. Forest Service EMTs that the patient was stable and had a pain level of "3" (Mild Pain that is noticeable and distracting, however, the patient can get used to it and adapt).

The EMTs realized that the probability of a full-blown shock event was low. They discussed patient transport options and the most rapid way to transport the patient to a burn unit. While an EMT was finishing dressing the wound, the Forest Duty Officer made calls to the nearest burn center.

The decision was made to ground transport the patient directly to the ER that was attached to the burn center, thus reducing the probability of referral conflicts, and providing the patient with the highest level of care possible. Within three hours of the burn injury occurring, the patient was admitted and receiving burn treatment in a regional burn center.

Lessons

Many lessons were learned in this incident:

- *"See Something Say Something."* We teach this and speak this, but do we really practice this? In our new working environment and technological world, face-to-face communication is becoming less and less. Is the world we operate in as successful as it needs to be in open two-way communication? At times it has become more difficult to teach employees the importance of speaking up during a potential incident. In this case,

several personnel saw the drip torch fuel spill onto the pant leg, however, they didn't speak up or report the incident to a supervisor. If this was reported, or the employee was approached, this incident could have possibly been prevented.

- When weighing policies and best practices against each other, how do we navigate getting the patient to definitive care in less than one hour? Do we assess patient condition and add additional time to get into a burn center and avoid the constant headaches of patient referrals from ERs at local hospitals? In this incident, this latter course of action was determined to be the best option to achieve the best care for the patient. By taking the patient directly to the burn center rather than to the nearest hospital, we feel we provided the best possible outcome for the incident.

- *Train, Train, Train* – IWI check your plans and know the process. Train on all kinds of incident severity—then do it again. Even though we train often, when the injury actually occurs out in the field, it can still be difficult to make decisions and engage the IWI-IC. Practice and critique. Be honest in that critique—that's how we learn.

- Understand all PPE and equipment and know how it operates. What is the purpose of the PPE and what is it designed to do? Ask the questions regarding how this piece of equipment protects you and how it is designed to protect you. Learning this will help facilitate proper adjustments and gear corrections when the integrity of the equipment is compromised. We learned that the flame-resistant pants will withstand direct flame when ignited, however, they will also trap fumes inside when fuel is applied to the material. An operator is responsible for their PPE at all times and must ensure the safe and proper use of these materials.

- Create opportunities for team building between modules and crews. At home units where multiple resources are stationed, utilize down time for team building and communication exercises.

- This burn injury occurred on a weekend. The Forest Service's Albuquerque Service Center (ASC) is closed for normal operations on weekends. There is the hotline that works for incidents. However, this was a prescribed fire "project"—not considered an "incident". "We were unclear of the process to get the CA-16 started so we dug into connections to help us through this process," explained a Safety Manager familiar with this IWI medical response. "We learned that a supervisor is approved to initiate the CA-16 and begin medical treatment. Initially, this was unknown to us—or during the IWI, it was not remembered. This information should be made known to all appropriate parties as it's difficult sometimes in the moment to remember—or to deviate from normal operations. In addition, the ASC hotline should be open to any and all incidents and injuries."

This RLS was submitted by:

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