Rapid Lesson Sharing

Event Type: Tree Strike

Date: September 19, 2022

Location: Cedar Creek Fire, East Zone
Division Juliet

This incident was the second tree strike in less than one week in which two firefighters were injured during falling operations on the Cedar Creek Fire.

Incident Overview

Middle management was given large chunks of ground with lots of resources that, at times, stretched them beyond their span of control and required them to work outside current qualification levels.

The Cedar Creek Fire had grown to almost 114 thousand acres over the course of one month. It was 14 percent contained, with just over 2,000 resources still committed to the incident.

Mid-September brought a shift in weather patterns along with cool and wet fall-like conditions that had served to drastically slow the fire's progression. Even so, many resources remained and were actively engaged in work that had been undertaken when fire growth was rapidly expanding and posed a threat to values at risk.

Due to the large fire size and the expansive distances that comprised each Division, radio communications among resources were strained and transmissions over TAC were often inaudible.

Middle management was given large chunks of ground with lots of resources that, at times, stretched them beyond their span of control and required them to work outside current qualification levels. For example, trainees were working independently without a trainer and overhead was utilized in management positions beyond what was found on their resource order.

Concerns were shared upward. But the response given by the Incident Management Team (IMT) was: *"their hands were tied"* and that *"additional resources were being order but coming back as unable to fill".*

This has become a familiar situation over the years and has become largely accepted as standard operating procedures on the ground. Rather than adjusting tactics until middle management positions can be filled, we continue to utilize the resources available and address span of control issues as situations allow.

It was under these conditions that a firefighter on a Type 2 Initial Attack Crew was struck by a tree during felling operations. This incident was now the second tree strike in less than one week in which two firefighters were injured on the Cedar Creek Fire. Luckily, in both instances the injured firefighters were able to be sent home to recover from their injuries. Both accidents took place under very similar conditions and included Type 2 Crews working in adjacent Divisions prepping the same contingency line only a few miles apart.

Accident Narrative

Two brothers working for the same Type 2 Initial Attack Crew had just finished their break at around 1615 on September 19. They were the first to stand and reengage the work of prepping a roadway by removing small diameter trees and bucking logs that remained after a masticator had been through the area. The older of the two

brothers was not yet certified as a FAL3, while the younger brother was a FAL2 Trainee working on his Position Task Book.

Both sawyers were excited about the opportunity they had been afforded for some more "trigger time" and were eager to get back to work. Both had demonstrated some proficiency operating a chainsaw throughout the day as trainees at their respective levels. They had therefore been given more latitude to carry out chainsaw operations without the direct supervision that they had previously received that day.

"I didn't really think there was much to be concerned about as we were only falling smaller sized trees."

The Younger Brother, FAL2 Trainee

He Watched in Horror as the Tree Fell Toward His Brother

The younger brother walked up and placed an undercut in an 8-inch diameter lodgepole pine that was 25 feet in height. He had not paid particular attention to the fact that the tree had a back lean opposite the intended lay. Just as he finished his back cut, he was surprised as the tree began to sit back and fall 180 degrees in the opposite direction from where he had intended it to go.

He began to panic as he noticed his older brother was bucking a log a short distance away—in the direct path of the falling tree that was now heading directly for him. He screamed and yelled, desperately trying to get his brother's attention. But his brother's head was down with his eyes focused on bucking his log. He couldn't hear his younger brother's screams over the noise of his saw, with his ear protection inserted in his ears.

The firefighter's helmet that was hit in this tree strike incident. (For more information, see page 5.)

For a moment, as the younger brother continued to yell, he moved under the falling tree he had just cut and attempted to hold it upright—fighting hard against its weight to keep it in place. He continued to yell, hoping his screams would eventually grab his brother's attention and get him to move before the accident—that he was watching unfold in slow motion—could take place.

As the weight of the tree began to commit to its natural lean, it finally broke what remained of the hinge wood. That's when the younger brother began to bear the true weight of the tree and realized his attempt to stop it from falling was futile. He therefore moved off to one side and watched in horror as the tree fell directly at his brother—striking him squarely in the center of his helmet. Although the tree was only 2 inches in diameter at the tip that struck him, it nonetheless hit him hard, causing his knees to buckle under the impact of the blow and knocking his helmet from his head.

National Statistics Show Forestry Workers are Most At Risk to Both Fatal and Non-Fatal Injuries

Compared to all industries, forestry workers have at least 15 times the fatality rate and three times the non-fatal rate, according to a 2020 U.S. Bureau of Labor Statistics report.

"Struck By" incidents and their injuries are almost equally divided between the chainsaw operators and other workers such as swampers.

The most common types of fatal accidents to workers in 2021/22 continue to be falls from a height, "struck by" type accidents including moving vehicles, and struck by flying/falling objects. These "struck by" accident types accounted for more than half of all fatal accidents to workers in 2021/22.

Due to Radio Commo Issues, TFLD (t) is Four Miles Away

The Task Force Leader Trainee [TFLD (t)] who had been given responsibility to manage the crew and various other resources along this section of road, was four miles away on a knob when the call about this medical incident from the Crew Boss came across the TAC channel.

This knob location was the only place in which the TFLD (t) was able to monitor and respond to radio traffic that would reach all the resources under his control. Being so far away from the operation left him unable to provide direct oversight and management of these resources.

The Crew Boss reported they had a "GREEN" medical and stated they were prepared to read the 8-Line over Command. The TFLD (t) asked them to hold off as they had been instructed not to use the Command channel to report GREEN medicals and to utilize TAC frequencies instead. As the TFLD (t) began to respond—realizing his distance from the incident—he radioed another TFLD who was closer to aid in the response.

A flurry of radio traffic began to clog the airways as the qualified TFLD and Division J were shutting down numerous equipment operations taking place along the route in preparation for medical and other personnel to arrive.

There were masticators, feller bunchers, skidders, and water tenders of various types and sizes working together on the fuel break. Reaching every operator by radio inside their cabs over the noise of their machines continued to prove difficult. This dilemma added to the tension of those people who were attempting to shut down the operation in preparation for a medical response.

"We had a GREEN medical and a YELLOW mechanism of injury."

Medic 1

The Medical Response

Initially, direct communication requesting Medic 1 to respond was slow to take place. In fact, Medic 1 first heard about the "GREEN" medical when they received a text message from another medic working on the same Division who had overheard the radio traffic. It wasn't until then that Medic 1 began to respond.

Shortly after arriving at the accident scene, Medic 1 found the patient sitting on the back tailgate of a truck. He appeared to be alert and aware. After taking vitals and performing a patient assessment, everything checked out and the GREEN medical status was confirmed.

The status of the patient was eventually elevated to YELLOW by the IMT Medical Unit Leader after it was reported over the radio by Medic 1 that the mechanism of injury was a direct tree strike to the head.

The patient was then transported by ambulance to the local area hospital. He was treated and quickly discharged with a doctor's determination that it was safe for him to return to work. The firefighter then rejoined his crew.

The next day, after the adrenaline of the event had worn off, the injured sawyer began to feel the true aches and pains associated with the tree strike. His initial desire to continue working with the crew slowly began to fade as the physical post-accident realities set in.

It was also noted that other symptoms began to manifest that were symptomatic of a mild concussion. The decision was made to release the sawyer from the incident and send him back home to recover.

Commonalities
in Both Cedar Creek Fire Tree Strike Accidents

To see the RLS on the first Cedar Creek Fire tree strike incident that occurred on Sept. 15, 2022:

Cedar Creek Fire East Zone Hit by Tree

- Injuries occurred to sawyer trainees who—after the tree strike occurred—wanted to shake it off and keep working.
- The accidents happened just after a break and moments after reengaging in the work.
- Each incident took place late in the day—after 1600.
- Sawyers on both crews referenced a "lackadaisical" attitude toward falling small diameter trees.
- There was limited supervision of trainees and crews.
- There was a divergence from standard training practices around spacing and Work Area Control.
- The PPE involved in the incident was not available for inspection.
- The injured sawyer was not available for an interview with the RLS Team.

Lessons

Following Standard Safety Practices Taught in Basic Saw Training

Each year we continue to injure firefighters because of tree strikes that occur during felling operations that most likely could be avoided if adherence to standard safety practices taught in basic saw training were followed.

A contributing factor to many of these accidents is often a sawyer misreading a tree's lean or not completing a thorough tree size-up to account for the lean before executing the felling cuts.

- Review saw training materials to ensure safety training standards are known. Make adherence to these standards a requirement that builds good habits.
- Teach sawyers a standardized and comprehensive size-up process that includes identification of a tree's lean in relation to the desired lay.
- Never underestimate the dangers of falling small diameter trees. While performing cuts, these trees provide very little margin for error. They have enough mass that when coupled with height have the potential to be fatal.
- Always maintain direct sight and sound supervision when mentoring trainees as they perform high-risk activities and shutdown their work when direct supervision is not possible to ensure the safety of the trainee and those working around them.
- Make certification a requirement prior to allowing individuals to operate a chainsaw independently on an incident.
- Continually monitor the "Human Factors" and perform periodic check-ins with individuals to help maintain situational awareness and fend off complacency.

Systemic Problem:
The Lack of People Qualified for Middle-Management Single Resource Positions

Not having enough people qualified to fill middle-management single resource positions on emerging incidents has become a systemic problem. The effects of this situation are widely known.

Rather than seek solutions at the strategic level that might help resolve this current problem, the risk is routinely transferred to individuals working as overhead who fill single resource type positions on incidents. This places individuals in a compromised position. Furthermore, it forces them to work outside certification levels and beyond

what would be considered a normal span of control—that increases the likelihood of bad outcomes when things go wrong.

- Learn to speak up and refuse resources or assignments that push individuals beyond their comfort level and reduce the effectiveness to manage personnel.
- Practice Incident Within an Incident (IWI) protocol and become familiar with utilizing the Medical Incident Report (8-Line).
- Ensure direct communication with medical personnel any time assistance is requested to ensure they have received the necessary information to respond and prepare prior to their arrival on an accident scene.

Learning from Workplace Accident Investigations

- Often during accident investigations, specific details pertinent to the incident are damaged, removed, or are no longer available on site as scene preservation techniques are not widely known.
- Details—such as in this incident—of being able to physically examine the helmet of the injured sawyer, can provide clues that may lead to additional insight and opportunities for learning whether at the agency or individual level.
- A well-built investigation process can help get to the root cause(s) of an event and protect against similar events occurring again in the future.
- The Occupational Safety and Health Administration (OSHA) has outlined a four-step process to help employers and employees conduct workplace incident (accident) investigations:

Four Simple Steps to Manage Incident (Accident) Investigations

1. Preserve and Document the Scene
2. Collect Data
3. Determine Root Causes
4. Implement Corrective Actions

Is it Time to Take Your Helmet Out of Service?

Incident personnel who responded and observed the large crack in the helmet after this accident occurred assumed that the age of the helmet may have been a factor that contributed to this large-size crack as the helmet appeared worn and somewhat brittle.

However, responders at every level had differing understanding of what the correct serviceability date guidance really was. The exact age of the helmet in this incident was never able to be determined as it was not available for inspection during the review. In addition, the picture provided was a top-down shot that did not include the date of manufacture that is printed underneath on the helmet's brim.

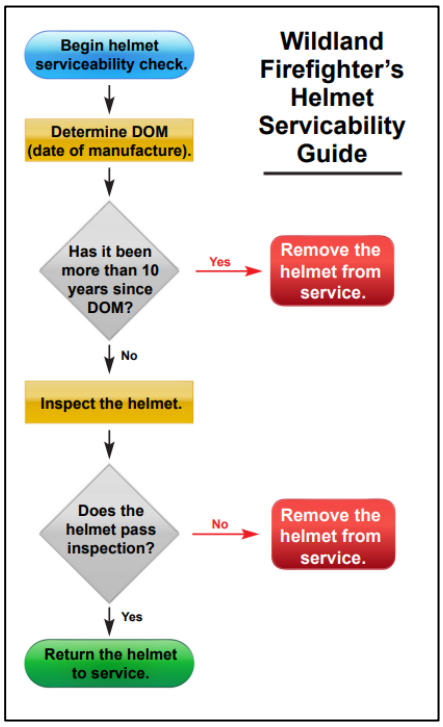
There has been differing direction over the years concerning how to determine a helmet's age and when it becomes time to take the helmet out of service. This has led to various understandings among the members of the wildland fire community as to when a helmet should be retired.

Current guidance for helmet serviceability is determined by three criteria:

1. Date of Manufacture: 10 years maximum.
2. Visual Inspection: Stress cracks, chemical exposure, Ultraviolet (UV) degradation, etc.
3. Physical Inspection: The 1-inch compression flexibility test.

A helmet needs to pass each of these three criteria to remain in service.

Depending on care and use, some helmets may remain serviceable up to the tenth year, while others that that have been subjected to harsh UV or chemical exposure will need to be retired long before then.



This flow chart provides the most up-to-date methodology that should be used to determine if your helmet needs to be replaced.

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