2020 Incident Review Summary
"Action without study is fatal. Study without action is futile."

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1. Introduction

The information in this report comes from wildland fire incidents—from various entities—submitted to and gathered by the Wildland Fire Lessons Learned Center (LLC) in 2020. The primary source of this data is accident reports (FLA, RLS, SAI, etc.). Most of these reports have been posted to the LLC’s Incident Reviews Database. SAFENETs and other data sources have been included when no full report was produced or could not be located.

For 2020 we collected information on 118 operational incidents. We also received 43 reports related to COVID-19. You can find summaries on the COVID-19 focused reports here: Wildland Fire Coronavirus Lessons Summary 2020.

This Incident Review Summary focuses on the 118 operational reports. We have examined these reports, compiled a few numbers and extracted specific lessons. It is our aim to present this information in a way that empowers us all to improve future operations. We hope you turn these lessons into learning—remember...learning requires action.

ACTION

This Icon identifies specific actions you can take to implement lessons.
2. Fatalities

In 2020 the Wildland Fire Lessons Learned Center recorded 15 wildland fire-related fatalities, six more than 2019. It is important to note that this number includes three Americans who died in an airtanker crash in Australia on January 22.

<table>
<thead>
<tr>
<th>Airtanker Fatalities Australia</th>
<th>Three-person crew of a C-130 Large Airtanker all died in a crash while fighting fire in Australia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop Fire SEAT Fatalities</td>
<td>Two SEATS collided during initial attack operations, killing both pilots.</td>
</tr>
<tr>
<td>White River Fire Helicopter Fatality</td>
<td>Helicopter crash during bucket operations.</td>
</tr>
<tr>
<td>Schill Fire SEAT Fatality</td>
<td>SEAT crash during initial attack operations.</td>
</tr>
<tr>
<td>Polles Fire Helicopter Fatality</td>
<td>Helicopter crash during sling mission.</td>
</tr>
<tr>
<td>Hills Fire Helicopter Fatality</td>
<td>Helicopter crash during bucket operations.</td>
</tr>
<tr>
<td>El Dorado Fire Fatality</td>
<td>Hotshot crewmember died while conducting suppression efforts, appeared to have been overrun by fire.</td>
</tr>
<tr>
<td>Salmon Airbase Fatality</td>
<td>Airbase Manager felt left arm numbness after PT. Later hospitalized, died of apparent heart attack.</td>
</tr>
<tr>
<td>Archie Fire Off-Duty Fatality</td>
<td>Heavy Equipment Operator found unresponsive in his vehicle at a staging area before he began his shift.</td>
</tr>
<tr>
<td>Stagecoach Fire Fatality</td>
<td>Individual awoke with chest pains, was transported to a hospital and died as a result of an acute medical emergency.</td>
</tr>
<tr>
<td>Indianola VFD Fatality</td>
<td>Returning from a grass fire, the individual collapsed, was immediately taken to a hospital and was pronounced deceased.</td>
</tr>
<tr>
<td>August Complex Fatality</td>
<td>Entrapment leading to a vehicle accident and burnover during a firing operation.</td>
</tr>
</tbody>
</table>

Ten-Year Graph

![Graph showing number of wildland firefighter fatalities by year from 2011 to 2020]
3. When Rigs Burn

This year we recorded six different incidents of vehicles catching fire. Four incidents occurred during active fire operations (two during initial attack, one during extended attack, and one during prescribed fire). In addition, a tractor caught fire during fuels reduction work and an engine caught fire while parked inside a bay.

**Woods Cabin Fire – Type 6 Engine Fire**

All indications are that the engine was parked in an area that contained a hot sagebrush stob, which eventually caused the rear tires to catch fire and spread to the vehicle.

**Lesson:**
Ensure there is cold black underneath any vehicle when parking within a burned area. Use hand tools and/or water to create a suitable area for parking and check with the back of your hand for hot spots where the tires will be in contact with the ground.

**Zion NP Engine Cab Fire**

The likely cause was an unidentifiable electronic device powered by a lithium battery, stored with maps underneath the back seat of the truck. The suspected device was an AED (automated external defibrillator) spare battery unit that produced heat as a result of its condition when in storage.

**Lesson:**
Do not store AEDs near flammable materials, including foam cushions, under seats or in proximity to other combustibles (maps, clothing, etc.). Make certain your AED, and all spare batteries, are a part of your PM Checklist.

**Burn Unit 217 UTV Fire**

The operator was returning to the briefing area when he noticed the brakes were not working. After a second attempt of mashing the pedal to the floor, the operator looked down—and realized that the floorboard under his feet was on fire.

**Lesson:**
After each operation, clean out under the UTV’s floorboards. The compartment under the floorboards is not obvious and is not easily cleaned by daily washing. To thoroughly clean this compartment, the panel on the floorboard needs to be opened and cleaned out.

**ACTION**

Does your crew:
- Inspect and/or spray down your parking area in the black?
- Inspect AED as part of your daily PM Check?
- Regularly clean under the UTV floorboards?

If your answer is NO to any of these – TAKE ACTION!
4. Loose Chaps
Just because your chaps are on does not mean your legs are protected—the chaps need to be snug. 2020 is the third year in a row with a chainsaw cut when loose chaps are pulled aside by the spinning chain.

2020

Chainsaw Kickback Incident
The fast-moving chain cut into the chaps, causing the chaps to be pulled toward the inside of the sawyer’s lower left leg, allowing for the lower leg to become exposed to the still-moving chain.

2019

Beeskov Fire Chainsaw Cut
The saw came off the cut and into the left outside of Sawyer #4’s saw chaps. The spinning chain rolled the chaps up and then quickly sliced into his left leg above the calf before it finally stopped.

2018

Taylor Creek Fire Chainsaw Cut
The saw’s teeth grabbed the saw chaps and rolled them from the outside inward, exposing the sawyer’s unprotected leg. The chain bit into his leg below the knee, causing a laceration.

Two Other Saw Cuts in 2020

Boring Back Cut Accident
Upon contact the saw glanced off the outside of the tree and swung down and to the left, striking the sawyer on the lower left arm.

Bucking and Limbing Boot Strike
While limbing a felled tree, the chainsaw came into contact with the sawyer’s boot.

ACTION
Does your crew:
- Have standards on tightening leg straps so chaps are snug?
- Routinely drill for how to deal with a chainsaw cut?
If your answer is NO to any of these – TAKE ACTION!
5. Rocks and Rolls

This year we received four different reports of firefighters being struck by falling rocks. The injuries associated with these events were significant.

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<table>
<thead>
<tr>
<th>Incident</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mullen Fire Hit by Rock</td>
<td>A rock struck a firefighter and knocked them into a tree, resulting in a concussion and multiple broken vertebrae.</td>
</tr>
<tr>
<td>Bighorn Fire Hit by Rock</td>
<td>A rock hit a firefighter, which caused them to fall onto an adjacent chainsaw. The firefighter received 30 stitches for a facial laceration.</td>
</tr>
<tr>
<td>Miles Fire Hit by Rock</td>
<td>A firefighter was digging line on a steep slope when a rock above dislodged and hit the firefighter, resulting in a broken finger.</td>
</tr>
<tr>
<td>SOG Fire Hit by Rock</td>
<td>A firefighter was struck on the head (helmet) by a 159 lb. rock and suffered a skull fracture requiring surgery.</td>
</tr>
</tbody>
</table>

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Heavy Equipment rollovers occur every year; 2020 was no exception. The two events from this year both mention maneuvering over rocks as a contributing condition.

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</tr>
</thead>
<tbody>
<tr>
<td>Baboon Fire Dozer Tip-Over</td>
<td>The rocks and the dozer started to slide. The dozer slid off the rocks and momentum tipped the dozer.</td>
</tr>
<tr>
<td>Neals Hills Fire Skidgine Rollover</td>
<td>The operator felt the machine shift sideways as his right rear tire rolled off a half-buried two-foot boulder.</td>
</tr>
</tbody>
</table>

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**ACTION**

- Rocks can increase the equipment’s operating angle.
- Talk with equipment operators about rocky ground.
- Rolling rocks present a significant risk to firefighters.
- How will you determine acceptable exposure to this hazard?
6. Trees on Trucks
Trees strike vehicles with some regularity. Recent occurrences: 2013, 2014, 2015, 2017, and 2020. The August Complex event from 2020: A tree fell onto the truck of a Task Force Leader who suffered three fractured vertebrae and extensive ligament damage. An Engine Captain was first on scene and called a “Red” medical on the radio. A REMS team responded, packaged the patient, transported them to a waiting ambulance at the nearest Helispot. A National Guard helicopter flew the patient to a hospital. **This report has very good lessons in it. You should read it.**

**Similar Instances**

**Tree Falls on Moving Vehicle**
A military crew leader was driving a truck (2015 Ford) when it was impacted by a 14-inch DBH green spruce tree. The tree landed directly on the vehicle’s hood.

**Nuns Fire Engine Tree Strike**
An engine crew stopped to assess smoke at the base of a tree. The 60-inch wide and 120-foot tall fir fell and landed across the hood of the engine.

**ACTION**
Falling trees present a significant risk to firefighters.
- How will you determine acceptable exposure to this hazard?
- Will you always use the same process?
- Who will be involved in the discussion/decision?
7. In Their Own Words
This section includes quotes and lessons from those who were directly involved in the incident.

Flammables and Fire
“We tote jerry cans all the time – should be thinking about staging them more and take that into account.”

*Put mitigations in place to prevent fuel from igniting.*

**Caldwell Fire Burn Injury**

Slow Roll
An Engine drove around potholes and the road’s soft shoulder gave way.
“As the engine slowly slid off the road, I had this surreal feeling of, ‘well, we are gonna roll’.”

*Go slow and stay off the road shoulder.*

**Engine 644 Slides Off Road**

Lightning Mods
“Both firefighters got struck through the ground. Both firefighters are OK. Moving downhill and taking cover.”

A medical on a fire staffed by two people leaves a single person responsible for all aspects of the emergency.

**Kidney Lake Lightning Strike**

No IC? It’s You.
During the Rock IWI, people responded to the scene in “rescue” mode. Instinctively, this meant they were going to take some kind of action.

The initial phase of the IWI was “a bit chaotic” (in the words of the participants) on the ground with people taking independent action until the Rock IC was established. People may engage in activities that are actually more hazardous (ex. people digging line into a smoky, hazardous area).

*Find out who the IWI-IC is when you get to the scene. If you can’t figure it out, it might be you.*

**Polles Fire Fatality**

Pause...
Those working to improve a helispot took the time to pause and discuss:
“We need to be really, really careful of what we’re doing. The trees are tall; be aware of where people are, we don’t want a 2nd injury.”

**Lily Lake Fire Smokejumping Accident**
**Dangerous Delivery**

“I feel sick. I can’t breathe.”

Two personnel delivering food packed with dry ice suffered carbon dioxide exposure.

Use caution when transporting dry ice in vehicle. Roll down windows to circulate air into the vehicle or consider alternate means to transport.

*Pine Gulch Fire Dry Ice Outgassing*

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**Death Missiles**

“The tree began to fall and was heading straight where I had intended it to go. I turned and took a few steps away. I heard and saw the tree hit the ground and come to rest. I moved a step or two back toward the tree, looked up to check for overhead hazards, and found one—with my mouth.”

Get away from the tree you just fell and let it simmer for a minute. Give it 30 seconds and wait for the death missiles to land before you approach the stump.

*Boggy Draw Hazard Tree Limb Strike*

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**Don’t Overtighten**

“I felt the rear of the engine sway. I looked quickly in my side view mirror to see the outside dual pass the engine.”

When a lug nut is overtightened, it causes the shaft to stretch. After each successive overtightening, it takes more torque to tighten the lug—causing further damage. This repetitive overtightening cycle causes lugs to fail by shearing, bending, or rattling loose.

*Engine Duals Come Off*

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**Your job is to implement these lessons.**

**ACTION**

Pick one lesson from page 8 or 9. Plan out exactly how you and your team will put this lesson into practice.
In 2020 we recorded 15 incidents that met the NWCG definition of “Entrapment”. Most of these events involved multiple firefighters.

To be clear, each incident is counted as one entrapment. One entrapment event often involves multiple people.

**During the Last Ten Years**

Average per year: 12 entrapments.

Total: 120 entrapments.

Fatalities: 13 different entrapment incidents involved fatalities. A total of 35 firefighters died by entrapment during this time span.

**NWCG Definition of “Entrapment”:** A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include “near misses”.

**ACTION**

Using the NWCG definition of entrapment (see above) discuss any times you have been entrapped. Share lessons from those experiences.