Event Type: Engine Burnover

Date: September 6, 2020

Location: Wild Mountain Fire, Idaho

In the early morning hours of Sunday, September 6, 2020, a Brush Engine from a rural fire department responded to a wildland fire. While attacking the left flank of the fire, the engine drove into an unseen gully and became stuck. The engine was immobilized in a patch of unburned fuels surrounded by black. Eventually, the engine caught fire and was destroyed. All crewmembers were able to exit the vehicle and retreat to a safe location in the black.

Photo 1. Brush A after burnover, stuck in the gully.

Response

On September 6, 2020, around 0030 hours, the Wild Mountain Fire was reported to be threatening a large residential community. Brush A, a local cooperator, was dispatched by County 911. Brush A responded to the incident as well as the department Fire Chief (in a separate vehicle). Brush A engaged along the west flank, knocking down the fire as they went.

Brush A eventually moved away from the fire edge, taking a more direct route through the black toward the head of the fire. A crewmember from Brush A walked ahead of the engine looking for hazards.

Due to night operations, navigating the terrain was difficult. The landscape was thick, tall, dense brush littered with gullies and ruts of various size.

At one point, the engine stopped as the scouting crewmember walked behind the engine to check on fire activity. While the scout was behind the engine, Brush A began to slowly move forward. Despite seeing a gully infront of the engine, Brush A continued forward, thinking it was the same size as previous gullies they had crossed.

The engine lurched forward into the gully, driving the front bumper into the opposite side of the bank. The chassis behind the cab came to rest on the ground with the front bumper lodged into the opposite side of the gully. The wheels were suspended. Brush A was stuck and there was no way of getting the vehicle out without assistance.

Communication

"My ultimate goal was to get to the head of the fire and keep it out of the juniper. There's nothing but houses on the bottom side of that." **Brush A, ENGB**

Photo 2. Interoperability box typically used by Federal Agencies. (Image courtesy c-at.com.)

The Engine Boss radioed[1] their Fire Chief informing her they were stuck and needed assistance getting the vehicle out.

In preparation for assistance to get their vehicle unstuck, the Brush A crew hooked-up a large chain to their engine that would be used to pull them out once a rescue vehicle arrived. The crew felt safe at their location due to the amount of black between them and any unburned brush. The crew failed to communicate to their chief that the engine was sitting in an island of green unburned fuel that was surrounded by black. The Brush A crew stated the engine was stuck but safe in the black. The crew continued to monitor the radio for any communication about their situation, waiting to hear when a rescue vehicle would be dispatched and expected on scene. After not hearing any communication regarding their situation, one crewmember began walking to the parking lot that was being used as a small staging area.

The local Forest Service Duty Officer (DO) and the Initial Attack IC both arrived at the staging area around 0130. Shortly after 0130, the Brush A crewmember walked into the parking lot and informed the DO about the stuck engine, stating that both the crew and engine were safe in the black. The DO told the Brush A crewmember he would see what he could do, but his priorities were lives and homes currently at risk.

[1] Most Fire Departments (City, Rural, Volunteer, and other public safety entities) use the 700MHz Band. This frequency allows for signals to cover large geographical distanced and penetrate most building walls whilst requiring less infrastructure. Federal, State, and Local government agencies may also use VHF (Very High Frequency) channels that are reserved for their use. Both bands require a license from the Federal Communications Commission (FCC). Because the frequencies are different, 700Mhz and VHF are unable to directly communicate with one another. An interoperability box is used to interconnect the two frequencies. Each radio with a different band is connected to the box. When a signal comes in from a 700MHz radio the frequency transmission is converted to a VHF signal and then transmitted to any VHF radios on the same channel and vice versa.

Due to cost, very few Municipal departments can afford the equipment. On average each box costs about $6000. Additionally, there must be one 700MHz and one VHF radio that can be connected to the box. Some government agencies have interoperability boxes available for use on wildland fire, however quantities are limited and are typically stored at a Fire Cache or other location and not easily accessed during initial attack if the incident is not near the storage location. The use of an interoperability box also causes a mild delay from one radio frequency to the other due to processing time.

Burnover

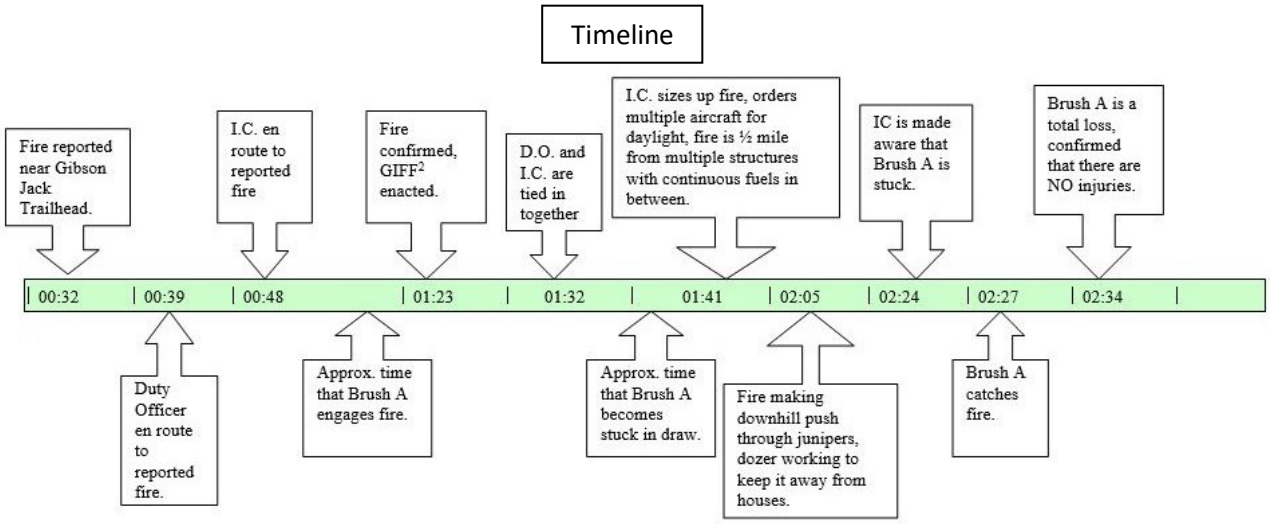
A Bureau of Land Management (BLM) Type 3 Engine and an additional Rural Fire Department Engine (Brush B) soon arrived on scene. The IC assigned the Type 3 Engine to pull Brush A out and assigned Brush B to attack the west flank of the fire. After several attempts to engage their 4wd, the BLM Engine Boss informed the IC they were unable to assist due to vehicle mechanical issues. The IC then assigned them to fire suppression efforts in less rugged terrain.

As Brush B headed down the west flank, they were unaware Brush A was only a few dozen yards away. Brush B began suppression efforts as the crew from Brush A looked on—wondering why Brush B was not assisting them. While engaging in fire suppression, Brush B received radio commo on their 700 MHz from their Chief directing them to assist Brush A. Brush B disengaged from fire suppression and began looking for Brush A. Brush B stopped 30-40 yards short of Brush A and assessed the situation. The "island of green" was actively burning, making its way toward Brush A. Brush B decided driving to Brush A's exact location was too risky and did not proceed.

Photo 4. Brush A fully engulfed.

"It exploded…it was like a 40-foot fireball!"
Duty Officer

Within moments of arriving near Brush A's location,Brush B noticed the mud flaps had caught fire.
Minutes later, Brush A was fully engulfed in flames.The engine exploded in a 40-foot fire ball within seconds. No crew members were near Brush A when it exploded, no personal injuries resulted.



[2] Gateway Interagency Fire Front (GIFF) was formed in the late 1980s as a means of facilitating a coordinated response to wildland fires in and around Pocatello. Current members include Pocatello, Pocatello Valley Volunteer, Chubbuck, Fort Hall, and Inkom Fire Departments, along with the Idaho Falls District Bureau of Land Management, and the U.S. Forest Service CaribouTarghee National Forest.

Commendations

- The crew of Brush A did a good job of keeping in radio contact with their command to relay their status and safety.
- In a situation with competing priorities, the IC kept focused on firefighter and public safety while acknowledging and addressing the property at risk.
- The crew of the BLM Type 3 Engine recognized their vehicle was not operating correctly and chose not to engage in rescue efforts, likely avoiding additional exposure.

Lessons

- Initial attack at night with multiple agencies will always complicate communications. In these situations, work especially hard to ensure understanding. If needed, take extra time.
- Just because a green island has not burned yet, does not mean it won't. Consider this when making plans and communicating needs.
- On terminology, discuss the difference between being "in the black" vs. a "green/interior island". These are very different situations but can easily be miscommunicated. This incident illustrates why the distinction is necessary.
- Off-road night driving is especially hazardous. Be very cautious and utilize a spotter in front of the vehicle whenever possible. See these similar instances:
    - Engine Night Driving RLS
    - Green Monster Rollover

Opportunities

- This situation highlights the continued communication challenges with GIFF and can serve as motivation to continue working toward solutions.
- This incident serves as an opportunity to discuss the dangers associated with pressure build-up and potential explosion of water tanks in fire situations.
- This incident can also serve as motivation to invest in pre-incident collaboration with an emphasis on common terminology. In high-tempo situations, seemingly minor differences can paint very different pictures. Interagency simulations and sand table exercises are a great tool for discovering and addressing differences.

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