Lessons Learned Review
Engine Burnover,
Injuries

Corta Fire, Elko District
BLM

08/04/2019

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1. Executive Summary

On Sunday, August 4th, Northeast Nevada was impacted with a dry lightning event. This weather event ignited the Corta Fire, the first reported wildland fire, at approximately 15:33 hours. Very quickly, more fires were reported throughout the region, tracking from the southern portion of the Ruby Mountains to the northeast portion of the state. This event resulted in two other large fires occurring and several small fires. In total, 14 fires were ignited on August 4th, and multiple fires were unstaffed due to lack of resources during the first shift.

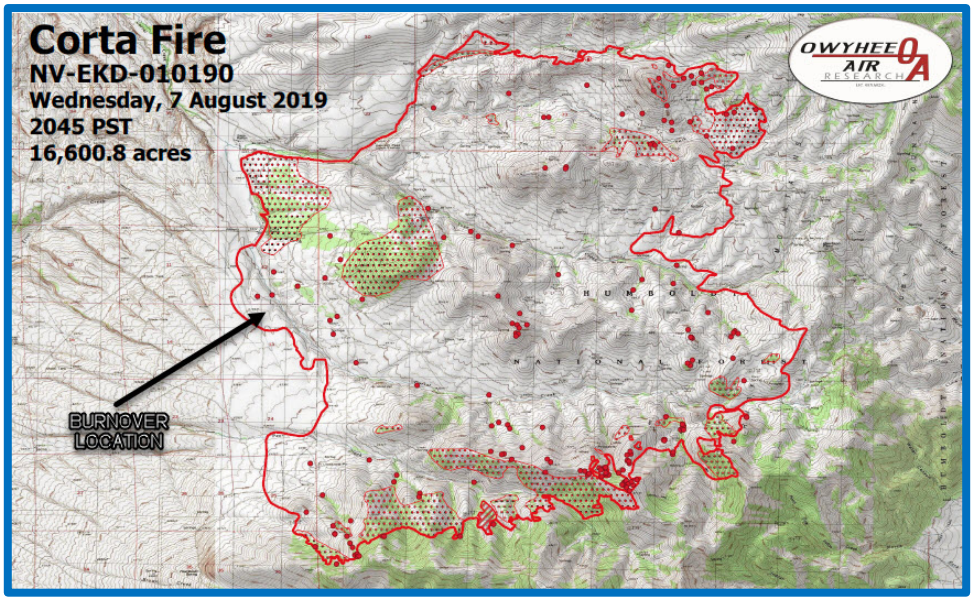
While reviewing WildCad logs, the Corta fire was reported to Elko Interagency Dispatch Center, from Elko Central Dispatch (911), at approximately 15:39 hours. During this time, a second fire was reported in the same vicinity and was named Corta 2 Fire. The following is a summary timeline of events:

- 15:51: The Elko County Fire District resources, en route to the Corta Fires, requested to transfer communication from 911 Dispatch to Elko Interagency Dispatch Center.
- 16:10: Helitack (Type III Helicopter) arrived on scene and sized up both fires and began ordering aircraft.
- 16:15: VFD Engine 55 (E-55) reported as on scene and gave brief size up.
- 16:26: E-55 reported truck burnover (Engine 47) and injured firefighter with minor burns.
- 17:35: The patient was evaluated by an ambulance and it was decided to send the injured firefighter to the Utah Burn Center per protocol.

On the evening of August 4th, the Corta Fire and Corta 2 Fire burned together and were then referred to as the Corta Fire. The fire was reported at approximately 3,000 acres at the end of the first shift. On August 5th, the BLM Fire Investigator (FINV), accompanied by Nevada State Fire Marshal's Office, determined the cause of the Corta Fire as ignited by lightning. On August 4th, the BLM, NDF, USFS, and Elko County determined through a risk complexity analysis the need for a Type 3 IC, and placed the order. On August 6th, a Nevada Type 3 Incident Management Team was in-briefed and took command of the fire at 1800 hours.

2 Purpose

The purpose of a LLR is to focus on the near miss events or conditions in order to prevent potential serious incidents in the future. In order to continue to learn from our near misses and our successes it is imperative to conduct a LLR in an open, non-punitive manner. LLRs are intended to provide educational opportunities that foster open and honest dialog and assist the wildland fire community in sharing lessons learned information. LLRs provide an outside perspective with appropriate technical experts assisting involved personnel in identifying conditions that led to the unexpected outcome and sharing findings and recommendations.



3. The Story

On Sunday, August 4, 2019, dry lightning ignited multiple fires across Elko County, impacting multiple jurisdictions. Fires quickly depleted resource availability and many fires were left unstaffed. At approximately 1530 hours the Corta Fire was reported to Elko Interagency Dispatch Center (EIDC), from Elko Central Dispatch Authority (local 911).

At approximately 1535 hours, the local Volunteer Fire Department (VFD) was dispatched, as closest resource, to the Corta Fire. Engine 47 (E-47) with the Captain 47 and one crewmember, E-55 with Captain 55 and one crewmember, and Water Tender 69 (WT-69) responded to the call. Initially E-47 was difficult to start and required the use of a battery charger to start the engine. E-55 and WT-69 left the volunteer station en route to the incident.

"It got hot…..so I jumped off"

Six minutes later, E-47 left the Volunteer Fire Station en route to the incident. At approximately 1600 hours, EIDC assumed all communication responsibilities for the incident. Within the next fifteen minutes, both E-55 and helitack delivered separate initial attack size-up reports to EIDC for the Corta Fire. Helitack initially estimated the fire at 7-10 acres. There is no official record of E-47 reporting "on scene."

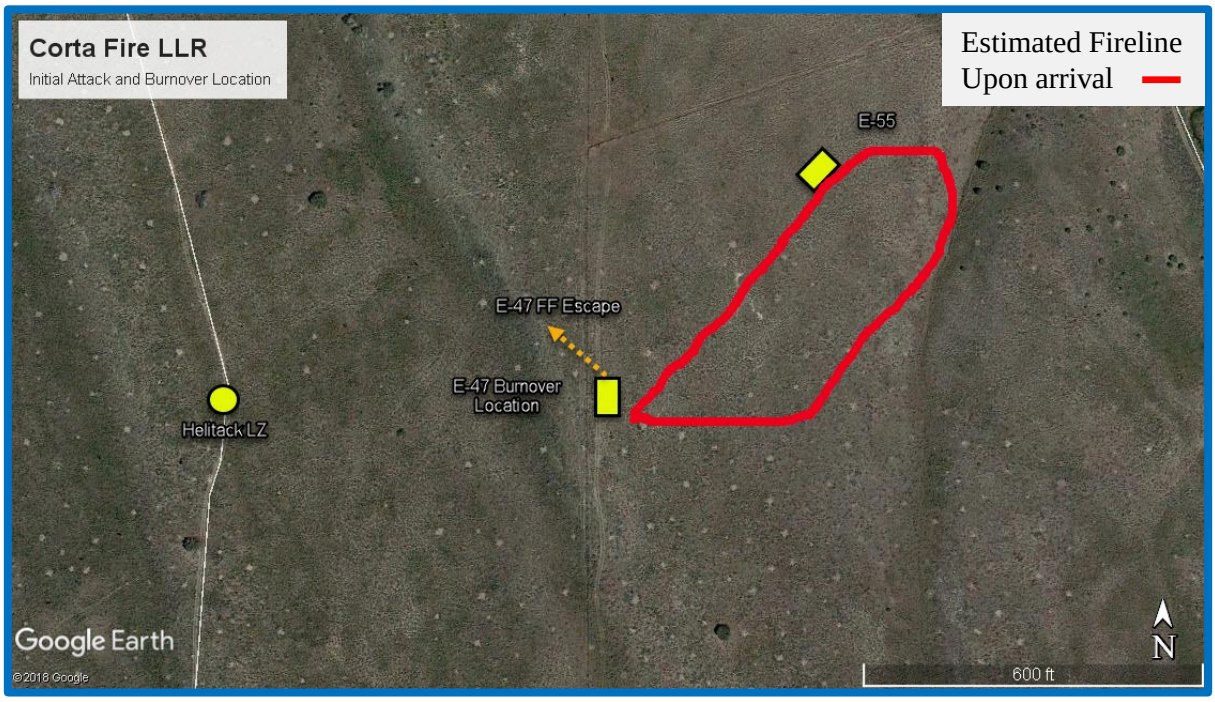
Predominant fuel type

Upon arrival on incident, E-47 proceeded south along a two-track road. Captain 47 contacted E-55, who had moved east toward the fire, near the more prominent drainage. Captain 47 advised E-55 to move away from the drainage and take action on the fire in the flats. At this time, E-55 lost prime on their pump and attempted to roll up their hardline and move location. Unfortunately, the hose reel on E-55 was inoperable. Increased winds and increased fire activity forced the engine to move location while dragging the deployed hardline. E-55 moved west, closer to the two-track road on which E-47 had headed south.

E-55 parked and rolled up their hardline by hand. Meanwhile E-47 moved toward the heel of the fire, with the pump running, and prepared to take action near the closest point between the two-track and the fire.

The fire was creeping in 8-10 inch tall crested wheatgrass (seasonally green at the time), 1.5-2 foot tall sandberg bluegrass and sparse sage, producing 8-10 inch flame lengths. At approximately fifteen feet from the fires edge, the crewmember from E-47 exited the engine and prepared to mobile attack the fire. Upon deployment of the hardline, with the pump running, the engine did not have sufficient pump pressure. The Captain 47 exited the driver's seat and both he and the crewmember went to the rear of the engine to diagnose the loss of pressure.

While both engine personnel were at the rear of the engine, the fire increased in intensity. Flame lengths that were initially reported at 8-10 inches increased to 4-5 feet due to increased and erratic winds. Fire impacted the engine on the front passenger side and quickly swept underneath the engine. The crewmember from E-47 escaped the heat to the northwest across the fence line, while the Captain 47 climbed to the top of the engine. The heat on top of the engine increased and the Captain 47 jumped from the engine, toward the rear. The Captain 47 ran through flames toward the direction of the escaped crewmember. E-55 witnessed the burnover of E-47. The Captain 47 sustained burn injuries during the burnover.

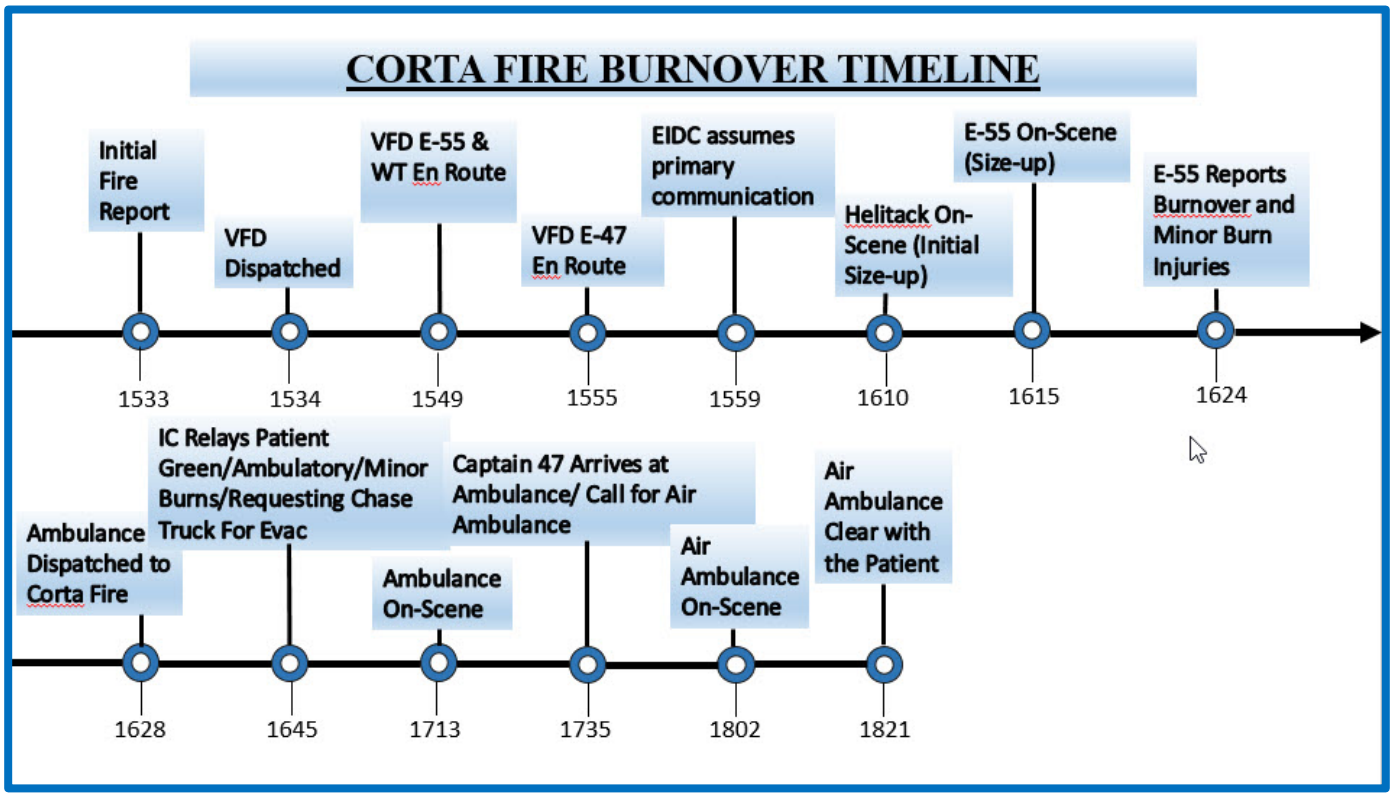


Just minutes prior to the burnover, helitack landed and deployed three crewmembers west of E-47 (IC, senior crewmember, and crewmember). The helitack crew quickly configured the ship for bucket work via belly hook and the helitack crew began working to establish communication with ground resources. The three helitack crewmembers on the ground, also witnessed flames impact E-47.

E-55 approached the burnover from the north-northwest and made contact with E-47 personnel. The fire intensity had greatly decreased and E-47 personnel were able to step into the black. E-55 communicated to EIDC, via command channel, reporting the burnover with minor burn injuries at 1626. EIDC requested 911 to dispatch an ambulance to the Corta Fire. Helitack was unaware of the burn injuries prior to the announcement over command. The IC sent over 2 crewmembers to tie in with E-47 and assess the situation.

The front passenger side took the most heat

E-55 picked up the crewmember from E-47 and continued suppression efforts west of E-47's location. Captain 47 returned to E-47 and was met with two of the three crewmembers from helitack. The front right tire of E-47 was on fire and the helicopter was instructed to put two bucket drops on the engine. After the two bucket drops, the front right tire remained burning. Captain 47 picked up the hardline from E-47 and with the pump still running, utilized the minimal pump pressure to suppress the flames on the front right tire.



The two helitack (senior and crewmember) spoke with the Captain 47, who repeatedly insisted that he was "OK" and "fine". The crewmember remained with the Captain 47. After a short time, the crewmember communicated to the senior crewmember, that the Captain 47 had facial blistering and that the injury might require more attention. The fire continued to increase in intensity then subside, causing E-55 to pull back, then re-establish an anchor and continue suppression efforts. During increased fire activity, the IC chose to make contact with E-55 and actually climb on the rear of the engine and be transported a safe distance from the fire activity.

"I'm a living statistic"

The IC, having made face to face contact with E-55, established radio communication with the engine for the first time. The senior crewmember returned to the Captain 47 and assessed the patient and determined the patient was "green status". A chase truck was requested to transport the patient off the fire line. At 1713 hours, the ambulance arrived on scene. No chase truck was available. The Captain 47 was transported to the ambulance via E-55. Upon patient assessment by the ambulance personnel, an air ambulance was dispatched to the Corta Fire. The air ambulance arrived at approximately 1800 hours and the patient was air lifted to Ely, NV for transfer to fixed wing en route to University of Utah Burn Center in Salt Lake City.

Transfer of command of the Corta Fire, to a Nevada Type 3 Incident Management Team was completed on August 6, 2019. Current burned acreage of the Corta Fire is at 16,526 acres.

4. Lessons Learned Findings

The Lesson Learned Review Team would like to share our gratitude and big thank you to Elko County and the agencies and the departments for their support and courage to participate in this review. A special thank you to those that were directly involved in the incident and shared to make this review as accurate as possible. May the content of this review reach far and wide to help other firefighting organizations with similar situations.

The Burnover

- Fighting fire in light flashy fuels is a common denominator on fatality fires and firefighters must stay situationally aware even when experiences minimal fire behavior.
- Gusty erratic outflow winds from the thunderstorms produced unexpected fire behavior that contributed to the burnover.
- The Burning Index was 87.5, the Ignition Component was 79, and the ERC was 92 (near 85%) on 08/04/2019.
- Crested wheat grass is commonly utilized for competing against cheat grass growth and holds moisture longer than other grasses. Crested wheat grass does not burn with the same intensity as cheat grass.

PPE

- Personnel Protective Equipment was provided but not worn by the Captain 47 (e.g. no hard hat, nomex shirt, nomex pants, or gloves).
- A Fire shelter was present in the driver side door of the cab.
- E-47 crewmember was in full PPE.
- The Captain 47 donned his nomex shirt after the burnover occurred.

The Engine

- Pump issues were present throughout the incident in both E-55 and E-47. Loss of prime, lack of pressure, and troubleshooting were contributing factors in this incident.
- Truck maintenance and procedures were not documented on either engine the day of the incident, and there was no evidence that the pump and flow was operable prior to leaving the VFD station.
- There were no labels on valves on E-47's pump panel (e.g. tank-to-pump, pump-to-tank, tank fill, etc.)
- The hose rewind on E-55 was out of service.
- A maintenance request was completed for having issues with the battery on June 20th for E-47.
- The fuel cap performed as designed to vent in intense heat.

Medical Response

- The Captain 47 remained on scene in the black for over an hour after the burnover occurred. The Captain 47 also had facial hair that was clearly burnt. The Captain 47 donned PPE after the burn, which covered the full extent of the burn injuries.
- During initial evaluation of the injured, the Captain 47 consistently minimized or was unaware of the extent of his injuries stating he was “fine” and “ok”.
- Due to the down-play of the injury, a Medical Incident Report (MIR) was not initiated.
- The helitack senior crewmember identified that he should have completed a MIR upon initial evaluation.
- The Captain 47 received 2nd degree burns on exposed skin: hands, up his arms past the elbow, and face.
- The Captain 47 received treatment at a burn center and was released less than 24 hours after being admitted.

Training

- The VFD department staff have all been trained in basic wildland fire strategy, tactics, and weather.
- Elko County Fire District career staff had conducted RT-130 training prior to fire season.

5. Discussion Points

- How does minimizing injuries play into patient assessment? Either by the injured or by responders.
- How often should maintenance checks be completed?
  - What are your engine check procedures prior to a response?
  - What type of training does your department/agency provide for equipment maintenance?
- What constitutes out of service equipment and how does this play into risk refusal?
- What is your department/agency policy on burn injury protocol?
- How do you engage fire when there is unburned fuel between you and the fire?

Note: The goal of discussion points is to facilitate learning with your department/agency. It is not to imply causality or root causes of this Lessons Learned Review.

6. Recommendations

- Define, determine, and implement a protocol of when, where, and what circumstances PPE must be worn prior to response.
- Ensure a routine, documented maintenance protocol is in place (e.g. daily, weekly, monthly).
- Determine equipment check protocol to be completed prior to response.
- Clearly define what constitutes out of service apparatus.
- Ensure medical response protocols are followed (e.g. EMS protocols, Medical Incident Report, etc.).
- Ensure valves have proper labels.

7. Weather

Crane Springs Nevada (Nearest RAWS)

Daily Summary for

August 4, 2019

Hour of Day Ending at L.S.T.	Total Solar Rad. ° ly.	Wind Ave. mph	Wind V. Dir. Deg	Wind Max. mph	Air Temperature Mean Deg. F.	Fuel Temperature Mean Deg. F.	Relative Humidity Mean Percent	Dew Point Deg. F.	Wet Bulb	Baro. Press. in. Hg.	Total Precip. inches
12 pm	78.6	19.0	184	31.0	91.0		10	27	56		0.00
1 pm	69.8	12.0	208	29.0	92.0		10	28	57		0.00
2 pm	48.1	14.0	236	26.0	88.0		10	25	55		0.00
3 pm	20.5	10.0	181	25.0	88.0		11	27	55		0.00
4 pm	19.3	4.0	354	19.0	88.0		11	27	55		0.00
5 pm	23.0	5.0	45	21.0	87.0		9	21	54		0.00
6 pm	12.9	6.0	328	18.0	84.0		10	22	53		0.00
7 pm	0.9	6.0	341	14.0	74.0		13	20	48		0.00
8 pm	0.0	9.0	303	11.0	74.0		13	20	48		0.00
9 pm	0.0	5.0	5	12.0	72.0		14	20	47		0.00
10 pm	0.0	3.0	6	6.0	73.0		13	19	48		0.00
11 pm	0.0	2.0	37	5.0	73.0		13	19	48		0.00
12 am	0.0	2.0	321	3.0	72.0		13	18	47		0.00

Burning Index: 87.5

Energy Release Component: 92 (near the 85th percentile)

Ignition Component: 79

Corta Fire LLR Team

Team Lead:	Christopher Deets, Fire Management Officer, Green River District BLM.
Technical Specialist:	Julian Angres, Safety and Training Program Manager, NDF State Office
Technical Specialist:	Christian Ramirez, West Zone Fire Management Officer, Payette NF, USFS
Technical Specialist:	Linda Bingaman, Fire Administrator, Elko County Fire Protection District
Technical Specialist:	Adrian Grayshield, Safety Program Manager, BIA Branch of Wildland Fire