Ice Canyon RX Burn Injury

Non-Serious Wildland Fire Accident Investigation

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For:

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Introduction:

On August 09, 2011, a Farmington District firefighter was operating a Terra Torch on the Ice Canyon Rx approximately 20 miles southeast of Blanco, NM within the Farmington BLM Field office. The Terra Torch wand was leaking burn mix near the trigger. The operator got some burn mix on his right pant leg around the calf area, which ignited. The fire was extinguished using dirt by the operator and an engine crewmember. On scene EMTs assessed the Terra Torch operator for injuries and determined that he had received a 2nd degree burn to his right calf.

The purpose of the Non-Serious Accident Investigation (NSAI) is to:

1. Identify facts of the events and develop a chronological narrative of the event;
2. Identify what was learned and what should/or could be done differently in the future; and
3. Identify any recommendations, as provided by the field personnel and supervisors that would prevent or mitigate similar occurrences.

Investigation Process:

Due to the low complexity of the accident, it was decided to utilize an on-site After Action Review (AAR) approach to gather pertinent information from witnesses and crew supervisor to establish chronology of the event, what happened, lessons that were learned, and recommendations for improvement or prevention of future similar accidents

Chronology of Events – August 9, 2011:

The following chronology is provided to set the stage and describe the actions taken by parties involved in this incident. Times are more accurate than 24 hour report due to using date/ time stamps from photos taken of incident and Wildcad log from dispatch.

1623: Burn operations were halted to fix the Terra torch wand leak by tightening packing screw nut on gun per operator's manual guidance for troubleshooting gun leaks at handle.

1805: Terra torch wand leak fixed; burn operations resumed.

1806: Terra torch wand leaking again.

1806: Operator told driver to pull forward an additional 100 feet, to get the torch away from active flames. The leaking wand continued to drip burn mix and make a trail to the Terra torch vehicle. Engines were directed to proceed to the Terra Torch and extinguish any flames.

1806: An individual from one of the engines noticed that the Terra Torch operator's pant leg was on fire. The fire was immediately extinguished using dirt by the operator and the individual from the engine.

1807: EMTs from the engines assessed the Terra Torch operator for injuries and determined that he had received a 2nd degree burn to his right calf.

1808: EMT in charge took over the medical incident, it was determined that the patient needed to be transported to the hospital.

1808: The Burn Boss trainee notified Taos Interagency Dispatch (TDC) of the need of the ambulance and nature of injuries.

1812: TDC called Burn Boss trainee to get more info on extent of injury.

1815: All notifications were made by the Burn Boss.

1816: TDC called back to burn to see if the burn needed anything else. Nothing else needed.

1816: All burn operations ceased.

1817: TDC notified San Juan County Dispatch of the need for an ambulance and nature of injury.

1818: The patient was transported via government vehicle to meet ambulance and on to the hospital.

1830: All control lines were checked.

1915: An AAR was conducted on the prescribed burn and the medical procedures associated with the burn injury.

1930: The patient arrived at the San Juan Regional hospital.

1935: All resources released from incident.

2115: Burn boss arrived at the hospital. The individual received second degree burns to the right front calf, approximately one hand coverage or about 3% of body area. It was determined that the individual was going to be released from the hospital shortly.

2230: The individual was released from the hospital.

August 10, 2011

0900: An AAR was conducted on events leading up to and involving the terra torch incident.

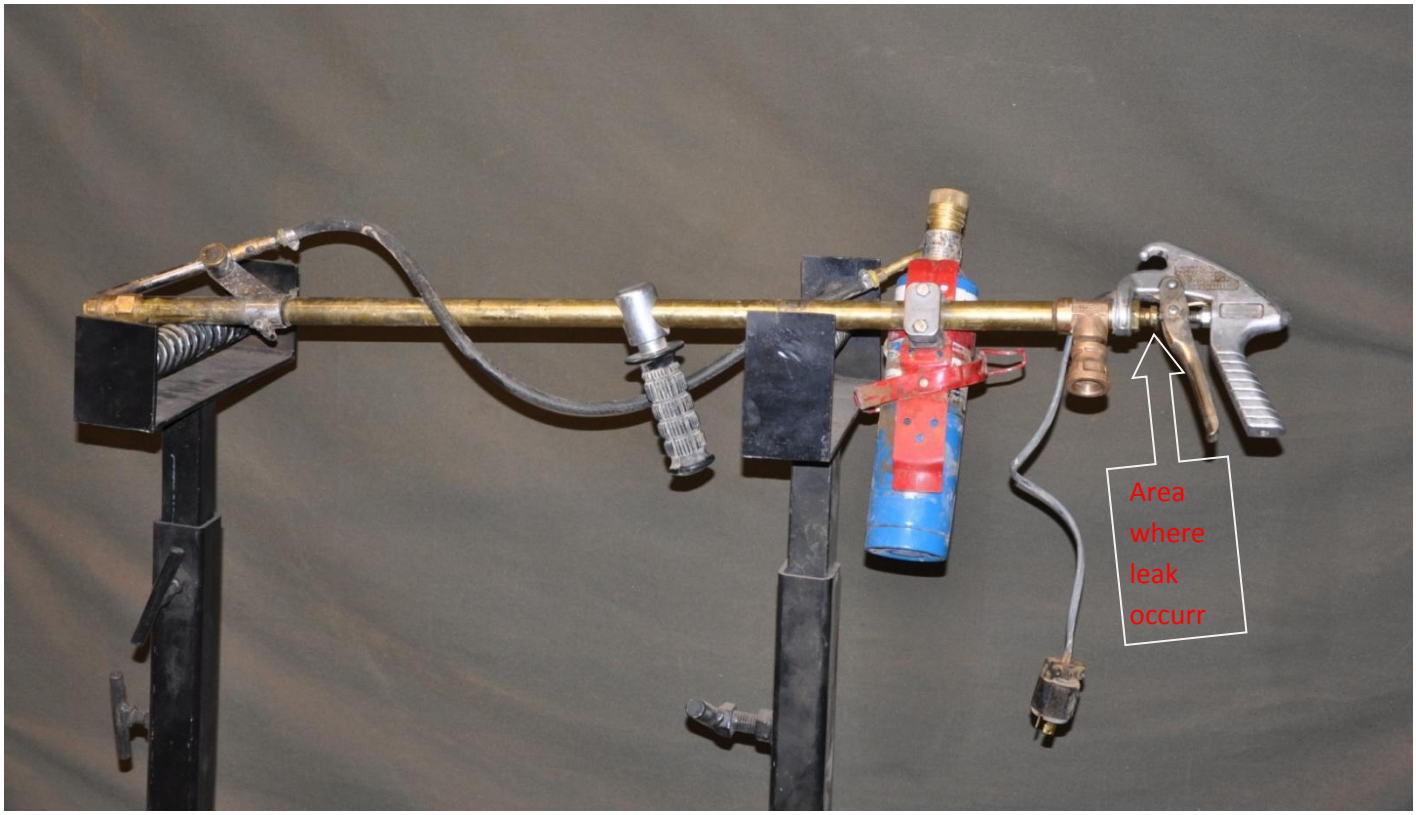
1500: Mark Lujan (Taos Field Office Safety Officer) arrived in Farmington to conduct interviews of witnesses and investigate incident.

Discussion:

This section will discuss in further detail circumstances surrounding the event and its outcome. This represents information gathered through interviews and an After Action Review (AAR) conducted with witnesses to the accident. The injured individual provided input and his account was the same as the information provided by the others.

On August 09, 2011, personnel from the Farmington District were conducting the Ice Canyon Rx a (fuels) burn approximately 20 miles southeast of Blanco, NM within the Farmington BLM Field office.

A district firefighter was operating a Terra Torch for ignition of the RX. The Terra Torch wand started leaking burn mix near the trigger handle. Burn operations were halted at 1623 to fix the leak.



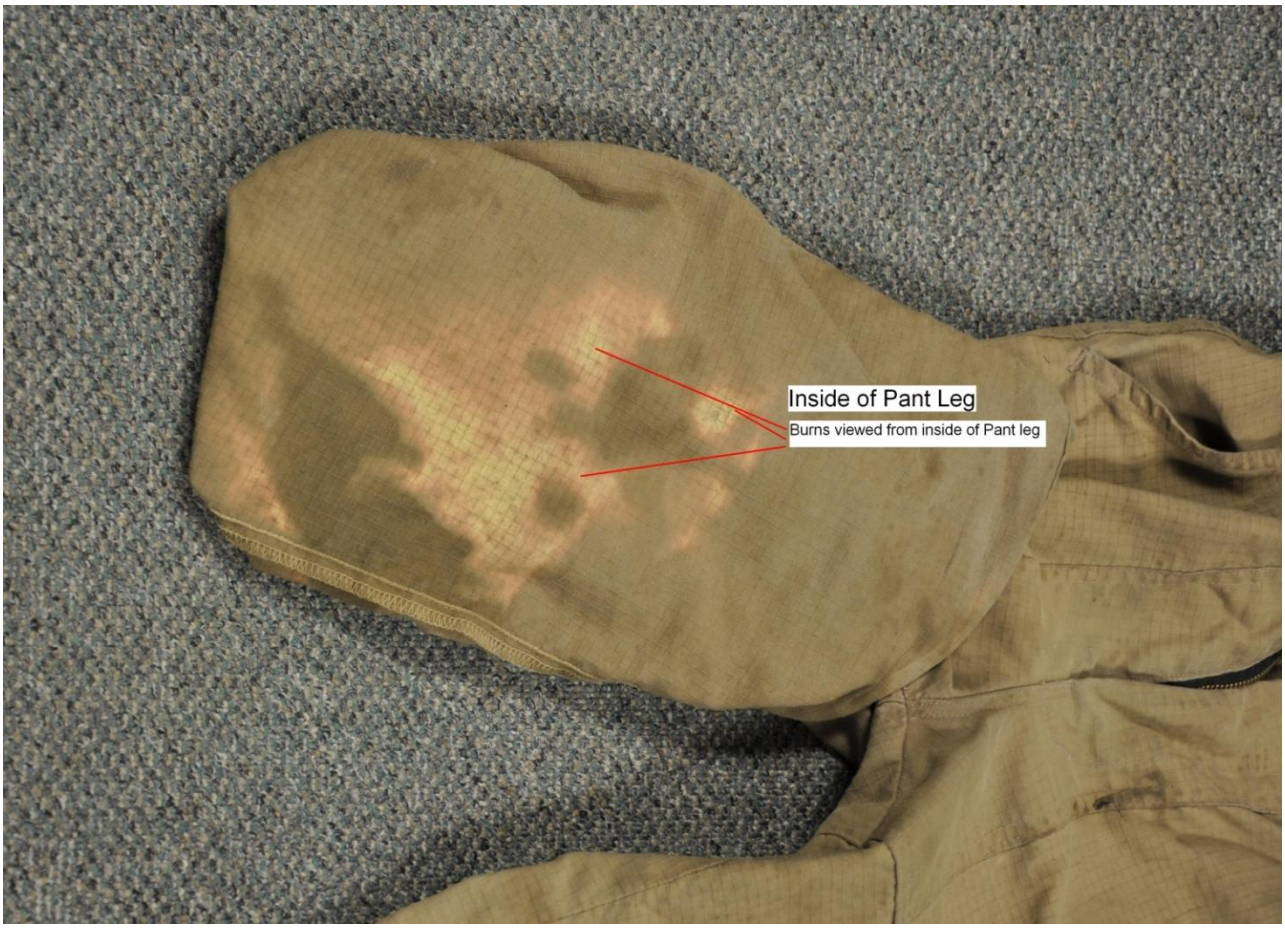
The wand was taken apart to assess what was causing the leak. After replacing some O rings the leak was apparently stopped. At 1805, it was decided to continue ignitions with the Terra Torch. The Terra Torch operator began ignitions and within 30 seconds the wand began leaking again in the same area and spilled some burn mix on the operators right pant leg which he did not notice. The operator told the crewmember assisting with the Terra Torch to close the supply valve to the wand to stop the wand from leaking and notified the driver to stop. The driver pulled forward an additional 100 feet, which is normal operating procedures to get the torch away from active flames. The crewmember could not understand directions given to him by the Terra Torch operator due to engine noise of the Terra Torch and thought that the operator wanted him to close the recirculation valve. This caused burn mix to

continue to drip and make a trail to the vehicle, instead of closing the valve to the wand which would have stopped the wand from leaking.

At 1806, when the vehicle stopped the operator stepped off the vehicle to close the supply valve. He stepped in the trail created by the leaking wand, which then ignited from the fire they had just lit. This trail of fire then ignited the burn mix on operator's pant leg.

Immediately engines were directed to proceed to the Terra Torch and extinguish any flames, within 15 seconds the fire was extinguished and a crewmember from one of the engines noticed that the Terra Torch operator's pant leg was on fire. The fire was immediately extinguished using dirt by the operator and the engine crewmember.

EMTs from the engines assessed the Terra Torch operator for injuries and determined that he had received a 2nd degree burn to his right calf. Medical emergency procedures as discussed in the burn briefing were put into place and the EMT in charge took over the medical incident. The burn was cleaned and wrapped. It was determined that the individual needed to be transported to the hospital.



At 1808, the Burn Boss trainee notified Taos Interagency Dispatch of the need of the ambulance and nature of injuries.

At 1815 notifications were made by the Burn Boss and all burn operations ceased.

At 1818 the individual was transported via government vehicle to meet the ambulance at County Rd 4450 and Hwy 64. The EMTs and a supervisor traveled with the individual to the hospital.

At 1830 Control lines were checked and an AAR was conducted.

The burn boss traveled to the hospital arriving there at 2115. It was determined the burn was not as bad as first thought and that the individual was going to be released that night The individual received second degree burns to the right front calf, approximately one hand coverage or about 3% of body area. The individual was released from the hospital at 2230.

The morning briefing included Medical Procedures and that a EMT would be in charge of any medical incident. This became very obvious once the incident was underway and provided a seamless operation for all involved.

Lessons Learned:

1. Be sure all directions are heard and understood. (Standard Firefighting Order #8 Give clear instructions and insure that they are understood.)

2. Having EMTs with engines proved extremely valuable in terms of an immediate response and medical treatment of the injured crew member.

3. The holding crews should stay in position on the line and in constant visual and radio contact with the terra torch operator.

4. Rapid assessment by EMTs allowed for prompt decision making, expediting the treatment and transport of the patient in a manner most appropriate for the nature of injury and site limiting factors.

5. The medical emergency was managed by one on-scene point of contact that followed the chain of command through the Burn Boss and then to Dispatch, who then made the request for the incident ambulance.

6. The injured firefighter suffered second degree burns to his lower right leg at a total of 3% of his body. It became obvious that managers on the ground took the employees personal welfare and long term health into consideration by seeking the best possible care available to them. In the stressful situation of emergency response, the best decision was made for our employee.

7. The appropriate burn kit should be on the vehicle with the Terra Torch. The kit should be located and easily accessible to the individuals assigned to the vehicle. The current burn kits available on the engines are for 1st and 2nd degree burn treatment. Consider having a kit or resources for 3rd degree burn treatment.

Recommendations:

1. Ensure that all personnel assigned to the Terra Torch operation review the operator's manual, are trained on proper use and operation, emergency shutdown and emergency response procedures before operation of the Terra Torch.

2. Setup a maintenance schedule for Terra torch, to ensure that all recommended parts are used and in proper functioning order.

3. Purchase spare wand and parts for Terra torch from the manufacturer that experience high wear and tear. No other parts should be substituted for repair. Recommended tools and spare parts to be located on the vehicle with the Terra Torch.

4. When doing field maintenance on Terra torch conduct a dry run with torch (No flames) to make sure machine is operating properly. Follow the recommended checklist startup procedures (Exhibit D) provided by the manufacturer.

5. Encourage crews, and Dispatch Centers to discuss and simulate medical emergencies in preparation for the RX/fire season. These simulations should also include the use of various evacuation techniques to accommodate factors such as limited personnel/or equipment, topography, weather, fire behavior, and time constraints.

6. Risk Assessment for prescribed burning was used during the briefing for the resources. RA's should be updated yearly for accuracy and relevancy to ensure that the briefings contain good and relevant safety information.

7. There are no national equipment standards or training for terra torches. National equipment and training standards should be developed through BLM's Fire and Aviation Office and/or elevated to National Wildfire Coordinating Group (NWCG).