



**State of Alaska
Department of Natural Resources
Division of Forestry**

Director's Office

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Safety Office

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This document is intended as a safety and training tool, an aid to preventing similar future occurrences, and to inform interested parties. The information contained in this report is subject to revision upon further investigation and/or should additional information become available.

ACCIDENT INVESTIGATION FACTUAL REPORT

**Type of Incident:
Water Supply / Burns**

**Location:
AK-DOF, Fairbanks Area, Logging Slash Fire, Alaska**

**Date of Accident/Incident:
July 9th, 2009**

Investigation Team Members:

Rocky D. Ansell, Statewide Safety Officer, State of Alaska, Division of Forestry, Palmer
Tom Kubichek, Alaska Smokejumpers Air Operations Supervisor, BLM/AFS, Fairbanks
Mike Spencer, Safety Officer / Training Specialist, Pacific N/W Regional Office, USFS

Special commendations are warranted for the quick actions of the other personnel present on the Logging Slash Fire. They quickly reacted to the situation, encouraged the Pump Operator to “Stop, Drop and Roll” and provided immediate emergency care. These actions greatly reduced the degree of injury and significantly reduced the recovery time of the injured party.

Christian Blankenship	Incident Commander
Glen Farnsworth	Operations
Avi Shalom	Fairbanks Area WFRT IV
Mike Goyette	Fairbanks Area Prevention Officer

The investigation team would like to thank everyone assigned to the Minto Flats South IMT (Alaska Type 2 Green Team) for their cooperation.

Rob Allen	Incident Commander
Kato Howard	Operations Section Chief
Rich Webster	Safety Officer
Terri Berrie	Medical Unit Leader

Per the guidance provided to the investigation team by the Agency Representatives, this investigation utilized a modified After Action Review format.

The investigation team referenced the following documents for guidance in their efforts to obtain information, complete their findings and document this incident:

- Interagency Standards for Fire and Fire Aviation Operations 2009
 - Chapter 7, Safety & Risk Management
 - Chapter 18, Reviews, Investigations & Analyses
- State of Alaska, Policies and Procedures Manual, Section 2165

Summary

At approximately 1857 hours (ADST) on July 9th, 2009 while supporting a water pumping operation, a member of the Idaho City IHC was burned while working on the Logging Slash Fire in interior Alaska. The Idaho City IHC Crew Member was assigned the operation of a Mark 3 pump to support a water pumping function utilizing a folda-tank and Mark 3 pump. During a routine check of the fuel supply the crew member opened the Jerry can (fuel tank); flammable liquid and vapors spewed from the container and were ignited. The resulting flash fire burned the crew member. Investigation reveals the jerry can, during set-up of the pump, was placed in close proximity to the Mark 3 exhaust (muffler). During the interval that the pump was running the exhaust did impinge upon the jerry can preheating the gasoline. Upon opening the bung of the jerry can; volatile gasoline vapors and liquid escaped and were ignited by the muffler/hot components of the Mark 3 pump. Portable fire extinguishers were used to extinguish the fuel can, pump and other burning objects that had been ignited by the flash fire.

A designated medivac helicopter from an adjacent fire was dispatched while medical personnel on scene began treatment of the injured crew member and prepared him for transport. The injured crew member was rapidly transported to a Fairbanks hospital and after an evaluation by physicians, was then transferred to a Seattle burn center. The crew member spent several days in the intensive care unit of the burn center where his condition rapidly improved and was released from the hospital on 07/22/2009. He continues to convalesce and is expected to make a full recovery.

Conditions

The Logging Slash Fire (#73911404) was reported to the Fairbanks Area Office of the Alaska Division of Forestry by the FAA Flight Tower as 2 acres, smoldering approximately 20 miles southwest of Fairbanks, Alaska on 07/08/2009. Weather conditions obtained from the closest RAWS sites indicate temperatures at the time of the accident were in the high 80's to low 90's, relative humidity 33%, winds NNE at 10 mph and no recent precipitation. Assessment by the responding Incident Commander was the fire's behavior was extreme, with some crowning, spotting with 40 to 50 foot flame lengths.

The accident occurred at the ICP/Staging Area of the Logging Slash Fire which was located near N63:56:00 x W148:45:08. This area may be accessed from the Parks Highway near Mile Marker 342, taking the Old Nenana Road exit, following the Standard Creek Road then following a single lane logging road for approximately 26 miles.

Personnel Assigned As Of 07/09/2009

Type 3 IMT

Delta #2 Type 2 Crew

Idaho City IHC (temporarily re-assigned from Minto Flats South Fire)

Sequence of Events

07/07/09

1000 hours

Idaho City IHC arrived in Fairbanks from Boise

1700 hours

Minto Flats South ICP (Nenana), assigned structure protection on 73911320, (Crew received multiple briefings including "no spills in drill pad")

07/08/09

0800 hours

Set-up pumps, sprinklers and hose lays around Doyon Arctic Wolf drill site

07/09/09

1030 hours

Idaho City IHC temporarily re-assigned to Fire 73911420

1857 hours

Accident occurs, burning Idaho City IHC crew member

1952 hours

Burn victim arrives Fairbanks Memorial Hospital via Helicopter N16973

2315

Burn victim prepared for transport to Seattle via Guardian Flight, Inc –
estimated flight time 3.5 hours

Narrative

Five Type 1 crews were mobilized from the Lower-48 to Alaska to support multiple incidents. The Idaho City IHC (IC-IHC) was one of these crews. The IC-IHC was assigned to the Minto Flats South Fire (#73911320) on July 7th, 2009. The IC-IHC did receive an Alaska Briefing prior to being assigned to the incident. When the crew was sent to the Minto Flats South ICP, the Crew Superintendant and other senior members of the crew were provided an “environmental” briefing regarding work practices and reporting of spills while working on the Doyon Arctic Wolf drill pad, this included the use of spill containment, sorbent pads and the reporting of any fluids that come in contact with the pad. The Crew Superintendant then relayed this information to the IC-IHC members. The IC-IHC were assigned the task of developing a water supply utilizing portable pumps, a hose lay and deploying sprinklers on the drill pad for the protection of the Doyon Arctic Wolf drilling rig.

On July 9th, 2009 the IC-IHC were reassigned to a new fire named the Logging Slash. Upon arrival at the staging area the crew was assigned the task of developing a water supply utilizing Mark 3 pumps, folda-tanks and a hose lay to supply water to assist with suppression of this fire. The IC-IHC was working with the Delta #2 Type 2 Crew.

A member of the IC-IHC (Pump Operator) was assigned the task of deploying the #2 pump in the water supply operation. This pump and folda-tank was located in the staging area/ICP of the incident. After about 2 hours of operation the Pump Operator checked the Mark 3 pump and decided to check the fuel level of the jerry can that was supplying the fuel to the pump. The Pump Operator did reduce the RPM of the pump, and then proceeded to remove the bung from the jerry can. As the bung was being removed from jerry can, vapors and liquid escaped; came in contact with the hot muffler and engine components of the Mark 3 pump, igniting the vapors. The resulting flash fire was significant enough to cause injury to the Pump Operator.

Upon hearing a the sound of igniting fuel and indicators that a person was hurt, personnel in close proximity to the #2 pump operation reacted swiftly to assist the Pump Operator. Another crew member of the IC-IHC was known to have advanced EMT skills and was ordered to the scene of the accident. The Logging Slash IC promptly requested a medivac. A short discussion ensued between Fairbanks Area Dispatch, the Logging Slash IC, and the Operations Section Chief of the Minto Flats South fire regarding the appropriate helicopter to be used (Fairbanks Area IA ship or the ship from the Minto Flats South Fire). In just a few minutes the decision was made to utilize helicopter N16973, which had a medic ready to respond and was closer geographically. Helicopter N16973 landed at the Logging Slash Staging Area/ICP, the injured Pump Operator was loaded and flown directly to Fairbanks Memorial Hospital.

As the injured Pump Operator was admitted to the hospital, Administrative personnel from the Division of Forestry, assisted by a Comp Claims Specialist from the BLM/Alaska Fire Service began assisting with notifications and educating hospital staff regarding the Federal Wildland Firefighter Burn Injury Protocols. After initial treatment and evaluation, a fixed wing medivac was arranged to transport the Pump Operator from Fairbanks to Harborview Burn Center in Seattle, Washington.

Injuries

Initially reported as 1st and 2nd degree burns with possible 3rd degree to face, arms and hands. Field medic assessment identifies facial/ears, hands, forearms and leg burns, estimated to cover 25% of body surface.

Causal Factors and Findings

- Placement of the jerry can in close proximity to Mark 3 muffler and in an angled alignment with the exhaust.
- Size/shape of fuel containment dyke may have been a contributing factor in the placement of the jerry can next to the muffler. The investigation team recommends additional research regarding whether the fuel containment dyke does readily lend itself to safe and practical set-up / operation while adhering to containment standards.
- Briefing IC-IHC received regarding very strict spill prevention and reporting may have been interpreted to include all incidents.

Note: The pump and jerry can were removed from the scene of the accident prior to the arrival of the investigators. Both the Mark 3 pump and jerry can, along with other components present at the scene were inspected at the secure storage

facility in Fairbanks. Detailed pictures were taken on scene shortly after the accident. Inspection revealed no mechanical deficiencies with the pump and/or fueling system. The air vent on the jerry can was open.

Applicable Information and Issues

The injured member of the Idaho City IHC is a fully qualified Firefighter Type 1. A check of his training records finds that he completed annual Fire Safety Refresher on April 27, 2009, completed work capacity testing (arduous) and has taken Portable Pump & Water Use (S-211) on August 1st, 2001

Recommendations

- ✓ Educate all wildland suppression agencies and organizations of the Burn Injury Criteria that is present in Chapter 7 of the 2009 Interagency Standards for Fire and Fire Aviation Operations.
- ✓ Update NWCG S-211 course to include more information regarding the proper use of spill containment devices and importance of keeping the jerry can away from muffler side of pumps
- ✓ Place a label near fuel line port of jerry can stating "Do Not Place Can Near Exhaust"
- ✓ All training should emphasize the proper use of PPE including eye and hand protection during all fueling operations
- ✓ All training should address the utilization of Crew Resource Management during any emergency
- ✓ All wildland fire suppression organizations/agencies should develop a "Safety Gram" to emphasize the dangers of placing fuel containers too close to mufflers or other sources of ignition

Supporting Documentation:

Photographs (list)

Photo 1	Mark 3 Pump, Jerry Can & Folda-tank
Photo 2	Mark 3 Pump & Jerry Can
Photo 3	Slide from Unit 1, Lesson D, S-211 Class
Photo 4	TOPO Map





Unit 1 Lesson D Portable Pump Setup



