

ACCIDENT INVESTIGATION REPORT

BOISE DISTRICT FIRE TRUCK
FLAT FIRE NO. 1298

August 1, 1979

Table of Contents

1. Report Summary
2. Findings
3. Recommendations
4. District driver training packet
5. Fire behavior analysis
6. Pictures of accident
7. Personnel qualifications

SUMMARY

Accident Investigation

Flat Fire - Boise District

Date and Time of Accident:
August 1, 1979 - 1830 hrs.

Investigation Team Members

Butch Kasper	Team Leader	<u><i>Butch Kasper</i></u>
Stan Palmer	Team member	_____
Bob Webber	Team member	_____
Mike Demmick	Team member	_____
Dick McCoy	Team member	_____

Crew members involved in accident -

Blas Telleria	Crew Boss
Mike Nutt	Squad Boss
John McDonald	Tanker Driver
Matthew B. Kleffner	Lead Nozzle
Richard Weeb	Rear Nozzle

Description of Accident:

Insert #1

Two ground tankers in tandem were working fire line in flanking action on a small ridge of the southeast sector of the fire. The fire was burning in sage and grass with flame heights of three to six feet; wind was approximately 10 mph and parallel with the fire line.

Operations were being directed by the crew boss, Blas Telleria, using standard tactics for prevailing fire conditions. At the time of the accident, or just prior, the wind shifted 90 degrees causing the fire to run directly at the lead tanker. The driver of the lead tanker, John McDonald, proceeded to backup and had traveled approximately 128 feet when the engine died and the fire completely engulfed the truck.

The driver had some difficulty releasing his seat belt and was burned when flames came through the window.

Findings

1. Training

All personnel were adequately trained and had necessary qualifications to perform their job assignments.

2. Experience

All personnel had more than adequate experience. The Boise District is quite fortunate to have fire crews with so much experience. The least experienced fire crewman had four years as a crewman and was back nozzleman on the crew. The most experienced foreman had 17 years experience.

3. The crews were using standard tactics for a mobile tanker crew on a running range fire. Trucks were working in tandem in a flanking action. Escape routes were planned and executed. Had McDonald's tanker traveled another 40 or 50 feet his escape would have been successful.
4. The district's driver training program appears to be quite adequate. It is probably one of the best in the Bureau.
5. Fire behavior just prior to the accident was not abnormal nor was it too severe to prevent effective attack with ground tankers.
6. ^{Insert #2} We found no similarity between this accident and previous accidents. We also found nothing wrong with the tanker management, maintenance or training program.
7. The driver experienced difficulty releasing his seat belt and this apparently was a leading cause to some of his burns.
8. The fuel tanks on the burned truck did not explode. This type of tank should be considered for Bureauwide use. However, these tanks did have leakage caused by expansion of fuel. Location and design should be reviewed.
9. Probable Cause

The following series of events may have been contributors to the accident:

- A. Fuel build up on the desert was somewhat above normal.
- B. Burning conditions were extreme. Lack of spring and mid summer moisture resulted in the BI (burning index) climbing almost daily.

- C. These conditions seemed to have crept up on the crews, for they did not appear to be completely aware that burning conditions were above normal and that the situations they faced daily were continuing to get worse.
- D. Acute awareness of local weather patterns along the Snake River seemed to be lacking among some of the crew members.

RECOMMENDATIONS

Recommend:

- (1) All significant fires (extended initial attack required) be critiqued within 24 hours on the following items:

Insert #3

Fire behavior
Unusual or abnormal incidents
Accidents, personnel, equipment or aircraft
Suppression tactics and techniques

- (2) Initial attack crews receive informative daily briefings by a qualified and experienced fire behavior officer during periods of anticipated or experienced abnormal fire behavior and local weather patterns.
- (3) Safety and escape procedures be reviewed and analyzed, including use of safety and protective equipment, during the suppression action. Establish, where necessary, and review with all initial attack personnel.
- (4) The Washington Office (Fire Equipment Committee) evaluate the type of seat belts presently being used on all initial attack vehicles. *Reevaluate location and construction of gas tanks. Field tests for leakage, under extreme temperature conditions and consider installation of hand throttles.
- (5) State offices, with Washington Office and BIFC, evaluate S-course curriculum as it relates to initial attack and extended attack suppression actions. (Running attack on rangeland fires)

*Cross reference with CDF Loadstar 1500 model engine and their gas venting overflow safety systems.

Insert #4

FIRE BEHAVIOR ANALYSIS - DEADMAN FLAT FIRE ACCIDENT

A primary cause of the accident was a counter-clockwise shift in surface winds which put the subject tanker at the head of the fire, rather than at the flank.

Wind shifts have been noted as commonly occurring in late afternoon on desert lands adjacent to the Snake River Valley. These appear to be local wind situations which may be predictable under persistent weather patterns.

Crews fighting fire in this country should follow fire weather forecasts carefully, be alert to such local weather conditions, and try to anticipate wind shifts, which probably occur on a regular basis.

Joe J. Hugo

<u>NAME</u>	<u>FIRE ASSIGNMENT-#1298</u>	<u>RED CARD QUALIFICATION</u>
Mike Nutt	Squad Boss	Firefighter Tanker Driver Sector Boss Squad Boss
Matthew B. Kleffner	Assistant Driver/Lead Nozzle Patrol road on #1298	Firefighter Tanker Driver Sector Boss
Richard B. Webb	Crew Member/Back Nozzle Patrol road Mop up	Firefighter
Cary Gene Cada	Fire Boss	Tanker Driver Sector Boss Crew Boss Fire Boss
Joe Lafferty	Tanker Driver	Sector Boss Heliport Manager A.S.M Tool Manager Fire Boss III Tanker Driver
Terry J. Roedel	Crew Boss on flanking action Patrol southeastern section with tankers	Fire Boss III Sector Boss Tanker Boss Crew Boss
Blas Telleria	Crew Boss Patrol and mop up	Fire Boss III Sector Boss Tanker Boss
John McDonald	Tanker Driver	Sector Boss Crew Boss Squad Boss Tanker Driver Crewman

Insert #1

On July 31st at 1252 hrs. a fire was reported to Boise District dispatch. The fire was reported south of Glens Ferry, Idaho. Normal dispatching procedures were followed, the fire was named Deadman Flat #1298, Cary Cada was appointed Fire Boss. The crews worked on through the night and the following day, August 1st with demob planned for 1800 hrs. August 1st was spent cold trailing and securing the line with several spot fires occurring. At approximately 1815 a spot fire was reported outside the line in the southeast sector of the fire. Four tankers were sent to suppress the spot, one 206 helicopter and two cats were also assigned. The spot was burning in two to three foot high sage with light grass understory, winds were gusty and estimated at 10 mph. Flame heights were three to six feet. At this point everything was following the plan, communications were good and fire behavior was not abnormal, yet.

Around 1830 hrs. tanker # which John McDonald was driving was instructed to assist tanker # which Joe Lafferty was driving. Suppression efforts were being directed by Blas Telleria, Crew Boss. Tanker # came down and positioned in front of tanker # and began flanking the fire. There was approximately 200 feet between the units when a spot was reported behind tanker # . John McDonald had just started to backup approximately 15 to 20 feet when the wind shifted 90° and increased speed to approximately 30 mph and the fire blew up. The flames ran directly towards the tanker which caused the nozzlemen to leave their positions. When the fire moved closer the tanker's engine killed. The engine and cab sections of the tanker were completely engulfed in flames within minutes. At this point the fire behavior had suddenly changed. In comparing the fire behavior calculations of 1400 hrs. to 1830 hrs. the following increases were observed:

- (1) Temp. +4
- (2) RH -2%
- (3) Wind +10
- (4) ROS +54 ch/hr
- (5) Fireline Intensity +661 btu/ft/s
- (6) Flame Length +4'
- (7) Spread Distance 55 ch
- (8) Perimeter ch +124
- (9) Area Acres (R/S) +275
- (10) Ignition Component +17

These increases show intensive burning conditions that occurred at the time of the accident. It should be noted that under the burning conditions above, changes are difficult to feel or predict from visual indicators. Also, daily fire suppression efforts would have allowed conditions to go unnoticed.

The driver John McDonald exited the right side of the tanker only after having some difficulty with the seat belt. He ran 50-60' to safety where the crew was waiting. The crew administered first aid and requested the fire helicopter for evacuation. John was enroute to St. Alphonsus Hospital, Boise within 8-10 minutes after the accident. He received second and third degree burns on his face, hands, and elbow. He remained hospitalized for five days. The truck was a total loss and was replaced. The fire was contained within hours and declared out August 2nd at 12,000 acres.

Insert #2

But the fire behavior during the moments of the accident was extreme. Possibly too much for direct attack.

Insert #3

At the earliest possible time, suggest within 24 hours.

Insert #4

(6) The Washington Office needs to establish a Bureau policy as it relates to fire shelters for ground tanker crewmen.

(7) Special ground tanker "Burn-Over" training should be given to all fire personnel (what to do and how to do it).

TI-59 FIRE BEHAVIOR CALCULATIONS FORM

LOAD PROGRAM (2nd) PGM (2) SBR R/S - -4 display)

Fire Madison Flat Date 8/1/79 RUN 1 RUN 2 RUN 3
Cisco Dist., Blm Time 1400 1830 _____
Point Qlm. A _____

INPUT DATA (Enter in any order)	(PUNCH)	Reg. No.	↓	RUN 1	RUN 2	RUN 3
Fuel Model	(model no. <input type="checkbox"/> R/S)	6	↓	<u>6</u>	<u>6</u>	_____
Shade Value	(value <input type="checkbox"/> SBR SHADE)	60		<u>0</u>	<u>0</u>	_____
Dry Bulb Temperature	(value <input type="checkbox"/> SBR DB)	61		<u>92</u>	<u>96</u>	_____
Relative Humidity	(value <input type="checkbox"/> SBR RH)	62		<u>18</u>	<u>16</u>	_____
1 H TL FM, %	(value <input type="checkbox"/> SBR 1H)	28		<u>3</u>	<u>2</u>	_____
10 H TL FM, %	(value <input type="checkbox"/> SBR 10H)	63		<u>5</u>	<u>5</u>	_____
100 H TL FM, %	(value <input type="checkbox"/> SBR 100H)	30		<u>7</u>	<u>7</u>	_____
Live Fuel Moisture	(value <input type="checkbox"/> SBR LIVE)	33		<u>68</u>	<u>68</u>	_____
20 foot windspeed, mph				<u>20</u>	<u>30</u>	_____
Midflame Windspeed, mph	(value <input type="checkbox"/> SBR M WS)	79		<u>7</u>	<u>10</u>	_____
Windward Percent Slope, %	(value <input type="checkbox"/> SBR PCT S)	80		<u>4</u>	<u>9</u>	_____
Projection time, h	(value <input type="checkbox"/> SBR PT)	81		<u>1</u>	<u>1</u>	_____
Map Scale, m/in	(value <input type="checkbox"/> SBR MS)	82		<u>.38</u>	<u>.38</u>	_____

OUTPUT DATA (Must be run in sequence below)

Rate of Spread, ch/h	(<input type="checkbox"/> A)	88	<u>70</u>	<u>124</u>	_____
Heat per Unit Area, BTU/ft ²	(<input type="checkbox"/> R/S)	90	<u>562</u>	<u>604</u>	_____
Fireline Intensity, BTU/ft/s	(<input type="checkbox"/> B)	53	<u>718</u>	<u>1379</u>	_____
Flame Length, ft	(<input type="checkbox"/> R/S)	54	<u>9</u>	<u>13</u>	_____
Spread Distance, ch	(<input type="checkbox"/> C)	42	<u>70</u>	<u>125</u>	_____
Map Distance, in	(<input type="checkbox"/> R/S)	43	<u>.3</u>	<u>.16</u>	_____
Perimeter, ch	(<input type="checkbox"/> D)	40	<u>197</u>	<u>321</u>	_____
Area, acres	(<input type="checkbox"/> R/S)	89	<u>235</u>	<u>510</u>	_____
Ignition Component	(<input type="checkbox"/> E)	44	<u>83</u>	<u>100</u>	_____
Reaction intensity, BTU/ft ² /min	(<input type="checkbox"/> R/S)	52	<u>2286</u>	<u>2460</u>	_____

* Check inputs or outputs (RCL) Reg. No. = value)

* Any input value can be changed or corrected (value SBR data item label), and program re-run.

* 1 H TL FM % can be calculated by machine (SHADE DB RH R/S) in that order.

* 10 H TL FM % need not be entered if not known or needed for that fuel model. Same for 100 H. These will become same as the 1 H.