

Management Evaluation Report

Thirtymile Fire

Chewuch River Canyon
Winthrop, Washington
July 10, 2001

September 26, 2001

as amended October 16, 2001

Forest Service
U.S. Department of Agriculture



Accident Review Board

Board Members

Chairperson



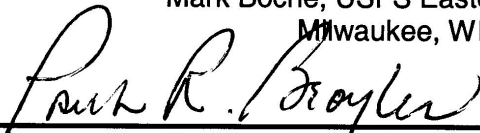
Tom L. Thompson, USFS Rocky Mountain Region
Denver, CO

Board Member



Mark Boche, USFS Eastern Region
Milwaukee, WI

Board Member



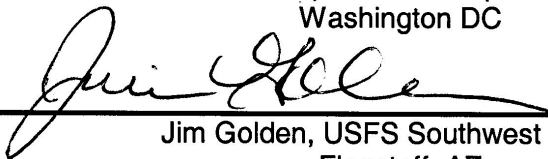
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Santa Fe, NM

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File Code: 6730

Date: August 21, 2001

Route To:

Subject: Delegation of Authority
Thirtymile Fire, Chewuch River Canyon, Winthrop, Washington
July 10, 2001

To: Tom L. Thompson, Accident Review Board

This memorandum formalizes your appointment as chairperson of the Accident Review Board to review and develop recommendations to prevent similar accidents in the future. The board is to be convened and is expected to complete its work by October 9, 2001. An extension may be granted based on valid justification.

Please contact and make arrangements with the following board members, advisors, and accident investigation team members as soon as possible.

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WO, Business Operations	Ron Hooper	202-205-1709	rhooper@fs.fed.us
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All travel and associated costs related to the board should be charged to HFPM42, with an Override Code of 1301. For additional information, please contact Caroline Deaderick, 703-605-0879, cdeaderick@fs.fed.us.

/s/ Clyde Thompson
CLYDE THOMPSON
Deputy Chief for Business Operations

cc:
Laurie Hileman
Official case file

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Preface

The Board of Review has accepted the Factual Report and findings of the Accident Investigation Team. The Board's Management Evaluation Report provides:

- A synopsis of the physical setting and summary of the events leading up to the accident.
- The causal factors generally arranged in the order which they occurred.
- A summary of the causal factors.
- Recommendations designed to prevent similar tragedies.

In the Board's evaluation, a further subdivision of the phases of the incident was made. The pre-entrapment phase identified in the Factual Report has been further subdivided to identify the preparedness, initial attack, and transition activities. Therefore, the causal factors are organized into the five phases of the incident:

- Preparedness, including pre-planning and readiness actions before the fire began.
- Initial decisions and initial attack actions.
- Transition, including the escalation of the fire to a higher level of complexity.
- Entrapment of firefighters and civilians.
- Deployment of fire shelters.

The Board found that these five phases lend context in describing this accident. They were, like links in a chain, inter-related with one another. Decisions and actions made early, in one phase, carried through to subsequent phases and often constrained decision options at the next phase. Eventually, they compounded and predisposed the tragic outcome that occurred on July 10, 2001.

Synopsis of the Thirtymile Incident

The Thirtymile Fire (Incident #103) began on July 9, 2001, as a result of an abandoned cooking fire during a period of high to extreme fire danger. In the days leading up to the incident, fire danger indicators were building toward record-setting levels. Several other fires were burning on the Okanogan-Wenatchee National Forest at the time the Thirtymile incident began, including the Libby South Fire, approximately 40 miles south. The Libby South Fire had grown to about 1,000 acres and, because it was threatening homes, had become a major focus of the Forest's fire suppression efforts.

The Chewuch River drainage, where the fire began, is a steep-walled canyon running southwest to northeast. A low pressure system was bringing a weak southwest airflow over the general vicinity. Although no wind events dominated the day's weather, the canyon and the gradient winds were in alignment.

The Thirtymile Fire started in a riparian zone next to the Chewuch River. Although the initial assessment of this fire from the air late on July 9th indicated its potential to become large, fire managers and those on the ground generally perceived it as a mop-up operation. It was a series of spot fires, with much of the general area unburned. In fact, today, much of the forest in the vicinity of the origin remains unburned and intact. However, the adjacent area, and particularly the area up canyon where the fire spread, burned intensely.

Firefighters from the Methow Valley Ranger District were assigned to initial attack. They were relieved by the Entiat Hotshots who continued the initial attack effort. This was the first change of command on the incident. The Entiat IHC had been working other fires and were tired when they arrived. The Incident Commander (IC) changed again in the mid-morning hours of July 10th, as the NWR #6 crew arrived. Part of this crew was dispatched in the middle of the night with little or no sleep. With the mid-morning change, incident command responsibilities were shared between the IC and a trainee. The IC maintained collateral duties as the Crew Boss.

The tactical suppression decision was to utilize pumps and hose as the means for control, but the water handling system was ineffective and a tactical change to construct hand-line was made. In the deep duff layers, and with the amount of downed fuel, construction of hand-line was hard. Spot fires and perimeter growth developed faster than the on site firefighters could contain.

About mid-day, two civilians drove by the fire up the canyon to the Thirtymile Campground. There was air support in the afternoon of July 10th, but the helicopter was delayed for several hours in providing support to the incident, partially due to a lack of clearance related to Endangered Species Act issues.

At mid-afternoon on July 10th, the Thirtymile Fire made a large run up the east slope above the Chewuch River. The IC, IC trainee, and the District AFMO acknowledged that they had lost the fire and that initial attack actions had failed. There was no direction from either the unit fire program managers on site and/or the IC to disengage, modify tactics, reestablish command, or

re-evaluate safe practices (including the selection of safety zones and escape routes). The overall situation was not reassessed for its potential. Even though the fire situation had significantly changed, firefighters continued tactics that were no longer viable.

Two engines arrived on-scene and proceeded up the road without checking in and without receiving a briefing. At the request of one of the engine supervisors, firefighters moved up the canyon to assist the engine in working spot fires. In this area, the fire had left the riparian zone and was in a drier habitat type, where fire potential was much greater. Combined with the rising temperatures and falling humidity, fire behavior increased considerably.

The firefighters assisting the engine crew with spot fires were up canyon and in front of the main fire, in the direction of the fire's spread. Their only escape route was the road. Between their location and the head of the main fire, the road became perpendicular to the direction of fire spread. It was here that the fire crossed the road and cut off the escape route. Fourteen firefighters and two civilians were trapped. Others had barely escaped as the fire crossed the bend in the road. Because of the drier fuel type, high intensity crowning developed, and the rate of spread picked up significantly.

The 14 firefighters retreated up canyon to an area they believed safe. Rockslides with only sparse fuels, the road, the river, and a sandbar provided a survivable environment. There was time to prepare for deployment, however, little preparation occurred. Shortly thereafter, two civilians trying to leave the area met the firefighters on the road.

Several of the firefighters were worried, yet there was not a collective sense of urgency to prepare for an impending crisis. Firefighters loosely formed into two groups; one on the road and the other on the rock scree. The IC tried to get the firefighters sitting on the rocks to move to the road, but it is not known if they heard his directive. Several firefighters were anticipating watching the fire burn around them. Some were taking photographs. Few of the firefighters seemed to recognize they were in a life-threatening situation until the fire's heat suddenly hit their location and overwhelmed them. It was only then that they tried to quickly get into their fire shelters, as the command to deploy was given. No one deployed on the sandbar. Several went into the fire shelters with their packs on (contrary to established procedure), and one was without gloves.

Of the six firefighters who deployed on the rock scree, four perished. The ten others on the road below survived, including the two civilians that shared a shelter with one of the firefighters.

Despite the high fire danger and numerous compounding factors and accumulating events that characterized the Thirtymile Fire, the fatalities were preventable. At several points in the growth of this fire, decisions could have been made and actions taken that could have avoided this tragedy.

This Management Evaluation Report examines the causal factors that contributed to this accident, some of which were found throughout the incident. The display of the causal factors

and the phases in which they were evident, illustrates the compounding effects of these actions. These have clear and significant implications in terms of management oversight and supervisory control, at the preparedness phase, the initial action phase, and the transition phase. It also clearly illustrates that firefighter safety is influenced by individual behavior. Tragically, all ten of the Ten Standard Fire Orders were overlooked, ignored, or violated and critical time was wasted waiting for the fire and the danger to pass.

Causal Factors

A causal factor is any behavior or omission that starts or sustains an accident occurrence. For this investigation, the causal factors have been classified as either significant or influencing. They have been identified from the four categories of Factual Report findings (environment, equipment, people and management).

The causal factors on the Thirtymile incident are interrelated, and it is difficult to point to one causal factor or one finding as the most important. Additionally, several causal factors were identified from more than one phase of the incident. The five phases of the incident were determined to be:

1. Preparedness (Wildland and Prescribed Fire Management Policy; Implementation Procedures & Reference Guide; August, 1998; (WPFMP))

“Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.”

Examples include: activities done in preparation for fire season such as, annual refresher training, work capacity testing, review of plans and guides as well as fire equipment and personnel readiness checks.

2. Initial Attack (WPFMP)

“An aggressive suppression action consistent with firefighter and public safety and values to be protected.”

These are the actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

3. Transition (from the Fireline Handbook, NWCG Handbook 3, PMS 410-1; pp 18 & 24)

Transition to the next level of management is expected and required when it becomes apparent that the assigned resources will not meet containment objectives in the expected time frames and/or the fire escalates to another level of complexity.

4. Entrapment (Glossary of Wildland Fire Terminology; NWCG, 1995; (GWFT))

“An entrapment is a situation where personnel are unexpectedly caught in a fire behavior related, life threatening position where planned escape routes or safety zones are absent, inadequate, or have been compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose.”

5. Fire Shelter Deployment (GWFT)

“The removing of the fire shelter from its case and using it properly for protection against fire.”

Significant Causal Factors

The causal factors determined to be significant in this management evaluation report are listed below with identified finding category and incident phase, in relative order.

Inadequate Safety Consideration (Management)

Phases of the Incident: Preparedness, Initial Attack, Transition, Entrapment, & Deployment

The safety considerations were not appropriate to respond to the current, potential, and subsequent fire conditions on this incident. All 10 Standard Fire Orders and 10 of the 18 Watch Out Situations were violated or disregarded during the incident.

Lack of Situational Awareness/ Inaccurate Assessment (Management)

Phases of the Incident: Preparedness, Initial Attack, Transition, Entrapment, & Deployment

At critical points throughout the incident the lack of situational awareness by key incident, district and forest personnel led to inaccurate assessments of fuels, fire behavior, and fire potential.

Fatigue (Management)

Phases of the Incident: Preparedness, Initial Attack, Transition, Entrapment, & Deployment

Work/rest cycles for incident and fire program management personnel, both at the forest and district levels were disregarded resulting in mental fatigue. This significantly degraded the vigilance and decision-making ability of those involved.

Command and Control (Management)

Phases of the Incident: Preparedness, Initial Attack, Transition, Entrapment, & Deployment

Failure to maintain clear command and control resulted in poor risk management and inhibited decisive actions, which contributed to the entrapment and deployment of shelters.

Strategy, Tactics, and Transition (Management)

Phases of the Incident: Initial Attack & Transition

The suppression strategy did not adequately consider objectives, fuels, fire behavior, and fire potential, nor the capability, availability and condition of the suppression resources. This led to the selection of tactics that could not succeed. As the fire complexity changed significantly and initial attack was unsuccessful, there was not a corresponding change in strategy or tactics.

Fire Behavior (Environment)

Phases of the Incident: Preparedness, Entrapment, & Deployment

A variety of environment factors supported the development of a crown fire, growing from a few acres to several thousand acres on the day of the accident:

- Valley bottom and slope fuels were dense with abundant ladder fuels.
- The moisture content of the fuels was at historically low levels.
- The combination of extremely low relative humidity, high temperature, and atmospheric instability created weather conditions conducive to the rapid movement, growth, and intensity of the fire at the times of entrapment and deployment.

Failure in Road Closure and Area Evacuation (Management)

Phase of the Incident: Initial Attack

The entrapment of two civilians was due to the failure to close the road and to subsequently evacuate the upper valley in a timely fashion.

Management Intervention (People)

Phase of the Incident: Transition

There were missed opportunities for intervention by management personnel on this incident. Leadership's failure to respond to concerns and observations by key individuals exacerbated circumstances that led to the entrapment.

Lack of Escape Routes and Safety Zones (People)

Phase of the Incident: Entrapment

Given the rapidly increasing fire intensity and changing fire situation, adequate consideration was not given to identifying escape routes and safety zones.

Failure to Prepare for Deployment (People)

Phase of the Incident: Deployment

Leadership of the entrapped firefighters failed to utilize available time and resources to coordinate and prepare crewmembers and civilians for shelter deployment.

Deployment Site Selection (Equipment/People)

Phase of the Incident: Deployment

Site selection for the deployment of the shelters above the road contributed to the four fatalities. The rocky nature of the deployment site made it difficult to seal out the superheated air. The large size and the arrangement of the rocks made it difficult to fully deploy the shelters.

Personal Protective Equipment (Equipment/People)

Phase of the Incident: Deployment

The improper use of personal protective equipment (PPE) contributed to injuries. Three people occupied one shelter. This exceeded the design capacity (although providing shelter protection of the two civilians was appropriate and justified by the emergency). One crewmember and the two civilians did not have gloves; other crewmembers did not wear their gloves. Some of the line gear that was left close to the shelters ignited, and there was burning vegetation close to and under the shelters.

Sudden Up Canyon Extreme Fire Behavior (Environment)

Phase of the Incident: Deployment

The dense forest and the strong fire-induced winds on the eastern canyon wall contributed to intense spotting, causing the fire on the canyon floor to intensify suddenly and surge over the deployment area.

Heat from Fire (Environment)

Phase of the Incident: Deployment

The fatalities were caused by inhalation of superheated air and exposure to high levels of radiant and convective heat. The presence of burnable fuels around and under the chosen deployment sites also contributed to the fatalities and injuries. The higher temperatures of the rock scree slope made conditions worse for deployment than conditions on the road.

Influencing Factors

The causal factors determined to be influencing by the Accident Review Board are listed below with identified finding category and phase of the incident.

Over-extension of Fire Personnel (Management)

Phase of the Incident: Preparedness

Unit fire personnel were over-extended. Although weather and fuel conditions were near historic highs and there was significant fire activity on the forest, additional fire program management personnel and additional initial and extended attack resources were not readily available.

Development of Crew Cohesion (Management)

Phase of the Incident: Preparedness & Deployment

There were a number of issues that limited the development of crew cohesion for the Northwest Regular #6 crew. These included: collateral duties of command, fatigue, incident complexity, lack of opportunity to work together, and management effectiveness.

Ineffective Water Operations (Equipment/People)

Phase of the Incident: Preparedness & Initial Attack

Water operations, both aerial and ground based, were ineffective, or delayed during the initial suppression actions.

Helicopter Delay (Management)

Phase of the Incident: Preparedness & Initial Attack

Assignment of a helicopter to the incident was delayed. This may have reduced the effectiveness of suppression actions. The lack of a clear process and determination of responsibilities to deal with Endangered Species Act issues contributed in part to this delay, as did dispatch actions and confusion associated with availability.

Organizational Relationships (Management)

Phase of the Incident: Initial Attack, Transition, Entrapment & Deployment

Unclear organization relationships among forest, ranger district and incident personnel reduced management effectiveness on the incident.

Summary of Causal Factors

In the late afternoon of July 10, 2001, the Thirtymile Fire on the Okanogan National Forest resulted in the fatalities of four firefighters and serious injuries. This resulted from the entrapment of 14 firefighters and two civilians, and their subsequent deployment of 14 fire shelters. The investigation identified a number of interconnected probable causes that must be addressed by the USDA Forest Service. Understanding the probable causes and taking all possible action to prevent similar happenings in the future is a critical concern for not only the Forest Service, but also for other Federal, State, and local government fire suppression organizations who must learn from these unfortunate and tragic happenings.

Intrinsic to forest, brush, and grass fires are many potential hazards and risks. Ensuring that firefighters are properly trained, and that policies, orders, and procedures are followed is the only way an organization like the Forest Service can deal with those hazards and risks. Over the years, lessons in how to safely fight forest fires have been learned and have resulted in new technology, fire organization improvements, availability of protective equipment, and expanded knowledge of fire science. These lessons have culminated in the last decade with major development and revision of federal wildland fire policy and a significant increased emphasis in firefighter and public safety. Unfortunately, increasingly dangerous fire conditions and expanded complexity of dealing with human factors such as leadership, experience, accountability, complacency, and fatigue continue to offer troubling challenges.

The lessons to be learned as a result of the fatalities on the Thirtymile Fire in July 2001 are mostly about what was not done that should have been done. There were many opportunities to prevent these fatalities. Accepted firefighting safety procedures were not followed. As a result, four firefighters lost their lives.

The most basic fact is that the four fatalities occurred because of inhalation of superheated air as a fast moving forest fire burned over fourteen firefighters and two civilians.

The fatalities and several injuries all occurred during, or shortly after, deployment of fire shelters. Failure to deploy before conditions completely deteriorated, failure to move to the most desirable deployment location on the road, and failure to deploy using the proper techniques, significantly contributed to the fatalities and injuries.

Twelve people are likely alive today because of fire shelter availability. However, four people died while attempting to gain protection. There had been a considerable length of time, approximately thirty minutes, to improve the likelihood of survival during deployment for all sixteen entrapped individuals; however, little was done until the very last moments.

The entrapment of 14 firefighters occurred because of a failure to recognize a rapidly deteriorating fire situation, the placement of firefighters in a vulnerable position, the lack of communication about critical information, leadership's ineffective control and command of

operations, and finally, and most critically, the failure to adhere to safety procedures and standard firefighting orders.

The entrapment of two civilians occurred because of a delayed closure of a potentially hazardous area and failure to successfully evacuate the valley upriver from the fire. Had the 14 firefighters not become entrapped, the two civilians likely would have been entrapped without access to fire shelters as the fire moved swiftly through the upper valley. There were no safety zones in the upper valley considering the intensity of the fire in the late afternoon.

The entrapment of firefighters and civilians was the result of a chain of interrelated events throughout the day, including the failure to recognize the deteriorating conditions and escalating fire activity.

Fatigue of nearly everyone involved on the incident from the time of initial attack to the time of deployment likely contributed significantly to failures in leadership, command, control, proper fire assessment and size-up, development of strategies and tactics, communication, and use of discretionary time.

The use of water on this fire at critical times was reduced because of an inability to fully utilize available pumps and an extended delay in getting a helicopter to the fire. Confusion and/or lack of clear understanding of processes necessary to deal with endangered species considerations on use of water from the Chewuch River for helicopter dipping contributed to the delay.

Strategies and decisions made on the Thirtymile Fire from initial attack to deployment did not appropriately reflect the extreme fire conditions that existed, nor did those decisions appropriately consider the diversity and complexity of fuel types in the valley bottom. Similarly features of the valley bottom and the lack of adequate safety zones influenced the final outcome.

Available training records confirmed that all key leaders on this incident were trained and qualified for their assignments.

Recommended Changes

The following recommended changes to avoid similar incidents are proposed for agency consideration and action, and as appropriate it is recommended that they be responded to with the involvement, understanding, and support of the interagency wildland fire community (National Wildfire Coordinating Group). These recommended changes should be considered in the context of this larger interagency perspective.

Situational Awareness, Assessment, and Transition

Ensure that fire program managers, fire-line supervisors, and firefighters have situational awareness, assessment, and decision-making abilities necessary to successfully and safely transition command from initial attack to extended attack on incidents.

Ensure that fire program managers and incident commanders have situational awareness, assessment, and decision-making abilities necessary to react to significant changes in fire danger thresholds.

Fatigue

Develop and fully implement a fatigue counter-measures program.

Incident Operations

Strengthen command and control performance of agency administrators, fire program managers, and Type 3-5 Incident Commanders.

Strengthen operating procedures to ensure accurate determination of complexity with proper alignment of resources to match the incident complexity and potential and requisite command and control.

Leadership

Critically review fire management leadership program on a national basis to ensure that all individuals in leadership positions, at all levels of organizations, have the skills and capabilities to unquestionably lead in a responsible way.

Develop and strengthen the annual preparation of firefighters for personal responsibilities and leadership.

Safety Management and Accountability

Improve fire program safety management by adopting and aggressively implementing proven components of a comprehensive safety program.

Equipment

Continue improvements in personal protective equipment to provide for firefighter safety.

Endangered Species Act Protocols

Clarify the relationship between the Endangered Species Act (ESA) and fire suppression actions to establish a coherent process that accounts for ESA requirements with respect to the full range of fire suppression activities.

Errata

Thirtymile Fire Investigation Report: Factual and Management Evaluation Reports

Released September 26, 2001

as amended October 16, 2001

The following errata sheet describes the changes that have been made to the September 26, 2001 version of the Thirtymile Fire Report. These changes consist of modifications to the report that were identified by the Board of Review on October 16, 2001 and other edits. The Board of Review modifications were made in response to the Chief's directive to revisit the issue of why some of the victims and survivors remained on the rock scree above the road even though some of the witness statements confirmed that there was an attempt to get everyone on the road.

Page	Location	Original Statement	Changes
Title Pg.		Winthop	Winthrop
Title Pg.			<u>as amended October 16, 2001</u>
Reports' Title Pgs	Factual & MER Title page		<u>as amended October 16, 2001</u>
Factual & MER	Various locations	Dark blue section headers	Gray section headers
5, 6,8, 14, 49	Various locations	Marshal	Marshall
6	Forest Management Diagram	Pete Ellinger	<u>Jack</u> Ellinger
13	4 th paragraph, 2 nd sentence	They drove almost to the end of the road and then headed back down looking for spots.	<u>Engine #704</u> drove almost to the end of the road and then headed back down looking for spots.
15	1 st paragraph, 2 nd sentence	... continue	... <u>continued</u>
15	3 rd paragraph, 1 st sentence	At 4:34 p.m., as Squad 3 retreated, Kampen radioed Ellreese Daniels to get the people out of the area.	At 4:34 p.m., as Squad 3 retreated, Kampen <u>and others</u> radioed Ellreese Daniels to get the people out of the area.
15	8 th paragraph, 2 nd sentence	Several times the IC told the people to come down from the rocks since the road was "the safe place to be." ⁽⁹⁰⁾	Several times the IC <u>tried to tell the people on the rocks to come down to the road.</u> ⁽⁹⁰⁾
16	3 rd paragraph, 1 st sentence	(73)	(<u>93</u>)
19	Figure 14	Deployment Spot on the Road Between Two Burnt Packs that Burned	Deployment Spot on the Road Between <u>Two Packs that Burned</u>
20	Reference 44	Dispatch and G. Jasso	<u>E. Hurd</u>
31	Finding #9, 1 st sentence	At approximately 2:45 p.m. the fire ...	At approximately <u>3:35</u> p.m. the fire ...

Page	Location	Original Statement	Changes
31	Finding #20, 2 nd sentence	One Naches Ranger District crewmember left the group of five in the rocks to join the people on the road because they "seemed calmer," the road looked like a safer place to be, and the IC said, "to come down."	One Naches Ranger District crewmember left the group of five in the rocks to join the people on the road.
32	Finding #22	The IC attempted to bring separated crewmembers back to the group by warning and instructing -- at least three times -- to leave the rocks (as that was not the place to be) and return to the road.	The IC attempted to bring the separated crewmembers <u>on the rock scree back to the group on the road, but it is unknown whether they all heard the directive.</u>
38	Finding #31	The IC informed the crewmembers that the road was the safe place to be and repeatedly told those in the rocks above the road to come to the road.	The IC informed the crewmembers that the road was the safe place to be and repeatedly <u>attempted to tell those in the rocks above the road to come to the road, but it is unknown if they all actually heard the directive.</u>
38	Finding #33	The crew did not physically gather together on the road even after repeated directions by the IC.	The crew did not physically gather together on the road even after repeated <u>attempts by the IC to bring them together; however, it is unknown if all those on the rocks actually heard the instructions.</u>
40	Standard Fire Order 4, 2 nd bullet	At the deployment site instructions were given but not adhered to.	At the deployment site instructions were given <u>and not all were adhered to, but it is unknown whether they were heard or understood by all.</u>
42	Watch Out Situation #6, 2 nd bullet	At the deployment site, instructions were given but not adhered to.	At the deployment site instructions were given <u>and not all were adhered to, but it is unknown whether they were heard or understood by all.</u>
44	2 nd paragraph, 3 rd sentence	But at a critical moment she decided to leave her friends who were gathered in a rocky area and she went to the road in response to repeated requests and orders from the crew leader.	But at a critical moment she decided to <u>move to the road.</u>
47	Logistics	Suvan Lake	<u>Swan Lake</u>
47	Information Officer	Mt Lake-Tarrace	<u>Mountlake Terrace</u>
47	Documentation		<u>Esther Woodward USFS Okanogan-Wenatchee National Forests Okanogan, WA</u>
49	Table Header	List of Individuals Interviewed	List of Individuals Interviewed <u>& Contacted for Information</u>
49	Anderson	Dwain Anderson	<u>Dewane Anderson</u>
49	Bennett	Fire Weather Program Leader	Fire Weather Program Leader, <u>Spokane National Weather Service</u>
49	Cannon	Member Entiat IHC	<u>Assistant Superintendent, Entiat IHC</u>

Page	Location	Original Statement	Changes
49	Dunn	Engine #704	Engine #701
49	Hammer	Meteorologist	Meteorologist, <u>Spokane National Weather Service</u>
49	Jasso	Forest AFMO, Lake Wenatchee	AFMO, Lake Wenatchee <u>Ranger District</u>
49	Marcott	FMO Lake Naches RD	<u>District</u> FMO, Naches <u>Ranger District</u>
49	Newcom	District Ranger, Twisp	District Ranger, <u>Methow Valley Ranger District</u>
49	O'Neal	Forest Supervisor Okanogan-Wenatchee NF	Forest Supervisor, <u>Okanogan-Wenatchee National Forests</u>
49	Quan	Deputy Forest Supervisor Okanogan-Wenatchee NF	Deputy Forest Supervisor, Okanogan-Wenatchee <u>National Forests</u>
49	Reed	Methow Valley Ranger District Duty Officer 7/10/01	<u>Dispatcher, Okanogan National Forest</u>
49	Soderquist	District FMO	District FMO, <u>Methow Valley Ranger District</u>
49	Smith	Pierce Aviation	<u>Pilot, Single Engine Air Tanker (SEAT)</u>
49	Tackman	Lead Pilot, Libby South Fire	Lead <u>Plane</u> Pilot, Libby South Fire
49	Taylor	Tom	<u>Thom</u>
49	Thomas	Forest FMO	Forest FMO, <u>Okanogan-Wenatchee National Forests</u>
49	Wallace, Roger	Fire Management Officer, Lake Wenatchee & Leavenworth RD	<u>District FMO, Lake Wenatchee & Leavenworth Ranger Districts</u>
52	11:00 a.m.	From 11:00 p.m. to 12:00 p.m. ...	From 11:00 <u>a.m.</u> to 12:00 p.m. ...
52	11:00 a.m.	...river (~11:00 p.m.)	... river (~11:00 <u>a.m.</u>)
52	1:00 p.m.	...campground (~1:00 a.m.)	...campground (~1:00 <u>p.m.</u>)
54	2 nd paragraph, 1 st sentence	Fire Weather Forecast, issued 8:30 a.m. July 10 th was not transmitted to the Thirtymile Fire.	<u>National Weather Service issued two Fire Weather Forecasts on July 10th. The morning forecast was transmitted to the Thirtymile Fire personnel but the afternoon forecast was not.</u>
54	Fire Behavior Figure 1	...the Phases of the Thirtymile Fire Phases.	...the Phases of the Thirtymile Fire.
54	2 nd paragraph, 2 nd sentence	The Spot Weather Report for the Libby South Fire, issued 7:36 p.m. July 9 th was the only Forecast delivered to firefighters on the Thirtymile Fire (See Appendix: Weather).	The Spot Weather Report for the Libby South Fire, issued 7:36 p.m. July 9 th was the only <u>Spot Weather Forecast</u> delivered to firefighters on the Thirtymile Fire (See Appendix: Weather).
63	4 th paragraph, 2 nd sentence	Figure 6	Figure <u>13</u>
63	5 th paragraph, 1 st sentence	...94) on the day of deployment...	...94° F) in the Chewuch River Valley on the day of deployment...
67	1 st paragraph, 3 rd sentence	...Thirty Mile Fire.	... <u>Thirtymile</u> Fire.
69	Photo caption	The Thirty Mile...	The <u>Thirtymile</u> ...

Page	Location	Original Statement	Changes
71	Table	Time	<u>Date/Time</u>
75	Figure 1	Figure 1 - 07/11/0040Z or 07/10/1740 PDT	Figure 1 - 07/11/00 <u>30Z</u> or 07/10/ <u>1730</u> PDT
75	Figure 2	Figure 2 - 07/11/0030Z or 07/10/1730 PDT	Figure 2 - 07/11/00 <u>40Z</u> or 07/10/ <u>1740</u> PDT
81	Item #4, 1 st bullet, 4 th sub-bullet	...fire line on the afternoon.	... fire line <u>in</u> the afternoon.
81	Item #4, 2 nd bullet, 1 st sentence	This led to a somewhat and ill-defined strategy...	This led to a somewhat ill-defined strategy...
82	Headings	1, 2, 3	<u>5, 6, 7</u>
84	Table	Entiat IHD	Entiat <u>IHC</u>
87	1 st bullet, 2 nd sentence	Thomas	<u>Thom</u>
94	Deployment sites list	<ol style="list-style-type: none"> 1. Beau Clark 2. Scott Scherzinger 3. Rebecca Welch 4. Nick Dreis 5. Armando Avila 5a. Jason Emhoff location after moving from Upper Deployment site 6. Elaine Hurd 6a. Thom Taylor Location after moving from Upper Deployment site 7. Matthew Rutman 8. Ellreese Daniels 9. Paula Hagemeyer 10. Bruce Hagemeyer 	<ol style="list-style-type: none"> 5a. Jason Emhoff location after moving from Upper Deployment site 6a. Thom Taylor Location after moving from Upper Deployment site <u>7.</u> Beau Clark <u>8.</u> Scott Scherzinger <u>9.</u> Rebecca Welch <u>10.</u> Nick Dreis <u>11.</u> Armando Avila <u>12.</u> Elaine Hurd <u>13.</u> Matthew Rutman <u>14.</u> Ellreese Daniels <u>15.</u> Paula Hagemeyer <u>16.</u> Bruce Hagemeyer
95	Item #5	Because Naches RD does not keep training records...	Because the <u>Lake Leavenworth</u> Ranger District does not keep training records...
MER-3	4 th paragraph, 3 rd sentence	The firefighters on the rock scree were ordered to return to the road; however, these orders were disregarded.	<u>The IC tried to get the firefighters sitting on the rocks to move to the road, but it is not known if they heard his directive.</u>
MER-10	5 th paragraph, 2 nd sentence	Failure to deploy before conditions completely deteriorated, failure to follow directions to move to the most desirable deployment location on the road, and failure to deploy using the proper techniques, significantly contributed to the fatalities and injuries.	Failure to deploy before conditions completely deteriorated, failure to move to the most desirable deployment location on the road, and failure to deploy using the proper techniques, significantly contributed to the fatalities and injuries.

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Thirtymile Fire Investigation

Accident Investigation Factual Report and
Management Evaluation Report