Summary

Summary

The Incident

On July 10, 2001, four Forest Service firefighters were killed after they became entrapped and their fire shelter deployment site was burned over by the Thirtymile Fire, in the Chewuch River Canyon, about 30 miles north of Winthrop, Washington.

The fire, an escaped picnic cooking fire, was detected on Monday, July 9. Initial suppression activities began that evening. In addition, the Libby South Fire was already burning about 50 miles south of this area, and exceeded 1,000 acres. The Northwest Regulars #6 (NWR #6), a 21-person Type 2 crew from the Okanogan-Wenatchee National Forest, was dispatched to the Thirtymile Fire in the early morning hours of July 10. They arrived about 9 a.m. in relief of the Entiat Hotshots who had been working on the fire overnight.

The area was enduring a lengthy drought and the moisture levels in large fuels were very low. The Energy Release Component, a measure of potential fire intensity, was near historic high levels for this time of year. Temperatures on July 10 reached nearly 100°F, and the humidity was very low. Although there was no dramatic shift in weather that would have created high winds, such as a dry cold front, up-canyon breezes were present to aggravate burning conditions. Fire conditions were potentially extreme.

By the late afternoon the fire advanced from its perimeter east of the Chewuch River toward the top of the east ridge. At this time, the NWR #6 was suppressing spot fires between the road west of the Chewuch River and the river itself. They were attempting to confine the fire to the east of the road. There were no personnel east of the river at that time since it had been determined that suppression activities there were fruitless. The NWR #6 crew took a break in mid-afternoon to eat, sharpen tools, and rest. About 4 p.m., they responded to a request from an Engine crew for help on a spot fire one-quarter mile north of their position. They sent two squads to assist.

In the moments immediately prior to the entrapment, one of the squads and the crew boss trainee (a total of seven people) were working in association with a fire engine and its three person crew when a spot fire erupted right next to the road. The seven NWR #6 crewmembers and the engine crew immediately got in their vehicles and drove south past the fire along the east edge of the road to safety. While driving, they radioed the remaining 14 crewmembers who were working north, further up the river, of their dangerous situation.

The remaining 14 crewmembers (the Incident Commander and two NWR #6 squads) were actively suppressing spot fires between the river and the road about one-quarter mile north of the first squad when they were informed of the worsening situation that threatened their escape route. Immediately, 10 of the 14 got in the crew van and began to drive south. The other four preceded the van on foot. The van was driven past these four and approached the fire that was now burning across the road. The Incident Commander (IC) assessed the risk as too great to proceed.

He turned the van around, picked up the four crewmembers, all of the crew gear, and drove north upriver. The IC assessed different areas as potential safety zones or shelter deployment areas.

Approximately one mile north, the IC selected a site characterized by an extensive rock scree field above and west of the road. The Chewuch River and a sand bar were just east of the road. The site also had relatively sparse vegetation in the surrounding area. The NWR #6 crew unloaded and congregated on and above the road as they watched the fire. The van was turned around and parked on the side of the road next to the river.

Two civilians, a man and woman, arrived in their truck shortly after the crew. In the early afternoon they had driven to a campground near the road terminus about two miles beyond the deployment site. They had noticed the fire and suppression work while driving up the road to the trailhead. Later in the afternoon while resting they saw the smoke and decided to leave the area. No fire shelters or information about shelter deployment were made available to them when they encountered the crew.

Although observers had noted the approach of the fire, the crew was not prepared for the suddenness with which it arrived. A rain of burning embers was followed by a rolling, wave of tremendous heat, fire, smoke, and wind. Eight of the crew deployed their shelters on the road. The two civilians took shelter with one of crewmembers. One squad boss was high above the road on the rock scree observing the fire. He ran down towards the road, but could not get there before the fire arrived. He turned around and retreated back up the slope. Four crewmembers and another squad boss, who had been sitting on some large boulders above the road observing the approach of the crown fire, also retreated up-slope. These five deployed their shelters in the same vicinity as the squad boss. Four of the six people who deployed shelters in this rock scree field died.

The surviving squad boss and crewmember (who had no gloves) both left their shelters at some point when the fire abated to non-lethal levels. The squad boss fled down the rock scree field to the road and jumped in the river. The other survivor sought shelter from the radiant heat behind a large boulder for a few minutes. He then fled to the safety of the crew van. The crewmembers and the two civilians that had deployed on the road eventually relocated to the river when conditions allowed their safe movement.

After the passage of the fire, all but four crewmembers were accounted for. The rescue party arrived approximately 35 minutes after the shelter deployment. One crewman with severely burned hands was evacuated to a hospital in Seattle while the remaining injured were treated locally and released.

All four deaths were caused by asphyxia due to inhalation of superheated products of combustion.

Significant 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 determined to be significant in the 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.