

Think While You Fight Fire

2002 Fireline Safety Refresher Training

Student Workbook



“For they had learned that true safety was to be found in long previous training...”
-Thucydides, *The History of the Peloponnesian War*, c. 404 B.C.

This presentation will provide an overview of basic principles for wildland firefighting including:

- ◆ The 10 Standard Fire Orders
- ◆ The 18 Watchout Situations
- ◆ LCES
- ◆ Wildland/Urban Interface Issues
- ◆ Downhill Fireline Construction

Through group exercises, students will be asked to apply these principles to real-life fire scenarios which occurred in the 2001 fire season.

INTRODUCTION

This year's fireline safety refresher training, THINK WHILE YOU FIGHT FIRE, is intended as an alternative delivery system for annual refresher training required by all personnel participating in fire suppression or prescribed fire duties. This training was designed specifically for fire personnel with fireline/operation qualifications and non-fire personnel who have a reason to be on the fireline unescorted. Check specific agency policy to determine if this training package meets all refresher training requirements.

PREREQUISITES

Students should have successfully completed S-130 and S-190 and have at least one season as a firefighter. Completion of S-130 and S-190 is also recommended for all non-fire qualified personnel.

COURSE OBJECTIVES

Upon completion of this training, the student will be able to understand and apply general wildland firefighting principles to simulated fire scenarios using the Incident Response Pocket Guide.

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Fire Entrapments, Shelter Deployments and Fatalities

- ◆ Total reported fatalities from 1910 to present - 809¹

ENTRAPMENTS (1976-1999):²

- ◆ 1,692 reported during 240 incidents – average 70/year

Entrapments by incident complexity (percent)

Type 1 or 2	Type 3	Type 4 or 5	Prescribed Burn
36%	22%	34%	8%

Entrapments by resource type (percent)

T2 Crew	Engine	Tractor/Plow	Overhead	Dozer	T1 Crew	T2 Inmate
26%	22%	17%	13%	12%	7%	3%

Entrapments by agency (percent)

USFS	States (Except CA)	CA Dept. Forestry	BLM	Rural	BIA	FWS	NPS
36%	31%	17%	8%	4%	2%	1%	1%

SHELTER DEPLOYMENTS (1976-1999):

- ◆ 1,050 shelter deployments on 109 incidents – average 43/year
- ◆ 70% on incidents managed by IMTs (Types 1, 2, or 3)
- ◆ 23% on initial attack
- ◆ 7% on prescribed burns

ENTRAPMENT FATALITIES (1976-1999):

- ◆ 105 fatalities on 28 incidents – average 4 fatalities/year

Fatalities by resource type (percent)

Dozer	Tractor/Plow	Engine	T2 Crew	Overhead	T2 Inmate	T1 Crew
20%	20%	16%	16%	12%	8%	8%

¹Source: “Accident Reports,” NIFC website: <http://www.nifc.gov/reports/safety>.

²Source: *Wildland Firefighter Entrapments 1976 to 1999*, 0051-2853-MTDC, October 2000.

Fire Entrapments, Shelter Deployments and Fatalities

(continued)

- ◆ Individuals involved in wildland fire operations died more often in burnovers than from any other cause.

Fatalities by cause, 1990 to 1998

	Burnover	A/C Accident	Heart Attack	Vehicle	Snag	Misc.
All Organizations	29%	23%	21%	19%	4%	4%
Federal Agencies (35 fatalities)	46%	11%	15%	11%	6%	11%
State Agencies (18 fatalities)	56%	11%	11%	-	11%	11% (Heat Stress)
Volunteers (41 fatalities)	12%	-	42%	44%	-	2%
Contractors (28 fatalities)	-	82%	6%	6%	6%	-
City/County (7 fatalities)	86%	-	-	-	-	14%
Private citizens (2 fatalities)	100%	-	-	-	-	-
Military (1 fatality)	-	100%	-	-	-	-

Fatalities by state, 1990 to 1998

CA	CO	AZ	NM	TX	MT	ID	WA	OR	AL	OK	UT	MO	AR, FL NY, PA WI, KY GA, SC	AK, ME NJ, TN LA, KS NE, NV
26	16	9	8	8	7	7	6	5	5	4	4	3	2 each	1 each

Source: *Wildland Fire Fatalities in the US 1990 to 1998*, 0051-2853-MTDC, October 2000.

Risk Management Process

Incident Response Pocket Guide, page 1

Step 1: Situation Awareness

Gather Information

- ◆ Objective(s)
- ◆ Previous Fire Behavior
- ◆ Communication
- ◆ Weather Forecast
- ◆ Who's in Charge
- ◆ Local Factors

Scout the Fire

Step 2: Hazard Assessment

Estimate Potential Fire Behavior Hazards

- ◆ Look Up/Down/Around Indicators

Identify Tactical Hazards

- ◆ Watch Outs

What other safety hazards exist?

Consider severity vs. probability.

Step 3: Hazard Control

Fire Orders →LCES Checklist=MANDATORY

- ◆ Anchor Point
- ◆ Downhill Checklist (if applicable)

What other controls are necessary?

Step 4: Decision Point

Are controls in place for identified hazards?

NO - Reassess situation

YES - Next question

Are selected tactics based on expected fire behavior?

NO - Reassess situation

YES - Next question

Have instructions been given and understood?

NO - Reassess situation

YES - Initiate action

Step 5: Evaluate

Personnel: Low experience level with local factors?

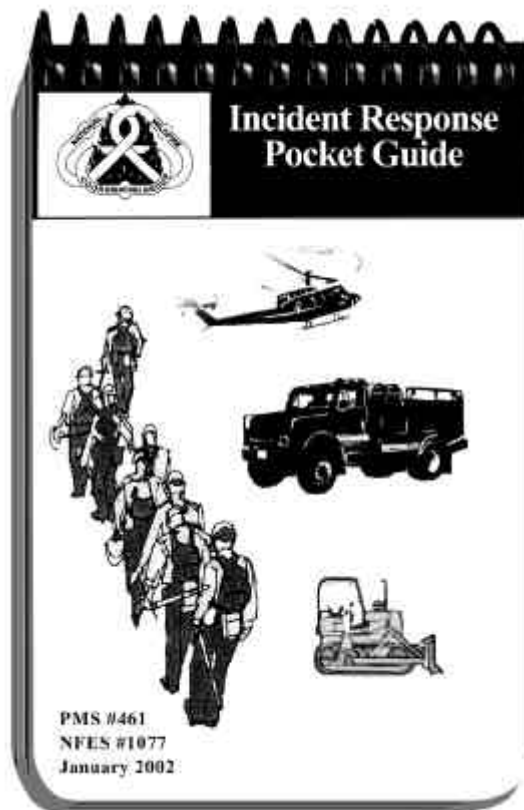
Distracted from primary tasks?

Fatigue or stress reaction?

Hazardous attitude?

Situation: What is changing?

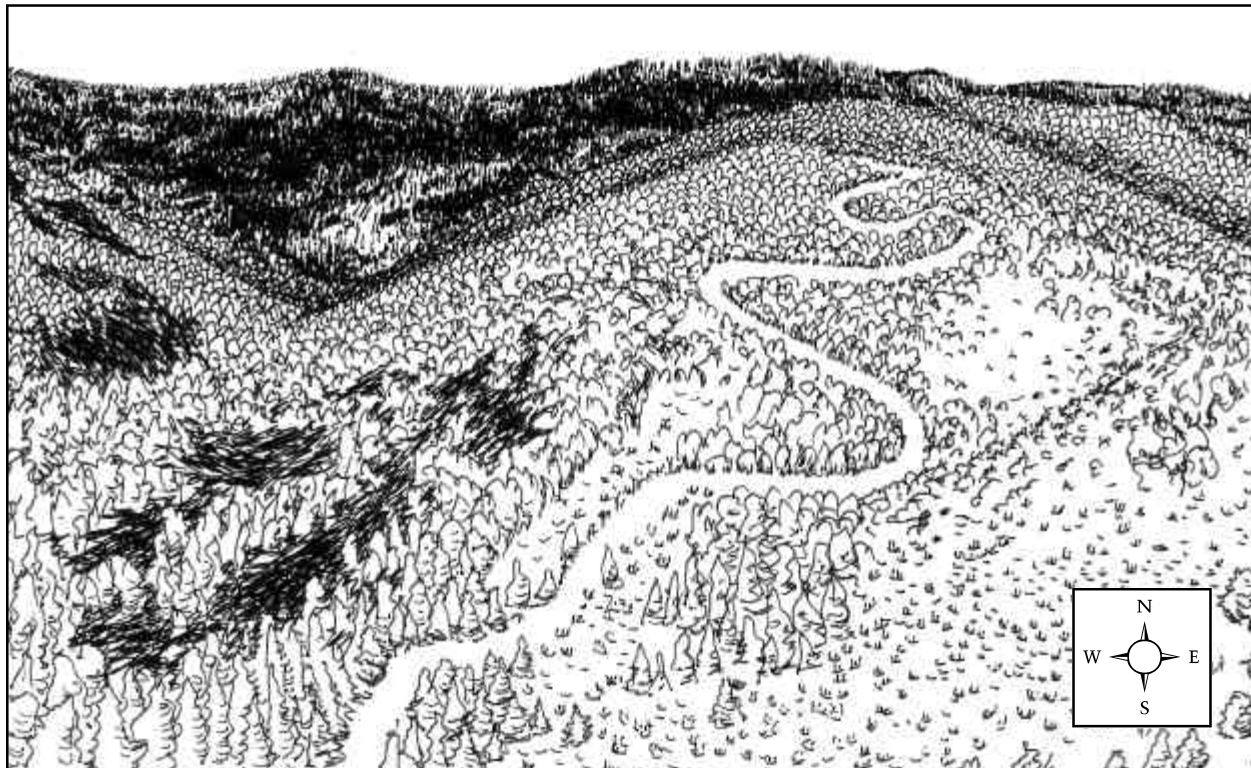
Are strategy and tactics working?



FRIDLEY FIRE, MONTANA, 2001

Module 1, Exercise #1

Work Group Task: Considering the number of spot fires and the amount of unburned fuel between the spot fires and the main fire; what course of action would you take as a Division Supervisor? What safety concerns would you address prior to engagement? If you were a crew member, what questions would you ask? To support your answers, use the green pages in the Incident Response Pocket Guide.



Current Situation

- ◆ Date, location and size: September 1, 2001, outside of Bozeman, Montana, 28,000 acres
- ◆ Division Group Supervisor on Division L: John Hojnowski, Manistee NF, Michigan
- ◆ Division L is five miles long; fire is approaching from the north and was spotting up to 1/2 mile
- ◆ Fire started about one week ago. Due to a wind event, the fire growth in one day was 15,000 acres.
- ◆ The fire has burned in patches. There are unburned islands with spot fires and unburned draws.
- ◆ Fuels, which lack continuous coverage, are subalpine fir and grass; fir is prone to torching.
- ◆ Weather forecast – temperatures in the upper 80s, RH: 15-17%; winds: NW 10-15 mph with gusts up to 25 mph
- ◆ Trigger points for torching and spotting – RH: 20%, wind: 15-20 mph
- ◆ Resources on hand: six hand crews, two strike teams of Type 6 engines, one 3,000 gallon skidder, two smaller skidgions with 15,000 gallons, two 5,000-gallon water tenders, one D-6 dozer
- ◆ Radio communication is established
- ◆ Objective: to keep the fire west of the road

10 FIRE ORDERS, 18 WATCHOUT SITUATIONS, LCES

Module 2, Exercise #1, Part 1

Work Group Task: Please read the following article.

Original Ten Standard Orders

by John Krebs

My interest in fire behavior, particularly in relation to fireline safety, has not diminished with time. I've had an opportunity to stay involved in fire with three fire assignments in 1996 and 1998, as well as participating in a couple of the National Fire Behavior workshops put on by the region.

Having just finished reading Maclean's *Fire on the Mountain*, I was again brought to tears at the tragic and senseless loss of those precious lives. The 1994 National FBA workshop included a visit to Mann Gulch. As we sat overlooking those 13 crosses, our thoughts were that this kind of event would not happen again because our knowledge of fire behavior and our emphasis on training had greatly improved. How wrong we were!

Where have we failed to make fire behavior the most important thought in the minds of our firefighters when they are actually engaged in the suppression activity?

Looking back to my first guard school training in 1958, I recall that the '10 STANDARD ORDERS' formed the framework for much of the teaching. The people who developed those original orders were intimately acquainted with the dirt, grime, sweat and tears of actual fireline experience. Those orders were deliberately arranged according to their importance. They were logically grouped making them easy to remember.

First and foremost of the Orders dealt with what the firefighters are there to encounter: "the fire."

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times. Observe personally, use scouts.
3. Base all action on current and expected fire behavior of the fire.

Each of the 10 Standard Orders are prefaced by the silent imperative "YOU," meaning the on-the-ground firefighters, the person who is putting her or his life on the line!

My gut aches when I think of the lives that could have been spared, the injuries or close calls which could have been avoided, had these three Orders been routinely and regularly addressed prior to and during every fire assignment!

As instructors and fire behavior analysts have we become so enthralled with our computer knowledge and skills that we've failed to teach the basics? One does not have to be a full-blown 'gee whiz' to apply these Orders—they revolve around elementary fuels, weather, topography. These are things that are measurable and observable, even to the first year firefighter.

When we went out as a fire team and were 'briefed,' it was our responsibility to seek answers to basic questions—the first being, What is the weather forecast?

Following that were questions concerning what the fire was doing, where it was expected to go and how was it to be confined, contained, and/or controlled. Every firefighter is entitled to ask and receive answers to these same inquiries. I should reword that—every firefighter should be "required" to ask....

Logically following these three fire behavior-related orders were three dealing with fireline safety:

4. Have escape routes and make them known.
5. Post a lookout when there is possible danger.
6. Stay alert. Keep calm. Think clearly.
Act decisively.

One cannot know if an escape route or a safety zone is adequate until the Orders addressing fire behavior have been specifically evaluated.

One of the primary functions of a lookout is observing and monitoring the weather and fire behavior. How can it be that some of our most highly trained and experienced fire personnel can be on a fire such as South Canyon and not record even one, on-the-ground weather observation? Where did we as trainers go wrong?

I have a nephew who jumped out of McCall. Shortly after the South Canyon tragedy, I asked him if he ever carried a belt weather kit. His answer shocked me, “Uncle John, we don’t have room for those things.” Please tell me that has changed.

If humidities (reference *Fire on the Mountain*) were as low as 11 percent at 2400 hours on July 5, just what were they (doing) on the afternoon of July 6 on the western drainage? ‘How can a firefighter possibly keep informed on fire weather conditions . . .’ without on-site monitoring of relative humidities, wind, etc.?’

The next three 10 Standard Orders centered around organizational control:

7. Give clear instructions and be sure they are understood.
8. Maintain prompt communications with your men, your boss, and adjoining forces.
9. Maintain control of your forces at all times.

Again, if one hadn’t properly considered the first three fire behavior-related orders, it would be impossible to think that Orders 7, 8 and 9 could be addressed with any validity.

The last of the 10 Standard Orders; “Fight fire aggressively but provide for safety first.”

This is the only Order, which I would change just slightly to ‘fight fire aggressively having provided for safety first.’

Read Maclean’s account (p. 65) concerning what should be the last order, as they chanted the ten basic fire orders in training, the first order ‘Fight fire aggressively, provide for safety first’ becomes transformed into ‘fight fire aggressively, provide for overtime first.’

I can remember helping to teach some of the fire behavior (and related) courses in Missoula and asking the participants to write down all of the Fire Orders they could recall. There were students in S-390 (and higher) who could not recall more than three or four orders! But they always remembered, ‘Fight fire aggressively....’

It was encouraging for me to learn from some first-year firemen that they were required to learn the Fire Orders in guard school. My fear is that this was merely an exercise in rote memory, as Maclean’s account would indicate. It’s something to chant but it is an exercise without memory.

I urge you to reestablish the original Ten Standard Orders. They were developed in a very special order of importance, grouped to make practical sense and most importantly when considered prior to and during every shift, they will save lives.

The 18+ situations that shout watch out; LCES; Look up, Look down, Look all around; etc., are merely tools to reinforce the thought processes initiated by the original Ten Standard Orders.

John Krebs is a retired Fire Management Officer for the US Forest Service, Clearwater National Forest, Palouse Ranger District, Potlatch, Idaho.

10 FIRE ORDERS, 18 WATCHOUT SITUATIONS, LCES

Module 2, Exercise #1, Part 2

Work Group Task: After reading the article by John Krebs, determine which of the 18 Watchout Situations are in direct violation of one (or more) of the ORIGINAL 10 Standard Orders. Tie specific examples to past experiences and share with the group.

ORIGINAL 10 STANDARD ORDERS <i>(from John Krebs' article)</i>		
<ol style="list-style-type: none"> 1. Keep informed on fire weather conditions and forecast. 2. Know what your fire is doing at all times. Observe personally, use scouts. 3. Base all action on current and expected fire behavior of the fire. 4. Have escape routes and make them known. 5. Post a lookout when there is possible danger. 6. Stay alert. Keep calm. Think clearly. Act decisively. 7. Give clear instructions and be sure they are understood. 8. Maintain prompt communications with your men, your boss, and adjoining forces. 9. Maintain control of your forces at all times. 10. Fight fire aggressively but provide for safety first. 		
18 WATCHOUT SITUATIONS	Does this situation violate an order(s)? (Yes or No)	If Yes, which order(s)?
1. Fire not scouted and sized up		
2. In country not seen in daylight		
3. Safety zones and escape routes not identified		
4. Unfamiliar with weather and local factors influencing fire behavior		
5. Uninformed on strategy, tactics, and hazards		
6. Instruction and assignments not clear		
7. No communication link with crew members or supervisor		
8. Constructing line without safe anchor points		
9. Building fireline downhill with fire below		
10. Attempting frontal assault on fire		
11. Unburned fuel between you and fire		
12. Cannot see main fire, not in contact with someone who can		
13. On hillside where rolling material can ignite fuel below		
14. Weather is getting hotter and drier		
15. Wind increases and/or changes directions		
16. Getting frequent spot fires across line		
17. Terrain and fuels make escape to safety zones difficult		
18. Taking a nap near the fireline		

SOLUTION TO EXERCISE #1, Part 2

The following are excerpts from Steep Weiss' comments on the importance and interrelationship of the 10 Standard Fire Orders and the 18 Watchout Situations and his solution to the previous exercise.

The 10 Standard Fire Orders are direct commands that always apply to everyone on every fire.

They are universal and imperative. We have only two choices: either make efforts to get into compliance with the Orders or quit the operation.

The 18 Situations That Watch Out can be divided into two categories as follows: Eleven of the 18 are purely situations that are of the utmost importance to be alert to and be ready to deal with, like noticing the wind changing or the air getting hotter and drier. Others we might at least influence, like removing the fuel between you and the fire. We must do something to cope with them, and backing off may be one of the options.

The other seven situations are categorically *violations* of the 10 Orders. Yes, we need to watch out, but more importantly, we need to either simply start following the order, or quit fighting the fire. It is always unacceptable to remain in one of these seven situations.

For example, Situation 1 (Fire not scouted and sized up) is a direct violation of Standard Order 2 (Know what your fire is doing at all the times.). Observe personally; use scouts. So find out or get out! We can change these situations by obeying the pertinent Fire Orders.

In fact, here they are:

Situation 1 is a violation of Order 2.

Situations 3 and 17 are both violations of Order 4.

Situations 5, 6, and 7 are all in violation of Order 8.

Situation 12 is a violation of both Orders 2 and 5.

Steep Weiss is from the Carson City Field Office.

Module 2, Exercise #1, Part 3

Additional discussion point: Which of the 10 Standard Fire Orders are not covered in LCES? Does LCES replace the 10 Standard Fire Orders?

ORIGINAL 10 STANDARD ORDERS

(from John Krebs' article)

1. Keep informed on fire weather conditions and forecast.
2. Know what your fire is doing at all times. Observe personally, use scouts.
3. Base all action on current and expected fire behavior of the fire.
4. Have escape routes and make them known.
5. Post lookout when there is possible danger.
6. Stay alert. Keep calm. Think clearly. Act decisively.
7. Give clear instructions and be sure they are understood.
8. Maintain prompt communications with your men, your boss, and adjoining forces.
9. Maintain control of your forces at all times.
10. Fight fire aggressively but provide for safety first.

Place checks in the boxes where the Order is covered by LCES.

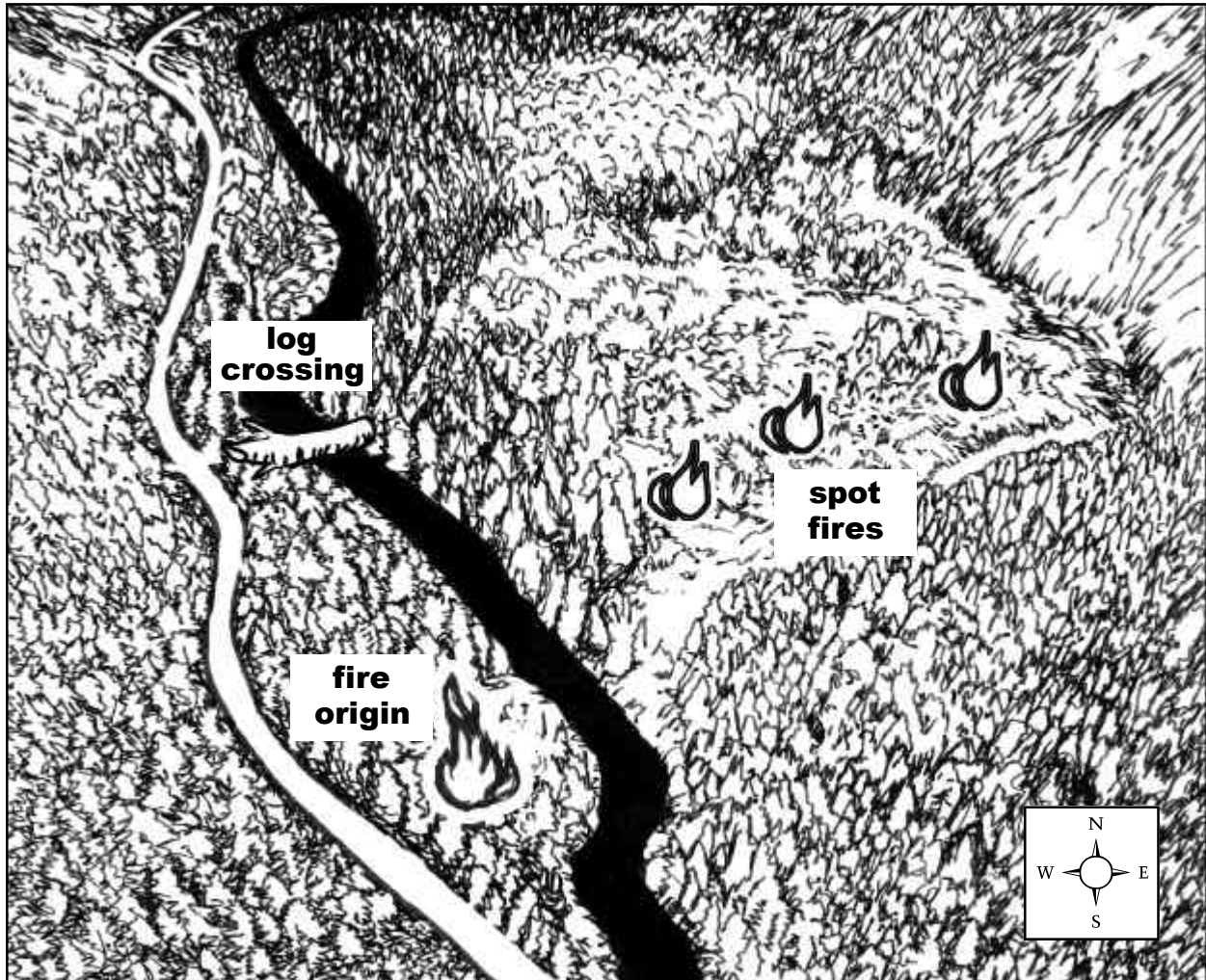
FIRE ORDER	LOOKOUTS	COMMUNICATIONS	ESCAPE ROUTES	SAFETY ZONES
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This exercise is designed to promote discussion among all participants.

PACIFIC NORTHWEST, WASHINGTON, 2001

Module 2, Exercise #2, Part 1

Work Group Task: Run through the risk management process in the Incident Response Pocket Guide. Armed with this information, how would you assign the resources available while adhering to the 10 Standard Fire Orders and mitigating any Watchout Situations?



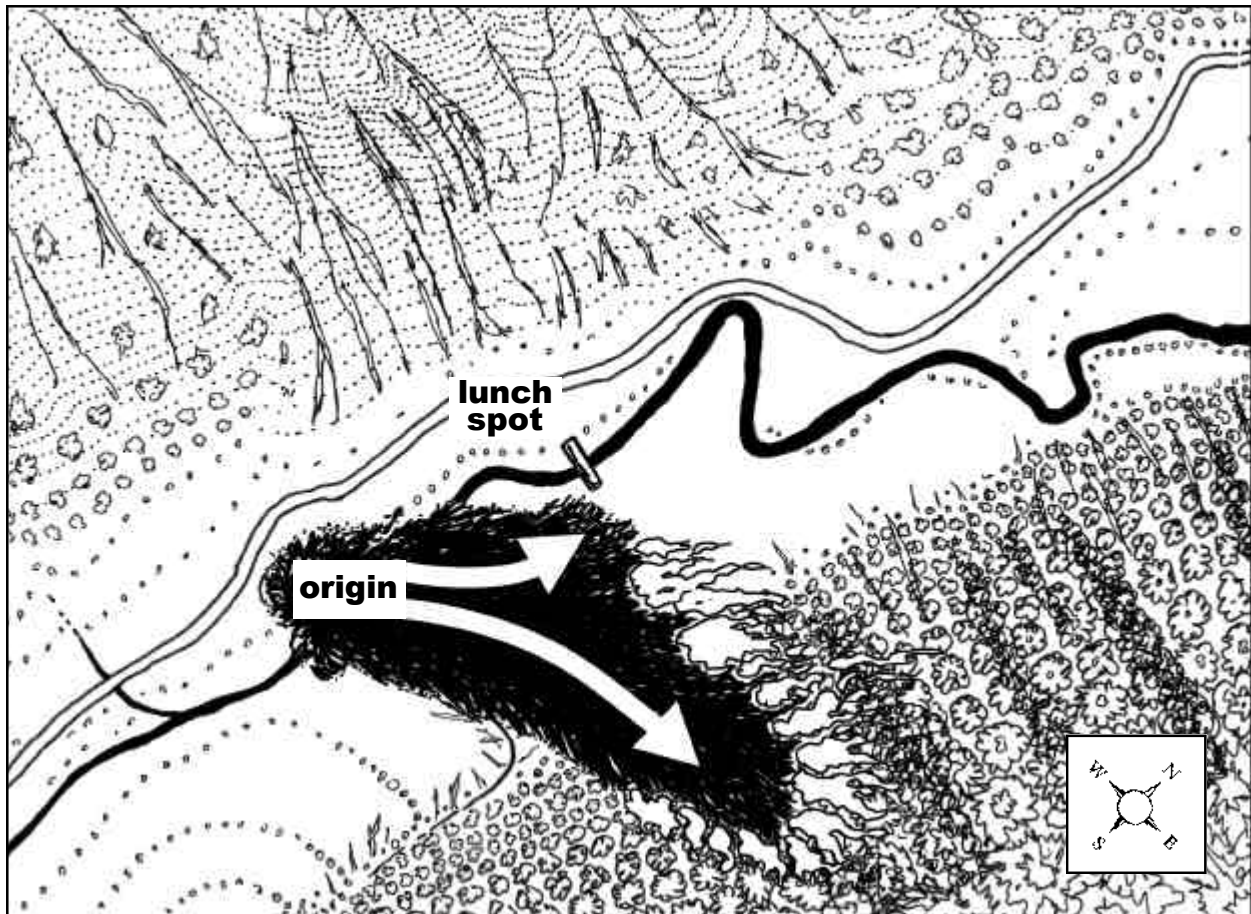
Current situation

- ◆ July 10, 10:30 a.m., Pacific Northwest
- ◆ Fire located in steep, narrow canyon; six active spot fires across the creek, northeast of the main fire
- ◆ Fuel type: 10 (ponderosa, douglas fir, spruce, lodgepole, cottonwoods, birch, shrubs, bushes)
- ◆ Temperature: 70°F, RH: 50%, wind: calm
- ◆ Resources: one Type 2 crew (21 total)
- ◆ Equipment: two Mark III pumps and 1,500 ft. of hose with an adequate supply of gated wyes, fittings and nozzles
- ◆ The east side of the river is accessible near the point of origin where the river narrows, as well as at the log crossing.

PACIFIC NORTHWEST, WASHINGTON, 2001

Module 2, Exercise #2, Part 2

Work Group Task: If you were the IC, or a firefighter crew member, what needs to happen before you would reengage? What are your reengagement criteria? Be as specific as you can.



Current situation

- ◆ Mid-afternoon, same fire
- ◆ Temperature: 87°F, RH: 17%, winds: S 5-6 mph
- ◆ Resources: one Type 1 crew, one Type 2 crew, AFMO, and two engines en route

Module 2, Exercise #2, Part 3

Work Group Task: Use as many of the following discussion points as desired to assess the lessons that can be learned from the Thirtymile tragedy. See the Appendix for the timeline of events from the Thirtymile Investigation Report.

Classroom Discussion Points

1. Did communication on this incident influence the eventual outcome?
How could communication have been improved?
2. How critical was the physical condition (fatigue) of the crews involved?
What could you do to minimize fatigue? Who is responsible for minimizing fatigue?
3. Were there opportunities for operational briefings that were not used?
If so, what should have been mentioned in these briefings?
4. What fire behavior factors were present that would indicate the eventual blowup?
If you were new to an area, how would you learn about key fire behavior indicators?
5. Discuss the difference between a deployment area and a safety zone and possible locations for each.
Use the Thirtymile fire, or other fires from your past experience, as discussion points.
6. Where were the anchor points, escape routes, and safety zones on this incident?
7. What lessons can be learned from this incident?
8. Discuss LCES in relation to this incident.
9. How could the use of trigger points have helped this situation?
10. Others...

Safety Zone Guidelines

Incident Response Pocket Guide, page 7

- ◆ Avoid locations that are downwind from the fire.
- ◆ Avoid locations that are in chimneys, saddles, or narrow canyons.
- ◆ Avoid locations that require a steep uphill escape route (greater than 50%).
- ◆ Take advantage of heat barriers such as lee sides of ridges, large rocks, or solid structures.
- ◆ Burn out safety zones prior to flame front approach.
- ◆ For *radiant heat only*, the distance separation between the firefighter and the flames must be at least 4 times the maximum flame height. This distance must be maintained on all sides if the fire has ability to burn completely around the safety zone. **Convective heat from wind and/or terrain influences will increase this distance requirement. The calculations in the table below assume no slope and no wind.**

Flame Height	Distance Separation (firefighters to flame)	Area In Acres
10 ft	40 ft	$\frac{1}{10}$ acre
20 ft	80 ft	$\frac{1}{2}$ acre
50 ft	200 ft	3 acres
75 ft	300 ft	7 acres
100 ft	400 ft	12 acres
200 ft	800 ft	50 acres

Distance Separation is the radius from the center of the safety zone to the nearest fuels. When fuels are present that will allow the fire to burn on all sides of the safety zone, this distance must be doubled in order to maintain effective separation in front, to the sides, and behind the firefighters.

Area in acres is calculated to allow for distance separation on all sides for a three-person engine crew. One acre is approximately the size of a football field or exactly 208 feet x 208 feet.

OPERATIONAL BRIEFINGS

Module 3, Exercise #1

Work Group Task: Review and discuss within your group the new briefing checklist. What are the advantages of having a standard checklist? Do you see this as a useful tool and will you use it this season?

Briefing Checklist

Incident Response Pocket Guide, inside back cover

Situation

- ◆ Fire name, location, map orientation, other incidents in area
- ◆ Terrain influences
- ◆ Fuel type and conditions
- ◆ Fire weather (previous, current, and expected), winds, RH, temperature, etc.
- ◆ Fire behavior (previous, current, and expected), time of day, alignment of slope and wind, etc.

Mission/Execution

- ◆ Command: Incident Commander and immediate supervisor
- ◆ Commander's intent: overall strategy and objectives
- ◆ Specific tactical assignments
- ◆ Contingency plans

Communications

- ◆ Communication plan: tactical, command, air-to-ground frequencies, cell phone numbers
- ◆ Medivac plan

Service/Support

- ◆ Other resources: working adjacent and those available to order, aviation operations
- ◆ Logistics: transportation, supplies and equipment

Risk Management

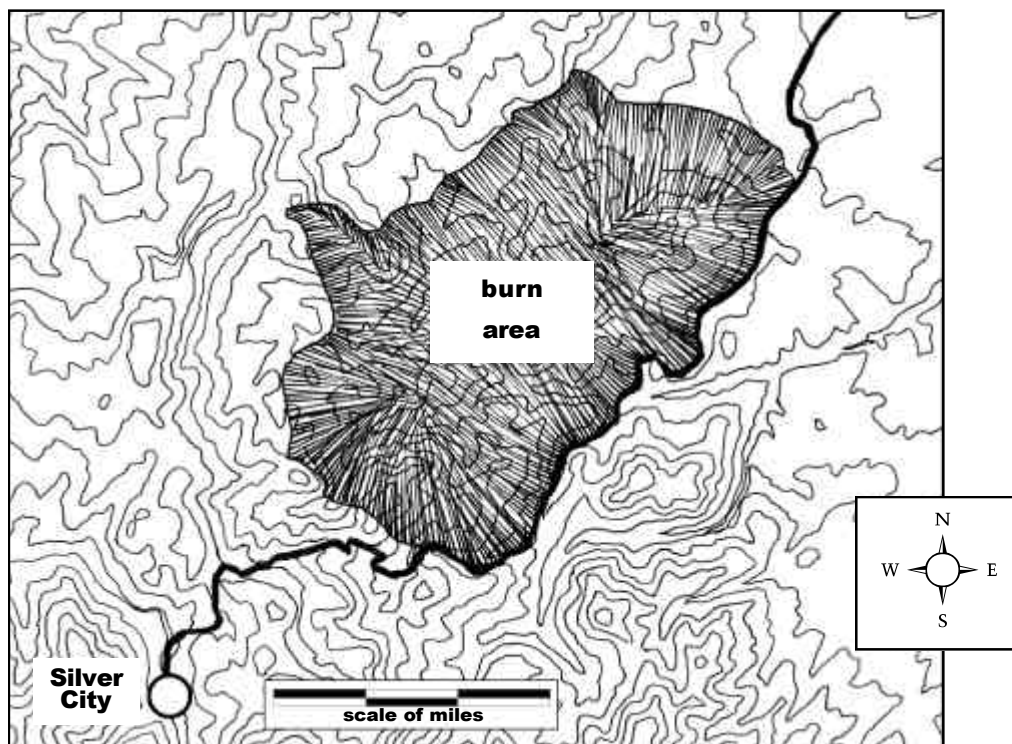
- ◆ Identify known hazards and risks.
- ◆ Identify control measures to eliminate hazards and reduce risk: anchor point and LCES.
- ◆ Identify trigger points for disengagement and reevaluation of operational plan.

Questions or Concerns?

WILDLAND/URBAN INTERFACE

Module 4, Exercise #1

Work Group Task: Using your Incident Response Pocket Guide, review and discuss the Wildland/Urban Watchout Situations, the Structure Protection Checklist, and the Structure Assessment Checklist. Relate these items to either the Rough Diamond incident or to issues you are facing in your local area.



Current situation

- ◆ End of August, 8:00 a.m., southwest Idaho, Rough Diamond Fire/Silver City
- ◆ Fire size: 10,500 acres, elevation: 5,000 ft., location: three miles N-NE from Silver City, separated by ridge and summit
- ◆ Fuels: grass, sage, juniper, Douglas fir and Ponderosa pine at higher elevations
- ◆ Predicted weather – temperatures: 86-89°F, RH: 8-13%, valley winds: up to 13 mph, ridge winds: NW 10-20 mph with gusts to 25 mph
- ◆ Silver City, elevation: 6,132 ft., historic mining town, used for recreation purposes, wooden structures, 20 local inhabitants present, oil, propane, gas storage tanks and wood piles scattered around town, north access route dead-ends at south side of the town, small green park at south end is a potential safety zone, small creek running through town, multiple abandoned mine shafts in surrounding area
- ◆ 30,000-gallon city water tank fed by the local spring, 4” line from the tank looping around the town with numerous pipes and 1½” valves for hose attachments
- ◆ Resources on hand: one strike team of VFD Type 2 engines, one TFLE, one DIVS, one resource advisor; air attack available
- ◆ Resources on order: four water tenders, additional hose, an Archeologist
- ◆ Other resources at risk: grazing permits, old willow growth, historic mines

Wildland-Urban “Watchouts”

Incident Response Pocket Guide, page 11

- ◆ Poor access and narrow one-way roads
- ◆ Bridge load limits
- ◆ Wooden construction and wood shake roofs
- ◆ Inadequate water supply
- ◆ Natural fuels: 30 feet or closer to structures
- ◆ Structures in chimneys, box canyons, narrow canyons, or on steep slopes (30% or greater)
- ◆ Extreme fire behavior
- ◆ Strong winds
- ◆ Evacuation of public (panic)

Structure Protection Checklist

Incident Response Pocket Guide, page 12

- ◆ Check roads before the fire hits. Know turnouts and bridge limits.
- ◆ Check each home for defense. Use Structure Assessment Checklist.
- ◆ Stay mobile; keep engine running, red lights on.
- ◆ Back in equipment for quick escape.
- ◆ Brief firefighters on plan and verify radio contact with lookout.
- ◆ Coil a short 1½” charged line with fog nozzle on your engine for safety and quick knock-down.
- ◆ Use short hose lays.
- ◆ Keep at least 100 gallons of water in your tank.
- ◆ Determine if residents are home. Advise residents of escape routes, safety zones and evacuation center. Ask residents to evacuate threatened livestock or pets. Leave home lights on inside and out, day and night.
- ◆ Place owner’s ladder at a corner of home on side least threatened by fire.
- ◆ Coil and charge garden hoses.
- ◆ Identify hazards at site; e.g., LPG, pesticides, paint storage, electrical wires.
- ◆ Don’t enter a burning structure unless you are trained, equipped and authorized.
- ◆ If a home becomes well-involved, LEAVE IT; move on to one you can save.
- ◆ ALWAYS WEAR ALL YOUR SAFETY GEAR.
- ◆ **Firefighter safety and survival is the number one priority.**

Structure Assessment Checklist

Incident Response Pocket Guide, pages 13 and 14

Address/ Property Name

- ◆ Numerical street address, ranch name, etc.
- ◆ Residents on-site?

Road Access

- ◆ Number of lanes, vegetation clearance?
- ◆ Road grade: greater than 15%?
- ◆ Creek crossings, clearance problems, drivable surface?
- ◆ Turn-outs, turn arounds?
- ◆ Bridges: adequate support structure?

Building Construction

- ◆ Roof: asphalt, fiberglass, tile, rock, metal or wood shake, debris, other easily combustible material?
- ◆ Eaves: covered and little overhang or exposed with large overhang?
- ◆ Other features: exposed wooden structural elements, overhang slope, attached wood deck, lightweight flammable curtains, large windows face heat source?

Defensible Space

- ◆ 100 ft. of vegetation, maximum 18 in. high and 30-ft. complete vegetation clearance?
- ◆ Flammable trees adjacent to structure?
- ◆ Other combustibles adjacent to structure?
- ◆ Structure located on a narrow ridge, in a chimney, narrow canyon, or mid-slope; and defensible space less than 200 ft.?

Hazardous Materials

- ◆ Pesticides, herbicides, flammable material or other unknown storage?
- ◆ Power lines or transformers near apparatus placement areas?
- ◆ LPG tanks near apparatus placement areas?

Available Water

- ◆ Hydrant or standpipe, water storage tank with valve, swimming pool with access?

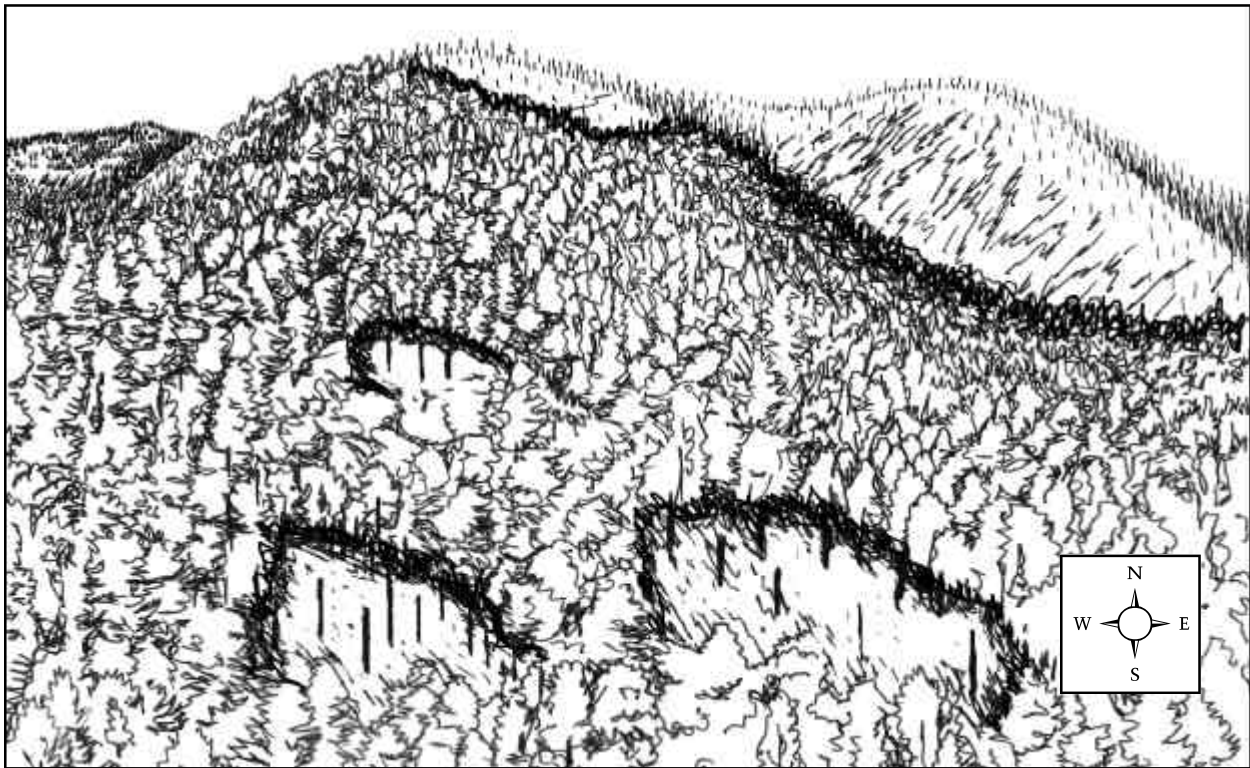
Estimated Resources for Protection Plan

- ◆ Number and type engines, water tenders, crews, dozers?
- ◆ Evacuation needs?

DOWNHILL FIRELINE CONSTRUCTION

Module 5, Exercise #1

Work Group Task: Where should available resources be deployed, what is your tactical strategy, and what are your safety concerns? Run through the Downhill Checklist in the Incident Response Pocket Guide and note any hazard mitigation measures you would put in place before beginning the assignment.



Current situation

- ◆ Fire started on 8/25 and made a downhill run toward a local community, then spread in all directions. It stopped over the ridge, with unburned pockets of fuel and multiple spot fires. The size increased from 350 acres to 870 acres.
- ◆ Fire is creeping downhill, spotting up to 1/8 mile, currently up to 15 spot fires, with unburned fuel in between
- ◆ Weather forecast – Temperatures: 83°F valleys and 73°F ridge; RH: 24-28%; N-NW wind: 8-10 mph, with occasional gusts to 16-18 mph. Wind event is predicted in 2-3 days
- ◆ Division I resources: two Type 1 helicopters, two Type 2 helicopters, two Type 1 crews, six Type 2 crews, two SOF2, one DIVS and one FOBS
- ◆ Safety issues present - steep, rocky, rolling rocks, spotting
- ◆ A road located one mile to the south can provide access to the lower spot fires
- ◆ Management objective is to keep the fire from spreading toward the south

Downhill Checklist

Incident Response Pocket Guide, page 8

Downhill fireline construction is hazardous in steep terrain, fast-burning fuels, or rapidly changing weather. Downhill fireline construction should not be attempted unless there is no tactical alternative. When building downhill fireline, the following is required:

1. Crew supervisor(s) and fireline overhead will discuss assignments prior to committing crew(s).

Responsible overhead individual will stay with job until completed (TFLD or ICT4 qualified or better).

2. Decision will be made after proposed fireline has been scouted by supervisor(s) of involved crew(s).
3. LCES will be coordinated for all personnel involved.
 - ◆ Crew supervisor(s) is in direct contact with lookout who can see the fire.
 - ◆ Communication is established between all crews.
 - ◆ Rapid access to safety zone(s) exists in case fire crosses below crew(s).
4. Direct attack will be used whenever possible; if not possible, the fireline should be completed between anchor points before being fired out.
5. Fireline will not lie in or adjacent to a chute or chimney.
6. Starting point will be anchored for crew(s) building fireline down from the top.
7. Bottom of the fire will be monitored; if the potential exists for the fire to spread, action will be taken to secure the fire edge.

Internet Web Site Links

www.fire.blm.gov/training/blmtrng/blmtrng.html

Web site for 2001 and 2002 Fireline Safety Refresher (student workbook and facilitator guide)

www.fire.blm.gov/

- ◆ Six Minutes for Safety
- ◆ Operational Documents and Reports
 - View investigation reports and reviews of:
 - Cerro Grande Prescribed Fire
 - Lowden Ranch Prescribed Fire
 - Point Fire
 - Sadler Fire Entrapment
 - South Canyon Fire
 - Thirtymile Fire
 - Historical Wildland Fire Fatalities

View a variety of interagency guides, handbooks, and publications.

- Incident Response Pocket Guide
- Fire Preparedness Review Guide
- Aviation User Pocket Guide
- Standards for Fire and Aviation Operations

www.nwcg.gov/

Select Working Teams, then Safety & Health, then Entrapments and Fatalities

- ◆ Entrapments and Fatalities Statistics

www.nifc.gov/safety_study/annual-refresh

Interagency annual wildland fire refresher web site

Publications

- ◆ Using Your Fire Shelter Video (2001), NFES 1568
- ◆ Your Fire Shelter Booklet, 2001 Edition, PMS 409-2, NFES 1570
- ◆ Incident Response Pocket Guide, PMS 3461, NFES 1077
- ◆ Fireline Handbook, PMS 410-1, NFES 0065
- ◆ Standards for Fire and Aviation Operations, 2002

Appendix: Thirtymile Incident Timeline

Event	Time/Date	Response Actions
<p style="text-align: center;">Untended campfire ignites a fire along the Chewuch River</p> <p style="text-align: center;">Fire reported by Canadian Lead Plane (9:26 p.m.)</p> <p style="text-align: center;">Fire size estimated 3 to 8 acres in heavy timber with 2-4 foot flame lengths (11:08 p.m.)</p> <p style="text-align: center;">10-person crew and 2 engines requested (11:08 p.m.)</p> <p style="text-align: center;">Fire investigator and Type 3 or 4 IC requested (11:22 p.m.)</p> <p style="text-align: center;">Fire size estimated 20-25 acres and "it will grow tonight, will not hold, will hit slope and get larger" (11:59 p.m.)</p>	<p>July 9, 2001</p> <p>– 9:00 p.m.–</p> <p>–10:00 p.m.–</p> <p>–11:00 p.m.–</p>	<p>3-Person hand crew en route to fire (10:04 p.m.)</p> <p>Engine #704 en route to fire (10:45 p.m.)</p> <p>3-Person hand crew arrives at fire (~11 p.m.)</p> <p>Entiat IHC & Mark III pump assigned to the fire (11:11 p.m.)</p> <p>Engine #704 arrives at fire (11:49 p.m.)</p>
<p style="text-align: center;">NWR #6 crew assigned to Libby South fire (~12:00 a.m.)</p> <p style="text-align: center;">Fire "slopped over river" (12:10 a.m.)</p> <p style="text-align: center;">Entiat IHC releases Engine #704, 3-person hand crew and 2-person chase truck (~1:30 a.m.)</p> <p style="text-align: center;">Fire line completed from road to west side of river (1:48 a.m.)</p> <p style="text-align: center;">Two spots contained (2:15 a.m.)</p> <p style="text-align: center;">Crew and helicopter ordered for morning arrival (2:15 a.m.)</p> <p style="text-align: center;">Two Mark III pumps with kits, hose, wyes, nozzles, reducers ordered (2:15 a.m.)</p>	<p>– 12:00 a.m.–</p> <p>July 10, 2001</p> <p>– 1:00 a.m. –</p> <p>– 2:00 a.m. –</p> <p>– 3:00 a.m. –</p>	<p>WR #6 crew contacted to meet in Twisp, WA at 7:00 a.m.</p> <p>Entiat IHC and 2-person chase truck arrive at fire (~1:00 a.m.)</p> <p>Engine #704, 3-person hand crew & 2-person chase truck depart the fire (1:30 a.m.)</p> <p>Plan of attack is to go east of river and find and line spots (~1:30 a.m.)</p> <p>Entiat IHC move to east side of river (2:15 a.m.)</p> <p>NWR #6 crew assembles in Leavenworth, WA (3:30 a.m.)</p>

Event	Time/Date	Response Actions
<p>Dispatch requested information on type of aircraft needed (5:26 a.m.)</p> <p>Seven spots covering a total of 5 to 6 acres - five spots lined (5:26 a.m.)</p>	<p>- 4:00 a.m. -</p> <p>- 5:00 a.m. -</p>	<p>Confirmed Helicopter 13N (Type III with bucket and long line) to be available at NCSB at 10 a.m. (5:26 a.m.)</p> <p>Entiat move to west side of river for rest and food (~5:30 a.m.)</p>
<p>About 1.5 acres lined (6:26 a.m.)</p>	<p>- 6:00 a.m. -</p>	<p>Entiat IHC return to fire on east side of river (6:26 a.m.)</p>
<p>NWR #6 arrives at Twisp Ranger Station (~7:00 a.m.)</p>	<p>- 7:00 a.m. -</p>	<p>Briefing — NWR #6 notified they would be mopping up “a small fire” (~7:00 a.m.)</p>
<p>NWR #6, District FMO, and Forest FMO depart for the fire (7:51 a.m.)</p>	<p>- 8:00 a.m. -</p>	
	<p>- 9:00 a.m. -</p>	<p>NWR #6, District FMO, and Forest FMO arrived at the fire (9:04 a.m.)</p>
<p>Fire status assessment completed (~9:45 a.m.)</p>	<p>- 10:00 a.m. -</p>	<p>NWR #6 Crew Boss assumes IC (9:30 a.m.)</p>
<p>NWR #6 Crew Boss Trainee completes crew briefing (~10:30 a.m.)</p>		<p>Plan is to put in “pump show, line, and mop up the fire”</p>
<p>Forest FMO orders another crew (10:40 a.m.)</p>		
<p>District FMO orders barricade to close the road</p>	<p>- 11:00 a.m. -</p>	
<p>Pumps and hoses set up (~11:00 a.m.)</p> <p>Entiat IHC go to bed down at campground (~11:00 a.m.)</p>		<p>NWR #6 crew began working the fire on west and east side of the river (~11:00 a.m.)</p>
<p>From 11:00 a.m. to 12:00 p.m.</p> <ul style="list-style-type: none"> • Some hoses burst • Trouble keeping pumps running • Four pulaskis break 		
<p>Dispatch notifies IC that Helicopter 13N available at NCSB (11:52 a.m.)</p>	<p>- 12:00 p.m. -</p>	
<p>IC checks on arrival of Helicopter 13N and orders “1 or 2 more crews” (12:30 p.m.)</p>		<p>NWR #6 tactics changed to digging line (~12:00 p.m.)</p>
<p>Dispatch unable to contact Entiat IHC (12:49 p.m.)</p>		<p>IC requests launch of Helicopter 13N (12:08 p.m.)</p>
		<p>Air Attack diverted from Libby South Fire to Thirtymile Fire (12:40 p.m.)</p>

Event	Time/Date	Response Actions
<p>Two civilians drive past the fire and crew toward the Thirtymile campground (~1:00 p.m.)</p> <p>Air Attack arrives at fire (~1:11 p.m.)</p> <p>IC repeats order for 2 additional crews (1:43 p.m.)</p>	<p>– 1:00 p.m. –</p>	<p>NWR #6 crewmember sent to wake Entiat IHC (~1:00 p.m.)</p> <p>Air Attack orders SEAT (1:15 p.m.)</p>
<p>Approval to launch Helicopter 13N (2:00 p.m.)</p>	<p>– 2:00 p.m. –</p>	<p>Entiat IHC arrive at fire (~2:00 p.m.)</p> <p>Helicopter 13N departs from 8-Mile Camp to begin making water drops (2:38 p.m.)</p>
<p>Engines #701 and #704 drive past crews looking for spotting (~3:30 p.m.)</p>	<p>– 3:00 p.m. –</p>	<p>NWR #6 pulled back to lunch site on west side of river (3:00 p.m.)</p>
<p>First Butte Lookout reports the fire is forming its own thunderhead (4:03 p.m.)</p>	<p>– 4:00 p.m. –</p>	<p>NWR #6 Squad 1 called up the road to support Engine #701 (~4:00 p.m.)</p> <p>NWR #6 Squad 2 called up to support Engine #701 (~4:20 p.m.)</p>
<p>Fire burns across the road entrapping Squads 1 & 2 (4:34 p.m.)</p>	<p>– 5:00 p.m. –</p>	<p>NWR #6 Squad 3 arrives at Engine #704 and immediately retreats toward lunch site (~4:34 p.m.)</p>
<p>Two civilian campers arrive from the Thirtymile Camp site (~5:10 p.m.)</p> <p>Column of fire reaches the deployment site (5:24 p.m.)</p> <p>Firestorm moves beyond the deployment site</p> <p>At least two injured and four unaccounted for (5:48 p.m.)</p>	<p>– 5:00 p.m. –</p>	<p>NWR #6 Squads 1 & 2 load in van and drive one mile up the road toward a deployment site</p> <p>Shelters deployed (5:24 p.m.):</p> <ul style="list-style-type: none"> • Ten people on the road • Six people on the rock slope <p>Two crewmembers on the rock slope leave their shelters - one to the river and one to the van</p> <p>Ten people on the road move to the river</p> <p>People move from the river to the sandbar (~5:50 p.m.)</p>
	<p>– 6:00 p.m. –</p>	<p>Entiat IHC, NWR #6 Crew Boss Trainee arrive and begin to administer first aid (~6:00 p.m.)</p> <p>NWR #6 crew and civilians given medical treatment and evacuated</p>

How Was It?

This video was made for you in hopes of adding some variety to the Annual Refresher Training. It would be very helpful to us if you would let us know what you thought of this course by answering the following questions.

What did you think of the format of the Refresher?

- no improvement needed needs improvement no opinion

remarks _____

What did you think of the contents?

- too basic need more details add more subjects

remarks _____

If another version of this course is produced, what changes would you recommend?

Facilitator, please return the evaluations. Comments by e-mail are welcome.

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