THE NUMBERS TELL A STORY

2004 Fireline Safety Refresher Training

Student Workbook

This presentation will provide an overview of basic safety principles for wildland firefighting.

Through group exercises, students will be asked to apply these safety principles to real-life fire scenarios from previous fire seasons.

INTRODUCTION

This year's fireline safety refresher training, THE NUMBERS TELL A STORY, is intended as an alternative delivery system for annual refresher training required for all personnel participating in fire suppression or prescribed fire activities who may be subject to assignments on the fireline. Check specific agency policy to determine if this training package meets all refresher training requirements.

PREREQUITIES

Students should have successfully completed S-130 and S-190 and have at least one season as a firefighter.

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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LOS ALAMOS CAMPGROUND FIRE
Exercise 1

Current Situation:

Date/Time: August 23, 2003; 1651 hours

Location: 60 miles north of Los Angeles, Angeles NF, CA

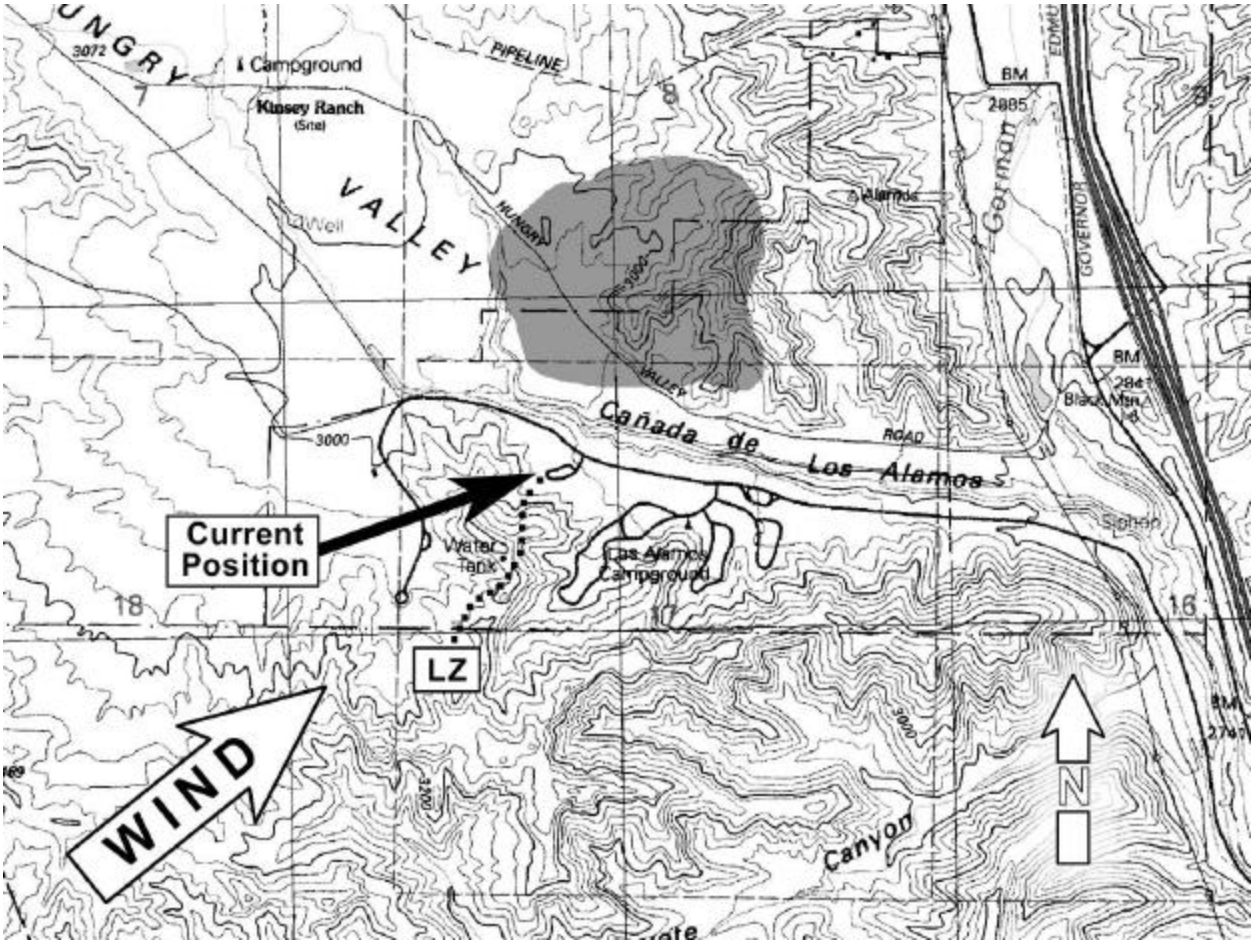
Tactical Assignment: Protect west flank of the Los Alamos campground

Fuel Type/Fuel Temperature: Chaparral; 91ºF

Size/Behavior: 200 acres; running and short distance spotting

Weather Forecast: Temperature, 85ºF; RH, 8-15%; Wind, S-SW at 5-15 mph, gusts to 19 mph. Topography is causing swirling/shifting winds.

Resources Available: LA County Fire Department; helishot crew; engine; other units from ANF, LPF, and LA County FD en route



Work Group Tasks:

You are part of a massive initial attack dispatch and the command structure was still being established.

- What are your safety concerns?
- Would you proceed to the fireline and use direct attack?
- What references in your IRPG can help you in this situation?

SIGNIFICANT FIRES AND GUIDING PRINCIPLES

YEAR	FIRE	GUIDING PRINCIPLE
1910	Idaho/Montana fires (78 fatalities)	Federal policy and funding
1937-1939		Firefighters Guide (Fireline Handbook)
1949 1953 1956	Mann Gulch (13 fatalities) Rattlesnake (15 fatalities) Inaya (11 fatalities)	Standard Fire Fighting Orders (1957)
1958-1959		13 Watch Outs
1966 1968	Loop (12 fatalities) Canyon (8 fatalities)	Downhill Line Construction Checklist (Downhill Checklist)
1971	Romero (4 fatalities)	Radio Cache Standards Red Card Qualifications System
1973		Common Denominators
1976	Battlement Creek (3 fatalities)	Carrying of fire shelters mandate
1979	Ship Island (1 fatality)	Mandatory use of gloves in fire shelters
1980-1985		Switch from 13 to 18 Watch Outs
1987	Fires of ’87 (23 fatalities)	Wildland-Urban Watch Outs
1985-1989		Standardized helicopter operations
1990	Dude (6 fatalities)	LCES (1992)
1994	South Canyon (14 fatalities)	Standards for Fire and Aviation Operations
1995	Point (2 fatalities)	Responsibility for non-federal volunteers
1998-1999		Safety Zone Guidelines
1999		Incident Response Pocket Guide
2001	Thirty-Mile (4 fatalities)	Thirty-Mile Abatement Plan
2002	Stanza (3 fatalities)	New driving restrictions
2003	Cramer (2 fatalities) Sawtooth Mountain (1 fatality)	Accident Prevention Plan Prescribed Fire Operations

*Research was compiled from various sources; dates varied.

STANDARD FIREFIGHTING ORDERS
Exercise 2

ORIGINAL STANDARD FIREFIGHTING ORDERS
1957 REPORT OF TASK FORCE

1. **FIRE WEATHER. Keep informed of fire weathe r conditions and predictions.**
2. **INSTRUCTIONS. Know exactly what my instructions are and to follow them at all times.**
3. **RIGHT THINGS FIRST. Identify the key points of my assignment and take action in order of priority.**
4. **ESCAPE PLAN. Have an escape plan in mind and direct subordinates in event of blow-up.**
5. **SCOUTING. Thoroughly scout the fire areas for which I am responsible.**
6. **COMMUNICATION. Establish and maintain regular communication with adjoining forces, subordinates, and superior officers.**
7. **ALERTNESS. Quickly recognize changed conditions and immediately revise plans to handle.**
8. **LOOKOUT. Post a lookout for every possibly dangerous situation.**
9. **DISCIPLINE. Establish and maintain control of all men under my supervision and at all times know where they are and what they are doing.**
10. **SUPERVISION. Be sure men I commit to any fire job have clear instructions and adequate overhead.**

STANDARD FIREFIGHTING ORDERS
Current Version

1. **Keep informed on fire weather conditions and forecasts.**
2. **Know what your fire is doing at all times.**
3. **Base all actions on current and expected behavior of the fire.**
4. **Identify escape routes and safety zones, and make them known.**
5. **Post lookouts when there is possible danger.**
6. **Be alert. Keep calm. Think clearly. Act decisively.**
7. **Maintain prompt communications with your forces, your boss and adjoining forces.**
8. **Give clear instructions and be sure they are understood.**
9. **Maintain control of your forces at all times.**
10. **Fight fire aggressively, having provided for safety first.**

Work Group Tasks:

- Review the *Original Standard Firefighting Orders* from the 1957 Report of Task Force and the current version of *Standard Firefighting Orders.*
- Discuss personal experiences using Standard Firefighting Orders.
- What do you do when faced with a situation where one or more of these orders cannot be followed?

DOWNHILL LINE CONSTRUCTION
Exercise 3A

Current Situation:

Date/Time: November, 1, 1966; 0600 hours

The fire was reported in a canyon near the boundary of the Angeles National Forest just outside the city of San Fernando.

King and his assistant led their crew to Point B in the photo. The objective was to tie in the line at Point D. The fire's edge fell off the ridge to the west into the "chimney" canyon and then down to the bottom of the deep canyon to the west. They held the crew at a small bench below this point until King decided if it was possible to cold trail the fire down into the "chimney" canyon.

King could see the County tractors and crews working an indirect dozer line eastward toward the lower end of the "deep" canyon immediately west of the "chimney" canyon and believed he could tie in with them at Point D.

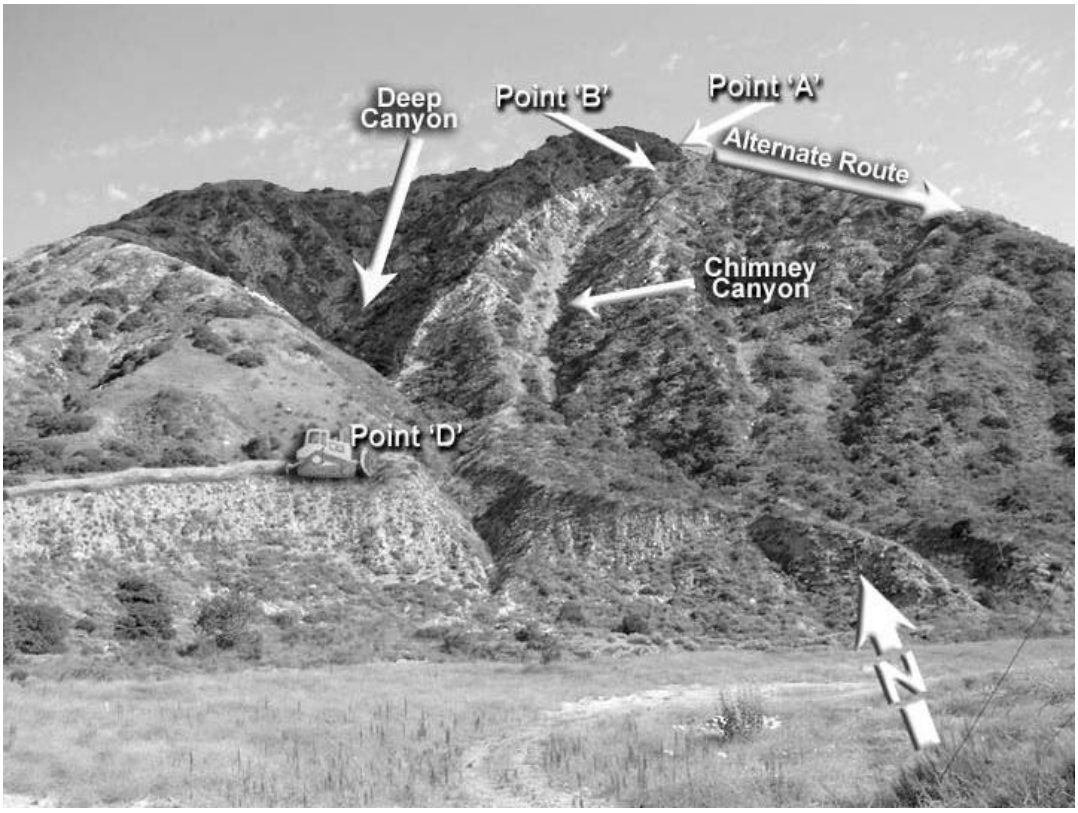
Safety Concerns: Above normal fire danger, periods of Santa Ana winds, steep terrain, and loose rocks

Tactical Assignment: Stop eastward spread of fire; cold trail the fire edge if possible

Fuel Type: Chamise, sage, and sumac

Weather Forecast: Temperature, 90ºF; RH, 12%; winds, NE at 10-15 mph

Resources Available: Los Angeles (LA) County Fire Department engines and hand crew, LA County dozer, and three hotshot crews



Work Group Tasks:

- List the items that are in favor of cold trailing down the "chimney" canyon.
- List the items that are **not** in favor of cold trailing down the "chimney" canyon.
- Describe what decision you would make at this point. Identify what information you were given that influenced your decision.

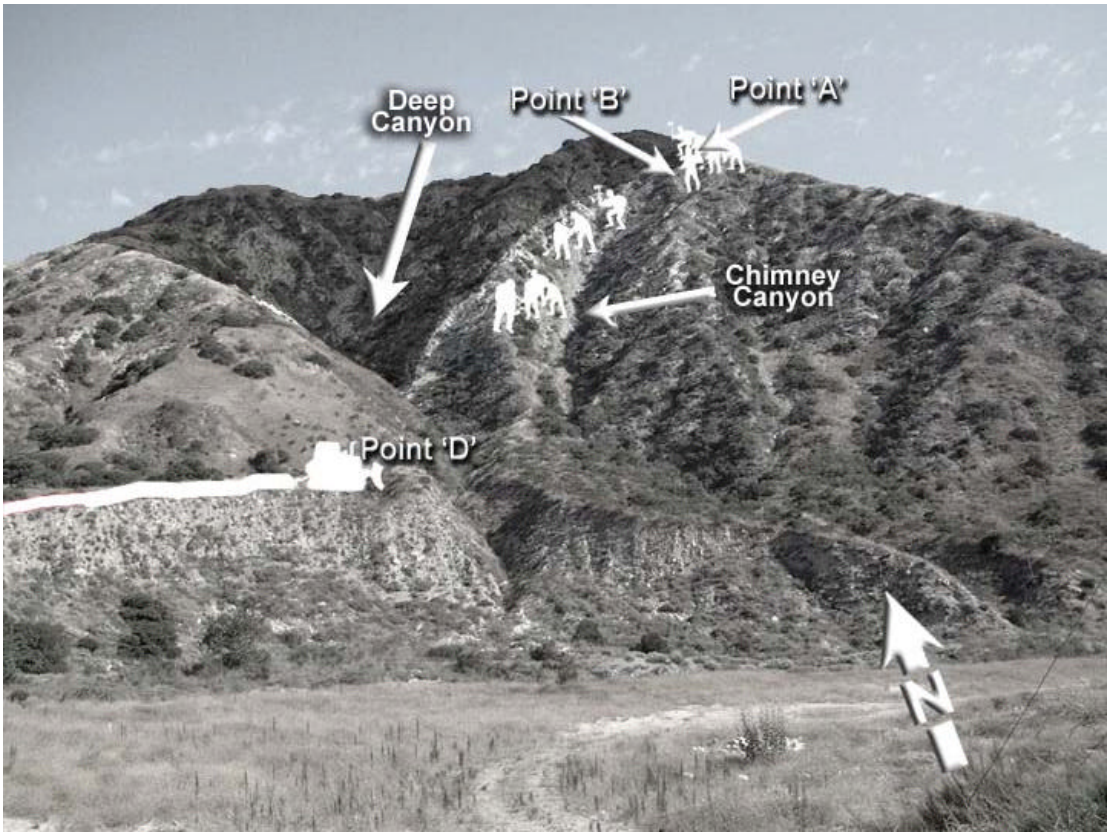
DOWNHILL LINE CONSTRUCTION
Exercise 3B

Current Situation:

Refer to Exercise 3A for the Current Situation.

Weather Update: Winds, NE to E at 30 mph with gusts up to 50

The distance between the dozer line close to the edge of the fire on the lower part of "deep" canyon and the edge near the "diamond" is approximately 500 feet. Of the 500 feet, 300 feet had a natural opening from 3 to 10 feet wide. The remaining distance at the lower end included some 200 feet of light brush cover. Fireline could be constructed; the El Cariso crew probably had the capacity to cut the 200 feet of line in 10 to 15 minutes. The behavior of the fire at 1530 was observed by Superintendent King from the "diamond," the Division Boss from the ridge above, the County crews from the lower west side of the "deep" canyon, and the County Liaison Officer from the road below. The fire was in a static situation with hot spots on the west side and near the bottom of "deep" canyon about 150 feet from the dozer line. The prevailing winds were out of the northeast but the leeside winds on the fireline were blowing from the southeast favoring closing the gap between the edges of the fire.



Work Group Tasks:

- List the alternative courses of action that were available to King as he sized up the situation at the "diamond." NOTE: Feel free to use the Downhill Checklist in your IRPG even though they were not available to Superintendent King at the time.
- List the fire behavior factors and any other key items for making any decisions (but not necessarily known to King) at this point.
- Identify and justify the course of action you would take at this point.

DOWNHILL CHECKLIST

Incident Response Pocket Guide

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) 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.

Radio Communication

The National Emphasis Topic for 2004

Site Navigation

Select One

Radio Communication
Virtual Radio Tour website

Effective communication is a fundamental component of safe wildland fire operations. It is the "C" in LCES and is a key element of the Standard Firefighting Orders and the Watchout Situations. Since the inception of SAFENET in 2000, nearly one-third of the filed SAFENETS are in regards to communications issues, especially radio communications.

The primary federal wildland fire agencies (BIA, BLM, NPS, USFWS, and USFS) have elected to focus special attention on radio communications in 2004. As the National Emphasis Topic, our goal is for personnel to utilize radios, including the new multi-mode radios, more effectively so that communication and safety is enhanced.

A Virtual Radio Tour website was created to assist hand-held radio users. This website goes through all the steps from changing a battery to the most extensive radio functions. Some of the information provided includes Communication "Watch Out" Situations, Radio Programming Pocket Guide, Programming and Cloning Procedures, Thales Terminology, and Radio Operations Etiquette. The 'Virtual Tour' makes this website unique. You are able to look at the entire radio as it turns in front of you on the computer screen.

The Virtual Radio Tour website will begin with instructions and graphics for the Racal Radio. Other radios will follow in the future.

National Interagency Fire Center
3833 S. Development Avenue
Boise, Idaho 83705
208-387-5512

NOTE: **Contents of this site will be reviewed and updated annually.**

Virtual Radio Tour:
www.nifc.gov/radios

SHIP ISLAND FIRE
Exercise 4

Current Situation:

Date/Time: July 26, 1979; 1515 hours

Safety Concerns: Steep terrain, rolling rock, unstable air

Management Objective: Keep the fire contained within the Tumble Creek drainage

Tactical Assignment: Three Inter-Regional (IR) crews were to construct fireline north of Tumble Creek for a potential burnout. Two crews using wet line were to impede progress of the fire as it backed down (north-facing slope) to Tumble Creek

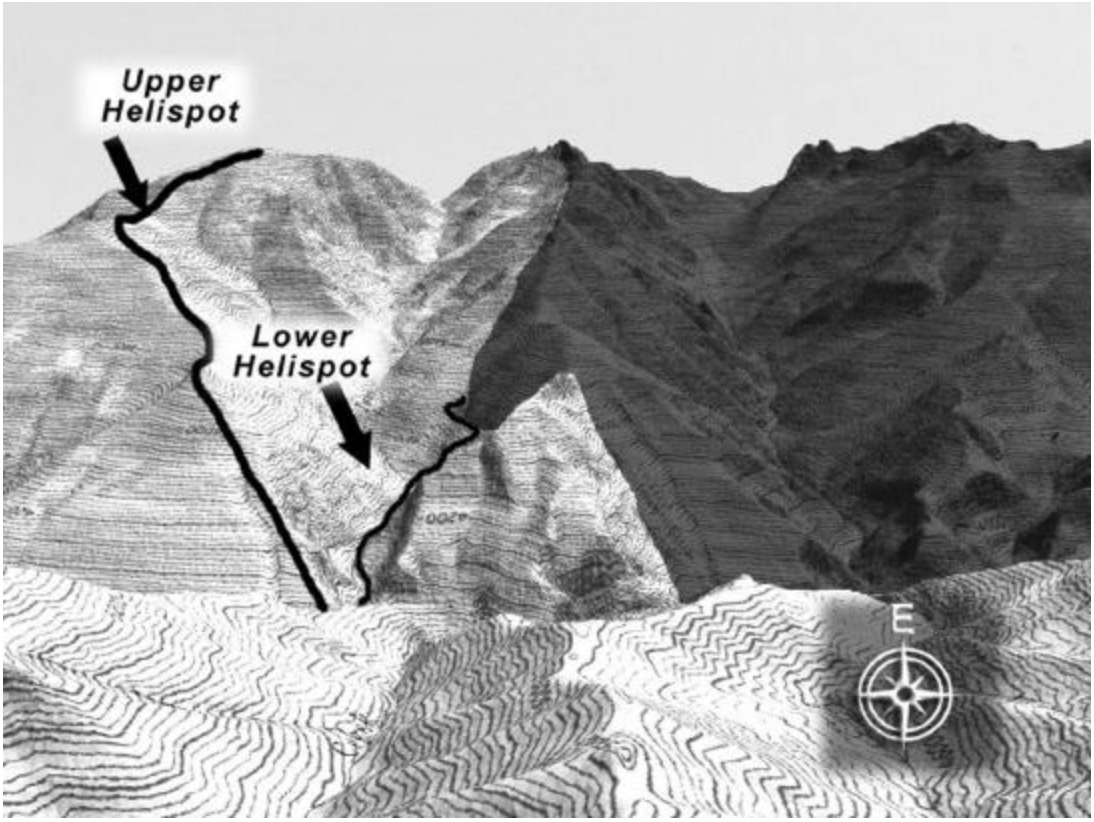
Fuel Type: Mixed conifer and bear grass understory

Size: 200 acres

Trigger Points: Spotting across a creek

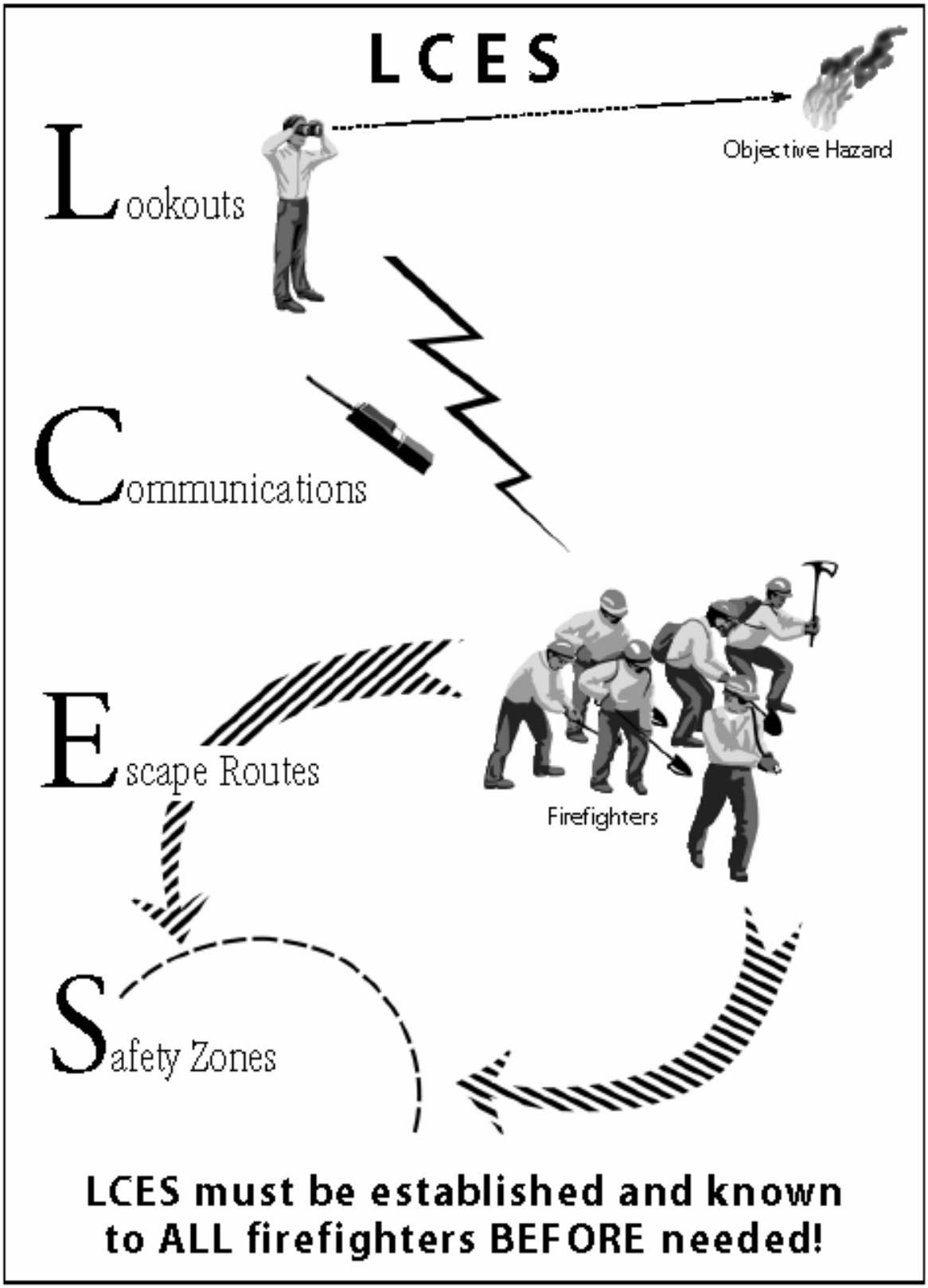
Weather Forecast/Fire Behavior: Temperature, 92ºF; RH, 10%; Wind, S-SE 8-12 mph increasing to SW 12-18 mph in the afternoon; dry thunderstorms; upslope afternoon winds in Tumble Creek; probable spotting across creek with rapid runs up the south aspect

Resources Available: Five IR crews



Work Group Tasks:

- Given the weather forecast and the previous day's fire activity, what do you think the fire will do?
- What is your assessment of the current plan and location of the lower helispot?
- What concerns do you have in establishing escape routes and safety zones? What problems might you anticipate?


LCES
Lookouts
Objective Hazard
Communications
Escape Routes
Firefighters
Safety Zones
LCES must be established and known
to ALL firefighters BEFORE needed!

HIGHLIGHTS OF THE EVOLUTION OF THE INCIDENT COMMAND SYSTEM AS DEVELOPED BY FIRESCOPE

1970 – During a 13 day period in California: 16 lives lost, 700 structures destroyed, and over one-half million acres burned. Although all agencies cooperated to the best of their ability, numerous problems of communication and coordination hampered their effectiveness.

1971 – The 92nd Congress approved funding for the U.S. Forest Service Research to design a system that will "Make a quantum jump in the capabilities of Southern California wildland fire protection agencies to effectively coordinate interagency action and to allocate suppression resources in dynamic, multiple-fire situations." This system became known as FIRESCOPE, (Firefighting Resources Organized for Potential Emergencies).

1972 – The California Department of Forestry and Fire Protection; Governor's Office of Emergency Services; Los Angeles, Ventura and the Santa Barbara County Fire Departments; and the Los Angeles City Fire Department joined U.S. Forest Service in the development of FIRESCOPE.

1973 – The first "FIRESCOPE Technical Team" was established to guide the research and development design. The two major components to come out of this work are the Incident Command System (ICS) and the Multi Agency Coordination System (MACS).

1974 – The National Wildfire Coordinating Group (NWCG) was chartered to coordinate interagency fire management programs. Nationally, many agencies used the Large Fire Organization (LFO) as the model for wildland fire organization and management.

1976 – FIRESCOPE agencies formally agree on ICS common terminology and procedures. Limited field-testing is conducted.

1978 – Parts of the ICS were successfully used on several wildland fire incidents and applied to urban firefighting.

The ICS was formally adopted by the Los Angeles Fire Department. Concept of MACS approved.

1980 – The ICS was formally adopted by the California Department of Forestry and Fire Protection (CDF), the Governor's Office of Emergency Services (OES), partner agencies and endorsed by the State Board of Fire Services.

The FIRESCOPE ICS training course development now under way will eventually satisfy the needs of State and Federal agencies. In fact, the training development effort will in all likelihood meet the needs of NIIMS. Thus, the FIRESCOPE Program training effort will have served to not only meet the local needs but also those of the national user.

The National Wildfire Coordinating Group (NWCG) performs an analysis of FIRESCOPE ICS for possible national application.

1981 – The ICS in wide use throughout Southern California by major fire agencies. Use on non-fire incidents increasing.

CDF, OES and the California State Fire Marshal all sign a "Statement of Intent" establishing a mutual commitment to support the FIRESCOPE Program.

The FIRESCOPE Board of Directors approves a response to NWCG, which generally supported the national adoption of a uniform emergency management organization. This organizational structure, referred to, as "NIIMS" is basically the FIRESCOPE ICS.

NWCG accepts the recommendation for developing the ICS for national application.

U.S. Forest Service approved Region 5 ICS implementation by 1983, and service wide use by 1985.

1982 – All FIRESCOPE ICS documentation is revised to National Interagency Incident Management System (NIIMS) terminology and organization.

WILDLAND-URBAN INTERFACE
Exercise 5

Work Group Task:
Review the following article, and answer the following questions:

- How much influence do you have on each key player in the Wildland-Urban Interface?
- What local Wildland-Urban Interface issues do you face in your local area?
- Have you properly pre-planned potential Wildland-Urban Interface incidents?

Improving Firefighter Safety in the Wildland-Urban Intermix

Introduction

Each year, the incursion of private residences in wildland increases the chance that wildland and structural firefighters will battle an uncontrolled fire in the "Wildland-Urban Intermix," where homes and naturally occurring vegetation are the fuels at risk.

While the natural fuel types of these fires may differ based on geographic and climatic conditions, one factor remains constant: the risk to firefighters.

Four distinct groups are key players in the Wildland-Urban Intermix. Their relationship to firefighter safety—before an ignition and once a fire is burning—is critical. These groups include the community, the home owners, the fire agency, and individual firefighters.

Defining the Players

The Community

For this paper the 'community' is defined as the level of government that is responsible for laws, regulations, statutes, and ordinances that control developments, planning, and law enforcement in areas defined as intermix.

Perhaps the most important function the community can play to ensure firefighter safety is through planning. By requiring developers and builder to adhere to strict standards for building materials, clearing limits, and fire resistant plant species for landscaping, the community can help ensure that firefighters have a reasonable chance to safely fight a fire.

Access is a critical component of suppressing any fire, and becomes even more critical in wildland-urban intermix fires. Road width, traffic flow, curve radius, and bridge weight limits all impact on the timeliness and ability of fire apparatus to reach a fire, or to gain access to protect a structure.

The Homeowner

The homeowner who chooses to live in the intermix has an important role. The choice of the construction design and building materials can significantly affect a residence's fire safety.

Maintaining the defensible space, reducing naturally occurring hazards, and preventing unwanted fires are all responsibilities of the homeowner.

The Fire Agency

The overall responsibility for ensuring the safety of firefighters lies with the agency having jurisdiction for the area. Once a fire ignition occurs, it is too late to take steps that are essential to ensure a safe and efficient fire suppression operation.

Communications have always been identified as a critical component in firefighter safety. In the wildland-urban intermix environment the capability of a communications system to function across jurisdictional boundaries is even more critical. These fires nearly always involve numerous fire agencies, often operating under a unified command structure. Agencies must provide their firefighters with communication systems capable of functioning in these environments. Failure to do so threatens firefighter safety and limits their ability to perform effectively. Communications failures or overload have been identified as a serious problem on both the Oakland Hills fire (California) and the Spokane, Washington, Firestorm fires in 1991, and as a causal factor of the 1993 Glenallen fire fatalities in Los Angeles County.

Physical fitness, the physical ability to do the job at hand, is another key area where fire agencies can have a positive influence on firefighter safety. Heart attacks were among the leading causes of firefighter fatalities (21%) on both wildfires and structural fires in the USA during the 1990s.

Another area where fire agencies have a major role in firefighter safety is in developing policies and standard operating procedures (SOPs) specific to the wildland-urban intermix fire operations.

The Firefighter

Firefighters are the most critical players in affecting their own safety on wildland-urban intermix fires. Shakespeare said, "To thine own self be true." This is especially applicable to the individual firefighter. Although many actions of the community, homeowner, and fire agency can help ensure firefighters' safety, firefighters as individuals, or as members of a team, are ultimately responsible for their own safety.

Firefighters have the responsibility to ensure they are physically fit for the job. They also have an individual responsibility to use appropriate personal protective equipment (PPE).

The best training is wasted if the individual involved is unable to apply that training and respond appropriately. Situational awareness—knowing what is happening around you—is important if they are to safely and efficiently perform their job.

All firefighters, regardless of their position in the fire organization, must do all they can to foster communications with other individuals above and below them.

Maintaining constant communications is a cornerstone of fire safety.

During the Fire

Up to this point, we have discussed firefighter safety before a wildland-urban intermix incident occurs. Once such a fire starts, a whole new group of factors come into play.

Access

Access can quickly become a critical factor once a fire occurs. If the civilian population is attempting to leave an area on the same roads that firefighters are using to enter the area, the result can be traffic jams, unsafe driving practices, and ultimately, gridlock for both civilian vehicles and the fire appliances. When this occurs during active fire behavior, firefighters may become trapped in dangerous locations, as they were in the Calabasas incident in Los Angeles County during the 1996 fire season. On that incident, firefighters trying to cross a midslope road were prevented from leaving a "chimney" by a civilian vehicle attempting to leave the area. When the fire made a strong uphill run through the chimney, the firefighters were burned over.

Local firefighters may need to be assigned with firefighters from other areas to help them move throughout the fire area.

Civilian Population

It is likely that the majority of residents threatened by a wildland-urban intermix fire will be grossly unprepared for evacuation. Some will be unwilling to leave their property. Their chaotic exodus, or their refusal to leave, may pose a serious risk to firefighter safety.

Special Hazards

Firefighters entering the wildland-urban intermix area for fire suppression activities face a variety of hazards that differ from the typical hazards in either wildfires or structural fires. Although intermix fires appear to be simply wildfires that threaten to burn residences, such fires represent unique, high-risk hazards that require special attention to prevent injury or death.

- Powerlines
- Propane, LPG, and natural gas lines
- Abandoned vehicles
- Hazardous materials

Mix of Forces

Nearly every wildland-urban intermix fire results in responses from a number of fire agencies, both wildland and structural. Unless properly coordinated, the mix of forces that responds to a fire can be a risk to firefighter safety. The variety of equipment, differing levels of training and experience, and the integration of hand crews, mechanized equipment, and air operations all offer opportunities for a breakdown in safe work practices. In that environment, firefighters and fire officers must be especially alert to the coordination required in using this mix of forces, and must follow their own agency's safe practices and procedures despite differences with the practices and procedures used by cooperators.

Command and Control

The command and control of intermix fires is often complicated. Factors that can cause confusion and conflicts and increase risk to firefighter safety include:

- Multiple jurisdictions.
- Unified command.
- Structural versus wildfire training and experience.
- Lack of coordination with law enforcement agencies.
- The sense of urgency that finds multiple dissimilar resources assigned to a common protection objective.

Close and timely coordination of responsible agencies is essential as soon as intermix fires occur. Although much of the needed coordination can take place during the off season, the critical interchange of information and agreements on operating procedures must occur on the fire ground between the designated fire officers from each involved agency. Especially sensitive areas include:

- Areas of responsibility.
- Communication links between resources.
- Coordination of air resources.
- Clear definition of boundaries such as division breaks.
- Emergency medical evacuation procedures.

Failure to adequately plan and execute the steps necessary to ensure firefighter safety in the wildland-urban intermix has resulted in close calls, injuries and fatalities:

- On the Dude fire (1990) in Arizona, six firefighters died when extreme fire behavior, terrain, and poor command and control resulted in a burnover.
- On the Wasatch fire (1990) in Utah, two firefighters died while trying to cut a dozer line along a fire threatening a subdivision. Communication was difficult because of the amount of radio traffic on the operating frequency.
- On the Sunrise fire (1995) on Long Island, New York, where numerous firefighters in full structural turnout gear experienced heat stress injuries while attempting to fight a fast-moving intermix fire on a hot August day.

Conclusions

Fires in the wildland-urban intermix will occur more and more frequently. Coordinated efforts between the community, homeowners, fire agencies, and firefighters before the fire occurs are essential to ensure firefighter safety. These measures must be reinforced by safety-conscious performance by both firefighters and fire officers once fires are being fought in the wildland-urban intermix.

Dick Mangan
USDA Forest Service
Technology and Development Program
Missoula, Montana

February 2000

WILDLAND-URBAN WATCH OUTS

Incident Response Pocket Guide

- Poor access and narrow one-way roads.
- Bridge load limits.
- Wooden construction and wood shake roofs.
- Inadequate water supply.
- Natural fuels: 30' 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

- 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

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?
- Turnouts, 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, overhangs slope, attached wood deck, lightweight flammable curtains, large windows face heat source?

Defensible Space

- 100' of vegetation, max. 18" high and 30-foot 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'?

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?

SNAG SAFETY

Incident Response Pocket Guide

Environmental conditions that increase snag hazards:

- Strong winds
- Night operations
- Steep slopes
- Diseased or bug-kill areas

Hazard tree indicators:

- Trees have been burning for an extended period
- High risk tree species (rot and shallow root system)
- Numerous down trees
- Dead or broken tops and limbs overhead
- Accumulation of down limbs
- Absence of needles, bark or limbs
- Leaning or hung-up trees

TREE STRIKES YOU'RE OUT

Introduction

Snags are dead or dying trees. Hazard trees can be dead, dying or green trees that are unstable. Over the years many people who have worked in the woods have been killed or injured in accidents involving hazard trees. On the Plumas, and elsewhere in western forests, snags are becoming an ever-increasing hazard after years of drought, fire exclusion, and bug kill. Because of safety concerns, a committee has been formed to study this problem and develop ways to help employees become more aware of this issue. Results of a forest survey indicate that many people have had accidents or close calls due to snags and other hazard trees.

This pamphlet has been developed, with information from the National Snag Hazard Task Force and others. We hope to increase awareness and educate employees about the dangers of hazards trees and how to work safely in the woods. The information in this pamphlet will help employees to:

1. Recognize indicators that will identify hazards trees.
2. Identify what work situations could put employees in danger (Watch Out Situations)
3. Apply appropriate safety guidelines.

Fact: There are several million snags on the Plumas.
Fact: All these snags will come down.
Question: Will you be under one when it comes down?

Hazard Tree Indicators

- Numerous down trees.
- Leaning trees.
- Dead or broken tops and/or limbs hanging in the trees.
- Absences of needles, bark, or limbs.
- Possible rot indicated by conks, broken tops, basal scars, cat faces, numerous down limbs, ants, abundance of woodpecker holes.
- Stump holes burning in the area.
- Smoke or fire burning in the base or tops of either dead or live trees may indicate rot and/or weakening of tree.

Watch Out Situations (Snags)

- Snags are falling or have fallen in work area.
- The area is occupied by trees that are susceptible to rot, especially white fir and old oak trees.
- Working or taking a break in a hazard area.
- Working in a hazard tree area for more than a few minutes.
- Working in hazard tree area during windy or potentially windy situations.
- Working in an area with trees that have been burning for an extended period.
- Tailgate safety session did not include discussion of snags.
- Lookouts are not posted or do not have communications in a hazard tree area.
- Becoming complacent in a hazard tree area.
- Too many snags for posted lookouts to keep track of.
- Tree within fire will fall over control line.
- Escape routes runs through hazard tree area.
- Safety zones exposed to hazard trees.
- Parking in hazard tree area.
- Crew fatigued from being on shift for an extended period.
- Working around heavy equipment or tree felling operation in a hazard tree area.
- Unable to see top of trees.
- Steep slope with hazard trees above you.
- Nighttime work in area not scouted in daylight.

Safety Guidelines

- Assess snag hazards before parking, taking breaks, or sleeping.
- Make sure that employees wear personal protective gear at all times.
- Use every day examples to brief and train employees about what snag hazards look like.
- Consider suspending operations during windy periods.
- Allow adequate time for scouting.
- Identify; tree species common to work area especially those that are more susceptible to heart rot, root rot, or shallow roots.

- Scout for hazard trees and visibly mark or flag individual and groups of snags that are in or near work areas.
- Post lookouts in areas of known or potential snag hazards.
- When possible, use work tactics which avoid or minimize employee exposure to snag hazards.
- All crewmembers have the responsibility to speak out when confronted by snag hazards.
- Discuss and plan escape route and safety zone considering vegetation and terrain.
- Assess the height of treetops when planning safety zone and escape routes.
- Fire safety zones must be free of hazard tree threat.
- Use extra caution when down hill of hazard trees. It is more common for trees and debris to go down hill.
- When escaping the path of a falling tree, do not turn your back. Watch the tree as you move out of its way to ensure you can see any change in its fall or roll caused by contact, breakage, etc.
- Use extra precaution during night operations.
- Determine if the benefit is worth the risk.

SNAG SAFETY

S ize up snag hazards in work area.
N ever become complacent.
A lways look up.
G et weather reports.

S cout out parking, sleeping, work areas, and safety zones.
A dvise co-workers of known hazards.
F ace your hazard and take appropriate action.
E xamine work area for other hazards.
T ake extra caution around heavy equipment.
Y ou are ultimately responsible for your own safety.

Taken from: http://fsweb.r1.fs.fed.us/forest/sales/hazard_trees/tree_strikes.htm

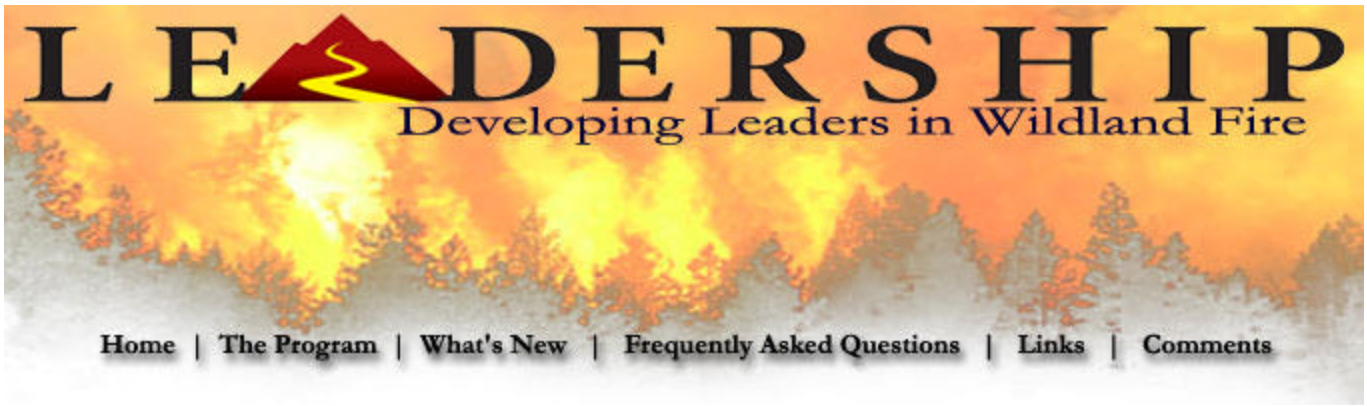
AVIATION WATCH OUT SITUATIONS

Incident Response Pocket Guide

- Is this flight necessary?
- Who is in charge?
- Are all hazards identified and have you made them known?
- Should you stop the operation or flight due to change in conditions?

Communications?	Weather?
Confusion?	Turbulence?
Conflicting Priorities?	Personnel?

- Is there a better way to do it?
- Are you driven by an overwhelming sense of urgency?
- Can you justify your actions?
- Are there other aircraft in the area?
- Do you have an escape route?
- Are there any rules being broken?
- Are communications getting tense?
- Are you deviating from the assigned operation or flight?



Values and Principles

Leadership Toolbox

Training Courses

Leadership Committee

Wildland Fire Leadership Development Program

The most essential element of successful wildland firefighting is competent and confident leadership. The wildland fire leadership development program has been established to provide an avenue for you to improve essential leadership skills during all stages of your career.

Updates and New Features

updated 2/25/04

- **Staff Ride Library**
- **Pay It Forward**
- **Lessons Learned Center's upcoming After Action Review Workshop**

This website is designed to provide information regarding the implementation of the NWCG wildland fire leadership development program. In addition it provides a resource to allow individuals to strive for a higher performance level as a leader through self-directed learning opportunities.

The Leadership Committee is chartered by the NWCG Training Working Team

Text Links:

Home | The Program | What's New | FAQs | Links | Comments

Values and Principles | Leadership Toolbox | Training Courses | Leadership Committee

Accessibility

Website support provided by National Interagency Fire Center
3833 S. Development Avenue
Boise, Idaho 83705

http://www.fireleadership.gov/

NATIONAL WILDFIRE COORDINATING GROUP

National Interagency Fire Center
3833 South Development Avenue
Boise, Idaho 83705

February 6, 2004

Memorandum

To: NWCG Members; Chairs- Working Teams and Advisory Groups

From: Chair, NWCG

Subject: National Incident Operations Driving Standards

This memo revises the 02/26/03 NWCG interagency standards concerning emergency hours of driving, hereinafter referred to as "incident operations driving".

Further in-depth research and legal consultation has resulted in a determination that state and federal fire agencies are exempted from several requirements under Department of Transportation 49 CFR (CDL requirements). These include hours of service (duty day hours) and record of duty status (log book). These exemptions intentionally provide fire agencies the latitude for more flexibility within incident operations driving than we originally interpreted and subsequently reflected in the 02/26/03 standards.

These revised driving standards set forth limitations consistent with the new 02/06/04 NWCG work/rest standards, while allowing significantly improved operational functionality over the earlier standards. Notably, this revised standard eliminates earlier duty day hour differences between CDL and non-CDL engine operators, which resulted in serious operational difficulties for the field. These incident operations driving standards have already been adopted as policy through the "Standards for Fire and Fire Aviation Operations 2004" Handbook by federal signatory agencies.

These new driving standards will provide improved incident operations within the interagency wildland fire community. Please insure that this information is made available to your fire management personnel.

Cc: Chairs, Geographic Area Coordinating Groups

INCIDENT OPERATIONS DRIVING

These standards address driving by personnel actively engaged in wildland fire or all-risk response activities, including driving while assigned to a specific incident or during initial attack fire response (includes time required to control the fire and travel to a rest location). In the absence of more restrictive agency policy, these guidelines will be followed during mobilization and demobilization as well. Individual agency driving policies shall be consulted for all other non-incident driving.

1. Agency resources assigned to an incident or engaged in initial attack fire response will adhere to the current agency work/rest policy for determining length of duty day.

2. No driver will drive more than 10 hours (behind the wheel) within any duty-day.

3. Multiple drivers in a single vehicle may drive up to the duty-day limitation provided no driver exceeds the individual driving (behind the wheel) time limitation of 10 hours.

4. A driver shall drive only if they have had at least 8 consecutive hours off duty before beginning a shift.

   Exception: Exception to the minimum off-duty hour requirement is allowed when essential to:

   a) accomplish **immediate** and **critical** suppression objectives, or

   b) address **immediate** and **critical** firefighter or public safety issues.

5. As stated in the current agency work/rest policy, documentation of mitigation measures used to reduce fatigue is required for drivers who exceed 16 hour work shifts. This is required regardless of whether the driver was still compliant with the 10 hour individual (behind the wheel) driving time limitations.

ATTACHMENT #1

NATIONAL WILDFIRE COORDINATING GROUP

National Interagency Fire Center
3833 South Development Avenue
Boise, Idaho 83705

February 6, 2004

To: NWCG Members; Chairs-Working Teams and Advisory Groups

From: Chair, NWCG /s/ J L Stires

Subject: 2004 Work /Rest and Length of Assignment Standards

In the fall of 2002, the NWCG tasked the Safety & Health and Incident Business Practices Working Teams with reviewing the NWCG work/rest and length of assignment standards. Proposed interim changes were tested during the 2003 fire season, with request for comments by October 1, 2003.

The enclosed final standards have been developed based on these comments, discussions with firefighters, line supervisors, geographic and national multi-agency coordinating group members, and other fireline leaders.

The standards have been revised to reflect the strong consensus that: 1. the previous standards be simplified, 2. managers be provided increased flexibility to meet operational needs, and 3. appropriate fatigue management be emphasized.

Work/rest guidelines have basically not changed. The 2:1 work to rest ratio is still valid and will be followed. However, flexibility to exceed the guidelines is allowed when warranted under certain circumstances.

This revised standard maintains a 14-day length of assignment. Fatigue management concerns, as well as many state contracts allowing only 14-day assignments, strongly indicated that the 14-day assignment length be retained. The new standard provides for a simplified assignment extension process when necessary.

For fatigue management purposes and in line with credible research recommendations, a 2-day-off-after-14 day assignment standard (exclusive of travel) has been adopted.

Please insure that this information is made available to your fire management personnel.

Cc: Chairs, Geographic Area Coordinating Groups

*** Refer to INTERAGENCY INCIDENT BUSINESS MANAGEMENT HANDBOOK, Chapter 10, 12.7 – Work/Rest, Length of Assignment, and Days Off, for additional guidance.**

GRAND PRIX FIRE
Exercise 6

Current Situation:

Date/Time: October 25, 2003; 0600 hours

Location: Rancho Cucomonga, Fontana, CA

Safety Concerns: Residential community and high Santa Ana winds

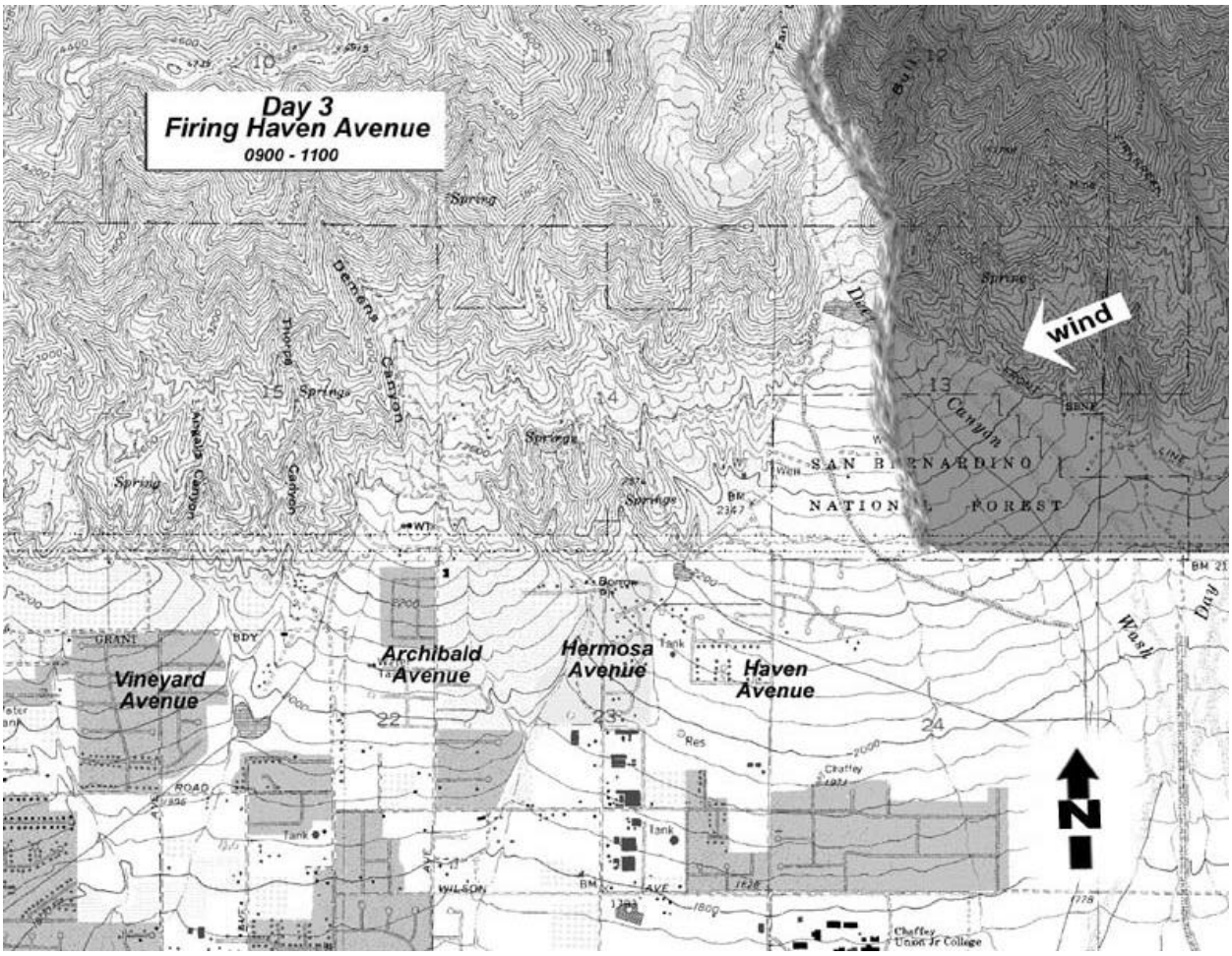
Management Objective: Protect subdivision from Haven Avenue to Archibald Avenue

Fuel Type/Other Concerns: Brush and chaparral; urban interface

Size: 13,730 acres

Weather Forecast: Temperature 80ºF; RH, 10%-15%; Wind, W at 5 mph; high probability of strong Santa Ana front

Resources Available: Arroyo Grande 20-person flight crew, 3 Type 1 crews, Big Hill flight crew, 1 Type 3 Strike Team of USFS engines, numerous Type 1 engines, Safety Officer, Division Supervisor



Work Group Tasks:

Assume you are the Division Supervisor.

- What are your safety concerns that you will convey during your briefing?
- What is your plan of attack?

"Typically, government organizational standards amount to collections of policy directives developed as a reaction to a tragedy. We have all we need now just not in the right place."

Lark McDonald, Mission-Centered Solutions

WRAP-UP DISCUSSION
Exercise 7

Work Group Tasks:

- Is it realistic to expect a ZERO fatality fire season?
- When given an assignment that you feel is unsafe, or the benefits do not outweigh the risks, how do you properly turn down the assignment? (Reference the IRPG)
- Did you learn anything during this training that will heighten your safety awareness while on the fireline?

HOW TO PROPERLY REFUSE RISK

Incident Response Pocket Guide

Every individual has the right and obligation to report safety problems and contribute ideas regarding their safety. Supervisors are expected to give these concerns and ideas serious consideration. When an individual feels an assignment is unsafe they also have the obligation to identify, to the degree possible, safe alternatives for completing that assignment. Turning down an assignment is one possible outcome of managing risk.

A "turn down" is a situation where an individual has determined they cannot undertake an assignment as given and they are unable to negotiate an alternative solution. The turn down of an assignment must be based on an assessment of risks and the ability of the individual or organization to control those risks. Individuals may turn down an assignment as unsafe when:

1. There is a violation of safe work practices.
2. Environmental conditions make the work unsafe.
3. They lack the necessary qualifications or experience.
4. Defective equipment is being used.

- Individual will directly inform their supervisor that they are turning down the assignment as given. The most appropriate means to document the turn down is using the criteria (10 Fire Orders, 18 Watch Out Situations, etc.) outlined in the Risk Management Process.

- Supervisor will notify the Safety Officer immediately upon being informed of the turn down. If there is not Safety Officer, notification shall go to the appropriate Section Chief or to the Incident Commander. This provides accountability for decisions and initiates communication of safety concerns within the incident organization.

- If the supervisor asks another resource to perform the assignment, they are responsible to inform the new resource that the assignment has been turned down and the reasons that it was turned down.

- If an unresolved safety hazard exists or an unsafe act was committed, the individual should also document the turn down by submitting a SAFENET (ground hazard) or SAFECOM (aviation hazard) form in a timely manner.

These actions do not stop an operation from being carried out. This protocol is integral to the effective management of risk as it provides timely identification of hazards to the chain of command, raises risk awareness for both leaders and subordinates, and promotes accountability.

Fire Shelter Update

Introduction

A new fire shelter has been under development for several years and is now available to wildland firefighters (Figure 1). The adoption of this new system, which includes the fire shelter, training shelter, video and booklet, began in June 2003. About 50,000 of the new shelters have already been delivered to the GSA. A complete transition to the new shelter is expected to take another 2 to 4 years. All wildland firefighters need to know the impacts of this change.

A Tech Tip entitled "New Generation Fire Shelter Developed for Wildland Firefighters (0351-2313-MTDC)" provides information on the new fire shelter system. This Tech Tip also includes instructions on modifying existing fireline packs to fit the new shelter, and can be accessed electronically on the MTDC website or can be ordered in hard copy through MTDC. *You will be prompted for a user name and password when accessing the MTDC website. Use the following user name: t-d / password: t-d.*

Fire Shelter References
• **Fire Shelter Information from the USDA Forest Service, Fire and Aviation Management web site.** • **More information on the New Generation Fire Shelter Developed for Wildland Firefighters (0351-2313-MTDC)** ***You will be prompted for a user name and password when accessing the MTDC website. Use the following user name: t-d / password: t-d.***

Figure 1 - New fire shelter

Size Comparison of New and Current Fire Shelters:

	New Fire Shelter	Current Fire Shelter
Weight - w/o case	**4.2 lbs**	**3.4 lbs**
Folded size - w/o case	**8.5" x 5" x 4"**	**8.5" x 5.5" x 3"**
Folded Size - w/case	**9" x 5.75" x 4.5"**	**9" x 5.75" x 3 1/8"**
Deployed Dimensions	**86" long**	**71" long**
	15.5" high	**24" high**
	31" wide	**48" wide**
Cost	**$256**	**$65 (approximate)**

How will adoption of the new shelter affect wildland firefighters?
From the perspective of how we train firefighters to use fire shelters, very little has changed. Though the new shelter offers better protection from direct flames than the original shelter, survival of the occupant is more likely if direct flame contact with the shelter is avoided. Even though the new shelter provides

increased protection compared with the original shelter, firefighters will still need to know how to recognize potential entrapment situations and how to avoid them. The same evaluation process that firefighters have been using to identify survivable sites still applies. Teaching firefighters to avoid deploying shelters in or near fuel concentrations, chimneys, and other potentially hazardous areas will continue to remain an important part of fire shelter training.

Use of Original Fire Shelter

The original fire shelter still provides good protection if used as described by existing guidelines. The original shelter can be used until the transition to new shelters is complete and as long as they meet the refurbishing criteria listed in the "Fire Equipment Storage and Refurbishing Standards" prepared by the National Fire Equipment System Refurbishment Standards Task Group, Sept.1998. (See related website links above).

Current Fire Shelter Training Aids (Original or New Shelter)

The present standard for fire shelter training materials for either shelter system includes the Entrapment Avoidance-Its Your Call! training program (2002),) and the Lessons From the Thirtymile Fire html/PowerPoint training program. There are two videos currently approved for fire shelter training; instructors will have to choose which video to use based on the type of fire shelter that trainees will be using.

Original Fire Shelter Training Aids

Instructors providing training for persons using the original fire shelter will need to utilize the Using Your Fire Shelter video (NFES# 1568, 2001 edition to demonstrate the most current original fire shelter information available today. A previous fire shelter training video, Your Fire Shelter (NFES# 1568, 1986 edition) shows techniques that are no longer recommended. Since both videos have the same NFES number and similar titles, it is suggested that the 1986 version be eliminated from training libraries to prevent confusion.

The Your Fire Shelter booklet (NFES #1570) 2001 edition, and the Avoid the Flames pamphlet (MTDC) 1999 edition can also be used as training materials for original shelter users.

Training Revisions for New Shelter

The new fire shelter and training fire shelter have significant differences from the original system (Figures 1, 2). Wildland firefighters will need to attend a training session to learn how to use the new shelter and training shelter before they are allowed to carry the new shelter on the fireline.

Figure 2 - Cutaway view of new fire shelter

The new training shelter, The New Generation Fire Shelter training video (NFES #2711, 2003 edition), and the New Generation Fire Shelter pamphlet (NFES #2710) became available in May 2003. A Spanish language version of the New Generation Fire Shelter training video and the Your Fire Shelter booklet will be available by mid 2004.

National Interagency Fire Center
3833 S. Development Avenue
Boise, Idaho 83705
208-387-5512

NOTE: **Contents of this site will be reviewed and updated annually.**

SAFENET

SAFENET is a form, and process, that provides a method for reporting unsafe situations on, or off, the fireline. The information provided on the form will help collect important, safety-related data to determine long-term trends and problem areas. A SAFENET may be filled out at any time to report a valid concern about unsafe situations in fire operations, as well as document corrective action.

Discuss the methods for filing a SAFENET.

- Electronically (access site through NIFC website)
- By hardcopy (self-addressed, stamped forms available through the cache system).
- By phone (1-800-670-3938)

Discuss advantages of filing a SAFENET through your supervisor versus sending it yourself.

- Increase the chances of finding an immediate solution.
- Keeps supervisor "in the loop."

Discuss using SAFENET in situations other than fire.

- Prescribed fire
- All-risk
- Training

Where does a SAFENET go, and what response can you expect?

- SAFENETs are received and stored in a database in Boise. After a SAFENET is received, the names are removed. It is then given a document number and posted to the web.
- Every new SAFENET is then forwarded to the affected agencies designated list of contacts, which usually includes the National or Regional Safety Officer.
- It is each agency's responsibility to ensure that corrective actions are taken.

Corrective actions can be filed by anyone at any time. They are automatically attached to the individual SAFENET on the database.

Discuss using SAFENET to monitor safety issues other firefighters may be having.

SAFENET

Wildland Fire Safety and Health Network

REPORTED BY

Name (optional)_____ Phone _____

Agency/Organization _____ Date Reported _____

EVENT

Date and Time _____ Jurisdiction/Local Unit _____

Incident Name & Number _____ State _____

Incident Type	Incident Activity	Stage of Incident
☐ Wildland	☐ Line	☐ Initial Attack
☐ Prescribed	☐ Support	☐ Extended Attack
☐ Wildland Fire Use	☐ Transport to/from	☐ Transition
☐ All Risk	☐ Readiness/Preparedness	☐ Mop Up
☐ Training		☐ Demobe
☐ Fuel Treatment		☐ Non-Incident
☐ Work Capacity Test		☐ Other

Position Title _____

Task _____

Management Level _____

Resources Involved _____

CONTRIBUTING FACTORS

☐ Fire Behavior ☐ Environmental ☐ Communications
☐ Human Factors ☐ Equipment ☐ Other (Explain Below)

Other:

NARRATIVE

Describe in detail what happened including the concern or potential issue, the environment (weather, terrain, fire behavior, etc), and the resulting safety/health issue. If more room is required, write on a separate piece of paper and include it with this form.

PMS 405-2 (2/02) NFES 2633

SAFENET

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 253 BOISE ID

POSTAGE WILL BE PAID BY ADDRESSEE

SAFENET
PO BOX 16645
BOISE ID 83715-9750

Fold on dotted line

SAFENET

SAFENET

Wildland Fire Safety and Health Network

The purpose of SAFENET is:

1. To provide reporting and documentation of unsafe situations or close calls.
2. To provide a means of sharing safety information throughout the fire community.
3. To provide long-term data that will result in identifying trends.

Submitting a SAFENET is not a substitute for on the spot corrections!

When filing a SAFENET:

You have the option of submitting SAFENET at any level of the organization, but are encouraged to submit it to your supervisor for immediate corrective action.

If you submit SAFENET directly to the national center, you are encouraged to provide a copy to your supervisor.

You have the right to report unsafe conditions anonymously, in accordance with 29 CFR 1960.

File a SAFENET by Phone
1-888-670-3938

Fold on dotted line

CORRECTIVE ACTION

Please document how you tried to resolve the problem and list anything that, if changed, would prevent this safety issue in the future.

INTERNET WEB SITE LINKS

www.fire.blm.gov/training/blmtrng/blmtrng.html
Website for 2001, 2002, 2003, and 2004 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 from high-profile fires.

  - Sawtooth Fire
  - Cramer Fire
  - Thirtymile Fire
  - Historical Wildland Fire Fatalities

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

  - Fire Preparedness Review Guide
  - Interagency Standards for Fire and Fire Aviation Operations, 2004
  - Task books for ICS positions

www.nifc.gov/safety_study/index.htm
(Also accessed through the Safety link on the NIFC home page)

- Wildland Fire Safety Training Annual Refresher (WFSTAR)
  What's New For 2004:
  - Radio Communication
  - Driving Safety
  - Work/Rest Guidelines
  - New Fire Shelter
- SAFENET
- Historical Wildland Firefighter Fatality Reports

www.nwcg.gov/pms/pubs/pubs.htm
Select National Fire Equipment System Catalog – Part 2 Publications 2003 Edition

- Using Your Fire Shelter Video (2001), NFES 1568
- Your Fire Shelter Booklet, 2001 Edition, PMS 409-2, NFES 1570
- Incident Response Pocket Guide, PMS 461, NFES 1077
- Fireline Handbook, PMS 410-1, NFES 0065
- Interagency Standards for Fire and Fire Aviation Operations, 2004
- New Generation Fire Shelter Video (2003), NFES 2711
- New Generation Fire Shelter Booklet (2003), NFES 2710, PMS 411
- New Generation Fire Shelter DVD (2003), NFES 2712

www.wildfirelessons.net
NARTC Lessons Learned website

www.fireleadership.gov
Interagency Fireline Leadership website

- Information concerning staff rides

NOTES

ANNUAL FIRELINE SAFETY REFRESHER COMMENTS

How many seasons have you worked as a firefighter? _____

What is your primary function in fire suppression?

- ☐ Line Firefighter
- ☐ Fireline Supervisor
- ☐ Other IMT Section
- ☐ In Support of Fires
- ☐ Management

What will you do differently after viewing this refresher?

_____

_____

_____

_____

_____

_____

How can the refresher be improved?

_____

_____

_____

_____

_____

_____

Facilitator, please return this form to the address below. Comments by e-mail are welcome.

BY MAIL: NIFC Fire Training
BLM Training Unit
Attn. Eva Brown
3833 S. Development Ave.
Boise, ID 83705

BY FAX: (208) 387-5378

E-MAIL: Eva_Brown@nifc.blm.gov