



FIRE PROTECTION TRAINING

Procedures Handbook 4300

FIREFIGHTER SAFETY

TOPIC: FIRELINE HAZARDS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

BEHAVIORAL OBJECTIVE:

Condition: Given a written quiz

Behavior: The student will confirm a knowledge of the different types of hazards and the procedures to follow when hazardous conditions are encountered

Standard: With a minimum of 80% accuracy

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate Audio visual equipment and screen
- Roll of 3" wide red and white barrier striped or chevron flagging
- Fireline or police perimeter flagging stating "Do Not Enter or "Do Not Cross"
- Optional, "Three Stripes You're Out!" Power Point Presentation
- Video: "If A Tree Falls" (NFES 1847)
- Written Quiz
- CAL FIRE Health and Safety Handbook 1700 §1738
- CAL FIRE 1800 Handbook
- Firefighter's Handbook on Wildland Firefighting, 3rd Edition, Teie, Chapter 1, 2005
- FOG ICS 420-1 Chapter 21, FIRESCOPE 2007

REFERENCES:

PREPARATION:

Fire is not the only hazard encountered on the fireline. Firefighters must be alert to recognize other potential hazards and employ the proper procedure to protect themselves and others from injury or death.



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FIRELINE HAZARDS

PRESENTATION

APPLICATION

I. IDENTIFICATION AND MANAGEMENT OF LIFE HAZARDS

NOTE: Show optional “Three Stripes You’re Out!” Power Point presentation

A. Definitions

1. Life Hazard

- a. The existence of a situation or condition that would likely cause serious injury or death to exposed persons

2. Life Hazard Zone

- a. An area within the incident perimeter that has been identified as life threatening and hazardous to emergency responders. The area is isolated through the use of barriers that clearly identify the area as hazardous and to prevent access by incident personnel

3. Life Hazard Lookout

- a. A person assigned to safely observe a Life Hazard Zone, monitor resources and personnel in the area and communicate with resources keeping them a safe distance away
- b. The Life Hazard Lookout will isolate and deny entry to any responders or resources until the life hazard is mitigated and the Incident Commander approves the release of the Life Hazard Zone

B. Notification Procedures

- 1. Any potential Life Hazard should be communicated to your coworkers and supervisor

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<ul style="list-style-type: none">a. If it is necessary to make notification via radio lead the transmission by stating "Emergency Traffic"2. Include the following information<ul style="list-style-type: none">a. Type/Nature of the hazardous condition (i.e. downed electrical wires, imminent building collapse, etc.)b. Specific location of hazardc. Resource needsd. Any immediate exposure needs or issuesC. Identification procedures<ul style="list-style-type: none">1. The Incident Commander shall assign a Life Hazard Lookout to prevent any incident personnel from entering the area until such time as the identification procedures have been completedD. Standard identification of Life Hazard Zones<ul style="list-style-type: none">1. Flagging<ul style="list-style-type: none">a. Preferred<ul style="list-style-type: none">(1) Red and white stripe or chevron barrier that states "life hazards, do not enter"b. Acceptable<ul style="list-style-type: none">(1) Fireline or Police perimeter flagging that includes the words "Do Not Enter" or "Do Not Cross"2. Configuration	<p>Show rolls of tape</p>

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<ul style="list-style-type: none">a. Three horizontal strands (3 stripes)<ul style="list-style-type: none">(1) Approximately 18 to 24 inches apart(2) Securely fixed to stationary supports<ul style="list-style-type: none">(a) Capable of supporting the barrier flagging throughout the incidentb. Size of Life Hazard Zone<ul style="list-style-type: none">(1) Sufficient flagging to provide complete isolation, distance and protection from the hazardc. Illumination<ul style="list-style-type: none">(1) Glow sticks attached to flagging(2) Orange cones with flashing strobe lightsE. Life Hazard Zones in remote locations<ul style="list-style-type: none">1. Minimum standards<ul style="list-style-type: none">a. Lookoutb. Flaggingc. Notificationd. Map<ul style="list-style-type: none">(1) Standard symbol<ul style="list-style-type: none">(a) Solid red octagon (stop sign) with three horizontal white lines(b) Specific hazard identified	

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<ul style="list-style-type: none">2. Posted along route of travel adjacent to life hazard<ul style="list-style-type: none">a. Securely fixed to stationary supports with three horizontal stripes of red and white life hazards flaggingb. Description sheet<ul style="list-style-type: none">(1) Location, distance, and type of hazard<ul style="list-style-type: none">(a) Attached to flaggingF. Established Life Hazard Zones<ul style="list-style-type: none">1. Communication<ul style="list-style-type: none">a. Face to faceb. Incident Action Planc. Emergency Radio Traffic message2. Removal<ul style="list-style-type: none">a. Approval from the I.C. is required prior to the removal of the Life Hazard Zone barriersG. Safety considerations<ul style="list-style-type: none">1. Ingress/Egress2. Communication3. Accountability	<p style="text-align: right;">Remember “3 Stripes, You're Out!”</p>
<h2>II. GENERAL SAFETY</h2>	

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<ul style="list-style-type: none">A. CAL FIRE vehicles shall carry a minimum of two rolls of red and white flaggingB. The flagging is not to be used for anything but marking Life HazardsC. Do not enter area that has been flaggedD. Any hazard observed should be communicated to supervisor and co-workers Immediately<ul style="list-style-type: none">1. Eliminate hazard if safe to do so<ul style="list-style-type: none">a. Move rocks, logs, cover, make berms, fall trees, etc.2. Flag off area if needed<ul style="list-style-type: none">a. Minimum of 25' radius3. Avoid night work if visibility is a factor.4. Minimize number of personnel in danger area<ul style="list-style-type: none">a. Only required workers5. Shout warning as needed6. Anticipate escape routes7. Brief next shift8. Proceed around danger area one person at a time<ul style="list-style-type: none">a. Rocks, limbs, etc.9. Stay out of area until danger has past<ul style="list-style-type: none">a. Dozers, powerlines, etc.10. Watch your footing11. Be alert	

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a. "Lookup, Look Down, Look Around"

12. Construct line to avoid hazard areas

III. HOLES, DROP-OFFS

A. Mine shafts, prospect holes

Where are mines found?

B. Wells, cisterns, septic tanks, cesspools

1. Around structures, old foundations.

C. Gullies, washouts, cliffs, drop-offs

1. Steep country, construction projects

D. Burned out stumps, roots

1. Roots can be some distance away

a. White ash, ground depressions

b. Ash cap "crust" often means burning logs below

c. Very common in logged over area that is a few years old

IV. HAZARD SOURCES

Show Video: "If A Tree Falls" (NFES 1847)

A. Falling and rolling material creates a hazard of hitting personnel or equipment, and of spreading fire into an area that may threaten the position of personnel or equipment

B. Tree hazards - look for

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<ul style="list-style-type: none">1. Roots of the tree<ul style="list-style-type: none">a. Provide structural support and anchorage for treeb. Look for the ground cracking and raising around tree<ul style="list-style-type: none">(1) Indicating recent movementc. Look for fungus on or around base of tree<ul style="list-style-type: none">(1) Check all sides of the treed. Look for damaged, missing or undermined roots<ul style="list-style-type: none">(1) Groups of dead, gray trees often indicate root rot pocketse. Look for fire or smoke in the roots or coming out of the groundf. Look for heavy leang. Look for burning pine cones or other material that could roll into the green2. Base and stem or trunk:<ul style="list-style-type: none">a. Look for rot, decay or mistletoeb. Look for hollows and cat faces - is more than $\frac{1}{4}$ of the cross section affected?c. Look for cracks, breakage, or mechanical damage in any supporting portion of the treed. Look for large sections of loose barke. Look for smoke issuing from cracks, openings or holes in any supporting portion of the tree	

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<ul style="list-style-type: none"> f. Look for fire in or on any supporting portion of the tree 3. Top and branches: <ul style="list-style-type: none"> a. Look for dead, forked, or broken tops <ul style="list-style-type: none"> (1) Lightning damage b. Look for mistletoe and decay in tops and branches c. Look for “widow makers” <ul style="list-style-type: none"> (1) Dead, loose, dangling or broken limbs that may fall d. Look for fire or smoke in top or branches e. Look for trees or snags that started to fall but hung up in the crown of another 4. Weakened trees or parts of trees become especially dangerous during periods of strong wind C. Rock hazards <ul style="list-style-type: none"> 1. Watch for rocks that may have been dislodged by equipment 2. Watch for rocks that may have been supported by vegetation 3. Watch for rocks that may have fractured from the heat of a fire D. Other falling and rolling hazards that accompany wildland fires <ul style="list-style-type: none"> 1. Logs 	<p>What is a “widow maker”?</p>

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<ul style="list-style-type: none">a. Limbs that have prevented a log from rolling may burn offb. Brush or other vegetation that has been preventing a log from rolling may burn offc. One section of a log may burn free of the well anchored portiond. Unexpected weight shift during bucking operations <p>2. Any heavy material that may be supported by combustible material</p> <ul style="list-style-type: none">a. Old vehicles on a steep, brushy hillsideb. Dwellings or other buildings built on wooden stilts or supportsc. Power lines <p>E. Working around equipment:</p> <ul style="list-style-type: none">1. Bulldozers <p>NOTE: This topic is covered in greater detail in another lesson</p> <ul style="list-style-type: none">a. Push over treesb. Weaken and break root systemsc. Weakened soil around and undercut root systemsd. Dislodge logs, rocks, and other heavy rolling material <p>2. Other equipment</p> <ul style="list-style-type: none">a. Any motorized equipment can vibrate, bump, or disturb heavy material that is in danger of falling or rolling	



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<ul style="list-style-type: none">b. Energized power lines can arc through heavy smoke, break, and fall to the ground <p>3. Air operations</p> <ul style="list-style-type: none">a. Vibration and air turbulence can dislodge material that is in danger of falling or rollingb. Air drops knock over healthy trees as well as weakened trees or parts of treesc. Air drops can dislodge rocks and other heavy material subject to rollingd. Air drops can reduce traction for motorized equipment causing a skid or rollovere. Air drops endanger footing causing slips and falls, especially while working with hand tools or hose	
<p>V. HAZARD MITIGATION</p> <p>A. Assess the condition of trees that could fall into a working or occupied area</p> <ul style="list-style-type: none">1. Check for weakened or burning trees or parts of trees<ul style="list-style-type: none">a. Use Life Hazard Lookout(s)b. Pass burning or fire weakened trees on the uphill side, or on side away from lean2. Flag and avoid known hazard areas or hazard trees3. Alert co-workers to any detected hazard4. Maintain communications	

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<ul style="list-style-type: none">a. The other crews and other shifts are to be made aware of the hazards5. Maintain extra work spacing when in questionable hazard areasB. Exercise extra caution when working in an area where falling and rolling material could be a problem<ul style="list-style-type: none">1. Do not work directly below bulldozer operations2. Exercise caution when working below other motorized equipment3. Offset or stagger personnel when working below others in areas where rolling rock is a problem4. Maintain constant watch when working undercut line<ul style="list-style-type: none">a. Heavy material loosened by the fireb. Fire ignited below your position by rolling materialc. Alert others before taking action on burning material that has rolled across the control lined. Use trenches to check rolling debris5. Shout a warning if falling or rolling material is spotted<ul style="list-style-type: none">a. The standard warning for falling material, such as trees, snags, or limbs, is "TREE!"b. The standard warning for any rolling material is "ROCK!"6. Avoid rolling rocks while walking or working on hillsides	

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- a. Watch where you put your feet
- b. Maintain stable, well balanced footing
- c. Maintain control over rocks and other loose items that you may have dislodged while working
- d. On rare occasions when dislodging smaller rocks can not be avoided, a crew may need to pass through the area in a tight group to avoid the danger of high speed rocks

VI. POWERLINES

A. Down or sagging

- 1. Immediately notify supervisor, coworkers and Incident Commander or Emergency Command Center (ECC)
- 2. Keep personnel out of area
 - a. Post guards as necessary
- 3. Flag area with Life Hazard flagging
 - a. Red and white
 - b. Three horizontal stripes
 - c. 25' radius - minimum
- 4. Treat all wires as live
 - a. Until confirmed dead and grounded by utility company
- 5. Problem of re-energizing
 - a. By power company
 - b. By home generators

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- 6. On metal fences, guard rails, etc.
 - a. Can energize for a long distance
- 7. Ground gradient
 - a. The ground can be energized by downed electrical wires

NOTE: Give short story example of an experience you may have had

VII. HAZARDOUS MATERIALS

NOTE: Discuss special problems in your area

- A. Dumps
- B. Storage areas
- C. Building or vehicle components
- D. Illegal, clandestine drug labs
- E. Radioactive materials
- F. Asbestos
- G. Fuels

VIII. EXPLOSIVES

- A. Storage facilities
 - 1. Old sites
- B. Ammunition reloading in homes
- C. Illegal, clandestine drug labs
- D. Bombing ranges
- E. Munitions storage area

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IX. AVOIDING ANIMAL, INSECT, AND REPTILE ENCOUNTERS

- A. Maintain Situational Awareness
 - 1. Wildlife (bears, skunks, etc.)
 - 2. Aggressive livestock
 - 3. Aggressive household pets
 - a. Domestic livestock
 - 4. Poisonous snakes
 - 5. Bee and hornet nests
 - 6. Scorpions, ticks
 - 7. Spiders

X. VEGETATION

- A. Poison oak
 - 1. Protective clothing
 - 2. Preventive ointments and washes
 - a. i.e. Tecnu
- B. Nettles
 - 1. Protective clothing, eye protection
- C. Thorns
 - 1. Protective clothing, eye protection
- D. Branches or roots
 - 1. Tripping hazards

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XI. OTHER HAZARDS

A. Special hazards

NOTE: Discuss known or suspected hazards in your area. Encourage students to share their experiences

Administer Topic Quiz

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SUMMARY:

Fireline hazards can be grouped into a variety of categories. Some categories are more lethal than others, but all have the potential to seriously injure or kill an unwitting victim. In order to avoid injury, it is important that all firefighters should be able to recognize potential hazards and take specific action to reduce potential harm. Depending on the character of the hazard and your level of responsibility and training, your action may range from marking and pointing out the hazard to actually rendering the hazard safe.

EVALUATION:

The student will complete a written quiz at a time determined by the instructor.

ASSIGNMENT:

Review your notes and Student Information Sheets in preparation for the upcoming quiz. Study for the next session.