



FIRE CREW FIREFIGHTER TRAINING

Procedures Handbook 4200

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 70% accuracy

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate Audio visual equipment and screen
- Roll of black and yellow hazard tape
- Slides/overhead transparencies for this lesson
- Video: "If A Tree Falls"
- Student Information Sheets 4204.2-1 and 4204.2-2
- Topic Quiz

REFERENCES:

- CDF Fire Protection Training Handbook 4300
- CDF Health and Safety Handbook 1700
- IFSTA Essentials, 4th Edition

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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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 8. 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 footing 11. Be alert 12. Construct line to avoid hazard areas <p>II. HOLES, DROP-OFFS</p> <ul style="list-style-type: none"> A. Mine shafts B. Wells, cisterns, septic tanks, cesspools <ul style="list-style-type: none"> 1. Around structures, old foundations. C. Gullies, washouts, cliffs, drop-offs <ul style="list-style-type: none"> 1. Steep country, construction projects D. Burned out stumps, roots <ul style="list-style-type: none"> 1. Roots can be some distance away. <ul style="list-style-type: none"> a. White ash, ground depressions. b. Very common in logged over area that is a few years old 	<p>Where would mines be found?</p>



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PRESENTATION

APPLICATION

III. HAZARD SOURCES:

- 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
 - 1. Roots of the tree
 - a. Provide structural support and anchorage for tree
 - b. Look for the ground cracking and raising around tree
 - (1) Indicating recent movement
 - c. Look for fungus on or around base of tree
 - (1) Check all sides of the tree
 - d. Look for damaged, missing or undermined roots
 - e. Look for fire or smoke in the roots or coming out of the ground
 - f. Look for heavy lean
 - g. Look for burning pine cones or other material that could roll into the green
 - 2. Base and stem or trunk:
 - a. Look for rot, decay or mistletoe
 - b. Look for hollows and catfaces - is more than $\frac{1}{4}$ of the cross section affected?



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<ul style="list-style-type: none"> c. Look for cracks, breakage, or mechanical damage in any supporting portion of the tree d. Look for large sections of loose bark e. Look for smoke issuing from cracks, openings or holes in any supporting portion of the tree f. Look for fire in or on any supporting portion of the tree <p>3. Top and branches:</p> <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 <p>4. Weakened trees or parts of trees become especially dangerous during periods of strong wind</p> <p>C. Rock hazards</p>	<p>What is a widow maker?</p>



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<ul style="list-style-type: none">1. Watch for rocks that may have been dislodged by equipment2. Watch for rocks that may have been supported by vegetation3. Watch for rocks that may have fractured from the heat of a fireD. Other falling and rolling hazards that accompany wildland fires<ul style="list-style-type: none">1. Logs<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 operations2. Any heavy material that may be supported by combustible material<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 linesE. Working around equipment:<ul style="list-style-type: none">1. Bulldozers	



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NOTE:

This topic is covered in greater detail in another lesson

- a. Push over trees
 - b. Weaken and break root systems
 - c. Weaken soil around and undercut root systems
 - d. Dislodge logs, rocks, and other heavy material
2. Other equipment
- a. Any motorized equipment can vibrate, bump, or disturb heavy material that is in danger of falling or rolling
 - b. Energized power lines can arc through heavy smoke, break, and fall to the ground
3. Air operations
- a. Vibration and air turbulence can dislodge material that is in danger of falling or rolling
 - b. Air drops knock over healthy trees as well as weakened trees or parts of trees
 - c. Air drops can dislodge rocks and other heavy material subject to rolling
 - d. Air drops can reduce traction for motorized equipment causing a skid or rollover
 - e. Air drops endanger footing causing slips and falls, especially while working with hand tools or hose



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IV. HAZARD MITIGATION

- A. Assess the condition of trees that could fall into a working or occupied area
 - 1. Check for weakened or burning trees or parts of trees
 - a. Use scouts and lookouts as necessary
 - b. Pass burning or fire weakened trees on the uphill side, or on side away from lean
 - 2. Mark or flag and avoid known hazard areas or hazard trees
 - 3. Alert co-workers to any detected hazard
 - 4. Maintain communications
 - a. The other crews and other shifts are to be made aware of the hazards
 - 5. Maintain extra work spacing when in questionable hazard areas
- B. Exercise extra caution when working in an area where falling and rolling material could be a problem
 - 1. Do not work directly below bulldozer operations
 - 2. Exercise caution when working below other motorized equipment
 - 3. Offset or stagger personnel when working below others in areas where rolling rock is a problem
 - 4. Maintain constant watch when working undercut line
 - a. Heavy material loosened by the fire



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<ul style="list-style-type: none">b. Fire ignited below your position by rolling materialc. Alert others before taking action on burning material that has rolled across the control line <p>5. Shout a warning if falling or rolling material is spotted</p> <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!" <p>6. Avoid rolling rocks while walking or working on hillsides</p> <ul style="list-style-type: none">a. Watch where you put your feetb. Maintain stable, well balanced footingc. Maintain control over rocks and other loose items that you may have dislodged while workingd. 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	<p>Display graphic 4204.2-1, pages 5 – 7</p>

NOTE: Hand out Student Information Sheet 4204.2-1, Fatality Summary Report, and review with class



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V. POWERLINES

- A. Down or sagging
 - 1. Immediately notify supervisor, Incident Commander, or Emergency Command Center (ECC)
 - 2. Keep personnel out of area
 - a. Post guards as necessary
 - 3. Flag area with hazard tape
 - a. Yellow and black
 - b. 25' radius - minimum
 - 4. Treat all lines as live
 - a. Until confirmed dead and grounded by utility company
 - 5. Problem of re-energizing
 - a. By power company
 - b. By home generators
 - 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 lines

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

VI. HAZARDOUS MATERIALS

NOTE: Discuss special problems in your area



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<ul style="list-style-type: none">A. DumpsB. Storage areasC. Building or vehicle componentsD. Illegal drug labsE. Radioactive materialsF. AsbestosG. Fuels <p>VII. EXPLOSIVES</p> <ul style="list-style-type: none">A. Storage facilities<ul style="list-style-type: none">1. Old sitesB. Ammunition reloading in homesC. Illegal drug labsD. Bombing rangesE. Munitions storage area <p>VIII. INSECTS, REPTILES</p> <p>NOTE: Hand out Student Information Sheet 4204.2-2, Fireline Hazards and talk about areas where these might be found</p> <ul style="list-style-type: none">A. Snake habitat areasB. Bee and hornet nestsC. Scorpions, ticksD. Spiders <p>IX. VEGETATION</p> <ul style="list-style-type: none">A. Poison oak	



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- 1. Protective clothing
- B. Nettles
 - 1. Protective clothing, eye protection
- C. Thorns
 - 1. Eye protection
- D. Branches or roots
 - 1. Tripping hazards

X. 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 seek out potential hazards and effectively reduce the potential for harm associated with them. 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.