



FIRE PROTECTION TRAINING

Procedures Handbook 4300

TOPIC: Avoiding Fire Entrapment

TIME FRAME: :45

LEVEL OF INSTRUCTION: Level I

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: Student will describe methods of avoiding fire entrapment and will be able to describe what to do if trapped by fire.

Standard: With a minimum of 80% accuracy

MATERIALS NEEDED:

- Writing board and pens
- Easel
- NWCG, NFES 1077 Incident Response Pocket Guide
- Appropriate visual aids
- Audio visual equipment

REFERENCES:

- NWCG, NFES 1077 Incident Response Pocket Guide, 2010
- Firefighter's Handbook on Wildland Firefighting, 3rd Edition, Teie, Chapter 1, 2005

PREPARATION:

The job of firefighting is recognized as a dangerous profession. Over one hundred firefighters have died in the last forty years on wildland fires. By recognizing the causes of these fatalities and other near-miss situations it is hoped future fire entrapment can be avoided. It is the responsibility of all firefighting personnel to know and understand how to fight fire aggressively and provide for safety first.



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PRESENTATION	APPLICATION
<p>I. COMMON CAUSES OF ENTRAPMENT</p> <p>A. Not following "The Ten Standard Firefighting Orders"</p> <p>NOTE: Instructor may want to review "The Ten Standard Firefighting Orders"</p> <p>B. Not recognizing and reacting appropriately to "The Eighteen Fire Situations that shout Watch Out!"</p> <p>NOTE: Instructor may want to review "The Eighteen Fire Situations that shout Watch Out!"</p> <p>C. Not properly applying "LCES" lookouts, communications, escape routes, safety zones</p> <p>NOTE: Instructor may want to review "LCES"</p> <p>D. Other contributing factors</p> <ol style="list-style-type: none">1. Senses dulled by carbon monoxide2. Poor visibility due to terrain, fuels, or smoke3. Lack of understanding of fire behavior <p>NOTE: Emphasize need for training</p> <ol style="list-style-type: none">4. Poor selection of safety zones5. Poor selection of escape routes6. Trying to outrun a fire going uphill7. Physical conditioning and stamina8. Failure to avoid (or misjudging) danger areas and/or situations9. Crew not alert to hazards and/or changing fire conditions	



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<ul style="list-style-type: none">10. Someone inadvertently setting a backfire or burning out in a manner that could jeopardize a crew<ul style="list-style-type: none">a. Not aware of crew locationb. Firing operation adversely influencing fire direction/intensityc. Firing wrong side of lined. Firing in the wrong direction (uphill vs. downhill)11. Extreme and/or unanticipated fire behavior	
II. ADVANCE PREPARATION	
A. Physical fitness	
<ul style="list-style-type: none">1. General fitness program<ul style="list-style-type: none">a. Physical strengthb. Stamina2. Conditioned to tolerate working in high daytime temperatures	Escaping a bad situation can involve maximum effort Train with full personal protective equipment
B. Personal protective equipment and other equipment	
<ul style="list-style-type: none">1. In place and secured	Can take precious seconds to secure in a bad situation

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<ul style="list-style-type: none">a. Nomex shirts and pantsb. Shroud, collarsc. Gloves, goggles, helmet with chinstrapd. Bootse. Fire shelter <p>2. In working order and well maintained</p> <ul style="list-style-type: none">a. Headlamps/flashlightsb. Radios <p>3. Proper equipment</p> <ul style="list-style-type: none">a. Mapsb. Compassesc. Radiosd. Canteense. Fire shelter	
<p>III. SAFETY ZONES/ESCAPE ROUTES</p> <p>A. Safety Zones are a pre-designated area where resources will assemble in the event their location on the line becomes or has the potential to become untenable</p> <ul style="list-style-type: none">1. This area must be large enough to accommodate all resources threatened allowing personnel to survive a threat without the need to deploy fire shelters or seek refuge2. Pre-plan number and location<ul style="list-style-type: none">a. Communicate location information to adjoining forces	

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<ul style="list-style-type: none">b. Will vary with terrain and fuelsc. May already existd. Construct new ones concurrent with line construction<ul style="list-style-type: none">(1) Plan and construct early(2) Plan and construct “big” for unexpected resources <p>B. Escape Routes are a pre-designated travel route a crew will take to avoid threat of fire overrunning them</p> <ul style="list-style-type: none">1. Often the best Escape Route is the fireline down and away from danger2. Will vary constantly as line progresses and fire conditions change<ul style="list-style-type: none">a. Keep everyone updated on location(s)b. Flag if necessary3. When possible, identify more than one route4. Consider the slowest person in the crew, fatigue, and weather5. May require brushing6. Avoid dangerous areas7. Large enough for all personnel8. Make use of natural routes	<p>Consider fire direction, rate of spread and wind direction</p>

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<ul style="list-style-type: none">a. Game trailsb. Dozer (skid) trailsc. Natural openings <p>9. Use burned over areas</p> <ul style="list-style-type: none">a. Potential for re-burn existsb. "Hard Black"c. "one foot in the black" in light fuels <p>10. May have to set an escape fire</p> <ul style="list-style-type: none">a. Open areab. Set firec. Step into burnd. If possible, notify your supervisor <p>11. Don't try to outrun a fire uphill</p> <ul style="list-style-type: none">a. Fire spreads much faster uphill<ul style="list-style-type: none">(1) Spread speed doubles with every 20% increase in slope due to super-heated air and pre-heating of fuels <p>12. Evaluate your situation</p> <ul style="list-style-type: none">a. Keep calm	<p>What are some natural escape routes?</p> <p>What is the safest part of the fire?</p>

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<ul style="list-style-type: none">b. Think clearly through your situation and your alternativesc. Select the best alternative and act on it quickly	
<p>IV. AREAS OF RELATIVE SAFETY</p> <ul style="list-style-type: none">A. Natural barriers<ul style="list-style-type: none">1. Bodies of water<ul style="list-style-type: none">a. Lakes, ponds, streams, marshes2. Large dry lake beds and washes3. Large rocks and rock outcroppings4. Lava caps5. Changes in surface fuels<ul style="list-style-type: none">a. Heavy brush to light grass6. Game trails7. Grazed areas (sheep, etc)8. Old burns9. Irrigated fields or meadowsB. Constructed barriers<ul style="list-style-type: none">1. Roads, trails, dozer lines2. Fire breaks, fuel breaks, old VMP burns	<p>Is any area 100% safe?</p> <p>What types of barriers would make a safer area?</p>



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<ul style="list-style-type: none">3. Culverts, bridges, tunnels4. Buildings5. Parking lots6. Quarries, gravel pits7. Water ditches, aqueducts, sloughs8. Helispots9. Vehicles <p>NOTE: Using a vehicle as a refuge may not be practical. Newer vehicle interiors are comprised mostly of plastic materials and may off-gas toxic fumes.</p> <ul style="list-style-type: none">10. Swimming pools <p>V. CREW PREPARATION</p> <ul style="list-style-type: none">A. Stay together<ul style="list-style-type: none">1. Keep close account of all crew members<ul style="list-style-type: none">a. There are cases where persons have died trying to find a crew member they thought had strayed offB. Follow directions of crew leader/supervisorC. Contact an "outside" person via radio or other available communications<ul style="list-style-type: none">1. Explain situation2. Give accurate description of your location and access to it<ul style="list-style-type: none">a. For ground/air support and/or rescue<ul style="list-style-type: none">(1) Retardant/water drops	

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<p>(2) Possible helicopter rescue or transport of injured</p> <p>D. Re-evaluate your situation</p> <ol style="list-style-type: none">1. Possible alternative escape routes2. Weigh risks of staying against risks of escape attempt3. Have you considered all options? <p>VI. RUNNING THROUGH THE FIRE</p> <p>A. Severity of this situation can vary greatly from a minor step-across in light fuels to a very risky last ditch sprint through high heat situations in heavy fuels</p> <p>NOTE: Refer to the section “Last Resort Survival” in the latest edition of the <u>Incident Response Pocket Guide</u>, NWCG.</p> <ol style="list-style-type: none">1. Indicators of the degrees of severity<ol style="list-style-type: none">a. Fuelsb. Topographyc. Flame intensityB. Preparations<ol style="list-style-type: none">1. Wildland fire safety uniform secured<ol style="list-style-type: none">a. No skin exposed. Most radiant burns involve the ears and noseb. Sleeves, pant legs, shroud, bandanna (dry), collar properly secured	<p>Cite some examples of various degrees of severity</p>

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<ul style="list-style-type: none"> c. Gloves/chin strap on helmet d. Fire shelter ready e. Goggles on 2. Keep tool <ul style="list-style-type: none"> a. Use as a heat shield b. Use tool to make break in fire edge 3. Dispose of any fire sensitive items <ul style="list-style-type: none"> a. Fusee, saw fuel packs 4. Shed hose packs or other items that might impair mobility 5. Maintain crew communication and coordination <p>NOTE: Of prime importance is to not breathe super-heated air. Selection of route should be based on this priority</p> <ul style="list-style-type: none"> C. Choose best route <ul style="list-style-type: none"> 1. Lighter fuels 2. Area of lowest fire intensity 3. Open area-no tripping hazards 4. Least residual flame or heat inside burn 5. Shortest distance to safety 6. Level terrain D. Proceed through flame 	<p>Important to know where everyone is and if they are safe</p>



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<ul style="list-style-type: none">1. Don't breathe while going through flame or hottest area<ul style="list-style-type: none">a. Super-heated air can easily damage respiratory system and can lead to death<ul style="list-style-type: none">(1) If you have a choice, it is better to suffer some body burns rather than breathe super-heated air2. Stay low in crouched position when most intense heat is high<ul style="list-style-type: none">a. Don't overdo to the extent it would hamper mobility or increase possibility of tripping3. Remain upright if flame length or height is low; such as in flashy light fuels4. Watch ahead -- pick your route as you go5. Use your fire tool as a heat shield<ul style="list-style-type: none">a. Keep broad area of the tool toward the greatest heat and use it to protect your faceb. Hold in such a manner as to not block your visibilityE. Upon reaching safe area<ul style="list-style-type: none">1. Check for burning clothing and extinguish2. Collect crew members together to ascertain status	<p>Instructor to demonstrate proper holding of a tool</p>

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<ul style="list-style-type: none">3. Advise I.C. or appropriate line supervisor of your status4. Administer any first aid or burn treatment as needed5. Evacuate or continue assignment6. Rest and recuperate if necessary<ul style="list-style-type: none">a. Hydrate7. Consider critical incident stress debriefing	

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SUMMARY:

Knowing the causes of wildland firefighter fatalities, near-misses and recognizing them on the fireground are extremely important in avoiding entrapment incidents.

If entrapment is unavoidable and your safety zone(s) is unavailable, seek an area of refuge or deploy a fire shelter. Entrapment can often be avoided by using an escape route or running through some fire conditions. Remain calm while you or your supervisor determines what to do.

EVALUATION:

A written quiz.

ASSIGNMENT:

To be determined by instructor(s).