



Online Courses for Wildland Firefighters

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Safety is Our #1 Priority!



S-185 ~ Fire Entrapment Avoidance

This course covers information required by a Wildland Firefighter to avoid being trapped by a Forest Fire.

S-185 ~ Introduction

Wildland Fires in British Columbia can be challenging for even the best prepared firefighters. Fires are both dangerous and unpredictable. No human life is worth a tree or a building. It is your responsibility to not only be an effective firefighter, but to get home alive and uninjured. Do not become part of the problem by following unsafe practices.

S-185 ~ Part One, Sections 1-4

1 - Fire Entrapment

The term "Fire Entrapment" indicates a situation where fireline personnel find themselves caught or "trapped" by a fast moving fire. This means they cannot avoid being overtaken by the advancing flames.

2 - Fire Entrapment Avoidance, the Firefighters role

The term "Fire Entrapment Avoidance" indicates a situation where proper strategies have been put into place and well thought out tactics are employed in the fire fighting efforts. These strategies and tactics must be put in place before any fire fighting activities begin.

It is the responsibility of every fire fighter to know what these procedures are before commencing work and to keep informed of all future updates and changes. You are responsible for your own personal safety. Do not

hesitate to ask your Supervisor questions if any part of the operation is unclear to you. Stay alert, stay informed, always be fire aware and stay safe.

3 - Fire Entrapment Avoidance, the Supervisor's role

It is the responsibility of all supervisors to know what the current fire situation is, what the fire entrapment plan is, where the safe areas and escape routes are and know when it is time to retreat from the fire line if conditions become too hazardous. The lives and well being of the crew members rest with a well-trained and aware supervisor. Clear communications of key information between the Supervisor and all the crew members is vital to a safe and efficient operation.

4 - Key Information

The following information should be known by all firefighters before they engage in any fire fighting activity:

- What is the Chain of Command. Who is in charge and who is your direct supervisor.
- What is the communication plan between fire-line personnel.
- What and where are the escape routes and safe areas. Are there at least two. Are they still appropriate and accessible.
- What are the fire-line hazards such as snags, cliffs, potential hot spots.
- What is the current fire situation and what is the expected fire behaviour over the next few hours.
- What are the fire suppression strategies, your specific job and how it will be accomplished.
- What are the special safe work procedures that you must be aware of in your situation?

Questions for Sections 1-4

Is the following statement True or False;

1- Fire entrapment means being trapped by an advancing fire.

True False

2- Fire entrapment avoidance means being trapped by a retreating fire.

True False

3- Firefighters are responsible for practicing fire entrapment avoidance.

True False

4- Supervisors have no role in fire entrapment avoidance.

True False

5- Knowing what the fire is doing is not an important part avoiding entrapment.

True False

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S-185 ~ Part Two, Sections 5 - 10

5 - L A C E S, Lookouts, Anchors, Communications, Escape Routes, Safety Zones

A continual assessment of the fire situation must be done. Wildland fires are forever changing and a safe firefighter is aware of all changes. Implementing LACES should be done during before any firefighting starts.

6 - Lookouts

On more aggressive fires, and experienced firefighter with knowledge of fire behaviour should be assigned the task of keeping an eye on the fire front, from a vantage point, and reporting any changes to the supervisor or crew. Regular safety-check ins are required. The lookout person should know where the fire is and where the crew and any equipment is working.

7 - Anchors

When building a fireguard, the guard should start at a point where the fire cannot creep around it and trap the firefighters. A good anchor point is a river, road, rock outcropping or bare ground.

8 - Communications

Effective communications is critical to proper firefighting operations. They should be clean, clear and precise. Do not waste airtime with unrelated talk. Establish a regular interval for safety check ins. Make sure every member of the crew either has a radio, is with someone with a radio or is working within ear shot. Test your radio before going on the fire line and carry extra batteries. Speak slowly, softly and hold the radio close to your mouth. Avoid loud background noise such as pumps or machinery.

9 - Escape Routes

It is the responsibility of the supervisor to pre-establish escape routes before you engage in fire fighting activities. It is your responsibility to know those escape routes and make sure they are well marked and current to your location. Escape routes should offer you a well-marked and clear path to a safe area. If you have to use an escape path, leave early and do not run. Take your tools with you. Examples of escape routes are cut trails, established paths, roads or hose lies. Escape paths should never go up slope or through areas of high fire hazard.

10 - Safety Zone (Safe Area)

It is the responsibility of the supervisor to pre-establish safety zones before you engage in fire fighting activities. It is your responsibility to know where the safety zones are and that they are still current for your needs and location. An effective safety zone should provide a distance of four times the maximum expected flame height. An example would be: expected maximum flame height of 100 m, the safe area should be at least 400 m wide. A good safety zone would be located below or at right angles to the advance of the fire, away from chimneys, gullies, canyons, steep hillsides and areas of heavy fuel. A burnt out area can also serve as a safety zone as well as a large deciduous patch or rocky area.

If there is no established escape route or safety zone, you should refuse to work on the fire line.

Questions for Sections 5-10

Is the following statement True or False;

6- LACES stand for Lookouts, Anchors, Communications, Escape Routes, Safety Zones.

True False

7- LACES are only important for the firefighter to practise after entrapment.

True False

8- The supervisor is responsible for establishing escape routes and safety zones.

True False

9- Should there be at least two escape routes and safety zones for firefighters to retreat to.

True False

10- At no time should a firefighter seek safety in a burnt out area.

True False

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S-185 ~ Part Three, Sections 11 - 14

11 - Fireline Disengagement Procedure

If the call is made to disengage from firefighting activities due to an increase in the risk of fire entrapment, all personnel should use the closest escape route and proceed to the assigned safety zone. Leave before the situation becomes dangerous. Walk and take your tools with you.

If you, as a front line firefighter, feel endangered by the fire activity, it is your responsibility to disengage and retreat to the nearest safety zone. Immediately inform your supervisor that the crew has left the fire and are all staging in the assigned safety zone. Always stay together as a group and make sure no one has been left behind. Stay calm, do not panic or run. Leave early to exercise on the side of caution.

If you become separated from the group, attempt to locate the crew. If unsuccessful, find an effective safety zone and remain there until the danger has passed.

12 - Fire Entrapment Survival

If proper precautionary measures have not been taken and you are unable to escape from an out of control fire, use the "last resort" tactics as described below.

The first decision you must make in a potential entrapment is whether or not escape to your safety zone seems possible. This decision is based primarily on fire behavior and the availability of an open escape route. Supervisors will recognize when a potential entrapment situation requires emergency escape efforts. Follow orders. If you are not part of a crew, or have become separated from it, you must rely on your own judgment. If emergency escape is employed fireline personnel must immediately advise their supervisor of their status and location.

Assess the situation and look for a safe area such as a creek, water way, rock outcropping or open area. Stay low and move as quickly as possible to that safe area. Consider moving into an area that has already been burnt over. Clear away the ash on a spot of ground that you can lay down in. Protect your airways and wait until it is safe to rejoin your crew. If you have a radio, signal where you are and what your situation is.

Remember to always be aware of the current fire situation. Be aware of any sudden or gradual changes in the weather pattern or size of the fire. Adjust your plans if needed and evacuate well in advance of the situation becoming dangerous.

13 - Survival Zones and Fire Entrapment Survival Action

If fire entrapment appears likely - stay calm and don't panic - you need to locate a survival zone and take fire entrapment survival action. A survival zone is an area where fireline personnel - unable to access a designated safety zone - can avoid

flame contact and prolonged exposure to heat and smoke. Use of fire entrapment survival action will be important to avoid injury while sheltering in a survival zone.

Survival zones feature the same characteristics as safety zones but because of smaller size or other compromising factors - cannot be considered a safety zone. Examples include previously burned areas, rockslides, roadbeds, clearings, knobs, ridges, benches, cat guards, wet areas and cleared areas in light or deciduous fuels. Supervisors may decide to burn out survival zones and adjacent fuels prior to flame front approach and may order retardant or water drops on the area around the survival zone.

The firefighter's personal protective equipment provides important protection from radiant heat and all fire entrapment survival actions prioritize lung and airway protection while attempting to minimize radiant heat and smoke exposure.

14 - Fire Entrapment Survival Action

Maintain a low profile - staying close to the ground (within 30 cm) will reduce radiant heat exposure.

Shelter yourself in a large area that is light or free of fuels (rocky area, water/wet area, ploughed field, a 'cool' burned area, bulldozed clearing, etc.). Find a fuel-free depression or trench, preferably behind a rock or dirt pile to block radiant heat.

Watch for flames that can 'wrap' around the sides of objects you are sheltering behind - stay mid-object, remain low and move behind a larger sheltering object if necessary. Protect yourself with clothing: sleeves down, collar up, gloves, goggles and hard-hat on. Lie flat, facedown, parallel to the flame front. Keep face down and protect your airway by taking shallow breaths close to the ground. With your hands dig a depression to make a well for breathing.

Curl arms and hands around head and ears. Cover yourself with dirt if possible. Wet clothing if possible. Do not wear synthetic packs or materials.

Questions for Sections 11-14

Is the following statement True or False;

11- If you are forced to retreat from a fire, the crew should stay together.

True False

12- It is important for the firefighter to stay constantly aware of the current fire situation.

True False

13- A firefighter can leave the fireline without the supervisors permission if the conditions become dangerous.

True False

14- While travelling through dense smoke you should stay low to the ground.

True False

15- The last parts of your body you should worry about are your airways.

True False

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S-185 ~ Part Four, Sections 15 - 18

15 - Vehicle Entrapments

If you are forced to retreat from the fire and cannot access your safety zones, consider (as a last resort) taking refuge in your vehicle. If you are in a good location - stay put - don't risk a worse entrapment situation by driving through smoke and heavy roadside fuels. If you are not in a good location - keep moving.

- In smoky conditions, turn lights on. Look for a place where the fire is less intense; avoid saddles or draws and areas of heavy fuels below the road.
- Look for rock outcroppings, ridges, or wide spots in the road - park behind a natural barrier or structure.
- Do not park on the downhill side of road, under power lines or over-hanging vegetation. Position vehicle in a direction, which provides the crew with maximum protection from approaching, flame front. Burn off around vehicle if there is time.
- In very thick smoke, you may be forced to stop. The engine may quit suddenly because of hot air and smoke. It is not likely to restart, so do not spend much time trying. If you are forced to stop and are in a fire entrapment situation:
 - Advise immediate supervisor of the situation. Request retardant drops on fuels surrounding your location.
 - If your vehicle has a pump, keep it running and use the engine protection line to deploy a fog pattern over the cab.
 - Maintain control of your people. Keep calm, display a positive attitude and maintain communications. Don't make a bad situation worse by panicking.

16 - Heavy Equipment and Building Entrapments

Heavy equipment units are often in a good position to survive fire entrapments - they can create fuel-free areas that are good safety or survival zones. It is important that equipment operators use fire entrapment avoidance safe work procedures and start escape procedures when any fire entrapment threat is perceived. If fire entrapment appears likely - heavy equipment units should retreat from the fireline to a more favourable site nearby or start clearing a safety zone (survival zone where time is critical).

If you are forced to stop and are in a fire entrapment situation:

- Advise immediate supervisor of the situation. Request retardant drops on fuels surrounding your location.
- If water is available deploy a fog pattern over the cab.
- Never stay on the machine during an entrapment since intense radiation and flames are more likely higher off the

ground.

- Maintain control of your people. Keep calm, display a positive attitude and maintain communications. Don't make a bad situation worse by panicking.
- Use equipment to dig a trench behind the machine.
- Park equipment sideways to the flames. Lower all implements to the ground and turn off the engine. The machine will block radiant heat and some flames. Move into the trench behind the machine away from oncoming flames and follow fire entrapment survival action training.
- Watch for flames wrapping around the machine, stay low and move to a better location if necessary.

17 - Building Entrapments

Fireline personnel may be deployed on a Wildland/Urban Interface fire with structures nearby. Like vehicles, structures can provide protection even if they are later destroyed by fire. Structures used to protect fireline personnel in entrapments must provide enough protection to warrant use as a temporary barrier. Surrounding fuels, structure size and flammability are all critical factors.

If you are in a fire entrapment situation with structures nearby: Advise immediate supervisor of the situation. Request retardant drops on fuels surrounding your location.

If time allows, move combustible materials (lawn furniture, wood piles, etc.) and vegetation away from structure. Shut off gas pr propane at the source.

Bring hand tank pumps, extinguishers and charged houseline (if available) into structure. Remove light material (curtains) from windows, and cover the windows with heavy materials. Close all windows, doors, and vents Ñ with the exception of a fireplace vent. Fill all sinks, bathtubs, and any available buckets with water. Soak towels, rags, and spare clothes for use later in putting out fires, or to place against exterior door jams. Stay on the ground floor and maintain access to a door or window, on the side of the structure away from advancing flames. Avoid upper floors and basements.

Be prepared to exit quickly in case heat and smoke force you from the structure before the heat dissipates outside.

If forced to exit, move away from the structure and get low to the ground quickly.

PROTECTING YOUR AIRWAY IS YOUR PRIMARY CONCERN.

18 - Summary

Wildland fires are dangerous, unpredictable and have erratic patterns. It is up to each individual firefighter to constantly be aware of what is happening and to anticipate problems. Follow your gut feeling. If you do not feel comfortable in a situation it probably means you should not be there!

Act early to avoid being trapped by an advancing fire. Know what the fire situation is, what your job is, where your escape routes are and where your safety zones are. Stay in good communication at all times. When in doubt, pull out.

Personal safety is always your number one concern.

Questions for Sections 15-18

Is the following statement True or False;

16- If needed, firefighters can seek refuge inside a vehicle.

True False

17- Never enter a house if you are trapped by an out of control Wildland fire.

True False

18- If driving a bulldozer, it is helpful to push back flammable material and create a safe zone.

True False

19- When in doubt, double your efforts

True False

20- Firefighter safety is always the number one priority.

True False

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