

Fire Shelter Training Reminders—2016

Fire Shelter Project Review—U.S. Department of Agriculture, Forest Service, Washington Office-Fire and Aviation Management requested the National Technology and Development (T&D) Program to review the fire shelter system, which includes the fire shelter, fireline pack, practice shelters, and training. The Fire Shelter Project Review information is available at http://www.nifc.gov/fireShelt/fshelt_main.html.

Training

Shelter Deployment Training—As a firefighter, you practice entrapment avoidance in order to stay out of situations where you need to deploy a fire shelter, but you can still find yourself in a situation where you're entrapped by fire and need to deploy a shelter. You must take training seriously, because you never know when you may need to deploy a fire shelter. It can happen to ANYONE!

Practice shelter deployments while wearing personal protective equipment (PPE)—especially gloves—in a high-stress environment, with time constraints, and in different positions; standing, kneeling, and lying down. Adding high ventilation fans to simulate wind and utilizing outdoor conditions also helps to create practice that is more realistic. You can find additional training materials at http://www.nifc.gov/fireShelt/fshelt_training.html.

T&D recently produced a video collection entitled “Fire Shelter Deployments: Stories and Common Insights.” You can view these videos on the Wildland Fire Lessons Learned Center YouTube channel at <https://www.youtube.com/playlist?list=PLTjug05B4KNt-OVXS8Ce93vqSufg-sOmY>. You can also order a DVD of this collection through T&D at 406-329-3900.

Shelter Inspection— Ensure that you are carrying a serviceable fire shelter. Use shelter inspection criteria to inspect shelters at the start of every fire season and periodically throughout the season. Review the “Fire Shelter Inspection Guide and Rebag Direction,” tech tip at <http://www.fs.fed.us/t-d/pubs/pdfpubs/pdf11512301/pdf11512301dpi72.pdf>. Take shelters that don't pass inspection out of service and use them for practice deployments.

Training Shelters— Firefighters who have deployed real shelters have indicated that these shelters are not the same as training shelters. The stiffer, heavier material of real shelters doesn't shake open as easily. Whenever possible, use out-of-service, real shelters to provide more realistic training.

Repacking practice shelters can be quite cumbersome. The short video at http://www.nifc.gov/fireShelt/fshelt_training.html provides direction on how to easily refold a practice shelter.

Entrapment and Fire Shelter Deployment

Escape Routes— Identify, flag, and monitor travel times for escape routes and safety zones throughout the day. Often, escape routes or safety zones that are adequate for the morning will be inadequate for

the higher fire intensities associated with afternoon burning periods. Removing your pack and carrying only your fire shelter can speed your escape.

Safety Zones— Firefighters cannot determine the true effectiveness of a safety zone until after the fire passes. If you are uncertain about a safety zone, be prepared to deploy your shelter.

Entrapment— When entrapment is imminent, don't wait until the heat drives you to deploy. Deploy your fire shelter well before the fire arrives. Waiting too long to deploy your shelter can leave you exposed to dangerous levels of heat.

Deployment Site Selection – Pick a site that has the sparsest fuels and where it is least likely that flames and convective heat will contact the shelter. Avoid chimneys, saddles, and draws.

Moving – Moving in a shelter or using it as a shield to move has been done before. However, it may expose your airway to extreme, even fatal air temperatures.

Shelter PVC Bags— Firefighters who have deployed real shelters indicated that training PVC bags open with much less effort than real shelter PVC bags. Expect to open the bag with a solid pull down of the red tear strip. Also, a high-temperature environment can soften the shelter's PVC bag, making it more difficult to tear open. Make sure to deploy your shelter before dangerous high temperatures arrive at the deployment site.

Amount of Protection—Fire shelters provide their best protection in a radiant heat environment and less protection against convective heat and direct flame contact. Selecting the best available site to deploy your shelter is very important. Deploy the shelter at a site that will minimize, as much as possible, exposure to convective heat and flame contact. T&D conducted fire shelter tests in both laboratory and wildland environments. The short video, "Comparing the New Generation and Old-Style Fire Shelters, May 5, 2006" <http://www.nifc.gov/fireShelt/fshelt_publications.html> shows a test in a wildland fire environment.

During development of the current shelter, fire shelters were subjected to a variety of lab tests including radiant and convective heat scenarios. In the radiant test, shelters were exposed to 40 kW/m² of heat flux for 5 minutes. The current shelter showed a noninjuring rise in temperature of 140 °F and a heat flux of 1.5 kW/m². An exposure of 40 kW/m² would be fatal to an unsheltered human. In the convective test, shelters were exposed to flames of 80 kW/m² of heat flux and temperature of 1300 °F for 20 seconds. The current shelter showed a noninjuring rise in temperature of 100 °F and a heat flux of 1.3 kW/m². An exposure of 80 kW/m² for 20 seconds would be fatal to an unsheltered human. Limitations of the test facility prevented an exposure of longer duration.

Current testing involves a convective test that can last much longer. The current shelter has survivable temperatures an average length of 55 seconds. <https://www.youtube.com/watch?v=yDICrT721Qs> It is not uncommon for wildland fires to reach 150 to 180 kW/m² of heat flux and temperatures of 1600 to 1900 °F. Flaming fronts usually burn through a site within 75 seconds.

High Winds— Deploying a shelter in windy conditions is difficult. Lie on the ground to unfold and deploy the shelter. This short video shows a firefighter deploying fire shelters in 50 mile per hour winds created by the Forest Service’s DC-3 airplane <https://www.youtube.com/watch?v=Lv_Rr3FMtz4>.

Gloves—Firefighting gloves are designed to provide appropriate protection from heat and physical hazards. The gloves provide limited dexterity when fine motor skills may be needed. Wear gloves while working in a fire area, except when you require fine motor skills. If you remove the gloves, remember to put them back on. Review the tech tip “Firefighters’ Leather Gloves Redesigned To Be More Comfortable” at <<http://www.fs.fed.us/t-d/pubs/pdfpubs/pdf09512312/pdf09512312dpi72.pdf>>.

Water—Only take your water bottle into the shelter with you if it is convenient and time permits.

Radio— Only take your radio into the shelter with you if it is convenient and time permits. Fire shelters can inhibit the ability of a radio to transmit and receive. You can slide the radio antenna under the shelter for better reception; only attempt to do this when you feel it won’t allow dangerous levels of heat to enter the shelter. Review the tech tip “Fire Shelters Weaken Transmissions From Hand-Held Radios” at <<http://www.fs.fed.us/t-d/pubs/pdfpubs/pdf03512342/pdf03512342dpi72.pdf>>.

Remember—Fires are an event. Weigh the risks of your assignment. Wildland fire can create a dynamic environment where drastic changes occur very quickly. Never take added risks because you are carrying a fire shelter. The fire shelter cannot provide sufficient protection in all fire situations.

Comments or questions? – Contact Tony Petrilli, U.S. Forest Service, National Technology and Development Program Fire Shelter Project Leader at apetrilli@fs.fed.us or 406-329-3965.