

Winter Operations

Lefthand Fire 2021



OVERVIEW

- Types of Winter Conditions
- Taking care of people
- Taking care of vehicles
- Scene Operations
- Chimney Fires



Tonight's training topic is a lot of common sense items. Most of us live in or at least recreate in the mountains, so winter and inclement weather is something we're familiar with. So while there isn't perhaps a lot of new information here, what I want to do is put this in front of people so we do remember to take the steps we need as responders to protect ourselves. And throughout I want you to remember that what we do on a good day is dangerous; what challenging conditions, be it nighttime, low temperatures or precipitation and slick conditions, and especially all three does, is reduce whatever margin of safety and comfort we have to a bare minimum.

Types of Winter Conditions

- Lower Temperatures
 - Icy roads
 - Frost
 - Wind Chill
- Greater reliance on heating systems
- Reduced physical endurance

In addition to these types of inclement weather, we can add wind to the occasion. While the focus tonight is on kind of the cold weather and snow phenomena and our structure fire and outdoor roadside calls, chinook winds in the winter drive wildfire. The 2009 Olde Stage fire was January 7th and burned primarily in grass, which is ready to burn year round. And while chinooks are a warm wind in the winter, we get plenty of cold wind to, which adds wind chill. Wind chill is perceived temperature, it doesn't affect inanimate objects or freeze water, but can certainly affect you while outside!

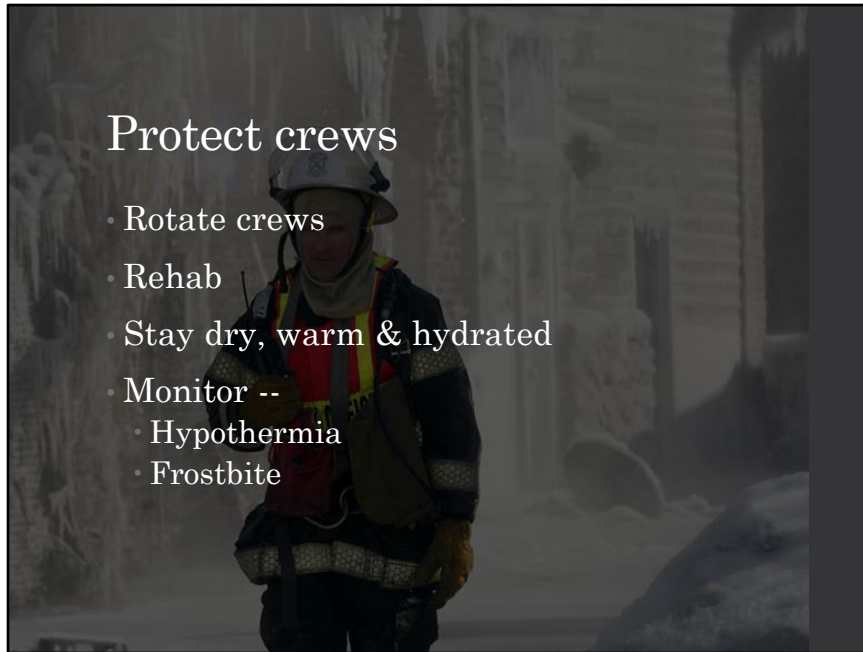
Types of Winter Conditions

- Inclement Weather
 - Snow or sleet
 - Freezing rain
 - Fog
 - Decreased visibility due to precipitation
 - Shorter periods of daylight



Personal Protective Equipment

- Layers & underclothing
- Have spare gloves, socks
- Dress like you'll be outside for a long time – you might be
- Be adaptable to changing conditions



Protect crews

- Rotate crews
- Rehab
- Stay dry, warm & hydrated
- Monitor --
 - Hypothermia
 - Frostbite

Early signs of frostbite: sensation of pins and needles, cold, numb and white. Think exposed skin, then extremities (hands & feet) and anywhere that is wet.

Hypothermia, shivering, and then shivering stopping after previously shivering without warming up.

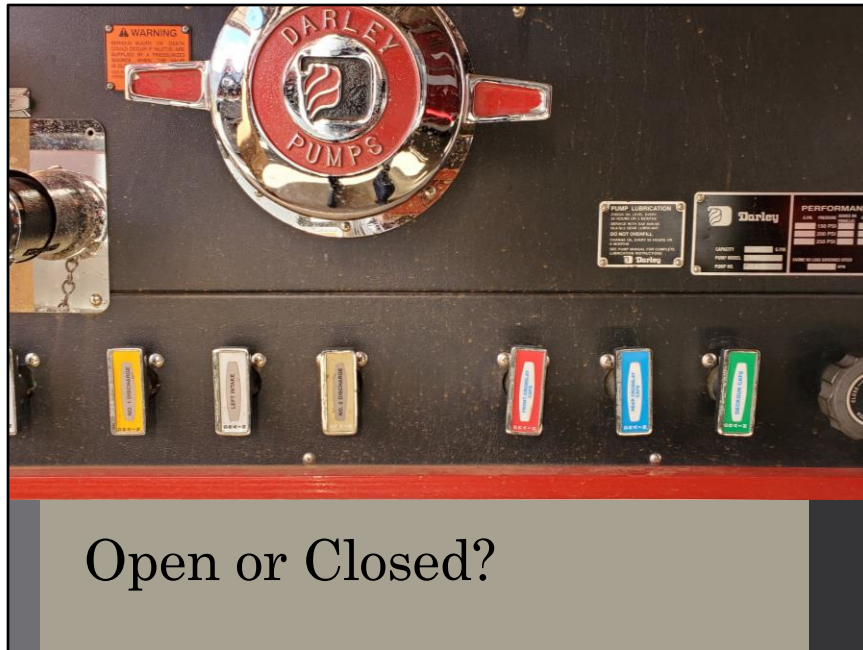
If you are shivering, if you are experiencing pins and needles sensation or numbness, speak up. It's far easier to address these problems early than to let them progress. And, it's likely that if you are feeling something, everyone else in the same conditions are too.



Vehicles

- Truck inspections and maintenance even MORE critical

Why is that? Really, operating in the winter isn't much different than any other time of year, with the exception that the margin for error is gone. It's never fun to be stranded with a mechanical issue, but in inclement weather, an inconvenience like that becomes a life threat. So making sure vehicles are topped off with fluids, batteries are good, systems especially lights and pumps work. We're trying even more so in inclement weather to make our decisions and actions count, so having our equipment in working order and in service is even more important.



Open or Closed?

Are these drains opened or closed?

Perpendicular to the ground these drains are opened.

In cold weather months we keep our pumps “dry”, and the signal to the next operator who might take a truck out that the truck is drained is to leave the valves open. Prior to driving in freezing conditions, the operator should close the valves so they don’t freeze in the open position, rendering the pump useless.

Let’s talk about pump winterizing.

The first thing I do, before draining anything, is run the pump with tank to pump closed and pump to tank open. Let the pressure drop out of the system so it runs dry a good 10-15 seconds before shutting down. Doing this we’ve thrown water out of the impeller and back into the tank. Then drain the pump manifold. I’ll start with the drains, but then work your way up and around the truck, opening every intake and discharge except the direct tank fill. All of the inlets and outlets are connected and will have some water in them, including the steamer connection. So open everything and let it drain, then close valves and put caps back on, keeping the drains open.

What this doesn’t remove unfortunately is water from the very smallest lines; bypass lines and lines to gauges.

If a truck has a pump compartment heater, use it!

Winter Driving

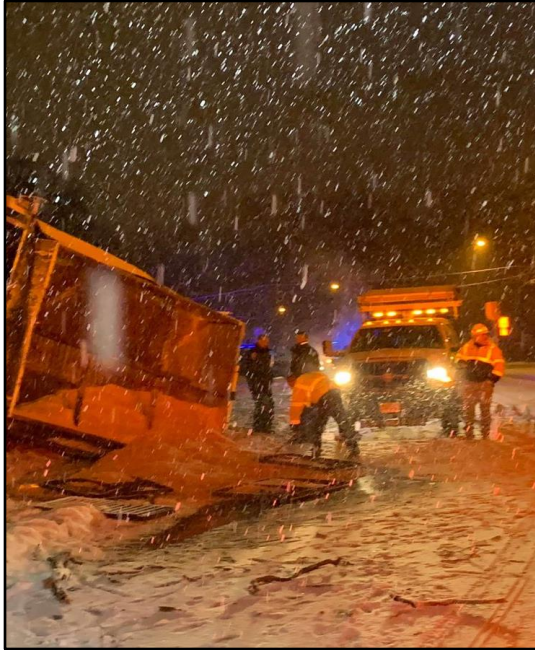
- Chains
- Drain pumps, manifold
- Turn OFF retarders and auxiliary braking devices
- Know your 4WD and auxiliary traction systems!



Generally, we chain only the rear axle, for some trucks like 4133 we have front and rear chains. This makes this truck a good option for climbing Nugget hill in snow.

A rule of thumb is it takes longer to put chains on than to take them off, so putting them on ahead of a storm makes good sense. With the low snow accumulations and only patchy ice we've seen this year we really haven't had a need for chains in anywhere in the district. One thing to consider is where we might be responding to as well; it may be the main road is dry but a long subdivision road or driveway may require chains.

Drivers, make sure retarders and engine brakes are off. These can grab at inopportune times when driving on ice and cause you to lose traction.



Limited Visibility

- Use appropriate emergency lighting and scene lighting
- High visibility gear and personal lights
- Other motorists have less time to see you and less stopping distance due to road conditions!

Things to think about when going to highway scenes. If we're responding in inclement weather, especially to a vehicle off the road, we have to consider that we may become the next vehicle off the road. We can downgrade our response based on road conditions. We also have to be aware that once on scene, the next motorist may have the same issue and possibly hit us, so traffic management and control, again, always a year round problem, has even less margin for error in inclement weather. Extend safety control zones and call for additional sand and plows early!

Personal Vehicles



are you ready?

It's important we talk about having our own vehicles ready to respond as well. As a primarily volunteer agency our residents are depending on our timely response from volunteers and that means having your vehicle ready to go. Many of the structure fires I've been on with this agency have been late night during snow storms and zero temperatures. So having your vehicle and gear ready to respond in the worst conditions is important. Make sure you've got a full tank of gas, sunglasses, cigarettes... extra clothes, tires are in good shape, heater works, your flashlights, helmet lights and gear lights on your turnouts the batteries aren't dead.

Scene Operations

- Ice forms fast, prevents runoff, adds weight to buildings
- Ladder rungs may become slippery, halyards freeze
- Hand tighten couplings, small drips will prevent freezing but also put ice on ground
- Recirc pumps once flooded



Operating on a winter structure fire can be extremely challenging. Think early on if trucks are going to need chains to get access, bringing sand trucks from the county especially in places where tenders are operating. Remember as we fill and then deliver water we often trail water on road surfaces which then freeze.

Water delivered into the building may not run off as it normally would if it freezes, which causes two hazardous conditions; slip hazards, plus, additional weight adding to collapse hazards. Working on ladders becomes a lot more treacherous, rungs may get water on them that then freezes and halyards and dogs may freeze into place, making them inoperable.

When plumbing lines unless we are drafting we should always be hand tightening. In winter especially it's ok to have a little leakage at a coupling, that flow will prevent freezing. However, that flow will also create surface ice where we are walking.

Engineers, the name of the game is if it's below freezing, once you flood your pump, commit to running your pump and recirculating the entire time.



Scene Operations

- Gasoline engines difficult to start and keep running
- Gas detectors may not work
- Shutting off utilities could shut off home heating
- SCBA regulator freeze up
- Parking on ice doesn't always work the way you think it might

A lot of the tools we depend on can fail in cold weather. Cold weather can eat up batteries on TICs and gas detectors, and can make gasoline engines on ventilation fans, pumps and saws difficult to start and keep running.

Another big hazard are SCBA regulators. When compressed gas depressurizes as in our SCBA system it loses heat (adiabatic cooling) and moisture from our breath can create ice. One tip is once you connect your second stage regulator to your facepiece, keep it connected. That ice might make it impossible to reconnect.

I put in the point about shutting off utilities, it's just something to be aware of. It's going to be situational. If we need to control utilities because a home is on fire we will do so. But in inclement weather to do so preemptively may have consequences. Another situation this might occur in is wildland fires in the winter. We do get those, and if a structure is imminently threatened then shutting off propane is the lesser of two evils. But if there is time, we may want to consider our actions.

A few things on parking. Always chock your vehicle, and be aware that the heat from the running apparatus can melt or partially melt snow beneath it, causing it to pool and potentially refreeze. Be aware of the ground you are parked on.

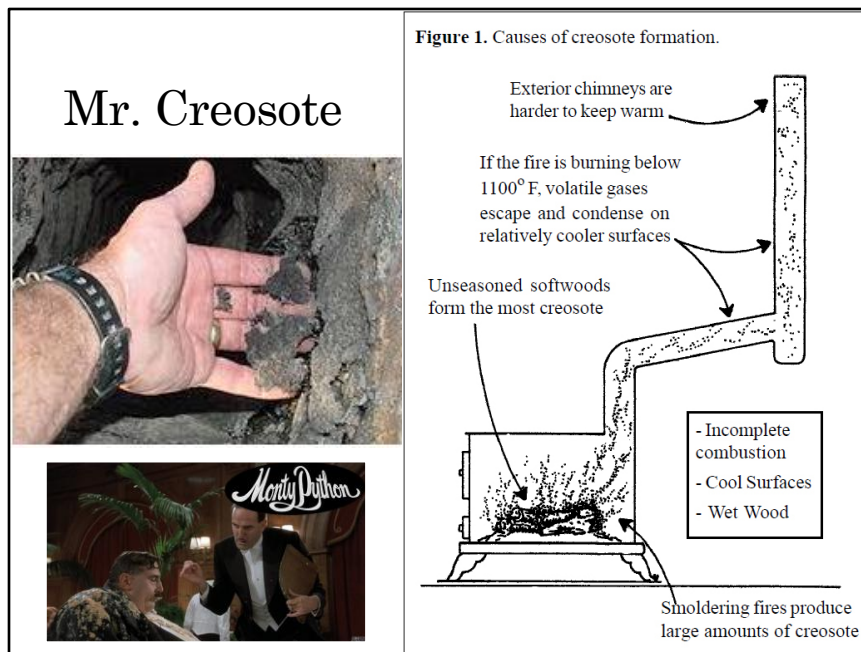
PART II: Chimney Fires



Let's take a break and then come back and talk Chimney fires.

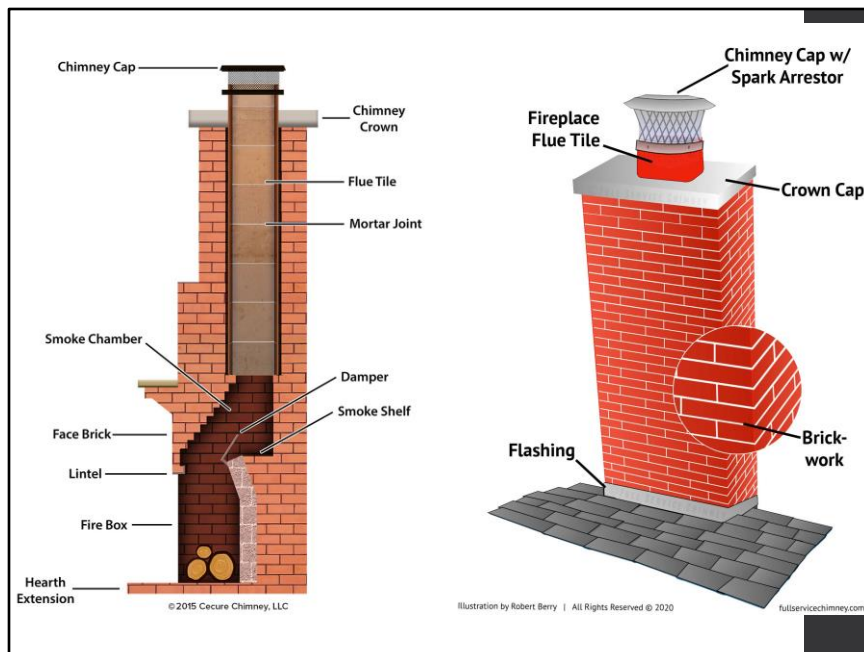
Before we get into Chimney fires, let's quickly discuss a few of the other structure fires we might commonly see in the winter months. Related to chimney fires we also see fires from disposing hot ashes in the yard. These can become an outside-in structure fire, which can grow substantially before the occupant notices it and potentially cut off their exit, these can also grow into wildland fires. Other fires we might see are from using electric space heaters, which can ignite material inside a house, or, overheat the wiring feeding the plug and create a hidden fire. Just a couple other scenarios to keep in mind and how you might deal with those.



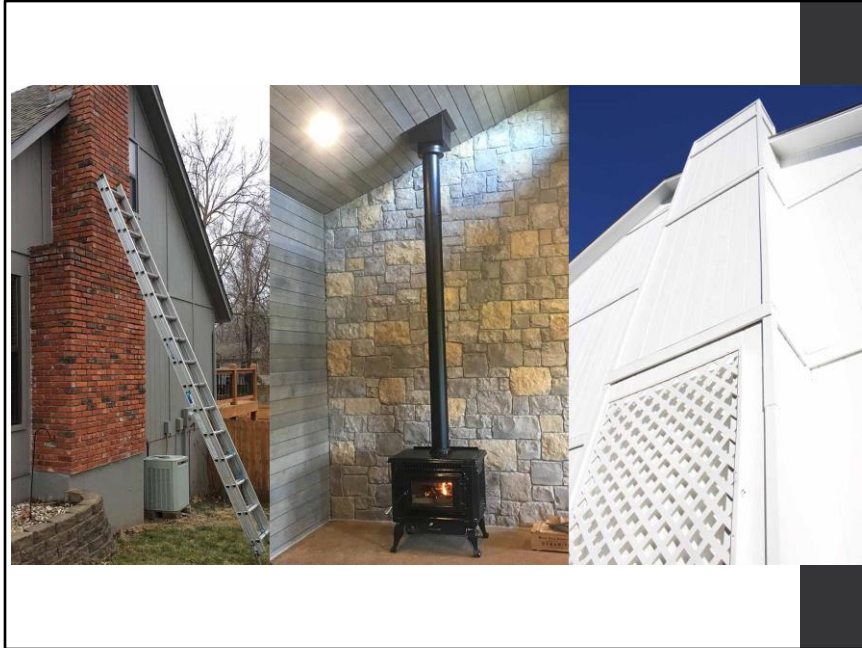


So like the video said, creosote is the fuel that starts a chimney fire, and it is unburned fuel that collects in the fireplace or stovepipe. There are actually degrees of creosote; what he was showing in the video was mostly 2nd degree creosote, chunks, kind of like coal. 1st degree creosote is the fine ash in the picture above, 1st degree is the beginning of the problem. 3rd degree is a tar or glaze that coats the chimney and is the worst.

Creosote forms from incomplete combustion, or cold, smoldering fires. An exterior chimney like an old masonry chimney without a liner can get cold near the top. Modern airtight homes and wood burning appliances can have a different problem where they don't pull enough air to support really hot combustion, also leading to creosote buildup. Burning wet wood can also create creosote, and the type of wood makes a difference, with pines having more sap than hardwoods. It becomes a compounding problem because the smaller the diameter your chimney or stove pipe gets, that also suffocates the fire and causes it to burn incompletely.



Basic anatomy of a fireplace and chimney; we've got the firebox which is the appliance in the house that we have the fire burning in, a damper to control the ventilation and intensity of combustion, the smoke chamber which transitions from the firebox to the flue and then the flue, which is simply the hole in the chimney the hot gases escape from. Old fireplaces were a simple unlined masonry flue, the problem with these is they get cold fast towards the top, contributing to creosote, and when they fail hot gases escape and catch the house on fire. Now commonly they are lined with either ceramic, which is cheaper, but can crack and the mortar joints can dry out and fail over time, or stainless steel, which is more expensive, but more durable.



There are many types of chimneys we can expect to see; the left is a masonry chimney, and it could be unlined, lined and it could have more than one flue. The freestanding wood burning stove in the middle will likely just be a metal chimney pipe at the roof while the photo on the right shows a wood framed chase; these have siding to match the house to conceal the vent pipes and there can be more than one flue in there, possibly one for solid fuel heating and another for a furnace or a gas appliance. There are type A vent pipes which are for heating and type B, which are for gas appliances. Multiple appliances of the same type can feed one vent; in old buildings you might have multiple wood burners feeding one heating vent, or you can see multiple gas appliances feeding one class B vent, but you can never mix the two (or you shouldn't!)

Signs of a Chimney Fire

- Thunderous, noisy or low rumbles
- Turbulent smoke
- Very high temperatures
- Pops or cracks in flue
- Cold fire, cold fire then really hot fire
- Smoke where it shouldn't be



Some contributing factors might include, lack of cleaning, first cold spell of the year, using wet, unseasoned wood and pre-existing chimney or roof damage.

Smoke and hot gases escaping from cracks in mortar joints might result in a smoky haze, extension may occur outside first and not be noticed inside. When creosote gets going in the flue people have reported hearing an almost jet engine sound or a really noisy burn in the flue. The terra cotta liners can also crack and pop as can the masonry.

“JUST” a Chimney Fire

- DO NOT underestimate – full structure response until proven otherwise
- ***LIP: Life Safety, Incident Stabilization, Property Conservation***
- Evacuate occupants, perform 360 with a TIC, broadcast findings, pull/charge handlines and set ladders as needed



Consider IC, Safety Officer, Fire Attack, Roof / Chimney crew, Ventilation Crew, Exposure Crew, RIT and Rehab.

Just because we're pulling a handline doesn't mean we'll use it, depending on conditions, we'll get to fire attack in a minute, but be prepared.



Interior Chimney Fire Attack

- Close flue to limit air
- Steam with water soaked towel or ice cubes
- Remove firebox contents and extinguish outside
- Aim dry chem extinguisher up flue and discharge in short 1-2 second bursts
- Use extinguisher & PPV
- Use Chimfex or other commercial product



Exterior Chimney Fire Attack

- “Chimney Bombs” – small Ziploc bags with dry chem
- Hoseline with wide angle fog or snuffer nozzle – minimize water use to minimize damage to chimney and house!
- *Communicate – inside and out – so everyone knows what’s going up and what’s coming down!*

Salvage & Overhaul

- **It's always about customer service!**
 - BEFORE fire attack: consider tarps/runners inside
 - DURING fire attack: minimize additional damage
 - AFTER fire attack: cleanup as much as possible
- Request MAFIT sooner rather than later (on virtually any higher dollar fire), and protect evidence of any suspicious circumstance
- Use TIC to thoroughly check for extension – attic and all upper floors, and anywhere below where burning debris may have fallen – and use a mirror to look up/down flue
- Advise homeowner a professional fireplace inspection is required before re-use

