Government of
Northwest Territories

Northwest Territories Defensive Firefighter Training

SESSION 6

FIRE HOSE

Government of the Northwest Territories
Municipal and Community Affairs

First Edition (2025)

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SESSION 6 - FIRE HOSE

INTRODUCTION

NWT Defensive Firefighter Training (NWT-DFT) is a competency-based learning curriculum for community fire departments. This workbook provides volunteer firefighters with the knowledge required to achieve 34 skills. When successfully assessed, students and volunteer NWT firefighters will have met the basic requirements to respond to exterior fire scenes. Skills in the NWT-DFT program are to be assessed at National Fire Protection Association (NFPA) standards.

This session has been adapted for NWT communities without fire hydrant systems. For information on water supply for communities that do have fire hydrants please see *Session 7-Water Supply (Appendix 1 – Fire Hydrants).*

LEARNING OUTCOMES

1. Explain the purpose of supply and attack lines
2. Explain common techniques for hose rolls, hose loads and hose lays
3. Explain common techniques to advance an attack line
4. Explain how to extend an attack line
5. List the common types of couplings
6. List the common hose appliances
7. List two types of hose nozzles
8. Explain fire hose care and maintenance
9. Skill Drill 6-1: Perform a one-firefighter foot-tilt method of coupling a fire hose
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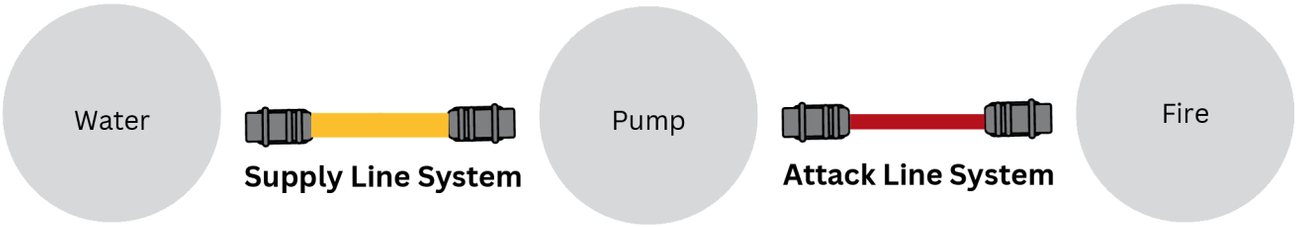
Digital versions of all books in the NWT Defensive Firefighter Training program are available for download and/or printing here:
https://communitylearning.learnworlds.com/defensive-fire

FIRE HOSE OVERVIEW

Firefighters use fire hose for two main purposes - as supply hose and attack hose. These hoses work together. The supply hose brings water from a water source to a pump. The pump makes sure there is enough water and pressure. Then the attack hose carries the water to the fire.



Supply Hose

Supply hoses bring water to the fire truck or another pump. They are bigger and wider because they need to move a lot of water. They are usually between 65 mm and 150 mm wide (2.5 to 6 inches). Supply hoses do not have as much pressure as attack hoses.

Attack Hose

Attack hoses are used to spray water directly on a fire. The pump adds pressure to help the water reach the flames. Attack hoses are smaller, lighter, and easier to move. They are usually 38 mm or 45 mm wide (1.5 to 2 inches), but can be up to 65 mm (2.5 inches) for bigger fires.

Both attack and supply fire hoses usually share the same basic features, but there are many different types and setups. It's important to know the hoses and equipment your fire department uses.

- **Inner Liner:** made of rubber or similar material to keep water from leaking out and limit friction inside the hose.
- **Outer Jacket:** made from strong fabric like polyester or nylon to prevent damage from use.
- **Reinforcement:** extra layers or other materials to handle higher water pressures.
- **Durability:** The hose needs to be tough enough to handle high pressure and rough use.
- **Flexibility:** The hose bendable and light so firefighters can move them around.

SUCTION HOSE

A suction hose is a rigid or semi-rigid hose used to draw water from a static source, like a pond or tank, into a fire pump. Suction hoses will be discussed more in Session 7: Water Supply.

FIRE HOSE ROLLS AND LOADS

Hose Rolls

Fire hose rolls help to store and move hoses safely and easily. These rolls are used to properly store fire hose and make sure it is ready for use.

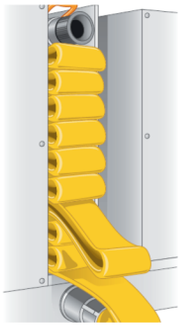
- The **straight roll** is the simplest way to roll a hose. It is rolled from one end to the other and is usually used for storage or transport when the hose is dry.
- The **single doughnut roll** is good for fast use at a fire. Both ends are on the outside, so it's quicker to connect and unroll.

Straight or Storage Roll	• **Male coupling at center of roll** • **Female coupling on outside of roll**	
Single Doughnut Roll	• **Both couplings on outside of roll** • **Can be connected and extended by one fire fighter**	

Hose Loads

Hose loads are ways to fold and store fire hose on a fire truck so it can be deployed, or put into use quickly during a fire.

- **Flat Hose Load:** The hose is laid flat in layers, one on top of the other. It's simple and easy to load.
- **Preconnected Flat Hose Load:** This is the same as the flat hose load, but the female end is already connected to the truck. This makes it faster to use as an attack line.

Flat Load	
Pre-connected Flat Load	

OTHER ROLLS AND LOADS

Fire departments may use different hose rolls and loads depending on their equipment, staffing, and needs. Here are some you might hear about:

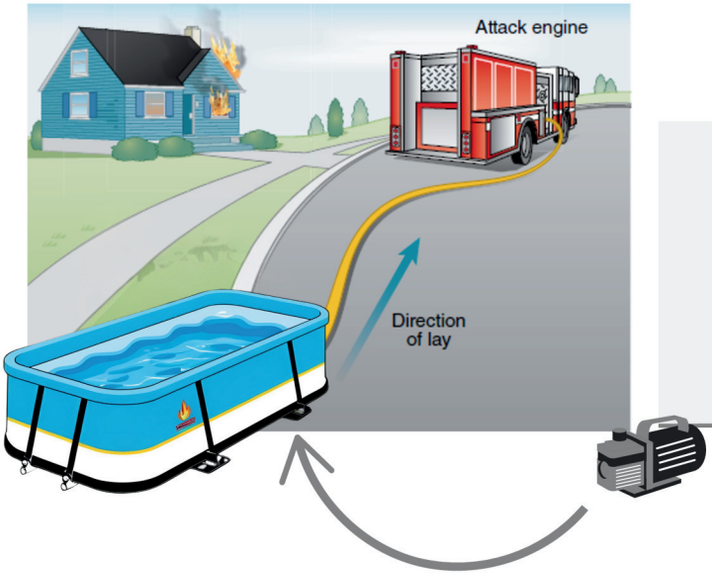
- Minuteman load
- Triple-Layer load
- Accordion load
- Horseshoe load
- S-Load
- Twin doughnut roll
- Self-locking twin doughnut roll
- Coil roll
- Skid load roll

FIRE HOSE LAYS

A hose lay is how firefighters deploy fire hose from the fire truck for use as supply or attack hose and position where it's needed. It helps bring water to the fire or from a water source (like a portable tank, if there are no fire hydrants).

Forward hose lay

- Attack engine arrives at a **water source first.**
- Attack engine drives to fire scene while hose is laid along the way.

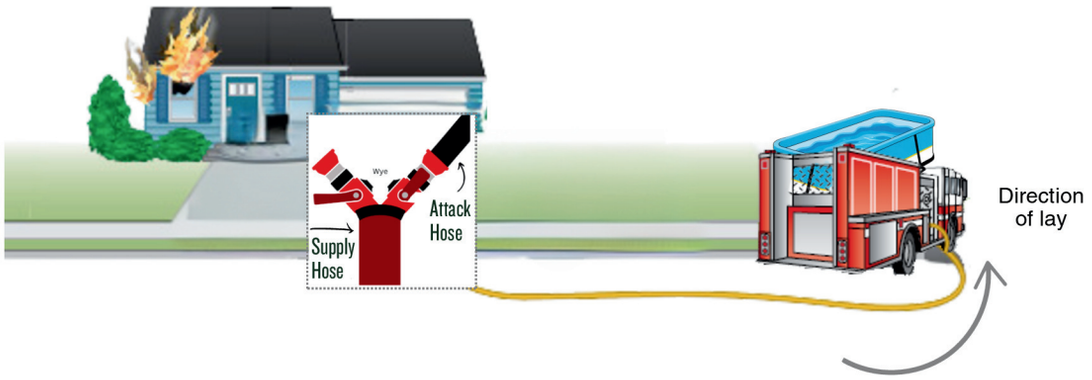


Portable tanks don't supply pressure to get the water from the tank to the engine — so this lay often doesn't apply in small NWT communities with only one pumper or attack engine. It may be useful if an additional pump is set up at the water source.

Reverse hose lay

One-truck scenario:

- Truck **starts at the fire**, lays supply hose on its way to water source.
- Truck drafts directly from the water source and pumps water into supply line.
- An appliance (gated wye) at the fire scene connects the larger supply line to smaller diameter attack lines.



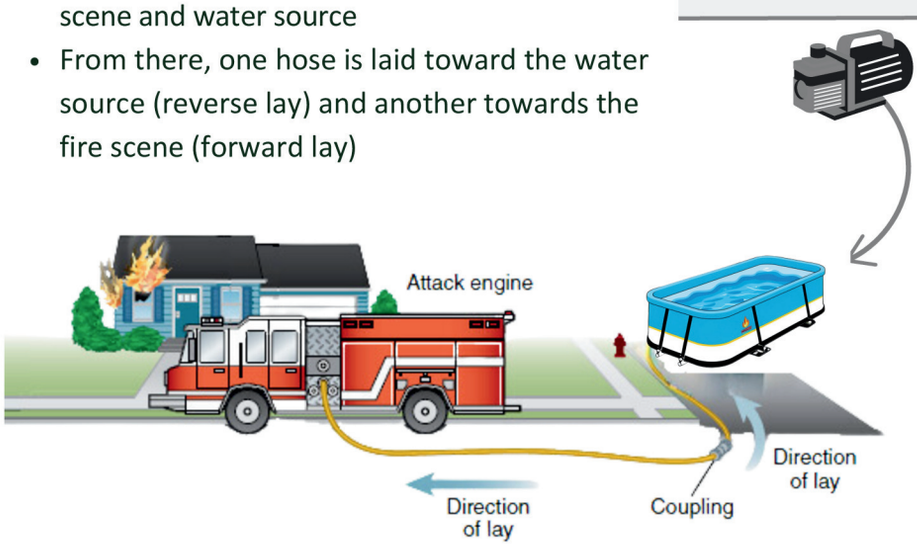
FIRE HOSE LAYS

Split hose lay

Often useful in complex situations where different areas need to be serviced at the same time, or where there are longer distances from the water source to the fire.

- Attack engine stops at point between fire scene and water source
- From there, one hose is laid toward the water source (reverse lay) and another towards the fire scene (forward lay)

Portable tanks don't supply pressure to get the water from the tank to the engine — so this lay often doesn't apply in small NWT communities with only one pumper or attack engine. It may be useful if an additional pump is set up at the water source.

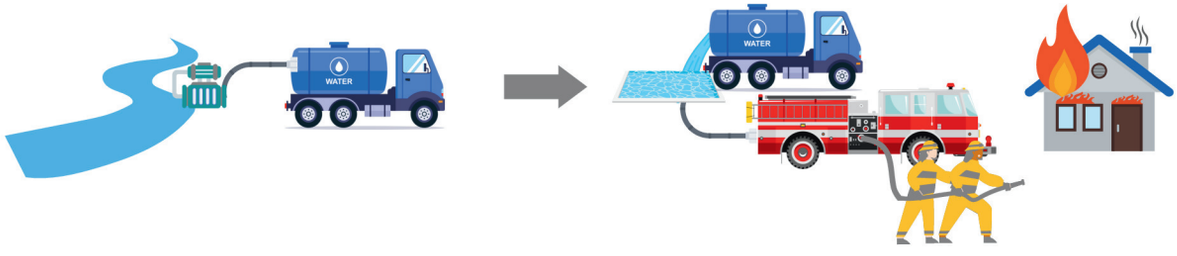


PUMPER TRUCK (ATTACK ENGINE)

The word "apparatus" means any vehicle or equipment used by firefighters. This includes fire trucks, ladder trucks, rescue vehicles, and more. A pumper or attack engine is a fire truck with hoses, a water tank, and a strong pump. It can get water from its tank or from an outside source like a portable tank.

WATER SHUTTLE

Supply hose lays need enough water flow and pressure to keep the attack lines working. In many northern communities with only one fire truck, water shuttling, using local water trucks, is often used to bring water to the scene. This setup helps make supply hose lays work even without fire hydrants. More about water shuttling in Session 7.



ADVANCING ATTACK HOSE

When firefighters get ready to fight a fire, they need to bring the attack hose from the truck to the fire. This is called advancing the attack line. It means safely and effectively pulling the hose off the truck and moving it toward the fire. This job needs teamwork, clear communication, and safe movement. The goal is to get water on the fire quickly and safely from a defensive position.

Firefighters carry the hose from the truck and walk to their assigned location outside the fire area (*see working hose drag and shoulder carry below*). Always lay out extra hose before adding water, because the hose gets much heavier and difficult to move once it's full. The extra hose makes it easier to move positions and reach farther. The hose should be flaked out in a loose S-shape (serpentine pattern) so it doesn't get tangled when filled. Once everything is ready, the hose is charged—this means filling it with water.

TERMS

- Evolution: A planned group of steps firefighters follow to get something done during a fire.
- Lay: The way the hose is set out on the ground from where the water comes from to where it's used.
- Advancing: Moving the hose closer to the fire scene so water can be sprayed where it's needed from a defensive position.
- Charged: Hose is filled with water.

Working hose drag

The working hose drag technique is used to pull hose from the truck's hose bed and move it over a short distance to the needed location.

Shoulder carry

The shoulder carry is used to transport full lengths of hose over longer distances where dragging isn't practical. It requires more than one firefighter to carry the hose.

Extending Hose

To extend hose, stop the water at the nozzle or pump. Connect another hose to the end. Once it's tight, turn the water back on and check for leaks. *See example below using a wye appliance.*

FIRE HOSE TOOLS AND ATTACHMENTS

Fire hose tools and attachments include:

- Couplings that connect the hoses together.
- Valves and splitters that help control how the water flows.
- Nozzles at the end of the hose aim the water where it's needed.

Hose Couplings

Fire hose couplings are the metal parts at the ends of the hose that let you connect it to other hoses, nozzles, the pump engine or other appliances or adaptors. There are two main types of hose couplings used in the fire service: threaded and non-threaded.


Storz-type coupling


Spanner wrenches


Higbee indicator


Rubber swivel gaskets


Lugs

Storz-Type (non-threaded) Hose Couplings

Storz-type hose couplings are easy to use because they don't have a male or female end. To connect them, line them up and turn a quarter-turn to the right until they lock. You usually need a spanner wrench for tightening and loosening Storz-type hose couplings.

Threaded Couplings

Threaded couplings have screw-like ends and are often used on smaller hoses. There are different thread types, so it's important that all equipment matches and works together. When connecting threaded couplings, you have to properly line them up with each other or they may cross thread or become damaged.

- **Higbee indicator**: A notch or mark on the lug of the threaded coupling that indicates where the thread starts. Align the Higbee indicators on both male and female couplings to avoid cross-threading.
- **Rubber Swivel Gasket:** Ensure the rubber swivel gasket is in place inside the female coupling. This gasket is crucial for creating a watertight seal.
- **Lugs**: The lugs on the couplings provide a better grip for tightening.
- **Spanner Wrench**: Used to securely tighten the couplings by aligning on the lugs.

FIRE HOSE TOOLS AND ATTACHMENTS

Hose Appliances

Hose appliances are any devices used with fire hose to deliver water. There are a variety of different hose appliances for different purposes. Some protect hoses (rollers and jackets), aid in connecting different sizes of hoses (reducers) or maximize hose capacity and control water flow (wyes, clamps). It is important for a defensive firefighter to know the purpose and safe use of the different hose appliances that your fire department carries. *See Appendix 1 – Fire Hose Appliance List*




FIRE DEPARTMENT CONNECTION

Some buildings in your community may have a Fire Department Connection (FDC). It's important to know which buildings have them and where they are. FDCs are outside hookups that let firefighters pump water into the building's sprinkler or standpipe system. The sprinkler system helps control the fire inside so people can get out safely. A standpipe system allows firefighters to connect fire hose to a pipe system inside the building to better position and properly attack a fire.

Nozzles

Nozzles control the direction and flow of water at the end of a fire hose.

Smooth-bore nozzle	Fixed opening size, producing a solid stream of water. Effective for reaching long distances and penetrating fuels for more effective extinguishing of fire.	
Fog steam nozzle	Produces a fog pattern by adjusting the nozzle to break the water stream into tiny droplets, creating mist for better heat absorption.	

HOSE CARE AND MAINTENANCE

Fire hose is made to handle tough use, but it still needs proper care to stay in good shape. Regular care and maintenance help prevent damage and makes sure the hose works when needed. Taking care of the hose helps:

- Keep your crew safe
- Avoid hose failure during a real fire
- Save money by making hose last longer

Inspect regularly	• Check hoses often • Look for cuts, holes, leaks, or worn-out couplings • Check after every use and at least once a year	
Test under pressure	• Test hoses with water under pressure once a year • Use your truck's pump if that's all you have • Watch for bulges or leaks while it's under pressure	
Clean and dry properly	• Clean and dry after every fire or practice • Rinse with clean water if it got dirty or used with foam • Let hose dry fully before rolling or storing	
Store correctly	• Store hose off the floor • Use wall hooks, racks, or shelves if possible • Don't leave hose sitting wet or in direct sunlight	
Remove damaged hose	• Fix or tag damaged hose • Take damaged hose out of service to be repaired or replaced • Mark it clearly so it's not used by mistake	
Keep records	• Write down the hose number, test date, and condition • This helps track how long hoses last and when to replace them	

SKILL DRILLS

SKILL DRILLS

Practice the following skills. Each step will be assessed in the NWT Defensive Firefighter Training program

SKILL DRILL 6-1: Perform one-firefighter foot-tilt method of coupling a fire hose

1	Place one foot on the hose behind the male coupling. Push down with your foot to tilt the male coupling upward.
2	Place one hand behind the female coupling and grasp the hose.
3	Place the other hand on the swivel of the female coupling. Bring the two couplings together and align the Higbee indicators.
4	Turn the female coupling counterclockwise until it clicks, which indicates that the threads are aligned.
5	Rotate the swivel in a clockwise direction to connect the hose.



SKILL DRILL 6-2: Uncouple hose with spanner wrenches

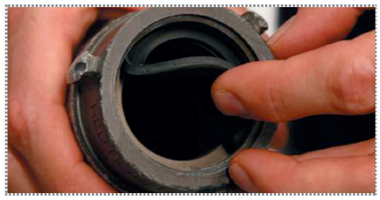
1	With the connection on the ground, straddle the connection above the female coupling.
2	Place one spanner wrench on swivel of female coupling, with handle of the wrench to the left.
3	Place the second spanner wrench on male coupling, with handle of the wrench to the right.
4	Push both spanner wrench handles down towards the ground, loosening the connection.


SKILL DRILLS

Practice the following skills. Each step will be assessed in the NWT Defensive Firefighter Training program

SKILL DRILL 6-3: Practice replacing swivel gasket on a fire hose

1	Fold the new swivel gasket in half by bringing the thumb and the forefinger together to create two loops.
2	Place either of the two loops inside the hose coupling and position it against the gasket seat.
3	Using the thumb, push the remaining unseated portions of the swivel gasket into the hose coupling until the entire swivel gasket is properly positioned against the gasket seat inside the coupling.



SKILL DRILL 6-4: Perform a straight/storage hose roll

1	Lay the hose flat and in a straight line.
2	Fold the male coupling over on top of the hose.
3	Roll the hose to the female coupling.
4	Set the hose roll on its side and tap any protruding hose flat with a foot. With this arrangement, the male coupling is at the centre of the roll, and the female coupling is on the outside of the roll.

SKILL DRILLS

Practice the following skills. Each step will be assessed in the NWT Defensive Firefighter Training program

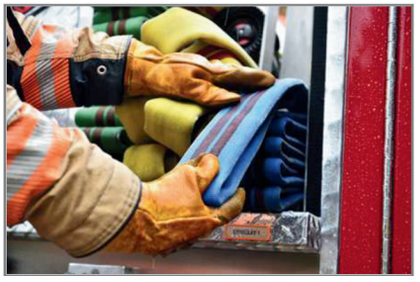
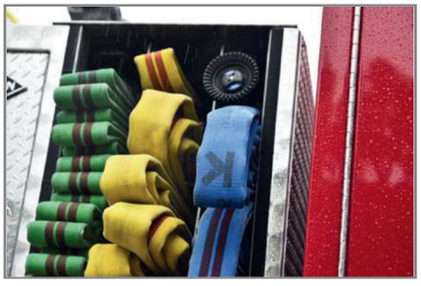
SKILL DRILL 6-5: Perform a single doughnut hose roll

1	Lay the hose flat and in a straight line.
2	Locate the midpoint of the hose.
3	From the midpoint, move 5 ft (1.5 m) towards the male coupling end. From this point, start rolling the hose towards the female coupling.
4	At the end of the roll, wrap the excess hose of the female end over the male coupling to protect the threads on the male coupling. With this arrangement, and for easy access, both couplings are on the outside of the roll.




SKILL DRILL 6-6: Perform a pre-connected flat hose load

1	Attach the female end of the hose to the pre-connect discharge outlet.
2	Begin flat loading the hose in the hose bed.
3	Load the first layer of hose and make the first fold even with the edge of the hose bed.
4	Make a loop, or ear, on the second or higher fold. The loop will be used as a pulling handle.
5	Flat load the remainder of the hose in the hose bed.
6	Attach the nozzle to the male coupling at the end of the hose.

SKILL DRILLS

Practice the following skills. Each step will be assessed in the NWT Defensive Firefighter Training program

SKILL DRILL 6-7: Advance a pre-connected flat hose load

1	Grasp the top section of hose and place it over your shoulder.
2	Turn away from the apparatus until the top load drops onto your shoulder.
3	Turn back around towards the hose bed, and grasp the lower loop, or ear.
4	Pull the remainder of the hose from the hose bed.
5	Turn away from apparatus, continue walking, letting the hose lay out off of your shoulder.

NOTE:
If there is a nozzle attached to the flat hose load, always ensure you maintain control of the nozzle when advancing/deploying a flat hose load. This helps protect the nozzle from damage and protects the firefighter from being struck with a nozzle.

SKILL DRILL 6-8: Practice cleaning/maintaining fire hose

1	Lay the hose out flat. Rinse the hose with water.
2	Gently scrub the hose with mild detergent and a soft bristled brush, paying attention to soiled areas.
3	Turn over the hose and repeat steps 1 and 2.
4	Give a final rinse to the hose with water. Make sure the hose is dry before storing it.

LEARNING DEBRIEF

REMEMBER

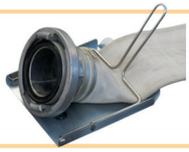
- Developing proper work habits during training in this course helps ensure safety later
- Do not attempt anything you feel is beyond your ability or knowledge
- Tell someone if you see something that you feel is an unsafe practice
- Continue to learn teamwork and practice working as a team
- A firefighter injured during training should not return until medically cleared for duty

Reflect on the following questions. Jot down notes or sketches in the spaces provided.

How does the fire hose play a key role in getting water to the fire quickly and safely during an emergency?	
What are some of the tools and appliances hoses use?	
How does maintaining the fire hose ensure the success of the firefighting operation and the safety of the crew?	

APPENDICES

APPENDIX 1: Fire Hose Appliance List

Wye	A fitting designed to split a single fire hose into two or more hoses, typically a larger 65mm hose into multiple smaller attack lines (38mm or 44mm), allowing firefighters to increase water distribution during firefighting operations.	
Water Thief	Similar to a wye but has valves on each discharge line. Allows for control of which hose is operating based on operations and multiple hoses to be connected to a single water source.	
Siamese Connection	Specific type of fire department connection (FDC) that features two or more inlets, typically arranged at an angle.	
Adapters	Connects different fire hose couplings (sizes, threads, or mating surfaces) or with other appliances.	
Hose Jacket	Splits metal cylinder temporarily placed over leaking section of hose to temporarily stop the leak when changing out a hose line isn't feasible.	
Hose Roller	Prevents damage to hose as hose is being hoisted or moved over a sharp edge (ie: roof line or windowsill).	
Hose Bridge	Designed to cover and protect hose, cables, and/or wires from damage when they need to be laid across roads or other areas with vehicle or foot traffic.	
Hose Clamp	used to temporarily stop the flow of water in a hose line so the hose can be fully connected, deal with a hose rupture or connecting different appliances in the system.	
Valves	A device that can be opened and closed to control the flow of water through hoses and pipes to ensure efficient delivery and management of water.	
Master Stream Appliances	Used to produce high volume water streams for large fires, often in defensive operations.	

GLOSSARY OF TERMS

Communications

- **ABC Button:** Customizable preset button on radios
- **Channel Selector:** Dial or button to change radio channels
- **Communication Feedback Loop:** Confirming messages by repeating them back
- **Decoding:** Interpreting the received message
- **Emergency Button:** Sends alert for immediate help
- **Emergency Line:** Dedicated line for urgent calls
- **Emergency Traffic:** High-priority message overrides others
- **Encoding:** Turning thoughts into a message
- **Feedback:** Receiver's response to a message
- **Message:** Information being communicated
- **Monitor/Scan Buttons:** Used to listen to multiple radio channels
- **Noise:** Anything that disrupts communication
- **Portable Radio:** Handheld radio for communication
- **Push-to-Talk (PTT) Button:** Press to talk on a radio
- **Receiver:** Person who gets the message
- **Sender:** Person who sends the message
- **Transmission:** Sending a message over radio

Equipment

- **Apparatus:** Firefighting vehicle
- **Deck Gun:** Fixed, high-volume water device on fire trucks
- **Dry Barrel Hydrant:** A hydrant that drains to prevent freezing
- **Handline:** Hose operated by hand
- **Hose Appliance:** Tools used with fire hoses to control flow
- **Hose Couplings:** Connect hoses to each other or a water source
- **Hose Lays:** How hoses are arranged from source to scene
- **Hose Loads:** Hose stacking methods for easy deployment
- **Nozzle:** Controls water stream from a hose
- **Pumper Truck/Attack Engine:** Vehicle with pump, hose, and water for fire attack
- **SCBA** (Self-Contained Breathing Apparatus): Air tank and mask for breathing in smoke-filled areas
- **Standpipe:** Built-in pipe system for supplying water inside buildings
- **Storz-Type Coupling:** Quick-connect hose ends without threads
- **Suction Hose:** Pulls water from static sources
- **Supply Hose:** Delivers water from source to pump
- **Threaded Couplings:** Screw-type hose connections
- **Turnout Gear:** Protective clothing worn during responses

Education and Training

- **Codes and Standards:** Laws and guidelines for fire safety
- **Exit Drills In The Home (EDITH):** Practice home fire escape plans
- **Home Safety Surveys:** Checking homes for fire safety issues
- **NFPA (National Fire Protection Association):** Sets fire safety standards

Fire Science

- **Backdraft:** Explosive ignition when oxygen re-enters a smoldering fire
- **Combustion:** Chemical process of burning
- **Conduction:** Heat transfer through contact
- **Convection:** Heat movement through air or gas
- **Decay Stage:** Fire slows as fuel runs out
- **Fire Tetrahedron:** Fire needs heat, fuel, oxygen, and a chemical reaction to burn
- **Fire Triangle:** Fire needs heat, fuel, and oxygen to start
- **Flashover:** Sudden full-room ignition
- **Fully-Developed Stage:** Maximum burning
- **Growth Stage:** Fire starts spreading and intensifying
- **Heat Transfer:** Movement of heat via conduction, convection, or radiation
- **Incipient Stage:** Fire just igniting
- **Light (Thermal) Energy:** Heat and light given off by fire
- **Mechanical Energy:** Energy from movement, sometimes causes sparks
- **Oxidation:** Reaction of fuel with oxygen
- **Pyrolysis:** Breakdown of material from heat before ignition
- **Radiation:** Heat traveling in waves
- **Smoke Colour:** Helps indicate type of material burning
- **Smoke Explosion:** Ignition of trapped fire gases

Incident Command Structure

- **Chain of Command:** Order of authority
- **Division:** Personnel and resources assigned to a geographic location
- **Emergency Management Organization (EMO):** Coordinates emergency responses
- **Group:** Personnel and resources assigned to a specific task
- **Incident Action Plan (IAP):** Plan for managing an incident
- **Incident Command System (ICS):** Structured approach to managing emergencies
- **Incident Commander (IC):** Person in charge of an incident
- **Operations Function:** Part of ICS that manages tactical operations
- **Span of Control:** Number of people a leader can manage (usually 3–7)
- **Single Resource:** One unit (e.g., one engine or person)
- **Unity of Command:** Each person reports to only one boss

Operations and Tactics

- **Advancing Hose:** Moving hose toward the fire
- **Attack Hose:** Used directly on the fire
- **Charged Hose:** Filled with water, ready to use
- **Defensive Operations:** Fighting fire from a distance
- **Establishing Command:** Identifying who's in charge
- **Evolution:** Planned firefighting tasks or maneuvers
- **Exposure:** Nearby object at risk of catching fire
- **Freelancing:** Acting without direction during an incident
- **Initiating Response:** Units are en route
- **Overhaul:** Checking for and putting out hidden fire
- **PAR (Personnel Accountability Report):** Roll call for safety
- **Rehabilitation:** Rest and recovery for firefighters
- **Salvage:** Protecting property during/after firefighting
- **Scene Size-Up:** Assessing what's happening at the scene
- **Size-Up:** First look and judgment of the fire scene
- **Staging Area:** Place where people/equipment wait near the scene

PPE and Safety

- **Accountability Tag:** Tracks firefighter location and status
- **Bunker Gear:** Full protective firefighting gear
- **Carcinogens:** Cancer-causing substances from fire/smoke
- **Critical Incident Stress Management (CISM):** Mental health support after tough calls
- **Freelancing:** Acting without direction during an incident
- **PPE (Defensive):** Gear for indirect fire attack
- **PPE (Structural):** Gear for entering burning buildings
- **Rehab Officer:** Person monitoring health in rehab area
- **Safety Culture:** Shared values and actions for safety
- **Unacceptable Risk:** Danger too high to allow action

Radio Language and Protocols

- **Arrival on Scene:** Unit has reached the incident
- **Cancelling Response:** Units not needed anymore
- **Clearing the Scene:** Leaving the scene, ready for next call
- **Incident Type:** Describes the emergency
- **Location Indicators:** Help identify where something is
- **Phonetic Alphabet:** A set of code words used to clearly communicate letters over radio
- **Priorities:** Life safety, property protection, incident control
- **Resource Request:** Ask for more units/equipment
- **Situation Report:** Update on the current status

Water Supply

- **Dry Hydrant:** Pipe for pulling water from lakes or ponds
- **Portable Pump:** Moveable water pump
- **Portable Tank:** Temporary water holding tank at the scene
- **Pumper Truck/Attack Engine:** Vehicle with pump, hose, and water for fire attack
- **Static Water Supply:** Water from non-pressurized sources like ponds
- **Water Fill Station:** Spot for refilling water trucks
- **Water Shuttling:** Moving water from water source to scene