

3.2.2.2 Water Supply



YOUR ORGANIZATION
STANDARD OPERATING PROCEDURES/GUIDELINES

TITLE: Water Supply

SECTION/TOPIC: Company Operations

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PREPARED BY:

APPROVED BY:

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Approver

These SOPs/SOGs are based on FEMA guidelines FA-197

1.0 POLICY REFERENCE

CFR

NFPA

NIMS

2.0 PURPOSE

This standard operating procedure/guideline addresses acquiring and maintaining water supply at fire operations.

This procedure provides guidance to Company and Command Officers in determining water supply needs and selecting the most effective hose line size.

3.0 SCOPE

This SOP/SOG pertains to all personnel in this organization.

4.0 DEFINITIONS

These definitions are pertinent to this SOP/SOG.

5.0 PROCEDURES/GUIDELINES & INFORMATION

5.1 Acquiring and maintaining water supply at fire operations:

OVERVIEW

Adequate water supply during fire attack operations has a critical impact on fire control outcomes. A good water supply and adequate GPM flows from attack lines result in good outcomes. Delayed or limited water supply and inadequate GPM flows leads to delayed fire control, increased risk to fire fighters and victims, and greater fire loss. The use of excessive amounts of water, leaking couplings or nozzles may increase loss inside the structure.

HYDRANT WATER SUPPLY

First due companies approaching the scene with any evidence of a working fire in a structure should lay their own supply line. There would be few exceptions to this guideline (i.e., obvious critical rescue requiring a full crew, unsure of actual fire location in multi-unit building complex, etc.).

PUMPED WATER

Pumped water supply (Humat Valve Operation) is necessary when large volumes of water are required on the fire ground. This normally occurs later in the attack operation when Engine Mounted Master Streams, ladder pipes, or multiple high GPM attack lines are in operation.

Generally, first alarm companies should lay their own supply lines to cover all critical tactical positions before pumped water is considered. A non-pumped 500 foot 4" supply line can flow 800 GPM. Most initial attack operations, including Engine Mounted Master Stream operations can be adequately supplied without pumped water.

In most cases, the need for pumped water occurs late in the first alarm assignment, or as the second alarm companies arrive. Command should address the need for pumped water as ladder pipes or multiple Engine Mounted Master Streams are ordered into operation and assign engine companies to pump lines.

When pumped water is initiated, Command should maintain control of key hydrants and order pumped water on a priority basis.

ENGINE MOUNTED MASTER STREAMS

Engine Mounted Master Streams offer very large GPM flows (500 to 1,000 GPM), quick operation, reach and penetration. A solid bore tip offers greater reach, penetration, with a more intact stream than a peripheral nozzle that is set on straight stream.

Engine Mounted Master Streams should be considered for structures that are well involved, beyond rapid reach of attack lines, for exposure protection, and situations that pose an unusual safety risk to fire fighters.

ATTACK HOSE LINE CHOICE

The objective of the attack hose line choice is to provide enough GPM flow to overcome the volume of fire being produced, or adequate flow to effectively cool and protect exposures. The 1-1/2 inch attack line can be used for most small fires (i.e., one or two rooms in a residential fire). The company officer however should order 1-3/4" or 2" attack lines for a larger volume of fire.

BASIC ATTACK HOSE LINE PLACEMENT

When operating in the offensive attack mode, attack hoselines of adequate volume should be advanced inside the fire building in order to put water on the fire and to control access to halls, stairways, or other vertical and horizontal channels through which people and fire may travel.

- The first stream should be placed between the fire and persons endangered by it.
- When no life is endangered, the first stream should be placed between the fire and the most severe exposure or unburned areas.
- A second hose line should protect a secondary means of egress (always bear in mind the presence of Fire personnel operating in opposing positions).
- Additional hoselines should cover other critical areas or when covered, back up in place hoselines.
- Whenever possible, crews should position hoselines in a manner and direction that supports rescue activities, begins confinement, protects exposures, and controls loss.

When a change from offensive to a defensive operation occurs, crews should pull handlines out of the fire building only if safe to do so. Do not delay exit from the building for the sake of salvaging a few feet of hose and a nozzle if conditions are deteriorating rapidly, unless the line is needed for crew protection during exit operations.

FIRE STREAM CHARACTERISTICS AND CONSIDERATIONS

Fire control forces must consider the characteristics of fire streams and choose the most effective nozzle and stream for the task:

- Solid Stream: Greater penetration, reach and striking power. Less steam conversion.
- Peripheral: Increased heat absorption/expansion. Shorter reach. Most effective in confined spaces and protecting exposures.

Choose the proper sized attack hose line:

- 1-1/2" Lines: Fast, mobile, low volume, 125 GPM.
- 1-3/4" Lines: Fast, mobile, greater volume, 175 GPM.
- 2" Lines: Reasonable speed, mobility and variable volume. Depending on pump pressure and an automatic nozzle, up to 350 GPM.
- 2-1/2" Lines: Slow/difficult to move. Volume at 250 GPM.
- Elevated Master Stream: Mostly stationary, slow to set up - maximum water, 500 to 1000 GPM.
- Engine mounted master streams: Fast, large volume, great reach and penetration, 500 to 1000 GPM.

Offensive attack activities must be highly mobile--as mobility is slowed, attack activities begin to become more defensive in nature and effect. Many times effective offensive operations are often referred to as "aggressive."

FIRE STREAM CONSIDERATIONS

An offensive attack mode should achieve an effect on the fire quickly--consequently, backup judgments should also be developed quickly. If you apply water to an offensive attack position and the fire does not go out--React! Back it up or Re-deploy. Think ahead! Predict where the fire is going to go and put crews in position ahead of the fire.

Beware of hoselines that have been operated in the same place for long periods. Fire conditions change during the course of fire operations (most things will only burn for a limited time) and the effect of hose line operation must be continually evaluated. If the operation of such lines becomes ineffective, move, adjust, or redeploy them.

Beware of the limitations of operating nozzles through holes. The mobility of such streams is necessarily limited and it is generally difficult to evaluate their effectiveness. Sometimes you must breach walls, floors, etc. to operate--realize the limitations of such situation.

When utilizing crews with handlines to enter basement fires, crews should not open nozzles until they can see and/or are near the fire--crews should not use fog streams when operating in basement fires. Steam production will be extensive. Straight streams should be used.

If you commit attack crews to inside operations, command must closely coordinate exterior streams--particularly ladder pipes and engine mounted master streams. Extreme caution should be taken with interior and exterior attacks in the same building. It may be necessary to coordinate pulling crews out of the building while an exterior heavy streams knockdown is made. Know when to shut down nozzles--many times continuing operations of large streams prevents entry and complete extinguishment. Do not operate fire streams into smoke--fire location must be determined before water can be effectively applied.

Have attack lines ready during forcible entry operations. Attack crews should be fully protected and supervised before forcible entry is initiated.

Company officers and Sector Officers must assume responsibility for the effectiveness of their fire streams. These officers must maintain an awareness of where fire streams are going, their effectiveness and then report the general operational characteristics back to the Sector Officer or Command. Company officers must be aware that nozzle diameter adjustment or nozzle tip reduction may be necessary in order to produce an effective stream.

Ladder pipes are particularly useful and effective when operated on large open-type fires. A good

general rule is that you have written off the building (or portion) when you initiate ladder pipe operations and you are essentially in a defensive mode. Ground crews should be advised before ladder pipes go into operation.

When positioning ladder pipes to protect adjacent exposures (common walls) during defensive operations, the ladders turntable should be lined up with the wall to be protected, to permit the most effective operation.

Do not apply water to the outside of a roof and think you are extinguishing the fire. Such water application may offer effective exposure protection; but, if part of the roof is intact, it will shed water just like it was built to do and will prevent water from reaching the seat of the fire. This is particularly true of ladder pipe operations.

Do not operate fire streams down ventilation holes during offensive operations. This reduces the effect of ventilation and may seriously endanger interior attack crews.

Once offensive operations change to a defensive mode, Command must prioritize hand line operations. Most often, handlines will need to be shut down to provide adequate water supply for master streams.