Policy and Procedure

Incident Response Policy Appendix F Water Supply Operations

Issued by: Fire Chief Scott E. Goldstein
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SECTION 1. Purpose:

The purpose of the MCFRS Water Supply Appendix is to provide a framework for the initial development of water supplies at reported structure fires.

SECTION 2. Applicability:

All MCFRS personnel while participating in MCFRS activities and personnel from other organizations while operating in Montgomery County.

SECTION 3. Background:

The MCFRS water supply model has been validated by local testing with the equipment, water supply resources, and travel times specific to our organization.

POSITION STATEMENT

The MCFRS approach to water supply for structural firefighting operations is based on the idea that the rapid establishment of a reliable and expandable water supply is essential to supporting the fast water/coordinated ventilation approach. Initial fireground operations should not be not hampered by a lack of water.

Decision Making

Strategies and tactics must be determined with due consideration for the sustainability of the water supply. As the supply rate and reliability of water supply is increased, the number of tactical options is also increased. Likewise, when an engine arrives with only their tank water they must make tactical decisions based on what they have in their tank and only push past then when other resources arrive.

Water Supply Categories

Water supply operations can be divided into two basic categories: urban and rural. For the purposes of this appendix areas with fire hydrants are defined as urban and areas without fire hydrants are defined as rural.

Critical Flow Rate

The flow rate of water, measured in gallons per minute, required to suppress a fire in 30 seconds is known as the critical flow rate. The critical flow rate is independent of water supply reliability. Flowing less than the critical flow rate will not knock down a fire. Flowing more than the critical flow rate may result in a quicker knockdown, but also increases the chance of water being wasted.

It is not generally practical to calculate the critical flow rate during initial operations. Therefore operations are based on a rule of thumb for building initial water supplies: It is unlikely that a residential fire will require a critical flow rate of more than 500 GPM.

Stream Placement

Of equal importance to the critical flow rate is the need to accurately place the available water onto the burning surfaces in order to bring the fire under control. There are times, even with large fires, where it is more effective to use multiple smaller, more maneuverable lines than a single large, high flow line or master stream.

While MCFRS is aware of various techniques for gas cooling, gas cooling is not a tactic we use for fire suppression. MCFRS relies primarily on surface cooling in the context of residential structure fires. Surface cooling requires the application of water to burning surfaces, cooling those surfaces and reducing pyrolysis.

The Use of Class A Foam

Class A foam solution enhances fire suppression. The primary mechanism of Class A foam solution is to lower the surface tension of water allowing a more effective and uniform coating of surfaces. When using Class A foam for initial suppression it is used at relatively small percentages of the total water volume - around 0.25%. Water is the primary cooling agent; the Class A foam enhances the water.

Urban Water Supply

The development of an urban water supplies is straightforward. There are two units assigned to develop water supplies for each incident. Establishing two water supplies provides operational redundancy. The second water supply is an independent water supply for operations occurring opposite the initial attack e.g., in the rear.

In many cases, the second water supply will not be in a position to correct or augment water supply problems in the front for the first due engine. However, by establishing an independent supply in the rear they are less likely to impede water supply operations in the front.

The fifth due engine operates as a “defense in depth” for water supply operations. Because they don't have a predetermined apparatus position they are in the best position to correct lingering water supply problems. The fifth due engine should remain alert for issues with water supply on the fireground and assist with solving them consistent with other provisions of the Incident Response Policy.

Rural Water Supply

The fundamental principles of fire suppression in the rural environment are no different than those in the urban environment. What changes in the rural environment is that it takes much longer to develop a sustainable water supply. This reality means that personnel must be exacting and judicious in their application of water, ensuring that all the available water is landing on burning surfaces.

If the fire is not controlled by the initial attack line the Incident Commander may be forced to balance the requirement to establish a robust water supply - which requires a commitment of personnel - against the need to meet incident objectives, including fighting the fire.

Rural water supply operations are complex, they take time to build, and they are resource intensive. The Incident Commander must give strong consideration to assigning a water supply officer (WSO) as soon as practical. Having a WSO will allow the Incident Commander to focus on the fireground instead of the water supply.

The initial rural water supply tactic for rural water supply operations is referred to as attack tanker operations. This tactic requires the first or second due engine to initiate a water supply by laying a supply line attached to a clappered siamese into the scene.

The first due engine, second due engine and first due tanker (attack tanker) then co-locate to initiate operations with all their combined water resources. As this initial group assembles they have the support of between 4,000 (two engines with 500 gallons of water and one 3,000 gallon tanker) and 5,000 gallons (two engines with 750 gallons of water and one 3,500 gallon tanker) of water for the initial attack.

All subsequent water carrying apparatus must pump the siamese to support fire attack. This deployment allows sufficient water for support of initial search operations and fire attack.

Attack tanker operations are limited to a 500 GPM fire flow. When the needed fire flow is expected to exceed 500 GPM the Incident Commander should consider enhancing the water supply using either an on site water source, dump tank operations, or relay operations.

SECTION 4. Definitions:

See Appendix Q.

SECTION 5. Policy:

a. GENERAL

1. It is the policy of MCFRS that provisions be made for initiating and securing an uninterrupted water supply for all reported structure fires.
2. The engines assigned to initiate a water supply must give tentative water supply instructions by radio while en route to the scene.
3. All water supply operations must be immediately expandable as the situation allows.
4. The strategies and tactics chosen for the incident must match the available water supply both in total gallons available and the supportable flow rate.
5. In situations where strategies and tactics are constrained by available water personnel must focus the application and application rate of water based on the incident priorities; life safety, incident stabilization and property conservation.
6. Class A foam solution should be considered for the initial attack.

b. URBAN

1. Engines responsible for initiating a water supply must identify the target hydrant by address or intersection and use a forward lay whenever practical.
2. All hydrant hookups will use a “heavy water hook up” meaning that the hydrant steamer and at least one hydrant butt end will be “dressed” and immediately available for use.
   A. All hose connected to a hydrant shall be the largest available: 5” sleeve is preferred to 4” for the steamer, 4” is preferred to 3” for the side butts.
3. The initial water supply will be initiated by the first due engine.
   A. In order to call one’s “own hydrant” the engine must use the pre-connected soft sleeve.
   B. If the first engine takes their own hydrant the second engine is still responsible for ensuring, and if necessary, expanding on that water supply.
4. Additional water supplies will use a forward lay whenever practical.
5. Whenever the first arriving engine officer believes the incident will require the use of master streams they must consider laying in dual supply lines.
6. The laying of dual four inch lines must not unduly hamper access to the scene.
7. The third due engine is not obligated to lay dual four inch lines just because the first due engine did.
8. No more than two water supplies will be initiated for any one incident without the permission of the Incident Commander.
9. Developing a second water supply, when required by policy, must not detract from or impede the development of the initial water supply.

10. The second supply line should not be laid from the primary hydrant.
11. The first due engine should charge the building fire control systems as soon as possible.
12. Subsequent units should ensure that any additional connections are also charged as soon as possible.
13. When forced to choose, the standpipe system should be charged before the sprinkler system.

c. RURAL

1. The first due engine officer must announce the fill site location via radio.
2. ECC must add the location of the fill site to the event comments.
3. It is imperative that the rapid intervention dispatch and the water supply task force are dispatched at the first indication of a "working event."
4. Whenever practical, initial water supply will be initiated by the first due engine using a forward lay with a clappered siamese.
5. If the first due engine does not initiate a water supply, they must provide direction via radio to the second due engine to do so.
6. If the first due engine does not layout the second due engine must initiate the lay out with a clappered siamese.
7. The first due engine may elect to not lay a line in the rural setting when any of the following conditions are met:
   A. The first due engine and the attack tanker are expected to arrive at about the same time.
   B. The laying of that line will impede the ability of the second engine and/or tanker to access the scene.
   C. There is uncertainty about how to access the scene, including situations where the structure is not visible from the roadway.
8. The initial water supply operation for all rural water supply operations will be the attack tanker operation this means:
   A. The first engine, second engine and attack tanker are co-located.
   B. Their water supply resources are concentrated for maximum effect.
9. The early establishment of a WSO will be critical in developing a sustainable incident water supply.
10. When expanding water supplies in the rural environment the following options are available (listed in order of preference):
    A. On-Site Static Source

i. Used when there is an on-site static water source available.
ii. The Incident Commander must assign an engine to draft from the source.
iii. The supply line must be connected to the attack tanker's pump intake.
iv. All water carrying apparatus must continue to pump the clappered siamese until the on-site static supply is completed.

B. Dump Site Operations
i. A portable tank(s) is set up in a designated location with an engine drafting from the tank.
ii. The drafting engine then supplies the fireground through the clappered siamese.
iii. Effective dump site operations require a commitment of personnel and a WSO to set up and manage the dump site.
iv. Additional personnel must be added to the dump site as necessary to support operations.
v. Whenever practical the third due engine driver and second due tanker driver will work together to establish the dump site. They should contact command or the WSO for additional help if it is needed.
vi. All water carrying apparatus must continue to pump the clappered siamese until the dump site is completed.

C. Relay Pumping Operations
i. A relay operation may be attempted when there is a reliable water source within 3,000 feet of the clappered siamese.
ii. The length of the relay, roadway size limitations and the required fire flow are major considerations for the build out of the relay.
iii. When the length of the relay exceeds 2,000 feet and/or the required fire flow exceeds 1000 GPM, consideration should be given to using dual 4" lines in the relay.
iv. When using dual 4" lines in a relay only the supply lines should be charged sequentially.
v. Once the engine at the water source has secured a water supply, the driver will ensure that the next engine in the chain is ready before charging the supply line between them.
vi. Tankers must continue to pump the clappered siamese until the relay is completed.

11. Cisterns with less than a 30,000 gallon capacity may not be used as the only fill site for a structure fire.

A. They may be used to support operations while additional water supplies are developed.

B. Whenever cisterns are used the Incident Commander must ensure that they are re-filled.

12. Fill Sites

A. Fill sites should be made operational one at a time.

B. Each fill site should be able to fill tankers at a rate of at least 1000 GPM.

C. If a hydrant is used for a fill site, the fill site engine must be connected to the hydrant and must fill the tankers using the engine's pump.

D. Fill sites will be named by their physical address whenever one is available.

i. The use of common names for fill site, e.g., "Johnson's Farm", should be avoided.

ii. Fill sites must not be designated by number.

13. Parking

A. The roadway should be kept clear for tanker access to the siamese.

B. All units should park on the same side of the road (usually the side of the road that the fire is on) or off the roadway.

SECTION 6. Responsibility:

All personnel.

SECTION 7. Procedure:

See the Structure Fire Appendix.

SECTION 8. Cancellation:

This is a new policy.

SECTION 9. Attachments:

None.

Approved:

Scott Goldstein

Scott E. Goldstein
Fire Chief

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