

Spartanburg Public Safety Department Fire Division

Standard Operating Procedure	No. 102.08
Fire Suppression Systems	Page 1 of 8
Supersedes:	Effective: 12/07/2007

I. PURPOSE

Fire suppression systems in buildings offer greater protection to its occupants and firefighters. These systems include: sprinklers, standpipes, wet chemicals, dry chemicals, inert gases, carbon dioxide, and foam. These suppression systems need to be identified and utilized by fire personnel at the onset of an incident. It is essential that fire personnel identify the type, condition, and possible use of a fire suppression system during an incident.

II. SCOPE

This SOP is intended to address basic operational procedures during an emergency. It is not intended to address code required maintenance or testing. It is the responsibility of the property ownership to ensure systems are fully operational and compliant prior to an emergency event.

III. PLAN

In the event that a fire is reported in, or in the event a building or property is threatened by fire, the following guidelines have been established pertaining to the use of on-site fire suppression systems.

1. Determine if the involved occupancy has on-site fire suppression systems. If so, identify the type or types of fire suppression systems identified.
2. If the occupancy is so equipped, determine if the on-site fire suppression system(s) is in operation.
3. If currently in operation, determine the effectiveness of the fire suppression system(s).
4. If fire suppression system(s) is non-operational, determine how to activate such equipment and place it into service if it will aid in control of the fire.

5. Provide support to on-site suppression system(s) in accordance with the type of equipment involved and the nature of the fire situation.

III. SPRINKLER SYSTEMS

The following guidelines apply to all types of sprinkler systems including: sprinkler systems that include a combined standpipe system, wet pipe and dry pipe systems, deluge systems, pre-action systems, combined dry pipe and pre-action systems and outside sprinklers for exposure protection.

1. The Spartanburg Fire Division currently requires a 5” storz connection on standpipe and sprinkler connections. Existing systems may still be in operation that utilize two 2 ½” hose connections. Small residential systems that require limited water and pressure may be found with a single 1 ¾” or 2 ½” connection. **Fire personnel should fully utilize whatever fire department connections are supplied.**
2. If a building is equipped with a sprinkler system, one pumper should proceed to the hydrant that will be utilized to supply the FDC and standby for orders to make the connection. If directed to secure the connection, the pumper will lay a supply line from the area hydrant to the FDC. The pumper will secure the hydrant to the engine and secure one supply hose line, of appropriate size, to the FDC from the pumper. If directed to pressurize the connection, the following should be observed:
 - a. Provide 150 psi at the FDC
 - b. Advise command if any special circumstances exist at the connection. Examples include limited pressure systems that are posted as such at the connection or limited area systems that are posted as such at the connection.
 - c. If more pressure is needed by interior attack crews, the pressure at the FDC may be increased, but should not exceed 200 psi.
3. As a standard of practice, command should direct one person to survey the valves associated with sprinkler riser and floor of activation to ensure valves are in the full open position. In addition, command should direct one person to determine if the fire pump is operating. If possible, a firefighter should stay in the fire pump room throughout the incident.
4. Sprinkler systems should not be shut down until the interior attack teams gain control to extinguish the fire. Once a system is shut down, a person should be positioned at the valve to reactivate the system if necessary. An interior attack/fire watch team should remain on the floor.

5. After fire operations are complete, the owner or occupant should be contacted regarding the incident and the sprinkler system being out of order. He/she should contact the service representative to put the system back in operation. It should be explained to the owner or occupant that the property will not be protected and, if the sprinkler system is connected to a central signaling station, an alarm will not be transmitted.

IV. STANDPIPE SYSTEMS

When an occupancy is equipped with a standpipe system, fire personnel should utilize the system to eliminate the need for excessively long hose lays. Use the following procedures when utilizing a standpipe system.

1. The Spartanburg Fire Division currently requires a 5” storz connection on standpipe and sprinkler connections. Existing systems may still be in operation that utilize two 2 ½” hose connections.
2. If a building is equipped with a standpipe system, one pumper should proceed to the FDC staging area (where the pumper can lay a supply line from a hydrant and connect to the FDC) and standby for orders to make the connection. If directed to secure the connection, fire personnel will lay a supply line from the area hydrant to the pumper. Fire personnel will connect a hose line, of appropriate size, from the pumper to the FDC. If directed to pressurize the connection, the following should be observed:
 - a. Provide 150 psi at the FDC
 - b. Advise command if any special circumstances exist at the connection. Examples include limited pressure systems that are posted as such at the connection or limited area systems that are posted as such at the connection.
 - c. If more pressure is needed by interior attack crews, the pressure at the FDC may be increased, but should not exceed 200 psi.
3. As a standard of practice, command should direct one person to survey the valves associated with the standpipe and floor of activation to ensure valves are in the full open position. In addition, command should direct one person to determine if the fire pump is operating. If possible, a firefighter should stay in the fire pump room throughout the incident.
4. Standpipe valves controlling water distribution to the floors should not be shut down for any reason unless specifically directed by command. Floor control

valves should not be shut down while an interior attack team is in position, in operation, or advancing.

5. Based on the age of the building, standpipe connections may be found: 1) within the stairwells at each landing or immediate landing, 2) within elevator and main lobbies, 3) at each floor, 4) or areas assigned during construction. Personnel should make every attempt to make the shortest hose runs possible. Priority should be given to connections made within a safe environment for safe entry and egress (i.e. – within protected stairwells).

V. WET CHEMICAL FIRE SUPPRESSION SYSTEMS

Wet chemical fire suppression systems may be found in a variety of applications. These systems have become the standard application for restaurant suppression systems. These systems are designed and intended to control or extinguish a fire that occurs below the footprint of the hood, within the hood plenum, and address to some degree fire progress into the duct work. Use the following procedures when responding to a fire in an area protected by a wet chemical fire suppression system:

1. Survey the fire area. **If the fire is contained to the area under the hood system or protected by the suppression system and the system has not activated – locate the manual pull station or activation device and activate the system.** If the system will not activate or has activated and is not effective, begin firefighting methods appropriate for the fuel involved.
2. If the system has activated, or you are able to activate the system, monitor the application for effectiveness. Wet chemical systems are intended to create a foam blanket and smother the fire. Ventilation of the area should be done cautiously as not to disturb the foam blanket and risk re-ignition. Grease vats and similar items should be allowed to cool for an extended period of time before disturbing the area.
3. Fire personnel should check for fire in the upper floors or in the attic whenever a grease duct fire occurs. When possible, attempt to trace the duct work from the cooking area to the exterior in order to adequately search for fire extension.
4. After completing salvage and overhaul operations, the occupant or owner should be notified that the wet chemical system has activated, and the system will need to be cleaned, inspected, and recharged. The business operation, activity, or process cannot be initiated until the system has been reactivated. Notify the Prevention Office when such discharges occur for follow-up and inspection.

VI. DRY CHEMICAL FIRE SUPPRESSION SYSTEMS

Dry chemical systems may be found in a variety of occupancies and installations. Some of these include restaurants, spray booths, and dip tanks. Dry chemical systems are becoming obsolete and are more likely to be found in existing structures or operations. Use the following procedures when a dry chemical system has activated.

1. In the case of a local application systems inside a building, do not turn hose streams on the fire, since this is likely to splash the burning liquid out of the container and cause the fire to spread on the water outside of the container.
2. **If a total flooding system is operating, do not open up the enclosure until the powder has fully extinguished the fire and any hot objects, which can act as sources of re-ignition, have cooled off.** The chemical must be permitted to build up sufficient concentration inside the enclosure to do the job – any premature “opening up” would cancel out its operation.
3. If it is necessary to enter an enclosed space in which a dry chemical system has operated or may operate close up openings or effect a rescue, wear self-contained breathing apparatus, turnout gear, and work in pairs.
4. Fire personnel should check for fire in the upper floors or in the attic whenever a grease duct fire occurs. When possible, attempt to trace the duct work from the cooking area to the exterior in order to adequately search for fire extension.
5. After completing salvage and overhaul operations, the occupant or owner should be notified that the dry chemical system has activated, and the system will need to be cleaned, inspected, and recharged. The business operation, activity, or process cannot be initiated until the system has been reactivated. Notify the Prevention Office when such discharges occur for follow-up and inspection.

VII. INERT GAS EXTINGUISHING SYSTEMS

It is vitally important for all fire personnel to have an understanding of inert gas extinguishing systems such as Halon, FM 200, or similar. Inert gas systems function on the principle of displacing oxygen within a space and creating an environment in which a fire will not be able to occur. Older systems utilized Halon extinguishing systems, some of which have been found to adversely affect the ozone layer. Newer supplements are available such as FM 200 and other inert gas extinguishing agents. Fire personnel should use the following procedures when an inert gas extinguishing system is being utilized.

1. Locations utilizing a total flooding system should be clearly identified at each entry door to the room with signs or placarding and warning lights indicating activation. **If upon arrival the system has activated and no rescue is needed, secure the area from entry so the inert gas may fill the room.** Prepare to enter

the room for standard firefighting practices in the event that the suppression system is not effective.

2. If upon arrival, there is an apparent fire, occupants have withdrawn, and the system has not activated; operate the manual activation device and secure the room as noted above.
3. Self-contained breathing apparatus and turnout gear should be worn whenever entry into the discharge area is required.
4. Newer protected rooms may contain ventilation systems that may be activated to remove and pending inert gas. Older rooms may require that fire personnel utilize fans to assist with ventilation. Self-contained breathing apparatus should be worn whenever working in or near the discharge area. The ventilation should be directed to the outside where it will not enter a basement or crawl space. Halon 1301 is approximately 5 times heavier than air, and is apt to settle in low places.
5. The occupant or owner should be notified that the suppression system has activated and the system will need to be restored for proper fire protection. The Prevention Office should be contacted, if needed, to determine if this system will be required for start-up of continued operation.

VIII. CARBON DIOXIDE EXTINGUISHING SYSTEMS

Fire personnel need to be able to identify carbon dioxide extinguishing systems and take precautions when utilizing them. Fire personnel should use the following procedures when a carbon dioxide system is being utilized.

1. If upon arrival, the warning alarm has already sounded, the occupants of the room have withdrawn, the doors have closed, and **the carbon dioxide has already discharged into the area, do not open the door.**
2. If upon arrival, there is an apparent fire, occupants have withdrawn, and the doors have closed, manually activate the carbon dioxide system.
3. When a fire is being extinguished by a local application system, fire personnel may be able to assist in the extinguishment by using a carbon dioxide hand hose line system if available.
4. Be prepared to handle flashback that may occur after the gas has dispersed. Fire personnel should have supplemental extinguishing equipment ready for immediate use.

5. If it becomes necessary to enter a flooded room to effect a rescue or manually close an opening to seal up the enclosure, two fire personnel in self-contained breathing apparatus, turnout gear, and a life line should carry out the task.
6. Fire personnel should wear self-contained breathing apparatus when ventilating a room that has been flooded with carbon dioxide. Portable fans may be used to assist in removing the gas, especially where the vault or room has no exhaust system.
7. The occupant or owner should be notified that the carbon dioxide system has activated and the system will need to be restored for proper fire protection.

IX. FOAM SYSTEMS

Fire personnel should use the following procedures when a foam system is being utilized.

1. If the fire is still so small that the detectors have not yet operated, it may be possible to extinguish the fire with portable extinguishers before the system is activated.
2. If the fire has not yet been extinguished, make sure that the system has not had any valves closed, which would prevent the water from flowing, or electricity cut off, which would prevent the foam concentrate or water pumps from functioning.
3. If there is fire progressing beyond the capabilities of hand extinguishers, the system should be quickly tripped by hand (if not already operating) and backed up with additional protection in the form of foam streams from hose lines, or dry chemical extinguishers (providing these agents are compatible with the foam being applied by the system.)
4. If a large spill has occurred but has not ignited, any system designed to protect this area could be manually operated to provide a protective foam blanket as an interim precaution while the leak is stopped and the spill removed.
5. Do not use water streams on foam. This will break up the continuity of the surface blanket and could cause the spill to increase in size.
6. Some systems are designed to provide insulation and exposure protection, as well as extinguishment of spill fires; such is the case where foam spray nozzles are located over the vessel to be protected. Be careful not to wash away this foam protection with foam hose lines. The foam hose lines may be useful in shielding other tanks or processing equipment in the vicinity.

7. On large fires, fire personnel should set up portable monitor nozzles, ladder pipes, and elevating platform nozzles in locations where they can provide good exposure protection with minimum risk to firefighters.
8. The occupant or owner should be notified that the foam system has activated and the system will need to be restored for proper fire protection.