

CHAPTER II Operations

Rev. 3/91

SUBJECT 3 Emergency Operations**TOPIC 2 Fire Suppression Systems****A. SCOPE**

This topic modifies standard operations for structure fires when a fire suppression system is in place. Normal procedures will be followed except when there is a conflict between this section and standard structure fire operations, this topic shall take precedent.

B. PRIORITIES

Priorities remain rescue, fire control and property conservation, but in addition a top priority is supporting the fire suppression system enabling it to control and/or extinguish the fire.

C. PRE-PLANNING

Structures fully or partially protected by a Fire Suppression System shall be pre-planned. As a minimum the pre-plan shall include a drawing showing the location of system components (risers, shut-offs, pumps, agent supply containers, etc.) and area protected.

D. WATER SUPPLY

Water supply requirements shall be the same as for any structure fire, namely a source of water supply shall be secured by the first in Engine Company unless the pre-plan preempts this requirement. Most properties protected by fire suppression systems are large commercial buildings requiring a 5" supply line or soft suction connection. The first-in Engine Company shall connect to the sprinkler intakes of a sprinkler system (unless other arrangements are made on the pre-plan for that property) supplying the system with 150 p.s.i.g..

E. SAFETY

Rev. 6/89

1. Follow all safety precautions listed for structure fires.
2. Be aware of the potential danger created by chemical suppression systems (CO₂, Dry Chemical, Halon).
3. If the system is controlling the fire, it is not necessary to expose firefighters until the overhaul phase.

F. GOING TO WORK IN A SPRINKLERED BUILDING - NOTHING SHOWING

1. Listed here are tasks that should be accomplished at buildings equipped with a sprinkler and no signs of fire or system operation are evident from the outside on arrival.
2. Connect two (2) 2-1/2" lines to the sprinkler intakes. The pumper supplying sprinkler intakes shall be supplied by a soft suction or 5" hose connection to a fire hydrant.
3. One member equipped with a radio should be sent to the sprinkler system riser (main shut-off) to determine if the system is flowing and making sure the valve is fully open. This member shall immediately notify the incident commander of the system status. This position should be manned throughout sprinkler operations if at all possible.
4. If pumps are near the main shut-off, the member assigned to the main shut-off can also man this position. However, if the pumps are remote, another member should respond to the pump location. The Incident Commander must also be notified of the pump status. Upon receiving orders from the Incident commander, this member shall manually start the pumps. This position should also be manned throughout sprinkler operations if at all possible. It is poor practice to rely on annunciators to determine pump status. A physical check of the pumps should be made.
5. Other members should be assigned to conduct a systematic check of the entire building, if there is any indication of fire or system operation. If in doubt - check it out.

G. GOING TO WORK IN A SPRINKLERED BUILDING - Rev. 6/89 EVIDENCE OF
FIRE OR SYSTEM OPERATION ON ARRIVAL

1. If there are signs of fire or sprinkler system operation the main objective is to assist the system in controlling and extinguishing the fire while limiting property damage or in the case of system operation without a fire, to limit the damage caused by the system.
2. Connect two (2) 2-1/2" lines to the sprinkler intakes.
3. Force entry limiting damage to a minimum. But, with a fire in progress or system in operation, time spent in gaining entry will certainly add to the property damage, making a more aggressive entry justified.
4. One member equipped with a radio should be sent to the sprinkler system riser (main shut-off) to determine if the system is flowing and making sure the valve is fully open. This member shall immediately notify the Incident Commander of the system status. This position should be manned throughout sprinkler operations if at all possible.
5. If pumps are near the main shut-off the member assigned to the main shut-off can also man this position. However, if the pumps are remote another member should respond to the pump location. The Incident Commander must also be notified of the pump status. Upon receiving orders from the Incident Commander, this members should also be manned throughout sprinkler operations if at all possible. It is poor practice to rely on annunciators to determine pump status. A physical check of the pumps should be made.
6. Let the system do it's job. It is better to shut down too late, rather than too early. The system should be permitted to operate until the Incident Commander is sure the fire is completely under control. The only remaining fire, if any, should be small spot fires in concealed spaces.

G. GOING TO WORK IN A SPRINKLERED BUILDING - Rev. 3/91 EVIDENCE OF
FIRE OR SYSTEM OPERATION ON ARRIVAL (CONTINUED)

7. Prepare for interior attack and/or overhaul by laying hose lines and manning them with firefighters in full protective clothing, including Air Mask. Hose lines should not be operated except to limit fire spread and for overhaul. However, if the sprinkler system is in-effective due to damaged piping, malfunction or in-adequacy, then hose lines will take priority. The best practice is to give the system the benefit of the doubt being careful not to rob the sprinkler system of needed water by unnecessary use of hose lines. Remember, sprinkler systems have a 96%+ success rate in controlling fires.
8. Ventilation can channel the fire and limit fire extension if done properly. As with any ventilation, poor ventilation can spread the fire while increasing the fire's oxygen supply. If you cannot locate the fire due to smoke, steam, etc., DO NOT SHUT THE SYSTEM DOWN TO FIND THE FIRE, VENTILATE INSTEAD . The effectiveness of the sprinkler system in cooling the entire fire area may present a ventilation problem, as the cooled smoke refuses to rise sometimes requiring mechanical ventilation.
9. Members should be assigned to salvage operations while hose lines and sprinkler control are in progress. Salvage includes shutting down the system once the fire is KNOWN to be under control.
10. Restore the system to service by replacing fused sprinkler heads and reopening the valve if possible. If the system is too complicated or sufficient quantities of the proper type sprinkler heads are not available have the owner/manager restore the system as soon as possible.

H. WORKING AT A PROPERTY PROTECTED BY A DELUGE SYSTEM Rev. 6/89

1. The tasks required at a sprinklered building are basically the same for wet, dry or pre-action systems. The deluge system presents at least one more consideration, manual operation of the deluge valve. Many of these systems are located outside of buildings. Usually the hazard protected by these systems create extra hazards for firefighters attempting manual suppression. System operation is evident negating the need for the thorough investigation required in sprinklered buildings. Listed below are general steps to be taken at these properties, but pre-fire planning is the key to successful operation.
2. Check control valve and fire pump. Just as with the wet and dry pipe systems, it is important to maintain valves and pumps in a fully operational condition.
3. Operate deluge valve. It is possible, though improbable, that a fire would be in progress in an area protected by a deluge system that failed to operate. If the system is needed for fire control, the manual deluge valve should be operated. It is more likely that an exposure fire would threaten an area protected by a deluge system. It may be possible to cover these protected exposures with the deluge system by operating the deluge valve. Consideration must be given to the water supply requirements of these systems when being used as exposure protection. A deluge system may well deplete a private water supply system.
4. Check interlocks, deluge systems often trip interlocking systems when activated. For example, system operation may de-energize electric transformers, shut down conveyor belts, or shut off fuel supply. In most cases, there is a means of manually activating the interlock. If it is possible to safely shut down fuel supplies, etc., this should be accomplished. Usually the deluge system will control the fire even if the interlocks fail to function. It may be advisable to wait for plant personnel to shut off fuel supplies, de-energize transformers, etc.

H. WORKING AT A PROPERTY PROTECTED BY A
DELUGE SYSTEM (CONT'D)

Rev. 6/89

5. Let the system do its job! As with the wet and dry pipe systems, it is better to shut down too late rather than too early. A determination must be made that the fire is completely under control before shutting down. This system will be flowing large quantities of water, increasing the tendency to shut down prematurely. Remember, even with hose lines in place, it may be impossible to direct the quantity of water necessary to hold the fire if the system is shut down.
6. Back up the system. Hose lines manned by fully protected firefighters are required at strategic locations for fires involving conveyors. However, manually operated hose lines usually create a substantial safety hazard, if the system is protecting high voltage transformers. The Incident Commander must assess this situation carefully, knowing that charged hose lines offer a tremendous temptation. Most of the time, the protected transformer could completely burn out without endangering lives or other property. If the system is equipped with fire department connections, the water supply should be augmented.

I. GOING TO WORK IN A BUILDING EQUIPPED WITH A STANDPIPE

1. The first in Engine Company will advance to the fire floor with full protective clothing including air mask. The following equipment shall be considered the minimum:
 - a. Two (2) sections of 1-3/4" hose
 - b. Constant Flow 1-3/4" Nozzle
 - c. 2-1/2" to 1-1/2" Adaptor
2. The second in Engine Company will advance to the fire floor, backing up the first in Engine Company with a minimum size line of 1-3/4".

I. GOING TO WORK IN A BUILDING EQUIPPED
WITH A STANDPIPE (CON'T)

Rev. 6/89

3. The pre-plan can modify the equipment and company assignments. Unless specifically addressed in the pre-plan, hose lines shall be connected to standpipe risers on the fire floor, if the standpipe outlet is in the stairway. If the standpipe outlet is located in the hallway, hose shall be connected to the standpipe one floor below the fire.
4. Proper elevator safety procedures must be followed if elevators are to be used in the operation.
5. For fires above the reach of aerial ladders refer to "High Rise Procedures".
6. Check fire pumps and main control valves. This position will not usually require manning throughout the operation, as it does for the sprinklered property. It is important to assure the system is ready for service and pumps are operating. This function becomes critical when fires occur in upper stories of high rise buildings.
7. Supply the fire department connections. The water supply requirements are the same as with a sprinklered building, namely, two 2-1/2" lines connected to the fire department connection with a water supply from a hydrant via large diameter hose, soft suction, or two 2-1/2" lines. Some standpipes systems will not have internal supplies, relying entirely on the pumper supply. The volume supplied must be hydraulically calculated according to the Cincinnati Fire Department hydraulics as outlined in Drill Book #1.

J. GOING TO WORK IN AREAS PROTECTED BY TOTAL FLOODING CARBON
DIOXIDE OR HALON SYSTEMS

1. If the system is controlling the fire, maintain the enclosure by keeping the doors closed. There is no need to enter the area if the fire is being controlled, as entering the area will allow the Carbon Dioxide or Halon agent to dissipate thereby reducing the effectiveness.

J. GOING TO WORK IN AREAS PROTECTED BY TOTAL CARBON DIOXIDE OR HALON SYSTEMS (CONTINUED) Rev. 6/89 FLOODING

2. If it becomes necessary to enter the room to perform a rescue or for final extinguishment, members must wear full protective clothing, donning the air mask prior to entry. The area may appear to be completely clear yet pose a serious hazard due to a lack of oxygen or in the case of Halon, pose a threat due to corrosive decomposition gases.
3. These systems will generally be equipped with a manual actuation device which should be operated in the event that the automatic detection/activation devices fail.
4. Unlike the sprinkler and standpipe systems, Carbon Dioxide and Halon systems will have a very limited supply of extinguishing agent. Usually there is only enough Carbon Dioxide or Halon for two or three relatively short discharges before agent depletion.
5. Overhaul operations must be completed, especially in areas containing Class "A" materials as rekindles will occur as the agent is diluted over time.
6. System restoration, will by necessity, be left to the property owner and/or a contractor capable of recharging and resetting the system.

K. GOING TO WORK IN AREAS PROTECTED BY LOCAL APPLICATION CARBON DIOXIDE, HALON, FOAM, DRY CHEMICAL OR OTHER SPECIAL EXTINGUISHING AGENT SYSTEMS

1. These systems are generally protecting Class "B" or "C" hazards and do not depend on an enclosure.
2. Support the system by activating manual activation devices when necessary, or in the case of foam, pumping into the system and following pre-plan information for foam application to the area involved.
3. Be prepared with back up equipment, hose lines, foam lines or portable extinguishers as required to augment the system and/or complete overhaul.
4. System restoration, will by necessity, be left to the property owner and/or a contractor capable of recharging and resetting the system.