

Highrise Properties

15.0900 Scope:

A high-rise fire building has been defined in several different ways. One definition considers it to be a building in which the vertical movement of occupants is accomplished primarily by means of elevators rather than stairs. Another definition considers a high-rise building to be any occupied building which extends beyond the reach of fire department aerial ladder equipment.

While these definitions are short and quite easy to understand and apply, a building fifty or one-hundred stories high has significantly different fire safety problems than one that is eighty feet high. Thus, it is felt that a more comprehensive definition must be utilized. The definition of a high-rise building is one considered to be a structure in which complete emergency evacuation is not practical and in which the fire must be fought internally because of height.

The usual characteristics of such a building are:

- a. Beyond reach of fire department aerial equipment
- b. Poses a potential for significant stack or chimney effect
- c. Requires unreasonable evacuation time

The development and spread of fire in a high-rise building and subsequent damage caused to the structure are a function of a number of factors. Ample fuels are available in nearly all high-rise occupancies to support a damaging fire. While fire prevention codes attempt to reduce fire hazards in a number of ways, the fuel loading contributed by the contents are not normally regulated, particularly in individual apartments or residential buildings.

Fuel contribution is also made by the high-rise structure itself in a variety of ways. Interior wall and ceiling finish materials have been long recognized as providing potential for fire spread. Floor finishing materials and carpeting have been identified as being pertinent under some fire spread situations. Concealed spaces formed by suspended ceilings or sandwich type panel walls can also provide for fire and heat spread. Utility systems running through these spaces often use plastic materials for such items as wire insulation and duct connections. Combustible insulation is sometimes used. Most new buildings are required to provide enclosed stairways but also have elevators. Lastly, the spaces around ventilation ducts and other minor floor openings are not properly fire stopped.

Smoke spread is unquestionably the most significant life hazard problem existing at the time of a fire in a high-rise building. The movement of smoke, often to locations far removed from the floor of origin, appears to be the result of several different factors and is not always simple to predict. Studies have indicated that chimney or stack effect is present in tall building shafts and is a function

of the temperature differential between the inside and outside of the building as well as the height of the shafts. In cold weather, it produces a definite flow of air into the stair and elevator shafts on the lower floors and out on the upper floors.

An opposite effect occurs in warm weather when interior temperatures are lower than the exterior. The ventilation systems in the building can also play an important role in smoke spread, not only from the standpoint of serving as a primary means themselves, but also due to the significant influence they can exert on the building's stack effect on certain floor levels.

A number of unique evacuation problems exist in a high-rise building at the time of a fire. In a residential building, the detection of a fire is frequently delayed due to being unoccupied during the day and that the smoke detection systems may be local alarms only. Evacuation is also complicated by the fact that there is frequently no method of notifying occupants of a fire. The normal means provided for vertical travel in a high-rise building is by elevators. High-rise building fires continue to illustrate the vulnerability of elevators and their controls to heat and smoke. Also, when the alarm system sounds the elevator is required to return to the first floor and becomes inoperable by the tenants. Thus, stairways must be used as the primary means of emergency egress.

Tests have indicated that stairways can quickly become overcrowded if many floors attempted to evacuate at the same time. The facts presented are that serious crowding can result in a complete stoppage of occupant movement in stairways exposing occupants to large quantities of combustion products.

The physical demands placed on a fire department in a high-rise building fire are much more severe than that of a similar fire in a low building. Just getting to the fire floor, which may be a quarter-mile above the street level, may be difficult or impossible if elevators have failed or building occupants have already taken over their use for evacuation. Ventilation of heat and smoke, an important fire control procedure, is often quite difficult in a high-rise fire and greatly complicates fire-fighting operations. The lack of an effective means of communicating with the occupants in the building usually results in the fire department having to deploy a part of their firefighting manpower to individually notify the occupants of the situation. This can require more personnel than are needed to extinguish the fire itself. For these reasons, the following procedure has been developed.

15.0901 Response First Alarm:

- a. 2 – Engines
- b. 1 – Ladder
- c. 1 – Rescue
- d. 1 - Incident Commander

When a working fire has been ascertained, an additional alarm will be transmitted, and the response shall be increased by the following:

- e. 2 - Additional engines
- f. 1 - Additional ladder truck
- g. 1 - Ambulance (Gold Cross)
- h. All additional Town of Menasha Fire Department personnel.

A staging area and officer shall be designated by the Incident Commander and units placed in Level II Staging until needed.

15.0902 Level 1 Staging:

The first-in engine shall normally be near the FDC connection and hydrant and make up the fire verification and IC team. Because apparatus placement (especially aerial devices) is so critical during high-rise operations, ALL Other units shall stage 1 block away and await location assignments.

15.0903 First Arriving Officer Shall:

- a. Establish command and the command post in the lobby, or at the grade level entrance, and inform the communications center to the location of the command post.
- b. Recall all elevators to the ground floor.
- c. Designate what stairways will be used for evacuation and for ventilation. It will be necessary to designate stairways by letter for easier identification.
- d. Secure all building keys.

15.0904 Fire Verification Team:

This team will consist of the first arriving engine company - one officer (or team leader) and up to four firefighters. FVT must have a portable radio!

The driver/operator of the first arriving engine company shall position the engine to anticipate the connection of the standpipe/sprinkler system, however, they shall not connect at this time.

- a. Fire Verification Team Officer Shall:
 - i. Recall all elevators to ground floor.
 - ii. Establish a phone number in the lobby so that he may call down to inform the IC of the conditions on the upper floors.
 - iii. Establish the Forward Fire Command two (2) floors below the actual fire floor.
 - 1. It is important that the Fire Verification Team reaches the upper floors of the high-rise and reports the conditions found, such as heavy or light

smoke, and amount of heat encountered in the stairways. With this information, the IC will be better able to assess as to whether he will be able to contain the fire with the resources he has or if it will require additional resources.

2. The Fire Verification Team must check the floor two- (2) floors below the actual fire floor so that it can be used as the Forward Fire Command. This information must be relayed to the IC as soon as possible.
- b. Fire Verification Team Responsibilities:
 - i. The primary objective of the Fire Verification Team is to reach the upper stories of the high-rise and confirm the exact location of the fire or problem, extent of the fire, and the overall conditions of the situation.
 - c. Required Equipment:
 - i. The Fire Verification Team shall have in its possession the following equipment:
 - ii. Complete SCBA/PASS for each team member
 - iii. Pick head and flat head axes
 - iv. Sledge hammer
 - v. Pike poles
 - vi. 100 feet of 1-3/4 hose with gated wye (High-Rise Pack)
 - vii. Portable radio;
 - viii. Master keys to building
 - ix. Halligan bar
 - x. Hand lights

15.0905 Breathing Apparatus:

All personnel going above the lobby or grade level shall be equipped with SCBAs. The tank with harness shall be donned with the shoulder, chest, and waist straps pulled tight. The cylinder valve shall be in the on position. The breathing tube shall be connected to the regulator and the face-piece suspended from the firefighter, ready for immediate use by the fire fighter in an emergency or before entering the fire floor.

The remaining companies responding on the first alarm shall report on the scene and remain uncommitted clear of the fire building.

15.0906 Working Fire:

When a working fire is evident or the Fire Verification Team verifies the report of a fire, the IC shall transmit an additional alarm bringing the additional engines, trucks, ambulance, etc.

When a working fire has been transmitted, it is the responsibility of the IC to activate the Staging Area. The IC shall inform the communications center of the location of the Staging Area and direct all responding companies to the Staging Area not to the fire building.

The Staging Area shall be located at least 200 feet from the fire building in a safe area.

a. Second Arriving Engine Company:

- i. The second arriving engine company shall be positioned clear of the fire building. The driver/operator of the second arriving engine shall report to the first arriving engine and connect this engine to the standpipe/ sprinkler connection and await orders to charge the system. The driver/operator shall remain with this engine company. It may be the responsibility of the officer from the second arriving engine company to assume the position of Operations Officer at the Forward Fire Command.
- ii. All arriving firefighters on the second arriving engine shall don SCBAs and report to the Operations Officer at the Forward Fire Command area located two (2) floors below the fire floor with all forcible entry and firefighting equipment.
- iii. It shall be the responsibility of the Forward Fire Command officer to keep track of all firefighting personnel and their location under his command. If personnel are available, one firefighter may act as an aid to the Forward Fire Command to assist in this task.

b. Third Arriving Engine Company:

- i. The officer of this company shall be responsible for the staging area (Staging Officer). All other members shall report to the Forward Fire Command with their firefighting equipment. Based on the conditions of the fire, the Forward Fire Command will use this company for Rapid Intervention Team; for relief personnel; to perform or assist in the performance of truck duties; to supplement the firefighting personnel or to place additional fire attack lines into service. One person from this company will be in charge of the support area located three- (3) floors below the fire floor. All unused or uncommitted equipment shall be stored for future use in this area along with relief personnel.

c. Fourth Arriving Engine Company:

- i. This company shall report to the Staging Area and Staging Officer for future assignment. The personnel shall be utilized as the IC and Forward Fire Command see fit. Their assignment may include such operations as water supply; relief personnel; command staff; HVAC control; or logistics personnel to name a few.

d. First Arriving Ladder Company:

- i. The firefighters will provide forcible entry and ventilation that will be necessary to control the fire. Ventilation will have to be coordinated with the IC so that

the area around the building may be cordoned off by police department personnel while ventilation is being performed. It will be necessary for fire personnel to be removed from around the building under this area that is to be ventilated.

ii. Equipment Required:

1. Axes
2. Pike poles
3. Halligan bars
4. K-12 saw
5. Ventilation hammer
6. SCBAs

e. Operating Above The Fire Floor:

- i. Fire department personnel operating above the fire floor are operating at great risk. One firefighter shall be positioned at the stairway door at all times and keep in contact with the Forward Fire Command. This firefighter shall keep track of all personnel operating above the fire floor.
- ii. Members above the fire shall search the floors above the fires; provide ventilation of the fire floor and floors above the fire and search for extension of the fire. If one stairway is used for ventilation, the vents in the roof shall be opened from the inside.

f. Control Of Lapping Effect:

- i. If the fire cannot be controlled in the area of origin but starts to lap to the floors above, it will be necessary to start attacking the fire at different levels. This task could be divided and accomplished by three (3) different actions:
 1. Lay lines on the floors above the fire in advance of the fire
 2. Proceed above the floors involved and set up a defensive action with large caliber streams to prevent the fire from extending to that point of defense.
 3. Continue with an interior attack but extend operations to all floors involved in the hope of overcoming the advance of the fire. If this action is used, you will need greater alarms. The problem of control under these conditions will be very difficult. It will be necessary for every member of the Incident Command Staff to coordinate their efforts with the IC at all times in order to have a well-run operation.

15.0907 Rescue Company Operations:

It will be the responsibility of the Rescue Officer, or Acting Officer, to prioritize the support activities to be performed according to the fire conditions presented. Although some of the duties may have been already implemented by earlier arriving engine companies, it will be the responsibility of the

Rescue Officer to coordinate the remaining activities to ensure they will be completed. The following are some of the activities or duties that must be addressed: rescue, ladders, forcible entry, salvage, ventilation, RIT and utility control. Many of these duties can be carried out simultaneously with one another.

An arrangement must be made to refill and transport air bottles to the support area three- (3) floors below the fire floor.

The procedure that will be followed will be for these firefighters to move whatever bottles and masks that are required to the elevators and have them moved to the support area.

15.0908 Elevators:

If a fire has been confirmed on the upper floor of a high-rise building, movement of firefighters and support equipment will be extremely slow without the use of an elevator. An elevator may be used by fire department personnel with the following restrictions:

- a. At no time will the elevator be used by fire department personnel unless it is in the Fire Service Mode
- b. If the elevator cannot be placed in the Fire Service Mode it shall not be used
- c. All personnel entering the elevator car MUST wear SCBAs with the face-piece in place
- d. The operation of the elevator car in the Fire Service Mode will be performed by fire department personnel only
- e. There shall be no more than five (5) firefighters plus their equipment in each car
- f. A halligan or pry bar must be in the elevator car.
- g. The elevator car must be stopped at two (2) floor intervals to make sure the elevator is under fire department control
- h. All personnel shall exit the elevator car at least three (3) floors below the fire floor
- i. At least one firefighter shall remain in the elevator car at all times when the elevator is placed in the Fire Service Mode

15.0909 Summary:

The fighting of a high-rise fire presents a variety of problems that must be dealt with by the Incident Commander. The key to successful operations at a high-rise fire depends on the fact that every firefighter is familiar with the overall high-rise operational procedure. The company officer plays a pivotal role; the company officer must know the basic fundamentals of firefighting and be able to confidently make decisions based on the fire situation and the operation of the high-rise procedures. If any one of the components of the procedure begins to breakdown, the chances for injury and/or death increase dramatically.

Read and become familiar with every duty and responsibility of this procedure for your safety as well as the safety of your fellow fire fighters.

15.0910 Glossary:

- a. Command Post - The operations and communications center for the operation of a major incident. Headquarters for all command staff at the scene of an emergency.
- b. Divisions - Each Floor is a Division - An Engine Company working on the 5th floor is referred to as Division 5!
- c. Fire Service Mode - The controlling of an elevator so that it cannot be called by floor call buttons.
- d. Forward Fire Command - A command center two (2) floors below the fire floor, where the officer in command of the above ground fire activity sets up his command post.
- e. High-rise - A structure in which complete emergency evacuation is not practical, and in which the fire must be fought internally because of height.
- f. Incident Commander (IC) - The commanding Chief or Officer at any incident. Responsible for all activities at the scene of an emergency.
- g. Rest and Rehabilitation Area - Area of rest for the fire fighters located in the Support Area.
- h. Side A - The address side the fire building (unless specifically designated by the IC).
- i. Side B - The left side of the fire building.
- j. Side C - The rear of the fire building.
- k. Side D - The right side of the fire building.
- l. Staging Area - An area at least 200 feet from the fire building in a safe area where non-committed companies respond to a fire in a high-rise will be held in reserve until needed in the building.
- m. Staging Officer - Responsible for the organization of companies in the staging area.
- n. Support Area - An area three- (3) floors below the fire floor used for the purpose of assembling fire fighters and equipment to be used on the fire floor.