TOLEDO FIRE & RESCUE DEPARTMENT

High Rise Fire Procedures Manual

Date Revised: Spring 2025

Last Modified: 08/09/2025 19:57

Export High Rise Manual to PDF

I. Mission Statements

- To safely accomplish the goal of establishing a 2 ½" hose line flowing 250 GPMs within 18-20 minutes of the first arriving unit on scene and to support such an operation effectively and safely.

II. High-Rise Defined

- For this manual, a High-rise Structure will be defined as *"Any structure where all or portions of a building are beyond the reach of ground based firefighting equipment, specifically aerial ladders."* The concepts of this manual may also be applied to low rise buildings; whereas they would apply toward depth of structure versus height in its application.

III. Command

- The Command structure at high-rise fires will follow the Incident Command System as explained in section C-57 of TFRD's Emergency Procedures Manual. This includes the RCOG of two Battalion Chiefs on a high-rise regular alarm.
- The first arriving Chief shall assume Command and become the Incident Commander from the exterior designating a Command Post in an advantageous position. This Chief is responsible for the incident at large. The second chief shall join the interior crews at the Forward Operating Base (FOB) and supervise the attack by supporting the base of operations.

IV. Responding to a Commercial Fire Alarm – High-rise (CFAHR)

When a detection alarm is received without a corroborating civilian 911 call, an investigating response shall consist of a single engine. Despite frequent history of false reports and system failures in one form or another, a high level of awareness and readiness must be maintained during this investigation.

Crews shall be in full gear with SCBA in standby and have with them the TIC, water can or dry chemical extinguisher, and irons. The arriving engine SHALL complete a 360 size up, give a condition report upon arrival, and take Command. In many cases a 360 size up by the first arriving Engine may be impractical however, all efforts should be exhausted to obtain a visual of as much of the building as possible.

If ***"Nothing Showing"*** is observed exteriorly, the Officer and the crew will check the alarm panel and interview occupants to ascertain fire reality, severity, and/or location as per Emergency Manual C5. They will also locate the Knox box and procure the elevator key and/or master key if available. It may be in the Manager's office or with the maintenance person.

When consulting the annunciator panel do not solely look at the alarm that is displayed, it is paramount to scroll through the past alarms using the ***"Alarm ACK"*** button. Often the first alarm location is where the fire has started. The presence of multiple alarms going off may indicate the location of a working fire or at least identify the floors that have been affected by smoke. Before committing to an area deep within a building, the annunciator panel must be consulted.

If an alarm indicated by the annunciator panel is on the 5th floor or below, the responding engine **shall take the stairs**. If there is no smoke on the fire floor, they will investigate further and take applicable action. If the indicated floor is above the 5th floor, firefighters may use the elevator up to two floors below the suspected fire where they will walk up to the reported fire floor, taking note of floor layout, and checking for smoke. It is imperative that the elevator is properly evaluated and placed into **Phase 1/Phase 2** before ascending *(see, "V. Clearing an Elevator for Use and Operations" and "Appendix 10, Elevators")*. The safest method of ascending to the fire floor is to use a stair shaft that accesses the reported fire floor. When choosing to use elevators, keep in mind that when responding to high-rise commercial alarms and high-rise fires **personnel shall not operate in elevator cars that cannot be placed in fire service operation**.

Fire crews should pace themselves while ascending as this will be a physically demanding task. On the way to the fire floor, the officer should check several floors below the reported fire floor to familiarize the potential floor layout, fire conditions, and standpipe valve locations. The driver should remain in the lobby area to monitor the alarm panel and continue gathering information.

If smoke and/or fire are found and is beyond containment by a fire extinguisher or water can, dispatch shall be notified to send the balance of a High-rise Regular Alarm. The officer will then have the discretion, depending on the scope of the situation found, to request a High-rise 2nd Alarm. If a 2nd Alarm is called, these alarms should be separate to allow each wave to arrive naturally.

The first responding engine on scene will now become the **Recon/Attack** team and will identify the most

advantageous stairwell to mount an attack via the most appropriate standpipe location. In the event of a true working fire, these crews must use common sense and experience to balance risk/reward in relation to life saving efforts and fire containment without the safety of hose lines.

As the balance of the High-rise regular alarm begins to arrive, the first arriving officer will implement the Incident Command System and begin assigning units to task oriented priorities. Using the information that the Recon team has gathered, the IC will direct the arriving units to the appropriate stairwell to begin connection to the standpipe system. This incident should now be run in accordance with Regular High-rise Alarm Operations.

V. Clearing an Elevator for Use and Operational Recommendations

Personnel ***shall not*** operate in elevator cars that cannot be placed in fire service operation, nor take the elevator to the floor of the reported alarm *(see Memphis LODD 1994)*. Keep in mind elevators are subject to failure, and the safest means to the fire floor is the stairs. However, if the reported alarm is higher than 6 floors, elevators can be an efficient means of travel if properly evaluated and captured *(see Appendix 10, Elevators)*. The hoist ways (shafts) can provide a means of extension for smoke and fire and therefore must be cleared before use. Firefighters should look up into the hoist way through the crack between the floor and elevator using a flashlight and thermal imager to verify that there is no smoke, fire, or running water in the shaft.

Elevators ***should not*** be used under the following circumstances:

- If the alarm panel indicates that smoke or fire is in the "**elevator machine room**".
- If there is heavy fire seen from the exterior
- Fire is below grade
- Freight-style elevators
- Elevator does not have Fire Service Operation

Elevator use considerations:

- Source of the alarm is below the 5th floor, firefighters should use the stairs during the onset. It is quicker to reach the floor of origin by stairs because proper evaluation/clearing the elevator takes several minutes.
- All firefighters should be equipped with full PPE, SCBA, radios, extinguishers and irons for elevator travel.
- Do not overload the elevator. No more than six fully equipped firefighters should use an elevator car at once.
- Never take an elevator directly to the fire floor. Always stop two floors below the reported fire floor.
- During an extended attack where the elevator function is deemed safe, a firefighter should be assigned as an elevator operator for every car in use.

In summary, the elevator must be properly cleared and required operational checks performed before ascending. A full discussion on the use of elevators under "Normal Conditions" and "Emergency

Operations" is in Appendix 10, Elevators of this procedure.

VI. High-rise Regular Alarm Operations

- The regular alarm for a High-rise Fire is:
  - 5 Engines
  - 2 Trucks
  - 2 Rescue Squads
  - 2 Battalion Chiefs
  - Safety 134
  - 1 Med unit

First Alarm Assignments – Investigation Mode

When a detection alarm is received along with a corroborating civilian 911 call a High-rise Regular Alarm will be sent. First unit on scene SHALL obtain a 360 and give a condition report upon arrival. In many cases a 360 size up by the first arriving Engine may be impossible or impractical by themselves and will require a collective effort. The first arriving Engine should get a visual of as much of the building as possible and utilize other responding rigs to complete the 360 as they arrive.

If they observe **Nothing Showing**, the Officer and his crew will enter the building and determine the nature of the Incident following the guidelines laid out in "**Responding to a Commercial Fire Alarm - High-rise**".

NOTHING SHOWING ON A HIGH -RISE ALARM MEANS ABSOLUTELY NOTHING.

Initially the first arriving Engine shall establish Command and will set up the incident with the following priority.

- **Assemble a Recon/Attack group:** Two to three members should be assembled and ascend together to where the alarm was initiated *(see "Recon/Attack Group" description)*.
  - Crews shall be in full gear with SCBA on standby and have a water can or dry chemical extinguisher, TIC, irons, 2 ½" hose packs, and high-rise bag.

- **Lobby:** The first arriving engine driver should be assigned Lobby Control, investigate the source of alarm on the FACP, and verify fire pump operation.

- **Water Supply:** The 2nd arriving engine driver will locate the FDC, closest hydrant, and stage until directed to supply the system.

- **Incident Command:** Responding Chiefs will proceed to the building. First arriving Chief will assume Incident Command and set up a Command Post.

- **Staging:** All remaining units will stage.

First Alarm Assignment – Command Mode

If first arriving units see any visible sign of fire or civilians at the scene report a fire, the **Command Mode** shall be used.

- **Incident Command:** The first arriving unit shall establish Incident Command.
- **Assemble a Recon/Attack group:** Two to three members shall be assembled and ascend together to where the alarm was initiated.
    - Crews shall be in full gear with SCBA on standby and have a water can or dry chemical extinguisher, TIC, irons, 2 ½" hose packs, and high-rise bag.
- **Lobby Group:** The first arriving engine driver should be assigned Lobby Control during the onset of the incident and investigate the source of alarm on the FACP, then verify fire pump operation. Lobby Control should transition to a Lobby Group as required as the incident expands and then be coordinated by an officer-relieving the driver of the first arriving engine.
- **Water Supply:** The 2nd arriving engine should take a hydrant and charge the Standpipe System. The standpipe FDC shall have priority over the sprinkler connection.
    - If it is later scouted that the sprinkler system needs supplementation, it can be addressed by another engine company. Firefighters having water for the initial fire attack takes priority over all other water supply needs.
    - The balance of the crew shall be assigned as IC dictates
- **Command Post:** The 1st Chief on scene shall assume Incident Command and set up a Command Post.
- **Forward Operating Base (FOB):** The 2nd Chief shall join the interior crews and supervise the attack and the supporting base of operations.
- **RIT Group:** Two engines, or engine/squad will be assigned to RIT.
- **EMS Group:** An Engine, preferably an Engine and medic unit, will be assigned EMS.
- **Staging:** The 2nd and following alarm complements shall implement Level II staging as described in Emergency Procedures Manual C-57. The Level II staging area shall be under the direction of a Staging Officer who shall report directly to the Incident Commander or Operations if an Operations section is established. All staged crews should be monitoring radio traffic and looking at Preplans if available on the MDT for incident familiarization purposes. Trucks will stage in the Lobby and address pressurizing stairwells unless fire suppression and/or rescues are at a floor level conducive to aerial ops.
- **Support Group:** All remaining crews will be a part of the support group and assigned as prioritized by Command.
    - 1st and 2nd alarm companies should proceed directly to the building with their gear with

spare bottles and report to the Command Post to decrease transit time once assignment is made.

Group	Tasks
RECON / ATTACK 1 to 2 Engine Companies 1st Rescue Squad	Check panel for fire location. Take control of elevators. Check floor below fire floor for layout. Recon for most appropriate place to take standpipe. Fire attack.
WATER SUPPLY 1 Engine	Stage at hydrant. Take hydrant if needed. Connect to FDC Balance of crew assigned as needed
LOBBY CONTROL 1 Engine	Primary Accountability. Manage elevator use. Monitor / Silence Alarm Panel Verify fire pump is operational
SEARCH/RESCUE 2 Engines or Engine/Rescue Squad	Search all stairwells, starting with dirty first Search common areas Search fire floor/ Apartment involved Search two floors above, two floors below, and top floor
TRUCKS 1st and 2nd Truck	**If incident above aerial reach** Supplement Support function **If incident within aerial reach** Consider exterior aerial use for rescue. Flying standpipe or transitional attack \\PPV of stairwells
RIT 2 Engines or Engine/Rescue Squad	Report to floor below fire floor. Check layout and egress Set up RIT line, connect to standpipe on floor below the attack connection
SUPPORT Remaining crews	Report to Command Post for assignment. Utility Evacuation
EMS 1 Engine with Medic Unit EMS Supervisor 122	Report to three floors below fire floor Establish Triage / Treatment area Establish Rehab
COMMAND 2 Battalion Chiefs Safety Officer 134	First arriving Chief establishes Incident Command. Second arriving Chief establishes Operations Sector 134 establishes Safety Sector and fire floor accountability

Wind Impacted Fires

Considerations of wind impacted fires are of critical importance in the high-rise incident. Window failures of the involved unit or units coupled with as little as a 10mph wind have been proven to have substantial impact on fire growth and extension *(see Vandalia ST. NIOSH Report)*. Alternative tactics must be deployed when faced with window failure, heavy fire, and wind driven fire conditions.

Wind driven fires can be recognized by any of the following indications:

1. Picture frame of fire: A failed window in a wind driven fire will often appear as a “picture frame of fire” with little to no smoke or fire venting from the opening. An occasional star cluster of fire or puff of smoke may escape however, the force of the wind against the window will pressurize the opening allowing little to no escape of the products of combustion.

2. Horizontal Smoke: Smoke that is venting from the failed window will flow horizontally away from the opening instead of upward.

3. Pressurized Smoke from fire apartment, stairwell door, or hallway door: Smoke that is under pressure noted around the door frame of the involved unit or stairwell door.

When the fire is beyond the control of initial attack methods, such as a wind driven fire, the following options are available for consideration:

- Consider exterior master streams, such as deck gun, blitz nozzle, or aerial ladder trucks.
- Operate interior master stream appliances into the fire area from the stairwell on the fire floor.
- Consider deploying an exterior Bresnan nozzle if fire is contained to a single apartment. The Bresnan nozzle could be lowered into place from 2 floors above, or over the roof line if conditions permit.

Recon/Attack Group Operations

The Recon/Attack Group will ascend to two floors below the reported fire floor utilizing the safest and most efficient means. Upon arrival to two floors below the reported fire floor, the team should assess for suitability of a Staging area. It should be clear of smoke and an area large enough for tools, equipment and personnel that will soon occupy it.

An officer and a small group of firefighters will form the Recon element and ascend to the fire floor. The remainder of the Recon/Attack Group will prepare the initial attack line and await orders from the Recon officer.

Once the fire floor has been identified, the Recon/Attack officer will formulate a plan of attack and brief the Recon/Attack group. Three critical pieces of information must be obtained and relayed to the Incident Commander:

- **What are the conditions (size up)?**
- **What floor/ floors the fire is on**
- **What room/ rooms are involved**
- **How much hose will be required to extinguish the fire and protect adjoining units.**

The Recon/Attack group will hook up the attack line on the floor below standpipe connection, charge the line, and ensure proper standpipe pressure, minimum of **65 PSI** is achieved prior to entering the fire floor.

- Standpipes will be chosen by proximity to fire and the stairwell *(see Appendix 8 “Recon/Attack*

Group"). Standpipe should be tested and flushed before committing to it. The connection area needs to be a safe zone therefore, the floor below method will be utilized.

- Standpipes not located in a stairwell should be avoided due to potential for changing fire conditions with hose lines not leading to an area of egress. These lower interior standpipes can be used for overhaul operations.
- The Floor Below stretch should be utilized for hose deployment.
- Stretch the hose using as much of the floor below hallway as possible avoiding piles of hose in the stairs or landing.
- If possible, firefighters should be on each landing, to ensure the hose is stretched evenly using their body weight as it's being charged to help keep it from jarring out of place.
- One firefighter shall be assigned to monitor standpipe operating pressure and door control on the fire floor.
- The remaining personnel will operate and advance the attack line under the direction of the Recon/Attack officer.

Before advancing to the fire, you should take into consideration the possibility that occupants may be in the attack stairwell. The stairwell should be checked before opening the door to prevent exposing occupants to fire or smoke. Victims are often found at the top of stair wells as they seek refuge from smoke in the closest direction of perceived safety. Once you have opened the door and taken a line in with you, the stairwell door will no longer close and the stairwell may become filled with smoke. It may be necessary to delay entry to the fire floor until the stairwell above is clear of people.

Lobby Sector

This sector is the gatekeeper of the High-rise firefighting process. It will begin small and eventually grow into its own major operation with additional crews assigned as the extended attack evolves, especially if multiple fire attack bases are in operation. While monitoring the fire attack channel and using it when necessary, Lobby may ultimately require its own radio channel to coordinate with interior and exterior staging along with Command on matters of logistics.

- **Fire Alarm Control Panel:** Silence alarms so to facilitate communication on the fire ground, and make an announcement through the PA if applicable. As the fire progresses, ensure the FACP is monitored when staffing permits. After audible/visual alarms are silenced, any new alarm detected should reactivate audible/visual alarms, prompting Lobby Sector to investigate FACP.
- **Fire pump:** Determine if the fire pump is running and what the system's designed churn pressure is. Churn pressure is the pressure a fire pump produces when it's operating but not delivering water, essentially at zero flow.

- **Elevator banks:** All elevator cars shall be recalled to the ground floor using firefighter elevator keys. Elevators shall be cleared for use on a consistent basis. Each car that will be used to shuttle personnel or equipment will have an operator with knowledge on how to use it during fire operations, be in turnout gear and SCBA, radio, forcible entry tools and dry chemical extinguisher. No elevator shall go above the interior staging floor. Elevator operators will assure all occupants have checked in with Lobby accountability before transporting them up into the building.

Lobby will coordinate arriving companies and maintain accountability for the entire structure. In order to document all who enter and all who leave, Lobby must control egress points. To do this they will require an Entry/Exit officer. It is understood this will be a daunting task at first, but as the incident progresses, it must be maintained. Firefighters need to be self-aware and check in and out without skipping this process. While accountability will be a TFRD role, Entry/Exit control can be maintained by TPD personnel. They may also assist with civilian evacuation.

Lobby may be assisted by a civilian liaison. Building maintenance and managers know their building, its layout, public address system, and civilian occupancy. They have master keys, floor plans, and information to assist us. They understand their fire suppression systems and can help the IC understand if they are functioning properly. They can contact outside entities such as HVAC operators or electricians if power outages affect fire protection systems.

Lobby will need to gain control of the building's public address system, if one exists, to communicate with the civilians still in the building. It may be used to direct them to shelter in place depending on their location, or exit by designated evacuation stairwells from the building.

Finally, Lobby will also be the initial resource area. This will be the equipment staging area that needs to be transported up to support the fire attack. A Resource officer will be assigned to account for this and coordinate its transport up to interior staging. Attention must be given, if there are multiple fire attack bases, to assure proper logistical lines. Depending upon the size and scope of the incident, a Chief officer must be considered for taking command of the Lobby operation.

The Forward Operating Base (FOB)

In the military, an FOB is used to support tactical operations without establishing full support facilities. The heart of an FOB in the fire service application is its staging area which will support and supply an extended fire attack in the immediate fire area.

The FOB staging area should have fresh crews in place to be rotated with working crews. The objective of this is to maintain a constant application of water on the fire.

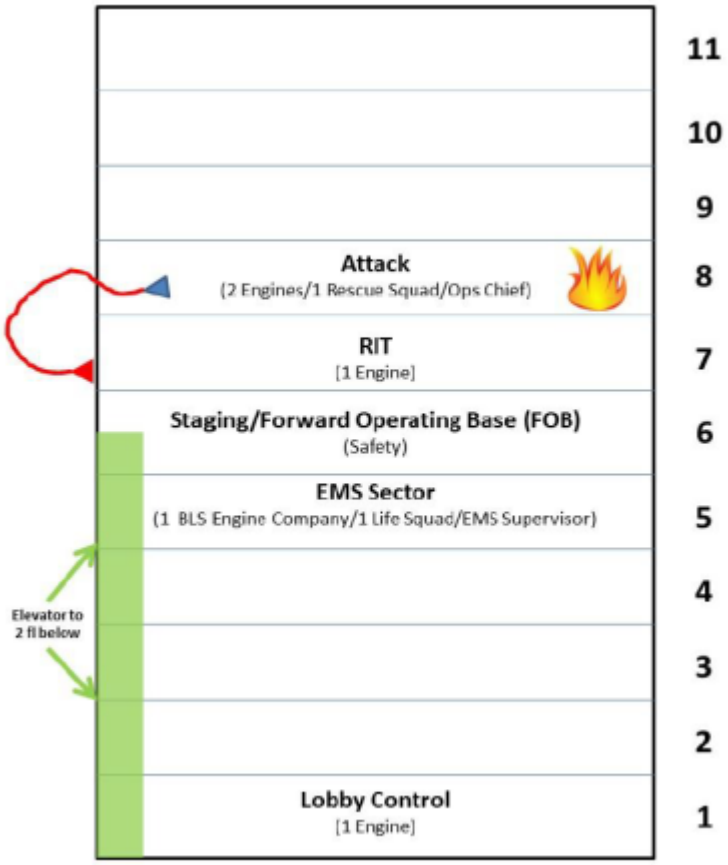
- A minimum of three Engines and a Ladder support unit is recommended.
- No one should come to staging empty handed.
- A supply of SCBA bottles should be made available, enough to maintain the sustained attack and overhauling stage, or until the atmosphere is considered non-contaminated by FOB Safety.

Once Recon/Attack has informed Incident Command of the lowest involved fire floor the remaining crews will populate the functions at the Forward Operating Base (FOB) prioritized by the Incident Commander to fit the situation.

According to the graph below, the highest attack floor firefighters are operating on through the staged EMS sector is the totality of the FOB. Any additional attack line in a separate stairwell shall have their own support FOB. If multiple FOB's are required, each shall be given a unique name designation.

The 2nd arriving Chief will report to the interior staging area and after being briefed by Incident Command will supervise attack and oversee the FOB. If there is more than one FOB there shall be a Chief FOB Commander overseeing each, along with their own Staging, RIT, EMS, and Safety sectors in support of each separate attack area. If the FOB becomes too large for appropriate span of control for FOB Command, a Base Manager should be considered.

The Forward Operating Base (FOB) Graph



Command Aide

Immediately upon the confirmation of an extended fire attack in a High-rise fire, NFPA 1710 codifies the use of Command Aides.

- Incident Command Aide; will assist the Incident Commander in the CP in any way the IC deems necessary such as tracking crew and rig locations as they are assigned.
- FOB Command Aide; will report to the interior staging area and assist the FOB Commander with accountability and supply lists.
- FOB accountability shall include; all names, crews and availability for assignment in the staging area.
- Supply list shall include gear and equipment in the staging area.

The Chiefs can appoint them as they see fit by personnel available.

Safety Officer 134

A Safety Officer shall be assigned per FOB. They shall function as outlined in the Emergency Procedure Manual C-58 for Incident Safety Sector Officer. For a High-rise incident, they shall have some extra responsibilities.

- The Safety officer will ascend to the Staging floor utilizing the safest and most efficient means in full SCBA and turnout gear.
- The Safety officer shall track accountability on the fire floor.
- The Safety officer is responsible for ensuring that personnel are moved, controlled, and supported in a safe manner.
- They will use the CGM to monitor the air of the FOB and stairwell areas.
- Assure a safe corridor between FOB and Lobby.

Safety 134 can be where they see fit within their FOB and shall consult with FOB Command. Interior Safety Officers should have another firefighter accompanying them, so they are not alone in a fire environment and assist with accountability.

RIT Operations

RIT shall function as outlined in the Emergency Procedure Manual C-82.

- While the initial RIT team will most likely be a single engine, command should strongly consider adding additional crews and forming a RIT group as soon as possible.
- The RIT Group will assemble their equipment and ascend to the staging floor utilizing the safest and most effective means.

- The RIT team shall stage one floor below the fire floor.
- A 360 survey may be extremely difficult to complete. Noting similarities and difference of floors and their layouts from the ascension would be prudent.
- Once in place the RIT officer shall discuss with Command and Safety any pertinent concerns, firefighter locations, and fire floor layout as best as possible.
- The RIT Group should verify and match the total length of hose used by Recon/Attack and add 50’ so that it can be attached using the same riser, on the floor below the Attack connection.

If additional RIT staffing is deemed necessary they will be under the direction of the preexisting RIT officer

EMS Sector

The EMS sector shall establish a Triage and Rehab area **three floors below** the fire. This sector will consist of one medic transport, one Engine, and an EMS supervisor such as 122. Extra staffing to bolster this complement is to be considered by the FOB Commander based on the demands of the incident.

- EMS personnel will be fully equipped in their PPE and SCBA and bring up all required ALS equipment. As control of elevators may be lost due to fire, smoke, or water entering the hoist way, stair chairs, scoop stretchers, and mega movers are recommended for evacuation of ill or injured civilians or firefighters.
- FOB EMS will be in contact with Lobby to coordinate transport of patients from the FOB to Lobby and on to the staged transport area.
- Fire crews that need Rehab shall report to the EMS floor. This function will be set up and run in accordance with Emergency Procedures, Firefighter Rehabilitation C-85.
- Once a committed crew has worked through a bottle they, as a crew, shall report to the EMS level for rehab.
- Once cleared by rehab, they shall return to the staging area for reassignment.
- They shall do this for two bottles, where after their 2nd rehab, they shall be rotated outside the FOB to exterior staging for an extended break and resupply before reassignment.

Advancing the Fire Attack

The actual fire attack can begin once the line is charged and the effect of leaving the stairwell door open has been assessed. Keep the fire attack simple, apply firefighting basics to locate, confine, and extinguish the fire while maintaining orientation.

The fundamental tactical objectives are the same whether you are fighting a fire in a High-rise Office or a High-rise Residential building.

- Forces should be directed towards protecting the hallways, corridors, stairs, elevators and other vertical openings while pressing the attack. Protecting these will prohibit vertical spread and aid in evacuation efforts.
- Use the TIC to assess building features, fire and heat movement during the attack.
- A defensive posture can hold the fire line until a second line can be put into operation to support an offensive attack.
- Use the hose stream to displace ceiling tiles as you advance. This allows for a visual of the plenum/cockloft.
- Proactively cool the upper areas, as high heat conditions are encountered during nozzle advancement, as well as direct the stream to the floor and side to side. This will allow for a sustained push, clear debris and reduce probability of flashover.

Any subsequent handlines stretched after the first may be positioned in a wide variety of locations depending on the needs and problems at a fire. At most operations, this second or Back-up line is positioned directly behind the first line in support of the Attack, following the path toward the seat of fire. The backup line is best attached and stretched from the floor below where the attack line was hooked up when the outcome of the fire is still uncertain. In an FOB, this will be the staging area floor. I.e.: If the attack line was hooked up on the 14th floor, then the backup line will be hooked up on the 13th floor. By hooking up to the floor below the attack line, we have some degree of redundancy. The downside is this requires an additional length of hose. When the fire has a more definitive outcome one can hook up the second or more lines where circumstances dictate or allow.

Circumstances will dictate specifically where the second line should be placed. In a residential high-rise with a common hallway the Back-up line should in most cases be directly behind the first attack line up to the point of entry. On the other hand, a commercial high-rise building might require something slightly different. Large open areas may require two lines to attack. If this is the case, they should be positioned in such a manner that each line could cover the other hose team if need be. With center core construction, each line may be sent in separate directions around the core, keeping in mind the potential for opposing streams when they wrap around and meet each other. Or, one line could create a static defensive position protecting the other hose crew while they roll up the fire around the core. Again, conditions will inform the tactics depending on the needs and problems of the fire.

It is imperative one or two floors above the fire floor are continually monitored for vertical fire spread and ensuring ventilation hatches in the stairwell are the way they should be.

Always keep the Incident Commander informed, especially when a sudden change of plan is needed. Concise, actionable Interior/Exterior communications will go a long way toward the interior and exterior crews helping each other coordinate the incident.

Support Group

The Support group is the next wave of firefighters to support the attack as shown in the Graph on page 8. It is the balance of the 1st High-rise alarm that is not a part of the Recon/Attack Group, water supply, or Lobby along with the arriving 2nd Alarm.

Command can assign the Support Group to conduct:

- Search missions
- Evacuation
- Check Extension
- Forcible Entry
- Overhaul
- Whatever 'The Job' may call for

Support Group must be attentive to radio traffic and have situational awareness to assist the outcome of the incident. They shall report to Lobby with their gear and check in with the Accountability officer in preparation for assignment by the IC.

- If assigned to the FOB, the Support group shall ascend to the Staging floor utilizing the safest and most efficient means.

- Upon arrival, they shall check in with the FOB Command Aide for accountability purposes and then await assignment.

HVAC Systems

Ventilation systems can be a primary concern for fire and smoke spread if not handled correctly.

- Shut down the ventilation system. It is necessary to prevent the spread of smoke causing intensification of fire.

- HVAC systems may have the ability to assist in removing smoke from affected areas of the building however, this should not be attempted without coordination and assistance from a building representative.

Ventilation and Truck Considerations

Due to the concerns of wind driven fires the use of horizontal ventilation via open windows or pressurization with positive pressure fans should not be taken lightly. This must be in coordination with FOB Command and Incident Command. Premature ventilation may cause conditions on the fire floor to be detrimental to firefighting efforts.

In older buildings, horizontal ventilation can be accomplished by opening windows. This should be accomplished via the windows on the leeward side (side the wind is not coming from) first and then the windows on the windward (the side the wind is coming from) side. Any attempt at ventilation using windows should be tested one to two floors below to determine the effects of the wind.

In newer buildings, windows must be broken. If this is necessary, use an axe to glaze the window and then a pike pole to pull the glass into the building. Prior to breaking the window, personnel and bystanders must be cleared from the area below. Coordinate this with Incident Command. Once a window has been broken the options to recover the opening are limited therefore extensive coordination with command is paramount. Also, many newer commercial buildings have floor to ceiling windows. Caution must be used to mark a broken vent window to avoid a fall hazard.

The initial attack stairwell must receive positive pressure ventilation; the Truck PPV can be used to pressurize a stairwell. It must be remembered that pressurized stairways do not remove smoke from the floors or hallways. It should be enough to negate the movement of heat and smoke into the stairwell. Ideally, evacuation stairwells should be pressurized as well.

If the stairwells are contaminated, a team can be assigned to the top floor and roof area. They are to open the hatch or roof door in coordination with a fan at the base of the stairwell activated. All other doors to the stairwell shall remain closed during this smoke removal period. Opening the door at roof level of an unpressured ventilated stairwell will increase the draft of that stair shaft. It will draw the fire, heat and smoke in the direction of that stairwell. When conditions are favorable, and authorization is given to vent in this manner, this top ventilation should improve conditions on the upper floors. The roof team will confirm when the stairwell is clear and then confirm when the door or hatch is closed. The stairwell will now become pressurized.

Structures taller than **15 stories** should utilize an additional fan **five floors below** the fire area. The fan would be in the hall or occupancy with the force of air directed into the stairwell. This will enhance the pressure throughout the height of the stairwell. *(See also Appendix 12)*

Salvage

Salvage operations are universal. In the event of a fire in a High-rise building, salvage operations will begin on the fire floor as practically as possible. The next area will be the floor below the fire floor. Water runoff from the fire floor can be removed down an unused stairwell or possibly down elevator shafts. Tarps should be brought up to interior staging. Computers, personal items and sophisticated office equipment should be given priority in protection.

Extension / Overhaul

The following guidelines pertain to overhauling High-rise fires:

- Begin overhaul only after approval from Incident Command.

- Check concealed spaces for hot spots. Pay attention to the ceiling tiles and the plenum above. Suspended ceilings hide structural areas, utility chases and air handling systems. This presents areas where fire can spread undetected.
- Elevators will likely be safe to operate at this stage of the fire. It should be remembered that NO material that could rekindle be put in an elevator for transport outside.
- Any smoldering material shall be completely extinguished in the area where it lays.
- If the fire is knocked down, and the overhaul stage has begun, it is ok to hook up 1 ¾" line, provided it has a smooth bore tip, to assist in the overhaul.

Communications

Communications will be problematic during a High-rise fire. In the event of an advanced fire, it may become necessary for Command to designate an officer to oversee Communications. It shall be the duty of the Communication Officer to find alternate methods of communication between on and off scene units.

- Radio traffic will be kept to a minimum, with brief actionable reports.
- Use face to face as often as practically possible, convey important accountability and tactical decisions on the air.
- In a large incident, Lobby will need its own channel.
- If the Incident Commander splits off the Operations function, they will need a separate channel.
- Staffing the EOC should be a consideration dependent upon the size of the incident.

Appendix 1

Pre-planning, Drilling, and Alarm Systems

Officers and crews should become familiar with the features of High-rise structures in their companies' district. If a preplan is available for any High-rise in your first alarm district, you should become familiar with the sections that deal with standpipes, sprinkler connections, stairwell locations, mechanical equipment rooms, elevators, fire protection equipment, annunciator panels, and ventilation possibilities.

High-rise training drills should be conducted regularly to allow firefighters and command officers the opportunity to become familiar with the High-rise firefighting operations. Drills should cover these important areas: incident command, firefighting and tactics including water supply, elevator operation, large area search, evacuation and management of occupants.

Appendix 2

High Rise Hose Pack and Bag

We will be using 50’ lengths of 2 ½” hose.

They will be stored in a flat load configuration with three straps to hold it in place.

It is suggested they are carried over your SCBA for ascent to allow for a hands-free carry.

The High Rise hose bag will contain the following items:

- 2 ½” smoothbore nozzle with 1 1/8” tip
- 45° elbow
- Inline pressure gauge.
- Lightweight wrench
- Spanners
- Door chocks and Spring clamps

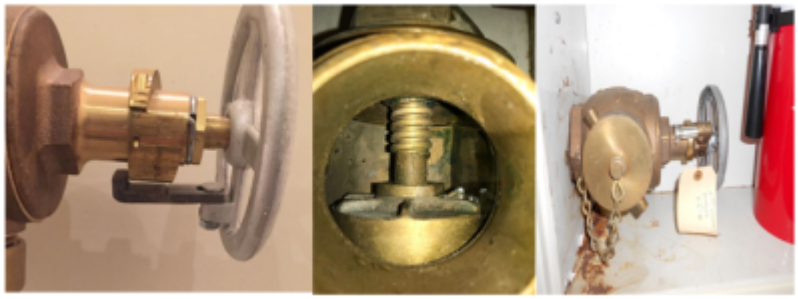
Appendix 3

Stand Pipes, PRD, PRV, and Fire Pumps

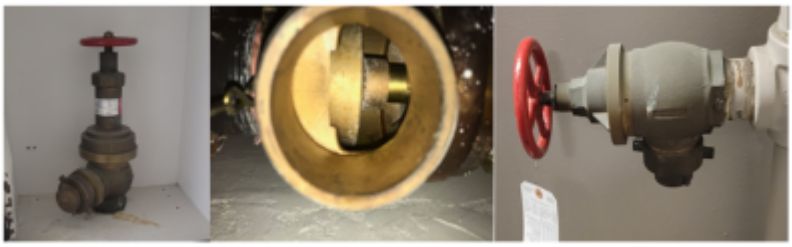
Courtesy Fire Engineering

“Most standpipe systems are designed for at least 500 GPM and often 750-1,250 GPM. These volumes represent the number of hose lines that may be required to extinguish a fire in various occupancies. The largest flow designs apply to buildings that are not sprinkler protected, or where we can expect fire to quickly develop, especially in open-floor-plan office and professional occupancies. Residential occupancies generally have lower flow designs partly because of the compartmentalized design of the floors with fire resistance rated assemblies between units and the corridors. That is not meant, however, to diminish the need for reliable hose stream support when operating off a standpipe in a residential occupancy, particularly in older buildings that do not have sprinkler protection.”

Standpipe Outlets/Pressure Restricting Devices PRDs



Standpipe Outlets/ Pressure Reducing Valves PRVs



Fire Pumps

As noted in Lobby Control section, the driver of 1st due engine that assumes Lobby Control should identify the **churn/fire pump pressure** in the pump room noting if the fire pump is running or not. If Lobby Control cannot complete this, they should designate a member to perform this task.

When observing the pressure on the fire pump controller, usually a gauge located near bottom of controller, should provide the fire pump pressure of the system. The fire pump pressure may also be identified on signs near FDC location, sign on fire pump controller, or on the stamped plate on the pump housing (churn pressure). This information must be relayed to Water Supply, so that in the event of fire pump failure, the driver knows what pressure to supply the FDC. Higher pressure systems will require ***Tandem Pumping*** to match fire pumps pressure.

Churn Pressure: is the maximum pressure a fire pump can produce when it's operating at its rated speed but not discharging water. Fire pump pressure is the pressure of the pump while it is running and flowing water through standpipe or sprinkler head activation. When checking the fire pump to verify its pressure, the churn Pressure and Fire Pump Pressure may be slightly different. Keep it simple, pump at the observed pressure at fire pump controller gauge whether the pump is running or not. This should be reported as “Fire Pump Pressure” to Water Supply.

Pressure Reducing Devices (PRD) and Pressure Reducing Valves (PRV)

Larger occupancies may have fire pumps that require greater operating pressure to reach remote standpipe connections. The standpipe connections closets to the fire pump often require PRD’s or PRV’s to lower the outlet pressure of the standpipe to a more manageable pressure.

Pressure Reducing Device (PRD): These devices only ***reduce flow pressure***; they have no effect on static pressure in a system that is not flowing water. They usually consist of a reduced orifice or adjustable orifice/baffle on the discharge side of the outlet. Some of these are adjustable, and others can be disabled by a firefighter at the riser via a pin or, simply removed. Remove them when connecting if possible, so the full outlet pressure can be utilized and gated.

Pressure Reducing Valve (PRV): These devices operate by using ***an internal spring*** that is calibrated to open a restricted amount when a given pressure is applied to them. It is important for responding crews to know that systems using these devices are engineered to work correctly (*correct PSI and GPM flow*) only when a ***specific pressure*** is achieved throughout the system. In other words, if the correct pump operating pressure is not achieved, the proper PSI or GPM of water flow will not be achieved on any floor. This typically cannot be defeated or adjusted in the field, nor can they be used to supply the system when employing an improvised FDC (***PRV's act as a check valve when pressure is supplied backwards into the outlet***).

Final thoughts

Various occupancies may be equipped with wet standpipes, dry standpipes, or automated systems that charge the standpipes through integrated alarm systems. Some systems feature standpipes only, sprinklers only, or a combination of both, which may be supplied by a dedicated fire pump or operate off the residential water supply. Fire Department Connections (FDCs) may also be designated for standpipe-only, sprinkler-only, or combination systems.

NOTE: Pre-incident planning is essential to understand these configurations before an emergency occurs

---

Appendix 4

FDC, Improvised FDC, Improvised Standpipes

FDC (Fire Department Connection) are designed to allow an engine to supply water pressure to the building's standpipe, sprinkler system, or a combination of the two (combined standpipe/sprinkler system). A standpipe can be either wet or dry, and classified as automatic, semi-automatic, or manual, depending on how the water is supplied to the system. There are occupancies that have a fire pump, and occupancies that operate off of residential water supply. Preplanning and having the information on the MDT will be a necessity to understand our capabilities before the incident even begins.

Improvised FDC: Remote Fire Department Connections (FDCs) may be prone to failure, while wall-mounted FDCs can be obstructed or have damaged fittings. In such cases, establishing an improvised FDC can serve as an effective supplement to the standpipe system. One method involves connecting two 3" lines from an engine to the first-floor standpipe outlet using a gated "Y." ***This approach is viable provided the standpipe does not incorporate a Pressure-Reducing Valve (PRV)***. Engine operators must identify the designed system pressure and pump as closely to it as feasible.

Improvised Standpipe: If an issue is found within the standpipe system that prohibits its use, several options are available to overcome this obstacle.

- **Window Stretch:** A “window stretch” in standpipe operations refers to a technique in which a hose line is deployed from a window of the structure to a pumping apparatus positioned at ground level. This can be executed by either dropping hose lengths directly from the window or by lowering a rope bag, securing it to the hose line, and then hoisting the line to the desired floor.

- **Well Stretch:** A “well stretch” refers to a method of efficiently deploying a hose line vertically through a stairwell by utilizing the open space between stair flights, commonly known as the well-hole. Rather than placing the hose line directly on the stairs, it is suspended within the well-hole, which minimizes the amount of hose required and facilitates quicker advancement during operations. Typically, if a gloved hand fits in the well, a 3” hose a well stretch is possible.

- **Flying Standpipe:** *This is the least preferred option for alternative standpipe solutions, as the aerial apparatus used for deployment becomes unavailable for any other fireground operations*. The flying standpipe operation includes the use of a tower ladder that possesses a discharge outlet in the platform. To perform a flying standpipe operation, apparatus must be positioned so the aerial ladder can be raised in a position where the hose line stretch and advancement operation can be performed. In the case of a building, this position will be the floor below the fire in a location near a stairway that can be used by the firefighters to access the fire floor.

Appendix 5

Building Design Features

Courtesy of Chief Jerry Tracy and Asst. Chief David McGrail

“The most common framing systems used for High-Rise buildings utilize either concrete or structural steel as the basis for forming the building skeleton. Both types of construction use vertical interior and exterior columns to which the horizontal support girders are attached. The girders span the horizontal distance between the columns and are used to support structural beams. These girders and beams will in turn support the floors. Although there is a difference in the materials used for the structural elements in a reinforced concrete or steel structural frame, they perform the same function of support.

Construction designs for High-Rise buildings are usually based on the concept that structural integrity of the building must be sufficiently maintained through any potential fire. In keeping with this concept, the principal components that comprise a High-Rise structural frame are required to have a high degree of fire resistiveness. Under prolonged exposure to sufficient heat, it is possible that failure of components could occur.

The building “Skin” is considered the exterior walls and windows. In the course of construction, once the frame and floors of a structure are complete, the skin is now mounted to protect the spaces from the

elements and weather. As the structure comes together it will now contain the products of combustion should a fire break out within the confines of its spaces.

The exterior walls of modern High-Rise buildings are usually lightweight, prefabricated walls. They are non-load bearing and referred to as curtain walls. A complete curtain wall consists of a panel with finished surfaces and a means of attaching it to the building frame. The most common method of attaching curtain walls to the building is by bolting them to clips that are attached to the structural frame or floor slab. This space between wall and structure is an avenue for extension.

Generally, stairwells in High-Rise buildings are usually built into the core and may be supplemented with additional stairwells on the outer perimeter of the structure, based upon the requirement setting limits for a specific distance of travel to each exit. This will vary depending on the occupancy type of the building. Stairwells and exits in High-Rise buildings are not designed to handle the total occupant load simultaneously. Additionally, the number of useable stairwells may be reduced by heat, smoke or fire department operations. This is one of the main reasons that total evacuation of building occupants during a High-Rise fire can be impractical.

There are two basic types of stairs, the return-type and scissor-type stairs. Return-type stairs entry and exit is made from roughly the same location on each floor. While scissor-type stairs consist of two separate sets of stairs, which cross each other within a common shaft. In this type of stair arrangement, the stair access point for each set of stairs in the shaft is at opposite locations on adjacent floors. Some scissor type stair arrangements will only service alternate floors with each set of stairs in the same stair shaft.

Center core building design features an office or living area surrounding a “core” containing stairwells, elevators, and utilities. The fire can wrap around the corridor and behind crews on hose lines. This situation can also occur in large open areas around the core. If the potential for this exists, operate two lines; one to attack the fire and the other to prevent the fire from wrapping around the core.

Some High-rises in Toledo have an exterior curtain wall of glass and/or aluminum. In some cases, there is a gap between the main structural frame and the exterior curtain wall which can be a path for vertical fire spread. It is this and auto-exposure, or exterior lapping of fire to the floor above, are the main means of fire extension that should concern fire forces and be scouted for early and often.

Split bank elevators are elevators where separate shafts serve differing levels of the building. One Government Center has this type of system. One services floors 3 through 13 and a separate bank services floor 14 through 22. The section from the ground floor to the 14th floor for that bank is called a blind hoist way. For example, a fire above the 16th floor would require Recon to assure the safety of its use; however, the bank that services floors 3-13 could be used to the 13th floor and then firefighters could walk the rest of the way up to staging and the fire floor.”

Appendix 6

Command Posts

The IC is responsible for determining the most advantageous position for the command post. Generally, the lobby of the involved structure or a location outside of the structure is chosen. Once the command post has been designated it should be communicated to all members on scene.

Locating the command post in the lobby has advantages such as immediate access to security, management personnel, information, and the Lobby function. Radio traffic will be minimized with this location allowing the IC to focus communication with FOB Command. This is best in a smaller incident. A larger incident with crowds of staged firefighters and evacuees, communication will be made difficult due to the noise and tumult, making an interior command post a much less beneficial choice.

The exterior command post has its own advantages. This includes the ability to monitor the exterior of the building allowing continual evaluation of the fire along with interagency communication ease. It will be much easier to interact with them at a clearly marked exterior command post. When choosing an exterior location look for the most convenient, advantageous, and safe location with at least two sides of the fire building in sight.

Newer High-rise buildings are sometimes equipped with a Command Center, which is usually near the lobby. This is often the ideal command post location, as these centers often provide excellent communications, video feeds, and the needed work space for command activities

---

Appendix 7

Evacuation

Success in clearing a building in an emergency can be expressed in two variables: **the amount of time needed to evacuate and the time available to them to do so**. Depending on the time of day and if the structure is a commercial or residential High-rise, evacuation could vary from a simple task to a complex and challenging situation. As soon as possible the IC must begin evaluating the needs for accomplishing evacuation.

If it is a large incident, numerous floors may have already begun self-evacuating. This may cause a mob scene of excitable people. While the Recon/Attack Group assembles to ascend, they and Lobby should be gathering information about the fires location using the resident’s knowledge of the building to direct the firefighters. Once Recon/Attack has determined an attack stairwell, it must be declared to the Incident Commander and be secured for both pressurization and ease of fire work. Ideally, this stairwell should have roof access for ventilation purposes. Lobby should then use the PA system to steer evacuees to the remaining stairwells dedicated to evacuation. An **Evacuation Stairwell Team** may need to be dedicated to directly manage these stairwells and the occupants within them.

Any attempt to totally evacuate one of these buildings would severely and negatively affect fire

suppression operations.

- The fire floor hallways and common areas must be searched and evacuated as soon as possible. A closed door on the fire hallway will be considered a place of refuge and will not be opened unless a specific life safety concern has been identified.
- Search and evacuate the two floors above the fire and then two floors below.
- It is understood these actions can only be accomplished as the resources of firefighter's available permit.
- An evacuee staging area safely away from the incident must be established.
- Occupants should be monitored and directed by TPD.

Once occupants have assembled, begin to create a roster of these occupants to determine who has been accounted for. This roster should include their name, what floor they were on, and the time they arrived at the evacuation area.

Appendix 8

Recon/Attack Group

The Recon/Attack group is arguably the most critical position on the high-rise structure fire. This group not only is the first to have eyes on the involved portion of the incident, they are responsible for gathering critical information that will shape the direction of the fire attack. The duties of Recon/Attack group can be simplified into four main objectives:

- **What are the conditions (size up)?**
- **What floor/floors is the fire on?**
- **What room/rooms number(s) is/are involved?**
- **How much hose is needed to extinguish the fire and protect adjoining areas of involvement?**

These four pieces of information relayed to the IC and remaining attack group members will indicate which stairwell will be best utilized for standpipe connection and subsequent hose deployment.

In order to accomplish the previously stated four objectives, Recon/Attack should consider the following strategies. When entering the fire hallway, the Recon team should stop at the hallway door and determine if it is tenable for advancement. If high heat or charged smoke is encountered, the hallway

door is considered a hard stop and the Recon team should cease advancement until a charged hose line is available. If light smoke and low heat is encountered, the Recon team can advance down the hallway to attempt to locate the fire unit. Be advised that when the firefighters advanced down the hallway at the Vandalia fire, **they encountered light smoke**, moments later they were overcome by high heat. A water can is a means of knocking down a small fire in the incipient stage, it is by no means protection for our members advancing down a hallway. This type of fire requires intelligent firefighters making intelligent decisions while balancing risk versus reward. Keep in mind that occupants protecting in place are typically safe when in an apartment with a closed door.

When the fire unit is identified, the extent of the fire's progression should be determined. Before forcing entry to the suspected fire apartment, it is imperative that crews force a door **on the same side** of the hallway as the fire unit so that if fire blows out the door and it cannot be shut, crews can evacuate to the relative safety of another apartment while awaiting rescue (area of refuge). Considering modern fire research and how flow paths can affect fire ground operations, doors should be damaged as little as possible to open the door. If the progression is beyond the capabilities of a water can the Recon team should retreat from the unit and maintain door control, in the closed position, to deter smoke and fire extension into the hallway. Door control can be achieved by attaching webbing to the door handle, effectively extending its reach. This technique enables firefighters to maintain control of the door while positioning themselves to the side, rather than standing directly in front, thereby enhancing safety during operations. The room number should be determined and relayed to the IC.

As the Recon team is returning to the attack stairwell they should make every effort to estimate the amount of hose packs that will be needed to reach the fire unit. This can be accomplished by counting the number of walking strides from the fire unit to the closest stairwell. This number, multiplied by three, added to 100' will provide an estimation of the required packs. For example, if the fire unit is 16 strides away from the stairwell, that is approximately 48'. Add one length for the floor below stretch (50') to the standpipe and one length for entry into the fire unit (50'), and you have 148' equaling three hose packs. Conversely, the remaining members of the Recon/Attack group who are staged at the floor below may walk the floor below and conduct the estimation based on the room number that was ascertained by Recon.

Appendix 9

Search and Rescue

First arriving crews must identify who needs rescue and who doesn't. There will be those who are in critical situations needing immediate rescue and those who are not directly affected by the incident. While advancing down the hallway a primary search should be conducted of the hallway and any open doors of the fire floor. A closed door will be considered an area of refuge for the occupant and should not be opened in this phase of the operation. Utilization of the "snowplow" method for searching the fire hallway will facilitate a hasty primary search.

The following three tasks are the most important Search operations at a High-rise fire in order of importance:

- The attack stairwell up to the roof must be cleared. Some buildings have automatic locking doors and people may become stuck in the stairwell above the attack.
- The fire room, hallways, common spaces of the fire floor, open doors on fire floor.
- Search of remaining stairwells, search and evacuation of the two floors above the fire and then two floors below may also be required.

Search, in any of its forms, must be based on a solid action plan that incorporates sectoring and accountability of all team members. Search teams need to have a backup rescue/removal crew in place. It must be decided, depending on the situation and goal, that if the searchers are to remove the victim or if it will be the job ancillary crew. Coordination with a hose line for protection is highly recommended.

Residential Occupancy Search Deployments

If smoke and fire get out into the hallway we will have no choice but to try and protect the affected occupants in place until IDLH conditions have subsided or until we can access these apartments and complete a search. All efforts should be made by search crews to isolate the fire room by closing the hallway door. This operation not only buys time for the search crew and potential victims but it may prevent a blowtorch effect from overtaking the search and/or attack teams.

Ultimately, all areas of the affected fire floor will need to be searched after the fire has been contained. Forcible entry may be required. Having a master key before starting the search operation would be very helpful, but should not be counted on. If we want to maintain the ability to protect the occupants and our firefighters during search, we must be able to reclose the door behind us.

Consideration must also be given to mark already searched areas. It can be done with grease pens, paint stick markers, scene tape, an “X” in the door made with your axe, commercial door search markers or large crayons. Whatever is being used, crews should know going into the assignment what it is and have the ability to create the marks themselves.

Final Search

With High-rises, Low Rises and large Commercial structures, Search should have an added third phase. We are all familiar with the Primary Search, a quick and thorough as possible search during initial fire conditions, and the Secondary Search, a slower more deliberate search as fire conditions have improved. In these cases, a Final Search is needed. This Final Search is a redundancy that should be conducted as a Secondary Search after the incident is well in hand. It assures that absolutely no occupants have been left unaccounted for and a final confirmation of no hidden fire anywhere in the building.

Combustible Gas Meter (CGM)

All areas of the structure affected by the incident should be thoroughly inspected using the CGM prior to allowing residents to reoccupy their dwellings. Particular attention should be given to the fire floor, the two floors above it, and the top floor. This is especially critical if positive pressure fans were used within the interior during operations.

Appendix 10

Elevators

The TFRD shall not use elevators that are not equipped with Fire Service functions, freight elevators, or those not secured by TFRD personnel during a potential fire incident (such as commercial fire alarms or high-rise emergencies). Personnel must utilize elevator keys, ensure proper evaluation, utilize Phase 1/Phase 2, and perform operational checks before ascending.

Ensuring a proper evaluation requires checking the hoist way for smoke, water, or fire using a flashlight and Thermal Imager looking above and below through space between the car into the hoist way. Operational checks will be discussed further below in “Phase 2 Car Capture”.

Fire Service is specifically designed to provide a level of safety that cannot be achieved through other service modes, such as Automatic or Independent. It requires two distinct phases which firefighters must fully understand and implement to ensure safe and proper elevator use. It is important to note that elevators are subject to mechanical failure, and the safest means of ascent is using stairwells. There have been NIOSH Line-of-Duty Deaths (LODDs) associated with improper elevator use, such as the incident in Memphis in 1994. Therefore, elevators must always be in **Fire Service mode**, and it is crucial to avoid ascending to the floor of origin.

Phase 1 Fire Service (Recall)

Phase 1 Fire Service is activated when elevators bypass all floor calls and are immediately recalled to the lobby. Upon arrival at the lobby, the doors will open, and power will be automatically shut off. There are two ways to achieve this phase: automatically or manually.

Automatic Recall

The building’s fire alarm system may trigger automatic recall. When the alarm is activated, elevators are automatically recalled to the lobby. If the alarm detects smoke in the elevator lobby, some systems may implement a secondary plan, recalling the elevator to the next highest floor. Not all buildings are

equipped with this feature, so crews should not assume that a fire is absent if the elevators are not recalled upon arrival. For example, in buildings like One Government Center, where certain elevators do not serve all floors, it is possible that not all elevators will be recalled. If elevators are not automatically recalled during a Commercial Fire Alarm (CFA), crews must initiate a **Manual Recall**.

Manual Recall

Manual Recall is initiated by firefighters by placing the fire service key into the switch IN THE ELEVATOR LOBBY and turning it to the “ON” position. At this point, all elevators in that bank will recall.

- The fire service switch in the elevator lobby will be either a 2 or 3 position switch.
    - Two position switches are generally found with older elevators and will have an “ON” and “OFF” position.
    - Three position switches will have “ON,” “OFF and “BYPASS” or “RESET” positions.
    - When elevators are placed in “BYPASS” or “RESET,” it returns the elevator system to Automatic Service, despite any alarms that may still be activated.
        - This feature is designed to allow occupants to reenter the building after the fire is knocked down and crews are performing overhaul where residual smoke may still be found inside the structure.

It is imperative once elevators have been recalled during a High-rise fire to account for all of them and verify they are void of occupants.

Phase 2 Fire Service (Elevator Car Capture)

To initiate Phase 2 Fire Service, the elevators **must first** be placed into Phase 1 Fire Service, either automatically or manually. It is recommended to turn the lobby switch to the “ON” position, even if the elevators have been automatically recalled. Additionally, it is critical to conduct a visual inspection of the elevator shaft using a flashlight, checking both above and below the car for any signs of fire, smoke, or water. This visual check should be repeated frequently during extended incidents.

To fully engage Phase 2 Fire Service, the firefighter must enter the elevator car and insert the key into the fire service switch inside the car. This switch may be a 2-position or 3-position switch, depending on the system.

- A two-position switch will have “ON” and “OFF” positions.
- A three-position switch will have “ON,” “OFF,” and “HOLD” positions.

To “capture” a car, the firefighter will turn the key to “ON.” At this point, the firefighter must perform the following operational checks to ensure the elevator responds appropriately:

- Press any floor button 2 floors below the origin of the alarm, the elevator door should not close.
- Press the “**Door Close**” button until the door closes partially, then the release door should open fully.
- Press the “**Door Close**” button and maintain contact until the door closes.
- Press the “**Door Open**” button until the door opens partially, then the release door should close fully.
- Press any floor button 2 floors below the origin of the alarm, as elevator ascends, press call cancel, elevator should stop at next floor.

The car has now been tested, and can be used for deployment, but keep in mind elevators are subject to failure.

Upon arrival at the requested floor, the elevator will stop but the doors will not open unless the operator pushes AND HOLDS the "**DOOR OPEN**" button until the doors are completely open. The doors will not remain open until they are fully opened to ensure protection of crews if the elevator has stopped on a floor that has fire or smoke present.

- If the fire service switch is a **two-position switch**, they can exit the car and begin their investigation.

- If the fire service switch has **three positions**, the crew should turn the key to "HOLD" and remove it. This ensures that no one else can take their elevator and it will be waiting with doors open upon their return.

To send the elevator car back to the recall lobby, crews should turn the fire service key to "OFF." It is important to note that this function will only work properly if the doors are completely open and stay open.

CAUTION: If the key is turned to the "OFF" position before the doors are completely open and crews exit, the elevator could be rendered inoperable and will require an elevator mechanic to put it back in service.

NOTE: *If at any time the "**Fire Service**," "**Maltese Cross**" or "**Fire Helmet**" indicator light is flashing, you need to exit the elevator as expediently as possible. This is a warning that smoke, fire and/or water has been detected in the elevator hoist way or machine room and the elevator will very soon shut down.*

Single Car Phase 2 Fire Service

Where only one elevator in the bank is captured by TFRD crews, can be advantageous during EMS runs. This ensures a timely response for the Medic Unit or prevents delays when transporting a patient.

- To achieve this, crews must first manually recall all elevators by inserting the key into the fire service **lobby switch** and turning it to the "ON" position.

- Once all elevators have been recalled, remove the key while keeping the switch in the "ON" position. Next, select the elevator that best suits your needs, **insert the key inside the chosen elevator**, and turn the key to the "ON" position, followed by turning it to the "HOLD" position.

- Afterward, remove the key, exit the car, and return the key to the **lobby switch**. Turn the key to the "RESET" position, hold for 3 seconds, and then turn it to the "OFF" position. Remove the key from the lobby switch. At this point, all other elevators in the bank will be returned to automatic operation.
- Crews can now enter the captured car and reinsert the key **inside the car**, turning it to the "ON" position. The elevator will now operate in **Phase 2 Fire Service**, allowing it to be used as needed for the operation.

Appendix 11

Wind Driven Fires

Considerations of wind impacted fires are of critical importance in the high-rise incident. Window failures of the involved unit or units coupled with as little as a 10mph wind have been proven to have substantial impact on fire growth and extension *(see Vandalia ST. NIOSH Report)*. Alternative tactics must be deployed when faced with window failure, heavy fire, and wind driven fire conditions.

Wind driven fires can be recognized by any of the following indications:

- **Picture frame of fire:** A failed window in a wind driven fire will often appear as a “picture frame of fire” with little to no smoke or fire venting from the opening. An occasional star cluster of fire or puff of smoke may escape however, the force of the wind against the window will pressurize the opening allowing little to no escape of the products of combustion.

- **Horizontal Smoke:** Smoke that is venting from the failed window will flow horizontally away from the opening instead of upward.

- **Pressurized Smoke from fire apartment, stairwell door, or hallway door:** Smoke that is under pressure noted around the door frame of the involved unit or stairwell door.

When the fire is beyond the control of initial attack methods, such as a wind driven fire, the following options are available for consideration:

- Consider exterior master streams, such as deck gun, blitz nozzle, or aerial ladder trucks.
- Operate interior master stream appliances into the fire area from the stairwell on the fire floor.
- Consider deploying an exterior Bresnan nozzle if fire is contained to a single apartment. The Bresnan nozzle could be lowered into place from 2 floors above, or over the roof line if conditions permit.

Appendix 12

Truck Ops

Use of Trucks shall be based upon incident need:

- **Life Safety:** As life safety is always the first concern in any incident, Truck ops should focus on this potential need first and foremost. Every effort to position the aerial at one of the corners of the

structure should be exhausted.

- **Flying Standpipe:** If the Fire pump, FDC, or standpipe is found to be inoperable, a flying standpipe may be considered if the height of the affected fire floor and proximity to aerial capabilities are within limits. A coordinated transitional attack may be an option from the aerial while interior crews make their way to the fire floor.

- **Interior Ventilation:** Command may request pressurization of stairwells from PPV fans. If no exterior operations are needed the Truck members should stage at the Lobby sector with gas and electric fans.

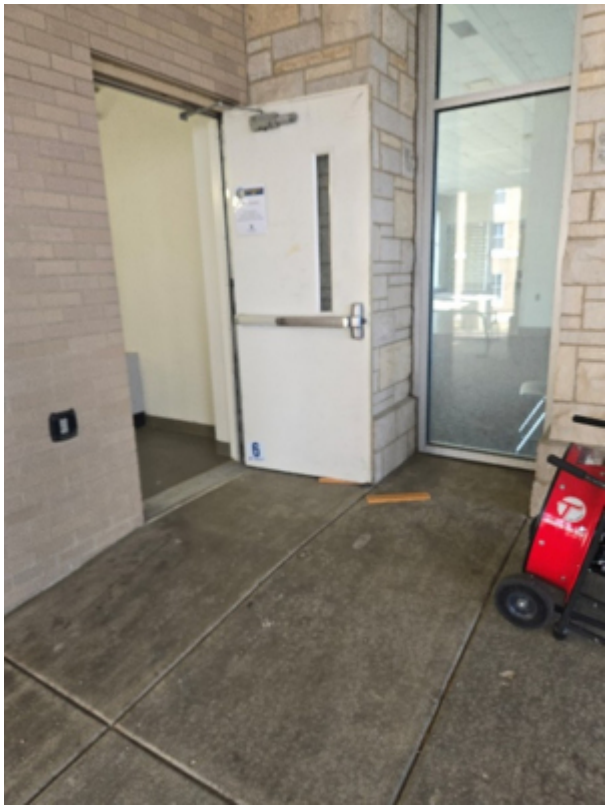
Pressurization of Stairwells

- When commercialized stairwell pressurization systems are not present or not working, fire department PPV fans can be utilized to pressurize stairwells.

- Stairwell pressurization is best achieved with one fan at the base of the stairs and an additional fan located 2-3 Floors below the fire.

- Tall buildings may require additional fans. A good rule of thumb would be to place a fan every 10 floors.

- PPV fans should be set back 4-6 feet from the doorway and angled back to 5 degrees.



Ground Level Fans

The ground level fan should be placed near the doorway closest to the base of the stairwell. If the stairs

do not exit to the exterior of the building, then propping of the lobby door is required to provide make-up air. Fans placed outside lobby doors will be least effective but remain an option based on circumstances.

Fans placed inside the building should be set back and angled the same as they would be for an exterior doorway. Fans on upper floors should be placed in the hallway or occupancy with the air flow directed back into the stairs. Fans placed directly in the stairwell are less effective and generate higher levels of CO. Fans placed on upper floors do not require make-up air.

CO can be a concern, but the risk should be compared to the risk created by the conditions in the stairwell.

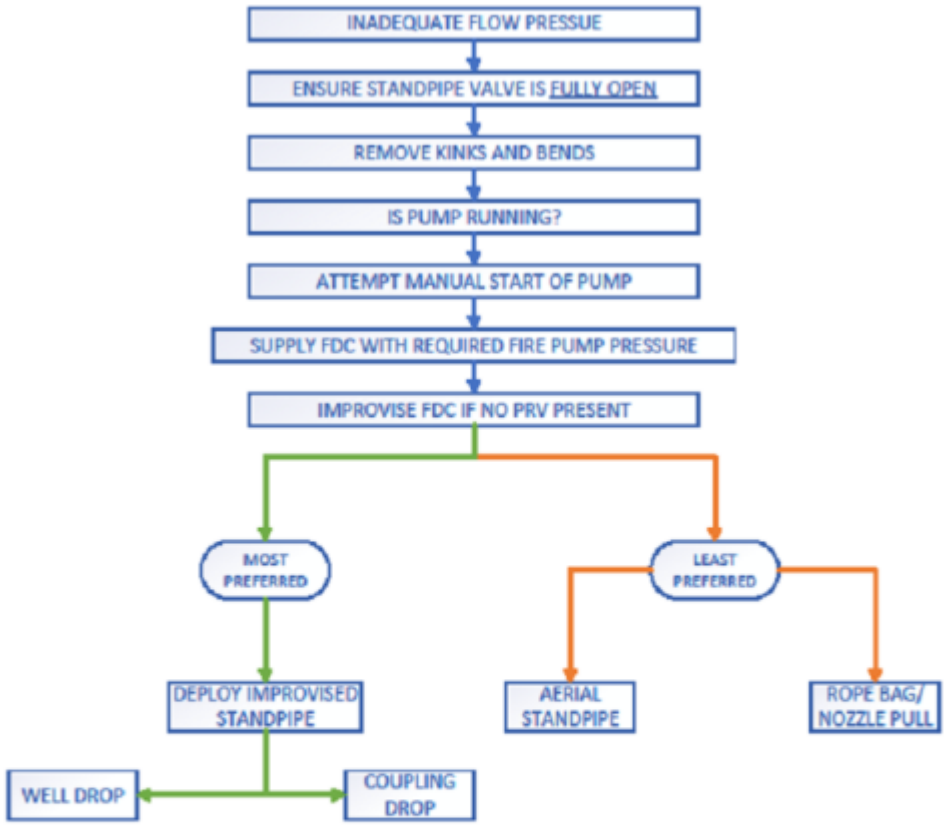
The use of gas-powered fans inside of the building is acceptable, and will be more effective at generating the required pressure to protect stairways. CO monitoring should be conducted. Electric fans remain a viable option for interior fan placement, keeping in mind the volume and pressure generated by electric fans will be measurably less than the gas counterpart.

Clearing of a stairwell can be achieved by beginning pressurization and then opening a topside vent or hatch to exhaust the smoke. Once cleared, the vent or hatch should be closed and kept closed. If this is performed during a fire attack, use smaller opening for a topside vent to maintain stairwell pressurization. Pressurize both stairwells with the attack stairwell taking priority.

Stairwell doors, except for where a fan is placed, should be opened only enough to allow for advancement of the hose line. Avoid propping open doors to the fire floor, floor below, etc..

Appendix 13

Flowchart for Water supply at High Rise Fires



* POSSIBLE WIND DRIVEN FIRE INDICATORS:
- FAILED WINDOW WITH FIRE/SMOKE NOT VENTING (PICTURE OF FIRE) BURPS OF SMOKE OR FIRE
- HORIZONTAL SMOKE FLOW ACROSS WINDOW
- SMOKE UNDER PRESSURE AT STAIRWELL DOOR AND THRESHOLD

* CHANGE TACTICS – BRESNAN FROM ROOF OR 2 FLOORS ABOVE,
EXTERIOR ATTACK WITH DECK GUN / AERIAL STREAM

Acknowledgements

This document produced by the High Rise Committee:

- BC Bob Krause
- BC Mike Nicely
- BC Matt Brixey
- Lt. Craig Ellis
- Lt. Kirk Keane
- Lt. Pete Traver
- Lt. Greg Yingling
- Pvt. Scott Hathaway

- Pvt. Jamie Morelock
- Pvt. Jake Hoffman

Additional thanks for proofing, suggestions and editing help to BC Bryce Blair, Capt. Mike Posadny, Capt. Mike Mowka and Ret. DC Ken Pauken.

Spring 2025 revisions thanks to:

- BC Nicely
- BC Molnar
- Captain Holt
- Lt. Glazener
- Lt. Lanahan

References:

Along with the dedication, experience and enthusiasm of the above and untold multiples of industry specific websites and articles; the following texts were used as our main research.

Averill, J. (2013). High Rise Fireground Field Experiments. National Institute of Standards and Technology. Bush, R. (1996). Operational Considerations for Highrise Firefighting. Emmitsburg: FEMA.

Coleman, J. High Rise Fire Procedures. TFRD

Hall, J. (2013). High Rise Building Fires. Quincy, MA: National Fire Protection Association.

McGrail, D. (2007). Firefighting Operations in High Rise and Standpipe-Equipped Buildings. Tulsa: PennWell.

Routley, J. G. (February 1991). Highrise Office Building Fire One Meridian Plaza. Philidelphia: FEMA.

Sexton, R. (2006). Incident Command at Highrise Operations. Washington DC: US Department of Homeland Security.

Smith, J. P. (2008). Strategic and Tactical Considerations on the Fireground, 2nd ed. Upper Saddle River: Pearson.

Sunder, S. (2005). Final Report on the World Trade Center Towers. US Government Printing Office. Washington DC.

Tracy, J. The High Rise Hand Book. FDNY

Various. (2002). NFPA 1710 Standard on Fire Department Deployment and Operations. National Fire Protection Association.

Permanent link:
https://tfrd.madhouse.dev/dokuwiki/doku.php?id=f_manual:high_rise

Last update: **08/09/2025 19:57**