HIGH-RISE AND MID-RISE/LOW-RISE STRUCTURE

EMERGENCY MITIGATION GUIDELINES

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INTRODUCTION

The Utah Fire & Rescue Academy (UFRA) provides training and education to firefighters throughout the state of Utah. This extends to training for the safe mitigation of emergencies in high-rise, mid-rise, and low-rise structures. As part of UFRA's commitment to training and education, these standard operating guidelines (SOGs) have been developed by the UFRA High-Rise Training Group based on guidelines from the National Incident Management System (NIMS), the Incident Command System (ICS), the Utah State Fire Chiefs Association, IFSTA's *Structural Fire Fighting: High-Rise Fire Fighting* (second edition)*,* and Fire Protection Publications' *Model Procedures Guide for High-Rise Firefighting* (second edition)*.*

UFRA's training programs aim to support course curriculum, including development and delivery of lesson plans, regular and formal training, and updates as needed. It is highly recommended that departments follow these guidelines regardless of size or staffing levels. Although many departments may not immediately have all the needed resources, effort should be made to follow the principles listed in this guideline. It is incumbent that all departments develop regional response plans and procedures to bolster their response.

PURPOSE AND OBJECTIVES

High-rise fires present unique problems in firefighting. Most of these are related to the difficulties of access, inadequate resources, complexities of construction, and the number of occupants in these structures. Hence, any incident involving a high-rise structure is considered extremely challenging and high-risk. Local jurisdictions may have numerous large mid-rise and low-rise structures that do not meet the height restrictions of a high-rise building but present many of the same extreme challenges. For the purposes of this guide, a high-rise building will be defined as a structure 75 feet (23 meters) or higher.

This document is intended to implement guidelines for operations in high-rise, mid-rise, and low-rise fire incidents and address the complex issues related to mitigating those incidents.

The first part of this document is a guideline/procedure and is specific to operating in high-rise, mid-rise, and low-rise structures throughout the state of Utah. Subsequent parts of this document provide details and general operations (SOGs and supplemental information) specific to firefighting and support for the operation. Additional information can be found in IFSTA's *Structural Fire Fighting: High-Rise Fire Fighting* (second edition) and Fire Protection Publications' *Model Procedures Guide for High-Rise Firefighting* (second edition)*.*

INCIDENT PRIORITIES

The priorities of rescue in a high-rise, mid-rise, or low-rise structure should be clear to all personnel on the scene, especially to Command. Regardless of the type of alarm received, all personnel responding to these structures will adhere to the following incident priorities:

1. **Provide for the safety of firefighters.** Establish rapid intervention.
2. **Rescue.** Protect life using one of three basic rescue strategies:
    a. Fight the fire and evacuate the occupants,
    b. Evacuate the occupants only, or
    c. Shelter the occupants in place and fight the fire.
3. **Control the incident.** Perform an aggressive attack.
4. **Conserve property.** Salvage.

In high-rise residential structures or commercial high-rise buildings, you must prioritize aerial apparatus in positions of the known location of victims and where close access to the structure can be achieved. For areas above the reach of aerial apparatus, the IC must coordinate the use of a controlled stairway or have occupants' shelter in place. Stairways with roof hatches or scuttles are *generally* used for smoke removal, with positive pressure at the base of the stairs. Stairways without roof openings generally will be used for rescue and evacuation. Stairways with roof access may be used for evacuation if most occupants are above the fire floor. If most occupants are below the fire floor, they can be evacuated by stairways down to the lobby area. Note: The rescue or evacuation stairway must also be pressurized with multiple fans at the base of the stairs.

Rescue efforts should be extended in the following order:

1. The most severely threatened victims
    a. Victim(s) whose location is known or when there is an obvious rescue
    b. Victim(s) close to the fire (fire floor)
    c. Victim(s) above the fire (floor above)
2. The largest number (groups)
3. The remainder of the incident area
4. The exposed area

TACTICAL ASSIGNMENTS

To achieve the Incident Command Strategic Operating Plan, the first-arriving companies at the scene of a fire must create the foundation that supports the successful mitigation of the event. This includes establishing command, initial scene assessment (size-up), information gathering, and the assignment of initial duties and responsibilities. Initiation of such procedures in the first minutes of the response is critical. Equally as important is ensuring that the actions and information are passed on to the first-arriving chief officer to adequately prepare the incident commander (IC) for the next level of incident command operations. Therefore, first-arriving companies must address the following seven tactical assignments in every situation. (Note: Command maintains strategic and tactical options but must always address the seven key tactical assignments. More

details on each of these tactical assignments can be found in Fire Protection Publications' *Model Procedures Guide for High-Rise Firefighting*.)

1. **Establish command.** *Regardless of the alarm type or pre-arrival information, command will always be established.* It is mandatory that any fire department member responding to high-rise incidents follow the NIMS Incident Command System guidelines.

    The first-arriving unit officer will establish command by:
    - Determining the unit designation and the name of command
    - Making a brief radio report that includes a scene size-up and the location of the alpha side
    - Making initial tactical assignments consistent with this document (see "High-Rise Response Tactical Assignments" on page 12).

    The command structure at a high-rise, mid-rise, or low-rise fire must be expanded early in the incident. Tactical assignment cards can assist the IC in expanding the organization easily. General staff positions must be implemented aggressively upon confirmation of a working fire.

2. **Determine the fire floor or area where the incident is reported within the structure.** When approaching the scene, first-in crew(s) must note what can be seen. They must talk to the occupants of the building upon entry to determine the fire floor or incident area. They must locate the fire control room or fire control panel and/or seek information from the building's system control manager, the building's security officer, or another responsible person who can provide critical information. **Once the fire panel has been checked, the crew member reading the panel must write the reading with a grease pen or permanent marker and announce the reading to Command. This will serve as a change indicator for the next member that reads the panel**. Some newer panels have the capability to print out an activity log. This allows the person at the control panel to observe and compare changes.

3. **Verify the fire floor and the extent of the fire.** Even with nothing showing, an assumption of concealed fire should be made by Command. The construction of most high-rise buildings effectively shields the interior of the structure from the view of companies arriving outside. Verify the location and extent of the fire by observing fire and smoke conditions, talking to occupants evacuating the area, and observing changes and conditions.

4. **Control the occupants.** Historically documented fires have proven that most building occupants will self-evacuate. Occupants of high-rise structures that practice evacuation drills in conjunction with an emergency operations plan have a greater chance for survival. The authority having jurisdiction (AHJ) should coordinate annual evacuation drills.

    Once a fire protection system has been activated or a report of fire has been given, occupants will begin the evacuation process. Most systems

will automatically notify occupants two floors above the reported fire floor. If the building's speaker system is used, fire personnel must be prepared to announce evacuation of the two floors above.

In some situations, a significant number of occupants may need to be evacuated or otherwise directed. It may be advantageous to separate this area of responsibility by assigning a branch director under the Operations Section. This may be the most efficient way to reduce the span of control and provide the proper number of resources and systems for safe and organized control of people.

Evacuation routes in high-rise structures are normally limited to two stairways. The stairways are also the prime access route for firefighting personnel to make an attack.

Occupants in the immediate fire area should be evacuated as quickly as possible to at least the third floor below the fire floor. Further evacuation should be predicated on risk to the occupants since premature evacuation often hinders fire control efforts and adds to general confusion at the scene. The determination of risk and the decision to evacuate should be made by personnel on their respective assigned floors. Subsequent evacuations should be managed to avoid interference with operations as much as possible. Always consider that numerous personnel may be needed to effect efficient evacuation at a high-rise. In addition, even when a well-defined evacuation plan has been developed, the reality is that many occupants may self-evacuate at the first notification.

Most doors in high-rise stairways leading back to the office areas are secure, but some are not. Do not rely on automated systems when the building is in alarm. Standard entry methods may be needed (i.e., hard keys and conventional forcible entry tools and procedures). Firefighters should assume the worst. Do not allow occupants to enter contaminated stairways, if possible. Once firefighters have identified a safe evacuation stairway, firefighters will ideally maintain the evacuation stairway by assigning personnel to keep the area clear and by keeping all doors leading to the evacuation stairway(s) closed.

5. **Control the building systems.** To gain control of the building systems, a building engineer must be summoned to Lobby Division or to the control room firefighter by Command. This assignment must be completed on every response, regardless of the alarm. Three building systems should be controlled:
    1. **Fire suppression/pump system.** Monitor operations.
    2. **Heating, ventilation, air conditioning (HVAC).** Limit the intensity of the fire and control the travel of heat and smoke by utilizing the building engineer to coordinate/control the HVAC systems. If the building engineer is not available, leave the system operating or shut off the system completely. However,

this must be coordinated with Command and divisions based upon smoke movement.

  3. **Elevators.** Activate the elevators into Phase 1. (Phase 1 will return the elevators to the ground floor.)

6. **Confine and extinguish the fire.** Reflex times (see the Glossary) of 30 to 45 minutes can be expected in high-rise response. Because of long reflex times and high fire load, first-in crews will use 2½" lines for the primary attack.

Experience has shown that an aggressive coordinated attack has been proven to be the most effective tactical option in the majority of high-rise operations. To accomplish this, a minimum of three crews (two engine companies and one truck company) will be assigned to the fire floor from the first due response assignment. If the first-in crew confirms a working fire, Command must immediately double the assignment to the fire floor. Standpipe operations will be the first tactical option for fires reported on floor five and above.

All standpipe valves must be secured. If standpipe valves are open and caps off, serious water damage can occur to uninvolved floors and, most importantly, proper nozzle pressures and flows will not be achieved. Firefighters advancing to the fire floor must check the valve(s). Once checked and closed, you may mark it "OK" in a spot that is visible for other firefighters to see. This task is completed once all valves up to and including the roof valve are closed.

As part of the process of confining and extinguishing the fire, elevators can be used to transfer personnel and equipment to any floor where firefighters are operating. It is intended that personnel and equipment will be shuttled from the lobby to the Resource Staging Area (RSA). The RSA is generally located two floors below the fire floor.

Elevators can only be used by personnel if it is determined they are safe and that the indicating alarm area has been checked by a building system representative or a fire department member. Even under these conditions, the following guidelines should be used when operating in an elevator.

  1. Fire service override should be working.

  2. No visible smoke, fire, or water should be present in the shaft.

  3. One set of keys should be in the elevator, and one set should be left in the lobby.

  4. A test of the elevator's operation should be made at the next available floor.

  5. Crews in the elevator must have their radios with them and turned on.

  6. Crews in the elevator must have a portable chemical extinguisher and irons, including a halligan and an axe.

7. Precautions should be taken regarding the loading of the elevator to allow enough room for crews to operate. There should be no more than two crews per car.

8. If all previous conditions have been met but fire conditions have not been confirmed, crews in elevators should be dressed in full PPE and on air.

9. Members located in the lobby must also have their portable radios on.

10. Do not use the elevators for initial access to the fire floor if the fire is reported on floor five or lower unless it is known to be a hydraulic system and the elevator control room is on the ground floor or below.

11. Under no circumstance should the elevator be taken closer than two floors below the fire floor.

12. As the elevator approaches the intended floor, a test stop should be made five floors below. A pry tool should be ready to force the interior doors open and engage the manual brakes if the elevator does not respond as intended.

13. Once conditions have been assessed, the use of the elevator to move equipment to the RSA should be considered.

7. **Address the floor above.** After the fire attack relief cycle of 3:1 has been established, a minimum of one crew will be assigned to the floor above. The responsibility of this crew will be to report to Command conditions above the reported fire floor. Their report shall:

1. Give smoke and heat conditions.

2. Report conditions and which stairway they are located in.

3. Confirm that evacuation has occurred or is controlled. (Remember that if the evacuation stairways have been compromised with smoke and heat, a shelter in place strategy may be necessary.)

4. Notify as to what resources are needed.

RESOURCE/RESPONSE REQUIREMENTS

LEVEL I RESPONSE. Automatic alarm drop, notifier alarm without confirming calls. Red light and siren response. NOTE: AHJ cancellation policy can apply to this type of alarm.

AHJ will dictate the actual response for this level.
1 Engine or
1 Truck

LEVEL I TARGET HAZARD (i.e., HOSPITAL) RESPONSE.
Automatic alarm drop, notifier alarm without confirming calls.
Red light and siren response. NOTE: AHJ cancellation policy can apply to this type of alarm.

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1 BC or chief officer
3 Engines
1 Truck

LEVEL II RESPONSE. Possible smoke in a high-rise, smell of smoke, no visible fire, no confirming calls, dispatch not receiving enough information to upgrade the assignment to a Level III Response.
Red light and siren response.

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1 BC
2nd-due BC or chief officer notified
4 Engines
2 Trucks
1 EMS ambulance
1 Heavy rescue

LEVEL III RESPONSE. *** Report of fire, visible smoke, confirming calls with or without automatic alarm drop.
Red light and siren response.
This is a balance of all assigned units at this point.

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1 DC or AC of operations or designated chief officer by respective
   department
4 BCs or other designated chief officers
8 Engines
4 Trucks
2 Air supply/utility
3 EMS ambulances
2 Heavy rescues

> **LEVEL IV RESPONSE. ***** Confirmed working fire by unit(s) on the scene.
> In addition to Level III Response already dispatched.
> Red light and siren response.

1 Multi-agency Regional Task Force consisting of:
    2 BCs or designated chief officers
    4 Engines
    2 Trucks
    1 DPS helicopter support/aerial reconnaissance

***A Level I or Level II Response will upgrade to a Level III Response if any criteria from the caller to dispatch dictates visible smoke or fire within the structure. This upgrade is automatic between the initial dispatch and companies going "on the air." If the first-due company or BC is "on the air," dispatch will relay additional information, and the decision to upgrade will be made by the first-due company or chief officer.

WORKING INCIDENT/ADDITION OF AIR OPERATIONS

If a working fire is confirmed, dispatch centers will make the necessary announcements over the air. In addition to the working incident notifications, the respective dispatch center will contact the Department of Public Safety helicopter. It is very important that all mutual and automatic aid agreements (regional) be current to do this. Helicopter crews that will be involved in a high-rise incident should be prepared to meet the following criteria:

1. Be familiar with the AHJ's guidelines and procedures along with "Quick Access Plans" for identifying high-risk occupancies.
2. Know radio channel use for the respective jurisdiction.
3. Understand that a function of the helicopter will be to report smoke and wind conditions at the roof level and make necessary reports to Command.
4. Understand the use of helicopters for rooftop rescues and that deployment of fire crews to the roof can be a function. It is highly recommended that the department chief officer accompanies the helicopter crew.

Once a helicopter has been dispatched to the scene, the IC must be prepared to implement the Air Operations Branch under the Operations Section. If the helicopter is on the scene prior to the implementation of expanded organization, Command will be responsible to maintain communications with the helicopter pilot. Until an expanded organization is implemented, the helicopter will remain a "single resource." **CAUTION**: Due to the intense safety requirements of using Air Support in the initial phase of a high-rise incident, Command should aggressively delegate the communication to an assigned, qualified deputy.

All those using this document should also use *Fire Protection Publications*, *Model Procedures for High-Rise Fire Fighting* to assist them in the preparation and addition of the Air Operations Branch in working high-rise incidents. Prior to dispatching and using Air Support, all fire departments within the AHJ should complete regular training

exercises that implement an Air Operations Branch. This can be scheduled and coordinated with the UFRA/NWCG representative.

UPGRADING LEVELS OF RESPONSE

A small, confirmed working fire in a high-rise building will require at least 50 firefighters to control the incident; however, statistics will show that 98% of fires in a high-rise can be controlled with as few as 24 firefighters if a pre-plan has been developed and used in the response. A Level III response is designed to cover the minimum required number of firefighters.

Regardless of the size, if a "working fire" is announced, Command must request a Level III High-Rise Response. This assignment will report to Apparatus Base location. Personnel will assemble all necessary equipment and supplies from Apparatus Base and prepare to advance to the structure. The Apparatus Base will be located a minimum of 200 feet from the incident and this location (address) will be announced over the air to all additional responding units.

Command will maintain the option of the number of resources requested. To do this, Command will request additional high-rise response levels. The decision to regulate the size of the incident response must be based upon: Department capabilities, fire load, occupancy type, size and location of the fire, resources needed at the fire floor, ability to use the elevators during the incident, and experience (forecasting).

Level III Notifications
In addition to AHJ notifications for structure fires, the following notifications will be made:
  a. The Emergency Operations Center will be activated, according to individual AHJ policies.
  b. Dispatch will initiate off-duty member call-back procedures.
  c. An additional EMS field supervisor will be dispatched to the scene.
  d. Fuel tanker will be dispatched to apparatus base.
  e. The Red Cross will be notified to respond.
  f. City, county, state emergency manager will be notified.
  g. Contact structural engineers, if needed.
  h. The city, county manager, or mayor will be notified.

RESOURCE RESPONSIBILITIES

Engine Company Functions
It is the responsibility of the engine companies to **rescue, provide firefighting water to standpipes, provide hand lines, and attack the fire.** Engine companies will make use of pre-assembled High-Rise Standpipe and Nozzle Kits. Fifty-foot bundles of 2½" hose will be used for the primary attack. The hose will be pre-formed into "horseshoe" loads. These loads are easily deployed and can be extended to any length needed. *(See description and pictures of Standpipe, Nozzle Kits, and hose bundles in appendix #.)*

Fire attack in high-rise structures must be decisive and aggressive. Sustained attacks may last for several hours. Generally, attack crews will be limited to 10 minutes of operating time with backup teams ready for deployment. Engine crews must have at least three members in the lead and two members at the entrance to the floor to assist with line movement. Until the arrival of a chief officer at the fire floor, the first-in captain will assume the role of division supervisor. It is the responsibility of the division supervisor to see that the attack crews have adequate help to support the attack including back up. Requests for additional resources to the fire floor must be made early in the incident. Division supervisors must communicate all requests through Command or the Operations Section Chief.

Truck Company Functions
It is the responsibility of truck companies to **rescue, force entry, gain access, ventilate, support engine company operations, and operate as Initial Rapid Intervention Team (RIT).** Truck company members carry and use all necessary equipment to support the respective responsibilities. Due to the number and special duties of truck companies, members should not waste energy carrying hose bundles or nozzle equipment. On initial attack, truck companies must prioritize their duties to support an organized rescue of the fire floor, forcing doors, opening the plenum space for the engine companies (gaining access), and breaching areas for an aggressive attack. Fourth due truck companies will work with Command to organize and implement ventilation strategies. In all high-rise structures, the primary ventilation strategy will be to pressurize the stairways. Additional pressurization may assist in an effective rescue by keeping the evacuation stairways clear.

Under the best conditions, ventilation control in a high-rise structure will be challenging. Building systems that normally add positive pressure to evacuation stairways should be augmented by blowers placed strategically at the base of stairways. Positive pressure will help keep the products of combustion out of the evacuation areas. Truck company members must control all openings to the stairways. Ideally, the "Ventilation Group" should operate on a separate channel and communicate conditions and progress to their supervisor. Note: Division and group supervisors must be in constant communications to confirm operational objectives are synchronized.

Aerial Rescue Operations
If the incident dictates ladder rescue is possible, aerial rescue becomes a high priority. Truck companies assigned to support the fire attack shift responsibilities to the next arriving Truck. Next arriving Trucks not assigned to aerial rescue will fill the support functions for fire attack. If aerial operations are required, the IC must call for additional Trucks.

Resource Staging Area
A resource staging area (RSA) must be established as soon as possible at the high-rise incident. The purpose of the RSA is to create a cache of equipment, tools, hose, firefighting teams, medical support, and RITs. The RSA will be located at least two floors below the confirmed fire floor. If conditions permit, the RSA can be located one floor below with approval of the IC. The RSA will be supervised by a Manager with the

primary purpose of maintaining the proper number of supplies and firefighters to support operations.

Communication Plan
High-rise incidents will be dispatched by a local, regional, or county dispatch center. It is paramount that the dispatch centers have a plan in place that assists the IC as requests are made. Centers should provide an operations communication channel to the incident as soon as possible. If a working fire is confirmed, dispatch centers should refer to pre-plans and high-rise response guides to assist in this process of securing resources from local and regional areas. It is recommended that dispatch centers utilize ICS Form #205 Incident Communications," to list support (logistics), operations, and emergency channels for the incident. Additionally, dispatch centers should make use of resource boards to assist in identifying the types, kind, and size of all local and regional resources. These boards can be kept in the centers but should be routinely reviewed for current staffing and resource levels.

HIGH-RISE RESPONSE TACTICAL ASSIGNMENTS

AHJs should consider developing expanded mutual and automatic aid agreements. This will help in shortening the reflex time to mitigating fires in high-rise buildings. Regardless of resource availability, consider the tactical assignment cards below as a consensus standard. All companies will carry a copy of these assignments in their apparatus. These assignments will serve as a prompt to assist in the initial assignments.

Chief Officers

1ST-ARRIVING CHIEF OFFICER
COMMAND/ACCOUNTABILITY

Apparatus Placement: 200' from the structure. IC announces location of Command Post and Apparatus Base.

Safety Procedure: Follows ICS, maintains accountability, controls radio traffic.

Tools: Command Kit, accountability system.

Main Objective: Establishes incident command, assigns initial tactical positions, builds resources aggressively, and prepares to expand the organization/accountability. Considers the establishment of an Incident Management Team.

2ND-ARRIVING CHIEF OFFICER
FIRE FLOOR DIVISION SUPERVISOR

Apparatus Placement: Places vehicle next to IC.

Safety Procedure: Full PPE w/ SCBA, radio, cell phone.

Tools: Command Kit, accountability system.

Main Objective: Checks in with Command. Communicates with IC and confirms current assignment of crews in the structure. This officer now advances to the fire floor and assumes the role of fire floor division supervisor. This officer gives a progress report to Command. Checks floor above with assistance of 4th-arriving engine.

3RD-ARRIVING CHIEF OFFICER
LOBBY CONTROL/ACCOUNTIBILITY

Apparatus Placement: Places vehicle in Apparatus Base.

Safety Procedure: Gathers radio, cell phone, and full PPE.

Tools: Command/Lobby Kit, accountability system, flashlight, building keys.

Main Objective: Note: Communicates with Fire Floor Division (sit/rep), Secure the lobby and elevators, identify stairwells, take control of the Fire Command Center, assist in accountability, and deploy the lobby kit.

4TH ARRIVING CHIEF OFFICER
RESOURCE / STAGING

Apparatus Placement: Locates vehicle in Apparatus Base.

Safety Procedure: Gathers radio, cell phone, and full PPE w/ SCBA.

Tools: Resource tracking system (Command/Lobby kit).

Main Objective: This Chief becomes the Resource Staging Area Manager on Resource Staging Floor. Confirms equipment and resources are adequately stocked in the Resource Staging Area. Oversees RIT, medical, and attack rotation.

5TH-ARRIVING CHIEF OFFICER
FIRE COMMAND CENTER (or FIRE CONTROL ROOM)

Apparatus Placement: Places vehicle in Apparatus Base.

Safety Procedure: Full PPE, radio, cell phone.

Tools: Command/Lobby Kit.

Main Objective: Reports to the Fire Command Center, manages building systems communications for interior crews, monitors elevator panel and fire suppression systems, coordinates HVAC system with building engineer. Note: Alerts IC of changes in fire control panel.

6TH-ARRIVING CHIEF OFFICER
PLANNING SECTION CHIEF or EMS GROUP SUPERVISOR

Apparatus Placement: Places vehicle in Apparatus Base.

Safety Procedure: Full PPE, radio, cell phone.

Tools: Command/Lobby Kit, ICS forms kit.

Main Objective: This chief becomes either the planning section chief or the EMS group supervisor (the event will drive the decision). Confirms progress of initial Incident Action Plan (IAP) and implements section responsibilities. Confirms/assigns resource unit or EMS units for triage, treatment, transport.

7TH-ARRIVING CHIEF OFFICER
APPARATUS BASE STAGING MANAGER

Apparatus Placement: Places vehicle in Apparatus Base.

Main Objective: Assumes role of Apparatus Base staging manager, organizes apparatus by type and kind in the base on angled placement. Communicates with Ops or IC.

Engines

**1ST-ARRIVING ENGINE
FIRE ATTACK**

Apparatus Placement: Near entrance, but not in front of entry doors.

Safety Procedure: All members: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit, building keys, dry chem. extinguisher, building phone (from Fire Command Center (FCC)

Tactical Objective: Must enter the Fire Command Center, mark the panel, return elevators to the ground floor, and find the stairways. Note condition of building systems. Report findings and your actions to incoming companies. Must determine fire location, size, and extent. Start the fire attack if conditions dictate. Report when in position with Personnel Accountability Report (PAR) #.

**2ND-ARRIVING ENGINE
COMPLETE STANDPIPE/BACKUP TO FIRE ATTACK**

Apparatus Placement: Engine goes to standpipe connection. Engineer performs reverse lay from the standpipe to a hydrant at least 200′ from structure. Makes hydrant hookup and prepares to hand lay a 2nd line to the standpipe. Remainder of crew reports to Fire Floor Division.

Safety Procedure: Full PPE, radios, cell phone, building keys.

Tools: Engine High-rise Kit. Extra equipment dropped in RSA.

Main Objective: Oversees water supply to standpipe/sprinkler. Engineer becomes Water Supply Group and communicates with 1st engine officer about water supply completion. The remainder of the crew checks standpipe valves and backs up the fire attack. Reports to Fire Floor Division with PAR#.

3RD-ARRIVING ENGINE
BACKUP TO FIRE ATTACK IN STAIRWELL

Apparatus Placement: Out of 200′ perimeter and easily movable.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace attack team on fire floor. Reports to Fire Floor Division with PAR#.

4TH-ARRIVING ENGINE
BACKUP TO FIRE ATTACK IN STAIRWELL

Apparatus Placement: Out of 200' perimeter and easily movable. Sets up in stairwell to relieve Fire Floor Division crews.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace attack team on fire floor. Reports to Fire Floor Division with PAR#. Report when in position. Check the floor above the fire floor with the Fire Floor Division supervisor.

5TH-ARRIVING ENGINE
POSITIONED IN RESOURCE. BACKUP TO STAIRWELL

Apparatus Placement: Places engine at Apparatus Base. Crew reports to Resource Staging Area and prepares to relieve stairwell crews.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Initial RSA manager. Report to RSA and prepare to replace an attack team in stairwell. Report when in position with PAR#.

6TH-ARRIVING ENGINE
POSITIONED IN RESOURCE. BACKUP TO STAIRWELL

Apparatus Placement: Places engine at Apparatus Base. Crew reports to Resource Staging Area and prepares to relieve stairwell crews.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Reports to RSA and prepares to replace attack team in stairwell. Reports to RSA manager with PAR#.

7TH-ARRIVING ENGINE
2nd STAIRWELL ATTACK

Apparatus Placement: Places engine at Apparatus Base.

Safety Procedure: Full PPE, radios, cell phone, building phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Tactical Objective: Begin fire attack from 2nd stairwell on fire floor. Must coordinate attack with Fire Floor Division supervisor. Initial 2nd stairwell Fire Attack Group supervisor. Reports to Ops or IC when in position with PAR#.

8TH-ARRIVING ENGINE
BACKUP TO FIRE ATTACK ON 2ND STANDPIPE/
2ND WATER SUPPLY

Apparatus Placement: Reverse lay from the 2nd standpipe location to a hydrant (different from first if possible) at least 200′ from structure. Makes hydrant hookup and prepares to lay a 2nd line to the 2nd standpipe. Note: If there is only one bank of connections, then this will be the 3rd line in and coordinates through Water Supply Group. Drives to a second hydrant at least 200′ away. Engineer stays with engine to support 2nd standpipe operations.

Safety Procedure: Full PPE, radios, cell phone

Tools: Engine High-rise Kit. Extra equipment dropped in RSA.

Tactical Objective: Engineer supplies the 2nd standpipe/sprinkler. Crew backs up fire attack in 2nd stairwell on fire floor. Reports to 2nd stairwell Fire Attack Group supervisor when in position with PAR#.

9TH-ARRIVING ENGINE
BACKUP TO FIRE ATTACK IN 2ND STAIRWELL

Apparatus Placement: Places engine at Apparatus Base.

Safety Procedure: Full PPE, radios, cell phone, building phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace attack team on fire floor in 2nd stairwell. Reports to 2nd stairwell Fire Attack Group supervisor when in position with PAR#.

10TH-ARRIVING ENGINE
POSITIONED IN RESOURCE. BACKUP TO FIRE ATTACK IN 2ND STAIRWELL

Apparatus Placement: Places engine at Apparatus Base.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace attack team on fire floor in 2nd stairwell. Reports to 2nd stairwell Fire Attack Group supervisor when in position with PAR#.

11TH-ARRIVING ENGINE
POSITIONED IN RESOURCE. BACKUP TO 2ND STAIRWELL

Apparatus Placement: Places engine at Apparatus Base.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace an attack team in 2nd stairwell. Report to 2nd stairwell group supervisor when in position with PAR#.

12TH-ARRIVING ENGINE
POSITIONED IN RESOURCE. BACKUP TO 2ND STAIRWELL

Apparatus Placement: Places engine at Apparatus Base.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Engine High-Rise Kit. Extra equipment dropped in RSA.

Main Objective: Prepare to replace an attack team in 2nd stairwell. Report to 2nd stairwell group supervisor when in position with PAR#.

Trucks

1ST-ARRIVING TRUCK
SUPPORT FIRE ATTACK TEAM

Apparatus Placement: Places apparatus in front of structure on an advantageous corner for possible rescue, where access allows for usable positioning. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone

Tools: Truck Kit. Extra tools are placed in the RSA.

Main Objective: Performs truck functions at the fire floor, opens up for the attack team, opens up plenum space after the Fire Attack Teams enter, stages in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and Initial Rapid Intervention Team (IRIT). If IC prioritizes aerial rescue operations, the Fire Attack Support Team's responsibilities shift to the next arriving truck company. Reports to Fire Floor Division with PAR#.

2ND-ARRIVING TRUCK
BACKUP TO FIRE ATTACK IN STAIRWELL

Apparatus Placement: Out of 200′ perimeter and easily movable. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone, building phone, keys

Tools: Truck Kit. Fan and extra tools are placed in the RSA.

Main Objective: Takes fan to base of fire attack stairwell. Upon relieving Truck Fire Attack Team on fire floor, performs truck functions at the fire floor, opens up for the attack team, opens up plenum space after Fire Attack Teams enter, stages in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and IRIT. If IC prioritizes aerial rescue operations, the Truck Fire Attack Team's support responsibilities shift to the next arriving truck company. Reports to Fire Floor Division with PAR#.

3RD-ARRIVING TRUCK
BACKUP TO STAIRWELL IN RESOURCE

Apparatus Placement: Out of 200′ perimeter and easily movable. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone, building phone, keys.

Tools: Truck Kit. Fan and extra tools are placed in the RSA.

Main Objective: Positions additional fan in stairwell one floor below RSA. Prepares to rotate to Backup Fire Attack Teams in stairwell. Upon relieving Truck Fire Attack Team on fire floor, performs truck functions at the fire floor, opens up for the attack team, opens up plenum space after Fire Attack Teams enter, stages in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and IRIT. If IC prioritizes aerial rescue operations, the Truck Fire Attack Team's responsibilities shift to the next arriving truck company. Reports to RSA manager with PAR#.

4TH-ARRIVING TRUCK
2ND STAIRWELL ATTACK

Apparatus Placement: Places apparatus near 2nd stairwell on an advantageous corner for possible rescue. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial occupancy, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Truck Kit. Extra tools are placed in RSA.

Main Objective: Performs truck functions on the fire floor from the 2nd stairwell, opens up for the attack team, opens up plenum space after Fire Attack Teams enter, stages in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and IRIT. If IC prioritizes aerial rescue operations, the Truck Fire Attack Team's support responsibilities shift to the next arriving truck company. Reports to 2nd stairwell Fire Attack Group supervisor with PAR#.

5TH-ARRIVING TRUCK
BACKUP TO FIRE ATTACK. 2ND STAIRWELL

Apparatus Placement: Out of 200′ perimeter and easily movable. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone.

Tools: Truck Kit. Fan and extra tools are placed in the RSA.

Main Objective: Takes fan to base of 2nd fire attack stairwell. Upon relieving Truck Fire Attack Support Team on fire floor, performs truck functions at the fire floor, opens up for the attack team, opens up plenum space after Fire Attack Teams enter, stage in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and IRIT. If IC prioritizes aerial rescue operations, the Truck Fire Attack Team's responsibilities shift to the next arriving truck company. Reports to 2nd stairwell Fire Attack Group supervisor with PAR#.

6TH-ARRIVING TRUCK
BACKUP TO STAIRWELL IN RESOURCE. 2ND STAIRWELL

Apparatus Placement: Out of 200′ perimeter and easily movable. If aerial rescue is deemed immediately necessary, place the turntable in a rescue position for a residential structure. If commercial, place tactically, if fire floor is within reach.

Safety Procedure: Full PPE, radios, cell phone

Tools: Truck Kit. Fan and extra tools are placed in the RSA.

Main Objective: Positions fan in stairwell one floor below 2nd stairwell resource. Prepares to rotate to Backup Fire Attack Teams in stairwell. Upon relieving Truck Fire Attack Team on fire floor, performs truck functions at the fire floor, opens up for the attack team, opens up plenum space after Fire Attack Teams enter, stages in stairwell, and becomes forcible entry (upon request of Fire Attack Team) and IRIT. If IC prioritizes aerial rescue operations, the Truck Fire Attack Team's responsibilities shift to the next arriving truck company. Reports to 2nd stairwell resource group supervisor with PAR#.

Heavy Rescue

**1ˢᵀ HEAVY RESCUE
RIT**

Apparatus Placement: Places apparatus in Apparatus Base and reports to Resource Staging Area.

Safety Procedure: Full PPE, radios, cell phone

Tools Required: RIT cache

Main Objective: Establishes RIT on the RSA floor. Reports to Resource Staging Area manager with PAR#.

**2ᴺᴰ HEAVY RESCUE
2ᴺᴰ STAIRWELL RIT**

Apparatus Placement: Places apparatus in Apparatus Base and reports to 2nd stairwell RSA.

Safety Procedure: Full PPE, radios, cell phone.

Tools Required: RIT cache.

Main Objective: Establishes RIT on 2nd stairwell RSA. Reports to 2nd Resource Staging Area manager with PAR#.

HIGH-RISE KITS

The purpose of developing high-rise kits is to assist the operation at the fire floor. Consistency between departments should be a high priority. If the kits are similar, then crews will be able to work together and accomplish the goals. This applies to local and regional fire departments. (See the photos of example kits at the end of this section.)

Command/Lobby Kit
All chief officers should secure a standardized Command/Lobby Kit. The kits will be carried on all chief officer vehicles and will be referred to as Incident Management Kits. Fire departments that do not have multiple vehicles can assemble these kits and store them in easily accessible bins within a department support vehicle. Each kit should contain:

- Bag (1)
- Notepads (1)
- Clipboard (plastic) (1)
- Assorted markers (1)
- Incident vest (1)
- Incident vest inserts (2)
- Accountability boards (1)
- Building phone (from Fire Control Room) (1)
- Box of lumber crayons, grease pens, or permanent markers (1)
- Complete set of ICS forms (1)

Engine High-Rise Kit
- Engine kit bag (1). The bag should be made of heavy fabric, like firefighter turnout bags, and have large rings.
- 2½" x 2½" gated valve (1). This valve will be of lightweight construction.
- NOTE: If a pressure gauge is available, it is recommended that you purchase one with the gauge installed.
- Spanner (2). This style and brand is very lightweight and is large enough to handle 2½" couplings.
- Vise grip or channel locks (1). Used for securing the valve of a standpipe if the wheel is missing or broken.
- 1½" to 2½" Increaser (1). To be used if you are unable to take the 2½" to 1½" reducer off.
- Nozzle (1). 2½" solid stream nozzle with tips (1⅛"–1¼") or 2½" high-rise nozzle
- Spare SCBA cylinder (one per person)
- Door wedge/rubber strap assortment
- High-rise hose pack (one per FF)
- Lumber crayons, grease pens, or permanent markers
- Dog bone Knox cap remover

Truck Kit
- TIC (1)
- Chain saw (1)
- Rotary saw (1)
- Trash hooks (2)
- Set of heavy irons (w/ shoulder sling) (1)
- Set of light irons (w/ shoulder sling) (1)
- Portable light (1)
- Spare SCBA bottle (1 per person)
- Lumber crayons, grease pens, or permanent markers

High-Rise Hose Pack
The hose pack should be assembled with high-rise hose:
- A split hose pack (50 feet of hose, or one section, carried per firefighter)
- A horseshoe load (carried over the SCBA air cylinder or shoulder)

The high-rise hose pack should be assembled in the following manner:

Step 1:
Starting at the male coupling, measure 32 inches from the outside of the male coupling up the hose. With permanent black ink, mark the 32-inch mark (32" H/R) on both sides of the hose for future use. It is preferable that at least three firefighters assemble the hose pack, to keep it as tight and as compact as possible.

<u>Step 2</u>:
At the 32-inch mark, make your first bend in the hose and return back down to a point just short of the male coupling. Do not go past the coupling; this will keep the hose pack small and compact. (Going past the coupling with the hose will make the hose pack fat and bulky at the ends.)

At this point, make another bend in the hose and return up to the 32-inch mark, continuing all the way around the top and back down the opposite side to a point just short of the male coupling. Once again, to keep the hose pack as compact as possible, don't go past the coupling.

Continue to fold the hose in a horseshoe-type configuration, keeping the entire hose pack as tight as possible, with absolutely no slack in the hose at any point.

Each time the hose reaches the point near the male coupling, stagger the folds, one long and one short, similar to an accordion-type hose load in the main hose bed of some pumpers. This keeps it neat and compact and maximizes space.

Step 3:
Continue folding the hose in a horseshoe-type configuration until you reach the female coupling.

Place the female coupling on the side of the horseshoe opposite that of the male coupling and just past the hose folds. This helps to balance the hose pack and distribute the weight more evenly.

Pull any hose slack back around to the male coupling side. Squeeze it together tightly and tuck it back up in between the first and second folds. Doing this ensures that the hose pack will always come out the same size, approximately three feet by eight inches, depending on the age and type of the hose used. (Because every section of hose on the hose rack and in a fire department's inventory is generally slightly different, give or take a few inches because of repairs and so on. Assembling the hose pack will rarely work out perfectly.)

Step 4:
To secure the high-rise hose pack, use some sort of lightweight quick-release strap or duct tape. An example would be a one-piece, quick-release, self-fastening type of strap with a reflective strip on the open end to identify the release point. This strap can be released with one hand and in dark conditions. Companies should use a minimum of three straps per hose pack.

Attach the straps, one on each side of the open end of the horseshoe and as close to the end of the hose folds as possible (this will keep the couplings tight to the hose and eliminate the chance of their flopping around). Attach the third strap near the top of the hose pack on either side.

The hose pack should be carried over the SCBA air cylinder.

Firefighters should rotate positions and assist one another in properly placing the hose pack over the SCBA air cylinder.

Sample Hose Pack

Sample Truck Kit

Sample Command/Lobby Kits

Sample Engine High-Rise Kits

GLOSSARY

AHJ: The authority having jurisdiction

Air Operations Branch: ICS organizational assignment. Implemented within the Operations Section during a complex or expanding incident to narrow the span of control or change focus to a technical or focus area within the incident. Its supervisory title is branch director or BD.

Apparatus Base: The defined location for all additional arriving apparatus and resources to park, hold, or place. Typically defined by the incident commander and assigned to local dispatch center. This is a physical address at least 200 feet from the structure.

Apparatus Base manager: An ICS title for the one overseeing the Apparatus Base

Commercial high-rise building: A building zoned for commercial/nonresidential use that is 75 feet or higher

FCP: Fire control panel

FCC: Fire Command Center (or Fire Control Room)

Fire Floor: The area where the incident is within the structure

Fire Protection Publications' *Model Procedures Guide for High-rise Firefighting:* A standardized set of guidelines for fire departments to use in the planning, response, and control of incidents in high-rise buildings, published in Oklahoma by FPP, a subset of IFSTA

High-rise structure: Any building 75 feet or higher

Horseshoe load: A preformed hose bundle that can be easily deployed and extended to any length needed

Low-rise structure: Any building with multiple stories, without ADA accommodations, that is less than 30 feet high

Mid-rise structure: Any building over 30 feet and less than 75 feet in height

Plenum space: The open space above the ceiling or below the floor used for air circulation. Technically, any ductwork area is considered a plenum space.

Pressure reduction valve (PRV): A PRV is a mechanical device that is installed into a sprinkler and/or standpipe design in many high-rise buildings. PRVs help to control pressure, which is extremely important in high-rise buildings where, because of gravity, pressure can build up significantly on the lower floors of a sprinkler or standpipe piping zone. This is critical in maintaining correct nozzle pressure in handlines.

Reflex time: A period of time that begins with the 911 call center receiving an alarm and includes the time to process dispatch, the alert to a station or stations, firefighters' turnout time, apparatus drive time, and the time it takes firefighters to ascend to the fire floor and begin a fire attack. Factors that affect reflex time include the type of call, whether it is direct or indirect, the time of day, traffic, and the location of fire apparatus and crews.

Residential high-rise building: A building zoned for residential/noncommercial occupancies that is 75 feet or higher

Resource Staging Area (RSA): An area used to create a cache of equipment, tools, hose, firefighting teams, medical support, and RITs. This area is generally located two floors below the fire floor and must be established as soon as possible. Teams in the RSA are to be ready to advance directly to the fire floor as directed.

Resource Staging Area manager: An ICS title for the one overseeing the RSA

Roof scuttle: An access hole, lid, or small door leading directly to the roof. May be designed differently in each high-rise building. Firefighters must identify their configuration during pre-planning or while inspecting high-rise buildings.

Tactical assignment cards: Cards listing companies' initial assignments. These cards should be kept in the apparatus. The cards specify predetermined tasks in order to maximize the use of limited resources.