

DEPARTMENT OF FIRE AND RESCUE SERVICES

	<h1>GENERAL ORDER</h1> 310.02	
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Originating From	Issue Date	Revision Date	Attachments
Operations	9/2/2009		A-H

EFFECTIVE DATE: JANUARY 4, 2010

SUBJECT: Initial Operations at High Rise Structure Fires

APPLICABILITY: All Personnel

POLICY:

This policy will define how Howard County Department of Fire and Rescue Service's (DFRS) command officers are to be deployed on high-rise building fires and their responsibilities as tactical commanders, in addition to those of the incident commander. It will provide guidance to company officers in directing firefighting operations and all support activities. Company Officers are responsible for the safety, welfare and accountability of the personnel assigned to them. Personnel will strictly follow the DFRS General Orders and Standard Operating Procedures on Incident Command, Communications, and Accountability/Mayday/RIC.

The initial arriving Company Officer is permitted enough flexibility to successfully accomplish the assigned mission. When the initial arriving Company Officer must deviate from this order, other responding Units must be advised through radio communications.

All Company Officers are responsible to maintain crew integrity and accountability for their personnel at all times.

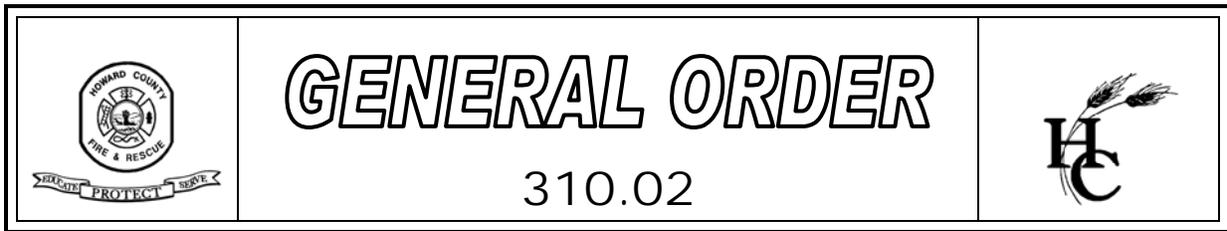
Personnel assigned to areas where Immediate Dangerous to Life and Health (IDLH) conditions are present will be in appropriate protective equipment at all times.

A high-rise building is **defined** as a building 75 feet above the lowest fire department access to the highest floor level intended for occupant use. Members must understand that problems characteristic in high-rise buildings are not limited to structures that meet this definition. Fires that occur in structures with fewer floors, or lower building height can still present the same challenges experienced in much higher buildings. A building four stories or more with at least one standpipe and one elevator may require most of the same tactical considerations as a high-rise, but some will not have the same built in fire protection systems.

1 OVERVIEW

- 1.1 As with other building fires, officers must always assess the risks and benefits associated with each operation. Certainly, we are willing to take a greater degree of risk to save a life than we would once a civilian life hazard has been negated.

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- 1.2 Due to the need for an unusually high commitment of resources, the process of control and accountability of each unit is of even more significance and this is a function of not only the incident commander, but the command structure that is implemented. **An exceptionally high level of discipline will be required of all officers and members during high-rise operations. Failure to follow any portion of the operational plan can lead to a break down of the entire operation and could result in firefighter casualties.**

2 FIRE OPERATIONS

2.1 Strategic Factors

2.1.1 The operational plan for high-rise fires must consist of five basic points:

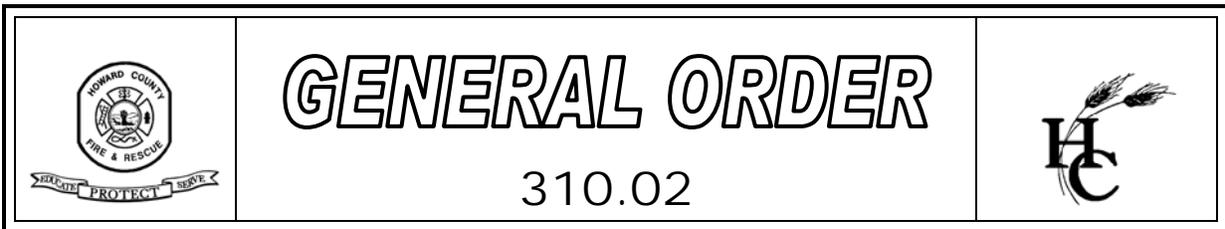
- 2.1.1.1 **Determine fire floor** - Determine the fire floor from information on dispatch, information from building occupants, and by checking annunciator panels or fire control room indicators.
- 2.1.1.2 **Verify fire location** - Companies must investigate to verify the exact location of the fire, including the specific location on the fire floor and the extent of fire involvement.
- 2.1.1.3 **Control occupants** - If necessary, evacuation of the immediate fire area may be needed, as well as facilitating movement of people already in the stairwells. Size-up may also indicate that control of occupants will be accomplished by protecting in place.
- 2.1.1.4 **Control of building systems** - Building systems must be brought under the control of the fire department. At a minimum, this must include control of the elevators, fire pump, and heating, ventilation and air conditioning system(s) (HVAC).
- 2.1.1.5 **Confine and extinguish the fire** - The fire must be confined before being extinguished. Obviously, putting the fire out accomplishes both, but a rapidly extending fire may make this impossible. The critical point is identifying the extent of fire, and stopping it from gaining more headway once operations begin.

3 COMPANY RESPONSIBILITIES AND POSITIONS

3.1 **Command shall be assumed by the third arriving engine or the first arriving command officer, whoever is on the scene first.**

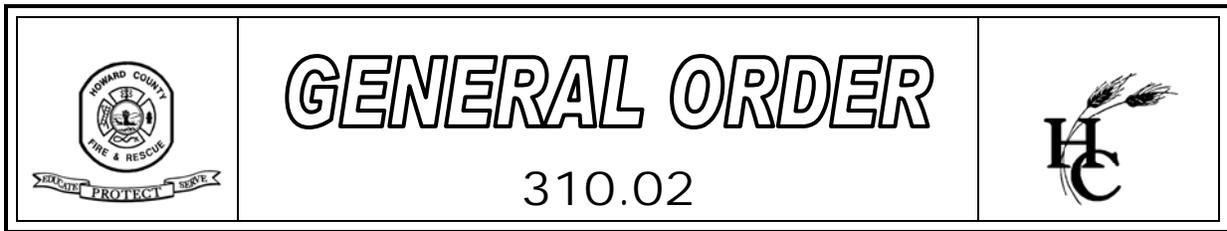
3.2 FIRST ARRIVING ENGINE COMPANY

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- 3.2.1 Establish water supply and support sprinkler and standpipe system. All intakes at the sprinkler or standpipe Siamese in use shall be supplied. If there are Siamese connections at other locations on the building, Command must ensure they are also supplied.
- 3.2.2 Report to the lobby to obtain information from tenants and check the annunciator panel for possible location of the fire if not known.
- 3.2.3 The officer of the first engine, in conjunction with the officer of the first special service, shall identify the standpipe outlet that is closest to the fire. The stairwell that contains this standpipe outlet shall be declared as the **“attack stairwell.”** ALL personnel must know what stairway has been declared as the “attack stairwell.”
- 3.2.4 The first and second arriving engine companies shall be used to deploy the first 2 1/2 inch attack line on the fire floor from the standpipe connection at the floor below the fire.
- 3.2.5 Initiate fire confinement. Crew may work in coordination with first arriving special service for proper hose line placement. Attack from a position that best protects occupants.
- 3.2.6 Assure access for aerial apparatus and other units as much as possible.
- 3.3 SECOND ARRIVING ENGINE COMPANY
 - 3.3.1 The engine operator shall assist the first engine with adequate water supply. This may include supporting additional fire department connections.
 - 3.3.2 Assist the first arriving engine to deploy the 2 1/2 inch attack line on the fire floor from the standpipe connection at the floor below the fire. The crew is responsible for proper pressure to the attack line from the standpipe connection and TWO OUT.
 - 3.3.3 The officer shall be positioned at the entrance to the fire floor and is designated as the division supervisor for the fire floor. This will provide communications between the officer supervising the line and the firefighter at the standpipe outlet to ensure proper operating pressure.
 - 3.3.4 In order to comply with OSHA and NFPA requirements, the crew from the second engine shall be available as a rescue team. The crew shall not commit to tasks that could not be stopped if the initial companies experience an

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emergency (mayday).

3.4 THIRD ARRIVING ENGINE COMPANY

- 3.4.1 The third arriving engine shall ensure that all sides of the building are viewed and report that information via radio.
- 3.4.2 If a command officer has not yet arrived, the officer shall assume Command and establish a command post in the lobby or at the fire control room or station if one exists.
 - 3.4.2.1 Once the command officer assumes Incident Command, the officer of the third engine shall be assigned the lobby control function.
- 3.4.3 The engine shall be abandoned and the entire crew shall be deployed to establish lobby control and assist with control of elevators and other building and communication systems. Upon declaration of the attack and evacuation stairwells the crew shall physically mark these entrances at the lobby level.

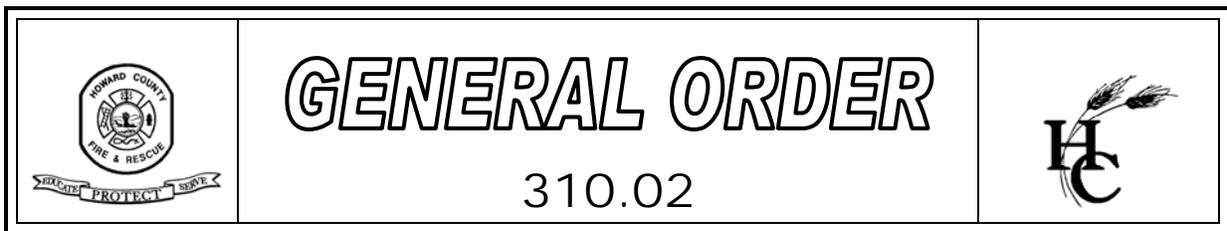
3.5 FOURTH ARRIVING ENGINE COMPANY

- 3.5.1 The engine operator shall support additional fire department connections. If this is not necessary, the operator shall accompany the crew.
- 3.5.2 The fourth and fifth engine companies shall be used to deploy the second 2 1/2 inch attack line on the fire floor from the standpipe connection two floors below the fire.
- 3.5.3 Crew may work in coordination with other companies operating on the fire floor.
- 3.5.4 Assure access for aerial apparatus and other units as much as possible.

3.6 FIFTH ARRIVING ENGINE COMPANY

- 3.6.1 The engine operator shall support additional fire department connections. If this is not necessary, the operator shall accompany the crew.
- 3.6.2 Assist the fourth arriving engine to deploy the 2 1/2 inch attack line on the fire floor from the standpipe connection two floors below the fire. The crew is responsible for proper pressure to the attack line from the standpipe connection.

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3.7 FIRST ARRIVING SPECIAL SERVICE (AERIAL LADDER/TOWER, RESCUE SQUAD, RESCUE ENGINE)

- 3.7.1 Report to the lobby to obtain information from tenants and check the annunciator panel for possible location of the fire if not known.
- 3.7.2 The officer of the first special service, in conjunction with the officer of the first engine company, shall identify the standpipe outlet that is closest to the fire. The stairwell that contains this standpipe outlet shall be declared as the **“attack stairwell.”** ALL personnel must know what stairwell has been declared as the “attack stairwell.”
- 3.7.3 The first arriving aerial shall park on side “Alpha” unless the fire location can be readily identified. If so, the aerial shall park on the fire side of the building if it is accessible. Rescue Squads must park away from the building to leave access.
- 3.7.4 The primary interior responsibilities of the first special service are:
 - 3.7.4.1 Clear the attack stairwell,
 - 3.7.4.2 Forcible entry and,
 - 3.7.4.3 Search and rescue operations on the fire floor.

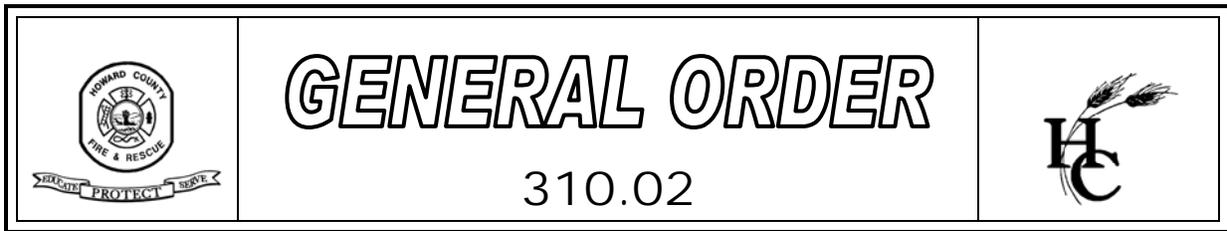
3.8 SECOND ARRIVING SPECIAL SERVICE

- 3.8.1 The second arriving aerial shall position to utilize the aerial to the fire floor if within reach. When possible, the second arriving aerial shall position on the opposite side from the first or opposing corner. Rescue Squads must park away from the building to leave access.
- 3.8.2 The primary interior responsibilities of the second special service are:
 - 3.8.2.1 Check in through lobby control,
 - 3.8.2.2 Forcible entry and,
 - 3.8.2.3 Search and rescue operations on the fire floor.

3.9 THIRD ARRIVING SPECIAL SERVICE

- 3.9.1 The primary interior responsibilities of the third special service are:
 - 3.9.1.1 Check in through lobby control and,

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3.9.1.2 Crew is to proceed to the attack stairwell one floor below the fire floor as the Rapid Intervention Crew.

3.10 FOURTH ARRIVING SPECIAL SERVICE

3.10.1 The primary interior responsibilities of the fourth special service are:

3.10.1.1 Check in through lobby control,

3.10.1.2 Clear the evacuation stairwell,

3.10.1.3 Forcible entry and,

3.10.1.4 Search and rescue operations on the floor above the fire.

3.11 FIRST ARRIVING EMS TRANSPORT UNIT

3.11.1 The primary interior responsibilities of the first arriving EMS Transport Unit are to report to the staging area two floors below the fire floor and establish rehab.

3.12 SECOND ARRIVING EMS TRANSPORT UNIT

3.12.1 The primary responsibility of the second arriving EMS Transport Unit is to establish a medical group to manage civilian casualties

3.13 FIRST ARRIVING COMMAND OFFICER

3.13.1 The first arriving command officer shall immediately gather all available information from companies already at the scene and assume Command. If the third engine has arrived, initial command by a company officer shall be set up in the lobby. The command officer must exchange information (Information shall be face to face when possible for accurate information transfer) and then assume command. The command post shall be at the command officer's vehicle.

3.14 SECOND ARRIVING COMMAND OFFICER

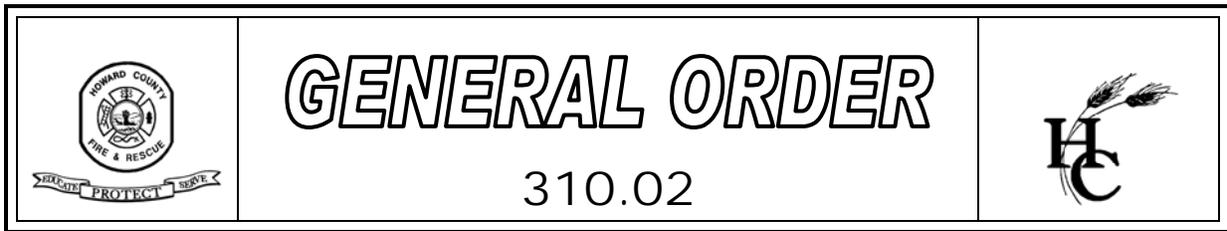
3.14.1 The second arriving command officer shall report to Command to receive briefing and assignment. Duties may include, but are not limited to:

3.14.1.1 Assume command of the fire floor

3.14.1.2 Lobby control Officer

3.15 THIRD ARRIVING COMMAND OFFICER

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3.15.1 The third arriving command officer shall report to Command to receive briefing and assignment. Duties may include but are not limited to:

3.15.1.1 Assume command of the fire floor

3.15.1.2 Lobby control Officer

3.16 FIRST ARRIVING SAFETY OFFICER

3.16.1 Report to Command to receive briefing and assume the safety officer position of the interior operations

3.17 GREATER ALARM APPARATUS

3.17.1 Incoming units will report to an appropriate staging area known as “Base,”

3.17.2 The first arriving DFRS unit will establish base area manager at a designated area.

4 ATTACHMENTS

A: High Rise Information (construction, tactics, search, ventilation, etc.)

B: ICS – High Rise Structural Fire Operational System Description

C: ICS–Position Manual – Base Manager High Rise Incident

D: ICS–Position Manual – Ground Support Unit Leader, High Rise Incident

E: ICS–Position Manual – Lobby Control Unit Leader, High Rise Incident

F: ICS–Position Manual – Systems Control Unit Leader, High Rise Incident

G: ICS–Position Manual – Staging Area Manager, High Rise Incident

H: ICS–Position Manual – Medical Unit Leader, High Rise Incident

I: ICS–Position Manual – Safety Officer, High Rise Incident

Approved:



William F. Goddard, III
Chief

High-Rise Building Fires – Attachment A

1 CHARACTERISTICS

- 1.1 Fire-resistive construction is the method typically found in high-rise buildings. Today you may also find a combination of non-combustible construction on the lower floors with frame construction on the upper floors.
- 1.2 These high-rises will house occupancies including assisted living, hospitals, business offices, apartments, and hotels. Depending on the occupancy, personnel may encounter a floor with many compartments or in the case of an office structure, have several thousand square feet of open cubicle area.
- 1.3 High security features may be found in many government and private technological type occupancies. These features can include vaults with lead-shielded wall and doors, and raised floors to accommodate computer and communications wiring as well as special locks.
- 1.4 Located throughout many of these buildings are: community rooms, restaurants, gymnasiums, parking garages, trash rooms and chutes, compactors, dumpsters, and mercantile occupancies. Typically these areas/rooms are located on the lower floors.
- 1.5 A large portion of the building will likely be beyond the reach of aerial apparatus.
- 1.6 The potential exists for stack effect and reverse stack effect, as well as, stratification related to the movement of smoke and heated gases.
- 1.7 Prolonged reflex time and evacuation times can be expected.
- 1.8 Dependency on internal fire protection systems is required.
- 1.9 Due to modern furnishings, the characteristics of fire resistive construction and reflex time involved, high heat conditions can be expected when battling fires in these structures.
- 1.10 Because of the amount of steel and concrete in the structure, officers and firefighters may have difficulty transmitting via portable radios. Consider channel 14 or 15 in the appropriate Zone on 800 MHz radios for transmission on the scene.

2 BACKGROUND

- 2.1 Fires in high-rise buildings everywhere have the potential to be one of the most challenging incidents to which we respond. The potential for loss of life is high. Fires can burn for extended periods of time before operations can begin. The reflex time involved is extended due to the additional time required to reach the fire area. It is not uncommon for 15 or 20 minutes to elapse after the arrival of the first unit before fire attack can actually commence.
- 2.2 A fire in a high-rise building requires a high level of coordination. Members should anticipate a large commitment of resources. High-rise fires have historically proven to be some of the most demanding a department can face.

High-Rise Building Fires – Attachment A

- 2.3 Members must realize that the majority of high-rise buildings in Howard County have built in fire protection systems. These systems include sprinkler systems, standpipes, fire detection systems, and fixed fire suppression systems. Only with proper planning, will familiarity with the response district be possible.
- 2.4 There are still a number of high-rise buildings, both residential and commercial, that have nothing more in terms of fire protection than a standpipe. Whether equipped with a sprinkler system or not, each of these structures presents its own set of problems and challenges in the event of a fire.
- 2.4.1 Command officers should be assigned to tactical command positions early in an incident to establish and build the proper command structure that efficiently and safely manages the incident. This enables the incident commander to keep company officers out of command level roles and allows them to supervise their company's activities. This also keeps each company functioning as a complete unit, improving the ability to carry out the long list of tasks in the operation.
- 2.4.2 Fire load characteristics are also a consideration in understanding fire behavior in high-rise environments. The 17th edition of the NFPA Fire Protection handbook states that a fire load in general office space is about 7.7 pounds per square foot. A conference area is about 5.9, but a file area jumps over 16 pounds per square foot! All of these are typically higher in government buildings, of which there are many. The useable floor space on each floor of one of these buildings can easily exceed 25,000 square feet. The combustibles involved can release 16,000 to 18,000 British Thermal Units (Btu) per pound. It is possible for these fires to double in size in as short a time as 90 seconds. A tremendous amount of heat is generated in a very short amount of time and is confined because of the energy efficient nature of high-rise construction.
- 2.4.3 Exposure protection not only involves checking the floor above, but also requires companies to be assigned to check areas extremely remote from the fire floor. Fire can extend via hidden voids and break out many floors away from the original fire. Additionally, exposure protection includes minimizing fire extension on the floor of involvement itself.
- 2.4.4 Ventilation, forcible entry, and fire attack must be coordinated. A significant fire may be present on a floor that has confined itself to that floor but also prevented any heat and smoke from venting to the outside. Punishing conditions should be expected.
- 2.4.5 Wind conditions, in terms of force and direction, must be determined near the fire. At high-rise fires, wind conditions at the level of the fire can be much different from what is happening at ground level.
- 2.4.6 At residential occupancies, ventilation is more likely to be performed than at commercial occupancies. In residential high-rise fires, companies that are assigned to vent the fire floor should take the time to open a window on the same side of the building as the fire and check the wind conditions before opening the fire floor. Engine crews should not open doors into the fire area until the information is relayed to them, or, risk being driven off the floor or seriously injured should fire be blown over them.
- 2.4.7 Members must understand and accept the fact that while aggressive fire

High-Rise Building Fires – Attachment A

attack, ventilation, and search is crucial, considerably more time will be necessary to coordinate and carry out the various tasks correctly.

Communication is essential for units to operate in concert with one another.

- 2.4.8 While it is also recognized that high-rise fires tend to be thought of as being out of the reach of exterior master streams, this is not always the case. The use of heavy caliber streams inside is possible and has actually been done at major high-rise operations.
- 2.4.9 Consider the time needed to assess the situation upon arrival of the first units; gather information from the enunciator panel or fire control station and building personnel; identify and confirm fire floor; proceed to that floor, locate the fire on the floor, and prepare to operate. All members must realize that this time frame can easily exceed 10 or 15 minutes, depending upon the size of the building and complexity of the situation. For example, at a fire on the sixth floor of an office high-rise, only eleven minutes elapsed from the time the fire department received the call until fire was out the windows! By the time crews got into position, only five floors above ground level, two 2 ½-inch lines could not advance on the fire.
- 2.4.10 The first command officer at the scene must establish or assume Command. Other command officers will be engaged in tactical command positions. The second due battalion chief will assume the first of these positions. In most cases, this will be as the chief in charge of fire attack on the fire floor(s). Other command officers should be placed in charge of major undertakings such as evacuations, lobby control, staging, or planning.
- 2.4.10.1 As with every IDLH situation, a Rapid Intervention Crew must be established. The optimum location for the R.I.C. is the attack stairwell one floor below the fire floor and within contact of the attack officer, thus enabling rapid deployment when and if needed. This must be no farther away from the floor of operations than Staging at two floors below.
- 2.4.10.1.1 If smoke or fire is showing in a residential or hotel occupancy, and the fire area is within reach of the aerial device, the aerial should be raised and placed to a location accessing the unit involved. The ladder should NOT be placed to a window or balcony showing fire unless there is someone at such a location in need of rescue. If the apartment or unit is totally involved, then the aerial should be raised to an adjoining unit. If there is no need for the aerial, or if the fire floor is out of reach, the crew goes in together.
- 2.4.10.2 Several factors should be considered when the officer makes the decision to use or not to use the aerial:
- 2.4.10.2.1 The various irregular shapes (H, T, Y, L, etc.) of these buildings make it extremely difficult to locate the truck near the fire apartment without some visible indication of smoke or fire from the outside.
- 2.4.10.2.2 The information normally provided in the initial reports of smoke on one or more floors is often inaccurate until the first units actually go to the reported floor to confirm the location and extent of the fire.
- 2.4.10.3 When the aerial company is required to operate utilizing the aerial, as might be the case in an obvious rescue situation, Command **must** be advised. If the first arriving aerial is a tower ladder, the unit should be positioned as above. However, the crew may ride the bucket up to the fire

High-Rise Building Fires – Attachment A

floor. The officer will have to determine whether to enter the building directly into the involved unit, based upon fire conditions and obvious rescue needs, or to enter by way of an adjoining apartment. This **MUST** be communicated to the attack engines and the Incident Command!

If the building is residential or hotel occupancy and the fire is within reach of the aerial, it should be raised to the level of the fire floor. This aerial should remain ready for specific placement as needed.

- 2.4.10.4 View as much of the exterior of the building as possible. Conduct a preliminary check of the exterior of the building for anyone in distress, smoke or fire showing from the skin of the building, or the need for any exterior operations. Communicate any previously unreported conditions.
- 2.4.10.5 Prior to entering the building, the crew should also take note of wind direction and strength.
- 2.4.10.6 Bring minimum tool complement of radios, handlights, set of irons, hydraulic door opener, hook, thermal imaging camera, and rope lifeline pack.
- 2.4.10.7 If **immediate** rescues are indicated and within reach of the ladders, one or both truck crews may have to engage in removal operations. **THIS MUST BE COMMUNICATED TO COMMAND!**
- 2.4.10.8 The command officer will reposition to the Command Post when that unit has arrived on scene and is ready to operate.
- 2.4.10.9 Normally, a staging area is to be established by the first arriving DFRS engine on the second alarm. In a high-rise fire situation, this area will be designated as “Base” and will simply become a parking area for fire apparatus. If not already identified, that officer should announce this location. Crews from this alarm are going to be put to work. The first officer to this area should NOT remain there, but instead go with the crew. The DRIVER of the first DFRS engine to arrive at Base shall become the Base Manager.
- 2.4.10.10 The first and second arriving engine crews on the second alarm should proceed to the area of the command post. (The driver of the first arriving DFRS 2nd alarm engine shall remain at Base). The officers alone should check in with Command for assignment. The officer shall take the accessory bag and the crew takes their standpipe pack and at least two spare air cylinders. They should anticipate being sent to Staging. **STAGING WILL BE SET UP AT LEAST TWO FLOORS BELOW THE FIRE FLOOR.** Command will assign an officer to establish “Staging” at this point.
- 2.4.10.11 Subsequent engines should park at Base and be prepared to take additional equipment to Staging when called for. It is possible, that one of these units may be assigned to the fire floor. Unless these units receive specific orders, their standpipe packs, spare air cylinders, and hand lights shall be taken to the front of the building, outside the lobby. This equipment should be available as needed by Staging, and the stairwell support group will then shuttle that equipment up for use.
- 2.4.10.12 Air Units will need to be positioned at a forward position for stairwell access to staging. Most of these units are equipped with a 250-foot air hose, as well as extra air cylinders that will be required at staging. Incident Command should consider calling for multiple air and light units

High-Rise Building Fires – Attachment A

as well as other sources of spare cylinders, if a major operation is underway.

3 GENERAL COMPANY TACTICS

3.1 GENERAL ENGINE COMPANY RESPONSIBILITIES

- 3.1.1 It is the responsibility of the engines to deliver sufficient water in the correct amount and configuration, which will suppress the fire. This includes supply to sprinkler and standpipe systems, proper selection and advancement of hose lines, correct nozzle and stream selection, proper assignment of member on the hose to ensure its ability to advance, and to provide relief for the nozzle person.
- 3.1.2 Use of the standpipe pack will most often be the manner in which engine crews operate hose lines. However, at the officer's discretion, if the fire is located on the first floor or below grade, lines stretched directly from the apparatus may be quicker. Often, the engine can be positioned at or near the entrance that provides quick and easy access to the fire, without taking the time to find and connect to a standpipe outlet. The fire itself might be closer to the entrance than to a standpipe outlet and may block standpipe access. Once crews reach the fire area, access to standpipe connections for additional lines can then be determined. Therefore, it is imperative that the standpipe system still be supplied, even if the initial attack is made with hand lines stretched directly from the apparatus.
- 3.1.3 If the fire is in a residential or hotel type of building, use 1 ¾-inch hose on the working end of the standpipe pack is preferred. This line provides 185 to 210 gallons per minute (gpm) and one or two lines of this size should be sufficient to handle the fire load expected in residential settings. It is also more mobile, which is necessary to negotiate all the turns that are inherent to compartmentation. Consideration should be given to the option of deploying 2 ½-inch lines. Should the fire be on the windward side of the building, and the door to the fire apartment be blocked open, extremely heavy fire conditions may be present in the public hallway. In this case, the higher flow from the larger line may be required just to overcome the conditions caused by the wind blowing into the fire apartment. If your position is questionable, use the large line.
- 3.1.4 If the fire occurs in a commercial occupancy, engine companies should be paired up and 2 ½-inch lines used for attack. Command must provide two engines per line when using 2 ½-inch lines. Once the fire is knocked down or reconnaissance reveals that the fire is not well advanced, engine officers can choose to use the 1 ¾-inch option of the standpipe pack. Great care must be exercised in making this decision. If the fire is not quickly controlled, it can rapidly overwhelm the capability of the flow and reach of the stream from the smaller line. Remember that the fire load in commercial occupancies is considered to be moderate, and therefore requires a fire flow of 20 gpm per 100 square feet of involved area.
- 3.1.5 Fires may be very difficult to access. This will be dependent upon the fire location, and intensity and amount of obstacles. Arrival of the first two engine crews at the fire floor is necessary to ensure that the deployment of the fire line can be accomplished.

High-Rise Building Fires – Attachment A

- 3.1.6 Conditions and location of the fire will dictate whether the standpipe connection is made on the fire floor or on the floor below. Engine officers may also consider the option of stretching over ladders rather than an interior advance if the building is residential and the fire is at the fourth floor level or lower. If the stretch is made over a ladder rather than via the interior, **COMMAND MUST BE NOTIFIED.**
- 3.1.7 It is hazardous to open a door in a high-rise, as in any structure, that is separating crews from the fire without a charged line. Wind conditions need to be considered as well as whether or not the fire has self-vented.
- 3.1.8 Any evacuation that has commenced needs to be reported to Command. Also, the status of elevators and HVAC systems should be checked. Prior to entering the building, the crew should also take note of wind direction and strength.

3.2 GENERAL AERIAL COMPANY AND RESCUE SQUAD RESPONSIBILITIES

- 3.2.1 Aerial and rescue squads are responsible for the same activities as at any building fire. However, a high-rise fire presents challenges to accomplishing these tasks not found elsewhere. Locating the fire, if not readily apparent is but one of the tasks that may be assigned to these units. Additionally, evacuation of a portion of one of these structures, in addition to victim rescue, is very time consuming, difficult, and staff-intensive. Minimum staffing for each of these companies should be four (4), and tasks will have to be carefully prioritized in order to maximize available resources. Duties expected from these units include locating the fire, R.I.C., search, evacuation, forcible entry, horizontal and vertical ventilation, elevator control, and control of utilities.
- 3.2.2 View as much of the structure as possible. Conduct a preliminary check of the exterior of the building for persons in distress, smoke or fire showing from the skin of the building, or the need for any exterior operations. Prior to entering the building, the crew should also take note of wind direction and strength, count the number of floors to the building, identify the number of floors to the building, and identify the number of floors from which smoke or fire can be seen. If the fire is on the upper half of the building, it may be quicker to identify the fire floor(s) as the number of floors down from the roof.
- 3.2.3 Be prepared to force entry in the event the entrance doors are not equipped with electronic locks which open upon activation of a fire alarm.
- 3.2.4 Assist the officer of the first arriving engine in gathering information at the fire control room. Check the annunciator panel for what has been activated; manual pull station, heat, smoke, or duct detector, water flow, or more than one device. If building maintenance or security is present, have they been reported on the fire floor(s) above or below? If the structure is a commercial high-rise, check the building directory located in the lobby for the type occupancy on the floor(s) involved. A copy of the floor layout should be available in the fire control room, and shall be reviewed quickly before proceeding up.
- 3.2.5 If smoke conditions are found in the lobby, this company must determine if the fire is located on the lobby level or possibly on a floor below or in the elevator pit. Elevators equipped with automatic recall may stop at an alternate floor above this area. The location of these cars must be determined and the

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- car checked for occupants.
- 3.2.6 With the engine company officer, identify all stairwells and elevator banks. Recall all elevators. Determine the elevator and stairwell that is used to proceed to the fire floor and confirm that the doors from the stairwells to the floors above are in fact unlocked. Often these doors can be unlocked from the fire control room, and in most cases, this becomes the attack stairwell. This information must be communicated to the incoming companies and chief officers.
- 3.2.7 Proceed to the floor below the reported fire floor with the first engine company. Whether the stairs or the elevator has been utilized, the companies shall conduct a quick assessment of the floor below noting the layout of the entire floor, type of contents, location of mechanical rooms, window type, and presence of access stairways. This step is not necessary if the floor below the fire is the lobby level as it will serve little, if any, purpose. Once the fire floor is confirmed, conditions need to be evaluated. If the location of the fire is not readily apparent on that floor, the truck or rescue crew should advance to determine the location, while the engine prepares the line to be stretched.
- 3.2.8 Do not assume that it is a false alarm if fire is not found on the reported floor. A fire on an adjacent floor may have activated detectors on the floor that is being investigated, or a malfunctioning system has incorrectly reported the involved floor. The floor below should be checked when layout assessment is conducted. The floor above must now be checked.
- 3.2.9 If smoke and heat are encountered in the stairwell, its origin must be determined. Once the fire floor is confirmed, a quick check of the conditions on the floor above must be made and communicated to Command.
- 3.2.10 Before the attack commences, take into consideration the possibility that occupants may be present in the stairwell above your point of attack. Once the door to the fire floor has been opened and the line advanced, the door will remain open and the stairwell will become polluted with smoke. This area should be confirmed clear of building occupants prior to commencing attack, if at all possible.
- 3.2.11 If the door to the fire floor is hot to the touch, or if fire and heavy smoke conditions is expected, the attack line should be charged prior to opening the door. Remember also that if the location of the fire is known, use only the amount of hose necessary to reach the fire.
- 3.2.12 The aerial or rescue shall open the ceiling on the fire floor to expose the plenum area, if one is present, to check for fire before the engine begins the attack. Crews should not advance under fire in this area. It must be knocked down as the attack commences.
- 3.2.13 It is hazardous to open a door in a high-rise, as in any structure, that is separating your members from the fire without a charged line. Wind conditions and whether or not the fire has self vented, needs to be considered. This can often be done on the floor below the fire in residential occupancies. There is the potential of being caught in a horizontal chimney.
- 3.2.14 Where there is indication of a working fire, truck and rescue squad crews should consider using a search line. The engine officer is basing his/her attack line deployment on the information received from the aerial or rescue squad. (At this point, the engine crew is the rescue team for the aerial if needed). Using a tag line is more of a necessity in commercial occupancies.
- 3.2.15 Once the fire is located and the line is preparing to be advanced, the aerial or

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rescue crew must begin search of the rest of the floor for victims in a residential occupancy. In residential occupancies, search priority should be given to the fire unit, hallways next to the exit, and then the adjacent units and the unit(s) across the hall from the involved units. The second engine should be in position to act as the interim RIC at this point.

- 3.2.16 This aerial or rescue squad crew is crucial to the engine being able to operate safely. In the case of apartments or hotel rooms, the compartment containing the fire must be accessed. Additionally, forcible entry should quickly be accomplished on the adjacent occupancies. If the fire is on the windward side of the building and winds are strong, it may not be possible to conduct the attack through the apartment entrance door. Assessment of the wind's potential effect and control of the door to the fire area is imperative. This door may have to remain closed and an attack mounted from an adjoining apartment through a hole breached in the wall. To attempt an attack otherwise may lead to loss of control of the entire hallway.

4 GENERAL SEARCH CONSIDERATIONS AND PROCEDURES

- 4.1 High-rise buildings, whether of commercial or residential occupancy, potentially involve a large number of occupants that must be carefully managed during a fire situation. Commercial occupancies typically have the highest population during normal work hours. Residential high-rises will normally have higher occupancy during the evening and night time hours.
- 4.2 Search of smoke-filled floors above the fire can be time consuming and anticipation of the need for multiple crews per floor, should be anticipated. Information on smoke and fire conditions must be relayed to the appropriate command officers to ensure that informed decision making is possible.
- 4.3 The primary search shall be conducted on a priority basis beginning with the immediate fire area and floor, the floor above the fire area, and the top floor including the hallways, stairwells, and elevators leading to these areas.
- 4.4 Crews operating on the floor above must search for signs of life as well as vertical extension, and communicate findings.
- 4.5 Floors between the floor above the fire floor and the top floor are next in priority.
- 4.6 Members must know the location of the evacuation stairwell for both ambulatory and non-ambulatory occupants that must be removed.
- 4.7 Search lines shall be used in commercial occupancies regardless of how small the fire might be; conditions can change.
- 4.8 Primary search efforts are labor intensive due to the large area to be covered.
- 4.9 It is extremely important that all areas compromised by smoke are searched. The following systems shall be utilized to avoid duplication of effort. All personnel shall be equipped with chalk or crayon in order to apply this search identification system.

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- 4.9.1 An “X” shall be used to indicate that a search has been conducted in an apartment, room, office, etc. Carpenter’ chalk or crayon shall be used.
- 4.9.2 When a crew enters an office or apartment off a central corridor, or enters a room or apartment or office, a single slash shall be made, either on the door or adjacent to the door upon entry for search.
- 4.9.3 After the search is complete, the crew shall make another slash completing and “X” upon exiting the room.
- 4.9.4 As the entire apartment, office, or room search is complete, “X” will be completed and the unit designator (T7, RS5, etc) is written next to the “X”.

5 GENERAL VENTILATION PROCEDURES

- 5.1 Ventilation is an important and difficult task that must be accomplished on a high-rise fire incident. It is critical that this operation is coordinated with attack, search, and evacuation activities. Communication to the Incident Commander is key. Command may identify the need to establish a ventilation group.
- 5.2 Steps will have to be taken to remove the heat and smoke that build up during the evolution of the fire. There are several tactical options available to accomplish this task. In choosing one of these options, fire officers must consider the impact wind and stack effect will have on the operation.
- 5.3 The three basic ventilation tactics include horizontal through the windows, vertical through stairwells, and utilization of the building’s Heating, Ventilation, Air Conditioning (HVAC) system.
- 5.4 Units conducting horizontal ventilation must exercise extraordinary care when engaged in this operation. Opening windows must be done in lieu of breaking them as much as possible to avoid the hazards associated with glass flying great distances. Residential high-rises are where this tactic is most frequently employed.
- 5.5 Horizontal ventilation in a commercial high-rise is not a prudent tactic in most incidents. Therefore, horizontal ventilation in a commercial high-rise while the fire is active should not be used. Window size and construction, the square footage of the fire floor, unpredictability of the wind, and the likelihood of increasing the intensity of the fire makes this a poor option.
- 5.6 Wind direction must be known and units must limit the number of windows that are taken out. It is extremely important that the basic guidelines associated with horizontal ventilation be observed; opening windows on the leeward side first and windward side last. Isolation of any areas that are not smoke contaminated should be achieved during the operation.
- 5.7 Wind at the upper levels of a high-rise can be very strong. Venting windows on the windward side can have a disastrous effect. The only way to accurately determine wind direction and its effect is by truck ore rescue companies duplicating the situation on the floor above or below the fire.
- 5.8 Breaking windows is dangerous for crews and citizens entering and exiting the

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building, due to falling glass. The operations shall not be initiated until the IC has been contacted and has taken the appropriate measures to evacuate the area below.

- 5.9 When possible, the glass should be struck from the outside with a tool driving the glass onto the floor area. If the area to be vented is out of reach of the aerial devices on scene, truck companies should vent from the floor above when conditions permit.
- 5.10 The aerial or rescue squads operating on the floor above the fire will open the window, assess wind conditions, and communicate conditions to the attack crew prior to ventilating.
- 5.11 Crews performing these ventilation operations must be aware of wind currents creating strong drafts in or out of the opening. Members need to back each other up or secure each other with rope tag lines.
- 5.12 Horizontal ventilation can be affected by the stack effect. In a normal stack effect situation, the heated smoke and gasses escaping into a stairwell will proceed up and out. If windows have been opened, this effect may violently blow fire toward the stairwell without smoke going out the vented window. Nothing is gained in this situation.
- 5.13 Incident Commanders must factor in temperature differences between inside and outside the building and the correlation with stack effect when considering ventilation in the high-rise.
- 5.14 Stairwells provide natural channels for the removal of smoke and gases. When openings are created at the top and bottom of stairwells, a natural upward flow of air will develop.
- 5.15 The best method is to utilize the stairwell closest to the fire that has a suitable opening at the top, exhaust at the top, and doors that open to the interior or exterior on the ground floor. Pressurizing other stairwells help push smoke across the floor into the intended stairwell for venting.
- 5.16 It is possible that the attack stairwell may be needed for ventilation efforts. This will hinge on the stage and volume of fire. This must be coordinated with the attack officer to avoid fire coming back onto advancing crews. However, members must remember that a stairwell that is still in use as an evacuation stairwell cannot be used for ventilation.
- 5.17 Crews advancing to the top floor(s) must assess the stairwells for the presence of occupants. That will help to determine which would be suitable for pressurization and evacuation.
- 5.18 The ventilation stairwell must have a suitable opening at the top, which must be secured in the open position.
- 5.19 aerial or rescue squads may be called upon to pressurize the stairwell utilizing the building system if present, or apply positive pressure ventilation (PPV) fans at ground levels and electric fans at intermediate levels, as necessary.

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- 5.20 The exhaust stairwell should have the pressurization system shut down if so equipped.
- 5.21 HVAC in the affected area should be shut down.
- 5.22 All crews operating in the building must be made aware of the ventilation strategy, and the location of ventilation and pressurization stairwells.
- 5.23 Only doors to the stairwells on the affected floors should be open.
- 5.24 Vertical ventilation using elevator shafts is the least desirable of choices. The openings at the top of the shaft are typically inadequate, and on higher buildings, the shaft may not extend to the top of the building. Open shaft doors on affected floors create an additional hazard for firefighters and occupants. Additionally, the mechanical room for the elevators is located at the top of the shaft, and the smoke will have to be moved up and through this room to get out of the building.
- 5.25 If this method is used, ensure that there is an adequate opening(s) at the top, move the elevator car below the floors to be vented, and secure ladders across the front of open hoist way doors.
- 5.26 Some buildings contain sophisticated HVAC systems. These should shut down in the area under alarm if the systems are set in the “auto” mode in the fire control room. The HVAC settings and status should be noted by the first arriving truck officer prior to ascending to the fire area.
- 5.27 If any company on the fire floor or floor above detects that the system has remained on, this must be communicated back to Command in order that the system be shut down. Otherwise, the rate of smoke and fire extension is greatly increased.
- 5.28 These systems can be placed in the exhaust mode to remove smoke on one or more floors. If the IC has elected to utilize the system in this manner, it would be wise to receive assistance from the building engineer.
- 5.29 Aerial and rescue companies in the building must be advised when the systems are placed in service for this method of ventilation. Conditions must be monitored and the IC kept informed.

6 ELEVATOR PROCEDURES AND GENERAL INFORMATION

- 6.1 Buildings with fire control rooms and some older building are equipped with fire service control. In buildings with fire control rooms, all elevators are recalled to the main lobby, upon receipt of the alarm. If the alarm is at the lobby level or below, the car will recall to an alternate location, usually two floors above. The master elevator panel in the fire control room should be checked for possible car location. This is designed to protect the occupants. In a few older buildings with fire control rooms, the elevators will only recall if the smoke detector in the elevator lobby area on any of the floors is activated. In either case, in a building with fire service control, company members must ensure that all elevators are recalled to the lobby manually with the

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fire service controls, or verify they have automatically returned. The elevator cars themselves must also be checked for occupants.

- 6.2 Water and smoke conditions can adversely affect the operation of the elevators. Companies operating on a high-rise incident must be cognizant of the possibility of elevator malfunction. Members must remain cognizant of elevator status.
- 6.3 FIRE SERVICE CONTROL
 - 6.3.1 Verify that the elevators have been automatically recalled, or recall with fire service control in the main lobby.
 - 6.3.2 Buildings with fire control rooms should have sets of keys available. The switch is activated with the fire service control key. Once the key is inserted, and turned to the ON position, the elevators are returned to the lobby, the doors will open, and the car will not respond to normal command for use.
 - 6.3.3 Once the fire service key switch is turned on, the key may be removed. The key is then taken into the elevator, inserted into the fire service switch, and turned to the ON position. The car is now controlled for fire department use.
 - 6.3.4 The emergency stop button does not work when in the fire service control mode.
 - 6.3.5 The “DOOR OPEN” and “DOOR CLOSE” buttons may have to be utilized for door control when in fire service control.
 - 6.3.6 After a company has arrived at the proper floor the fire service control switch in the car is turned off and the key removed.
 - 6.3.7 In some systems, the car will automatically return the car to the lobby. This is due to the fire service control switch in the lobby remaining in the “ON” position.
 - 6.3.8 In other systems, a member would have to accompany the care back down due to the requirement that the “DOOR CLOSE” button be pressed for the car to begin descending.
 - 6.3.9 The keyed switch in the main lobby shall not be returned to the “NORMAL” position until all fire department operations have terminated, and the Incident Commander has ordered that building systems be restored.
 - 6.3.10 Before members enter the elevator car, SCBA shall be donned and ready to go on air. Location of the closest stairs in relation to the elevator must also be noted.
 - 6.3.11 Only fire department member shall use the elevators during fire incidents.
 - 6.3.12 No more that two companies shall be permitted in the car at one time.
 - 6.3.13 Minimum complement of tools shall accompany the companies.
 - 6.3.14 The elevators shall be stopped, either on the initial trip or on any subsequent trips, at least two floors below the fire floor.
 - 6.3.15 Staging is established two floors below the fire floor to poll equipment and staffing.
 - 6.3.16 All elevator use will terminate at the floor level of Staging.
 - 6.3.17 In the event an elevator is malfunctioning, it shall immediately be placed out of service and Lobby Control and the Incident Commander advised.
 - 6.3.18 The car must be stopped at an intermediate point(s) to confirm control and to avoid being taken directly to the fire area.
 - 6.3.19 Should a company be ascending to staging and discover control of the elevator car has been lost; the doors of the car can be opened with approximately 30

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pounds of force. This action serves to open and activate the interlock, which stops the car.

6.3.20 **Any time water is observed in the elevator shaft by members operating elevator cars, Command must be notified. These situations will likely lead to the loss of the elevators and Command should be making preparations for a Stairwell Support Group.**

6.3.21 All cars in the elevator bank may not run on fire service control. In some situations, members may find that only one of the cars is so equipped. It is important to gain control of **ALL** elevators to prevent occupants from using them during emergency operations. This can be accomplished by shutting off the power to those cars not in use at the pit switch, inspection station on top of the car, or in the elevator machine room. Preplanning should make companies aware of this situation, but careful observations prior to operating are still necessary.

7 TACTICAL COMMAND CONSIDERATIONS

7.1 The Incident Commander is faced with a number of needs when managing a high-rise incident. In addition to direct supervision of the fire attack by, if possible, a chief officer, the following jobs may need to be assigned based upon the specific needs of the incident:

7.1.1 Rapid Intervention Crew(s), Lobby Control and Elevator Operations, Fire Control Room Operations, Search and Evacuation, Stairway Support, Base Staging ,EMS Branch or Group, Safety, Rehabilitation, Logistics, Planning, Reconnaissance for fire extension and smoke migration.

7.2 Tactical command of the fire floor(s) is an assignment that normally falls to a command officer early in the incident. Most often, this is the second arriving chief from the first alarm assignment. As the officer in direct control of the attack, this position is responsible for coordinating the companies operating on the fire floor. Initially, the group or division officer can expect a minimum of two engine companies and a truck or rescue company on the fire floor.

NOTE: The officer responsible for fire attack and control of the operations in this area will normally be a Division Supervisor. The use of a division or a group designation shall be determined as appropriate to the situation. A Command Officer shall be assigned to this position as soon as possible.

7.2.1 The Division Supervisor must obtain an aide. This enables the officer to link up with companies on the fire floor and gain first-hand information as to the fire situation and the progress of the operations. The aide shall remain in the stairwell in a clean environment for accountability purposes. It is also expected that the Division Supervisor be positioned in the stairwell on the fire floor in order to communicate with the operation units and to direct units moving up to that area. It is **CRITICAL** that the officer confirm the identification of the attack stairwell, communicate that confirmation to Command and Lobby Control. Units that are moved up via elevator, shall go no closer than two floors below the fire, and know what stairs to use to proceed up to the fire attack officer. For example, the officer should transmit to command, “Battalion 2 is in position on the 8th floor establishing Division

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8. Stairwell B is the attack stairwell. I have engines 71 and 91, Tower 7 and Rescue Squad 1 operating on the fire floor. Engine 51 and Tower 10 are operating on the 9th floor. All units initially assigned to the fire floor and the floor above, are under command of Division 8.” As with any portion of the command structure, this can later be subdivided as needed.

- 7.2.2 RAPID INTERVENTION CREW: The R.I.C. function is addressed as the incident progresses. With the assignment of the first two engines to the fire floor, several tasks can be accomplished. The first duty of these crews is to get the first attack line into service. As the line is being stretched, the officer of the second due engine should be positioned at the standpipe outlet in radio contact with the officer of the line. One of the firefighters should be positioned at the door moving hose out of the stairwell and the line advances. These two people constitute the rescue team prescribed by the “two in, two out” rule. Once that line is stretched, the crew of the second engine is to retreat to the stairwell. This crew is now in position to function as the initial R.I.C. for the engine and truck crews beginning to operate on the fire floor. Since relief is a constant factor during the operation, Command must ensure a crew is assigned to assume R.I.C. duties. The initial R.I.C. will likely be the first arriving Rescue Squad Company. The exception is when the rescue squad arrives before the first aerial. In that case, the rescue will operate on the fire floor and the first arriving aerial becomes the R.I.C.
- 7.2.3 LOBBY CONTROL OPERATIONS: The lobby control function is vital to the success of any high-rise operation. This job will initially be assumed by the crew of the third due Engine Company. This function may need to be expanded and require the addition of another company in order to carry out its tasks. Lobby Control is responsible for elevator control, staffing the fire control room or station, directing civilians to designated holding areas, directing fire department units to the proper stairs or access point, and track units as they move in and out of the building. Lobby control is not an accountability point, but is responsible for logging what units go up into the building, their destination and time of departure. Lobby Control is a function of the **Logistics Section**. It is the responsibility of ALL officers to pass through Lobby Control when leaving the building.
- 7.2.4 FIRE CONTROL ROOM OPERATIONS: Staffing the fire control room or station involves three major areas of responsibility. Monitoring the status of fire alarm systems, the status of the fire control systems, and monitoring and utilizing building communication systems. In addition, the air handling system status and elevator status must be observed. One means of accentuating lights on the annunciator panels in the fire control room is to momentarily turn off the overhead lights. This helps locate the indicator lights on the panels, which will be illuminated.
- 7.2.5 Fire alarm systems must be checked and any indications should be recorded. Any changes in components of the fire alarm system are critical, and this information must be provided to the Incident Commander. For example, when you first enter the fire control room, a smoke detector indicator is illuminated for a location on the 15th floor. Additional detectors begin activating. This information should immediately be relayed to the officer of the first engine upstairs and Command. Once units arrive at the area of alarm activation, this information becomes less critical. However, if the system begins to show activation in areas remote from the area of operation, such as

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- on another floor, that information MUST then be relayed to Command.
- 7.2.6 Fire control systems include sprinkler systems, standpipes, fire pumps, stairwell pressurization fans, and any other fire suppression systems that may exist in the building that is either monitored or controlled from the fire control room.
- 7.2.6.1 Sprinkler system status should be checked first. If sprinkler activation is indicated, particularly if a detector is also activated, it is likely that an actual fire exists in that area. **CONSIDER THIS TO BE CONFIRMATION OF A FIRE AND CONSIDER TRANSMITTING ADDITIONAL ALARMS.** Also, if multiple detectors have activated and the sprinkler system is showing a trouble indicator, no sprinkler flow, and perhaps a tamper switch indication, it is highly likely that not only is it an active fire, but the sprinkler system may be turned off in the area of involvement. This information should also be relayed to Command. It is possible that companies going to the fire floor can open the zone valve to provide water to the fire. If this is successful, water flow indicators should illuminate in the fire control room. ANY changes to the status of the sprinkler system that are indicated should be relayed to Command.
- 7.2.6.1.1 **SPECIAL NOTE:** *If a unit responded to an alarm and more than one detector of any kind is indicated as activated, the request for a full alarm assignment shall be made.*
- 7.2.6.2 If water is flowing from the sprinkler or standpipe system, ensure that there is an indication that the fire pump is operating. (This is true even if the building has a wet standpipe and sprinklers in the area of the fire.) If the fire pump has not started, Command must know.
- 7.2.6.3 Scan the fire control panels for indications of any other system that may be present and monitored within the building. If one is present, advise Command of its current status and any changes that are indicated.
- 7.2.6.4 Stairwell pressurization fans should be operating, if present, once the building alarm system is activated. Confirm that these fans are indeed operating and remain operating, unless ordered shut down by Command.
- 7.2.7 Building communication systems can be of great value in high-rise fires. Radio communication may be difficult, and as the incident escalates, radio traffic will increase dramatically. While the command structure is considering the use of multiple radio channels, the use of building communication systems can greatly enhance the ability of units to communicate effectively and reliably.
- 7.2.7.1 Fire service telephones are hard-wired telephones within the building for the specific purpose of fire service emergency communication. The phone stations are typically located in the elevator lobby on each floor, and sometimes in the elevator control rooms. Fire service telephones have an associated indicator light in the fire control room or station that shows the location of the phone. Should someone lift the handset at a fire service telephone station, the light in the fire control room will illuminate and an audible signal will be heard. Lifting the receiver in the fire control room allows direct communication with the caller. Note: in order to speak into a fire service telephone, the “push-to-talk” button on the receiver must be depressed. The phones can be utilized not only between the fire control room and each phone station, but also between each phone station.
- 7.2.7.2 The building’s public address system (P.A.) is a second means of

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communications available in the fire control room. This system can be utilized to provide direction to occupants of the building, and make selective or general announcements to our members operating in the building. The P.A. can be used to tell someone to go to a fire service telephone and contact the fire control room, or other location. Two-way communications can be facilitated as well. An example might be that the P.A. is used to tell both Fire Attack Group and Staging to pick up a fire service phone to communicate with each other.

- 7.2.7.3 The outside telephone system is another option for handling some communication needs and that phone number should be provided to the command post. Should Command decide to do so, an open line can be established between the fire control room and Command. Although this would necessitate someone staying on the line on each end, the need to use the radio between these two locations would be eliminated.
- 7.2.8 Elevator system status must be monitored.
- 7.2.9 Air handling systems (HVAC) have many different designs. Mechanical rooms may be found at the bottom or top of the building. Some systems may have mechanical rooms that only service one or several floors. These systems may be operating, and can transmit heat, smoke, and fire to area remote from the original fire area. For the safety of our members, HVAC systems that are operating when there is an active fire in the building are to be SHUT DOWN. No HVAC system component should be restarted without specific orders from Command. If requested by Command, the building engineer, or a building representative with intimate knowledge of the system, should be utilized to operate the system.
- 7.3 SEARCH AND EVACUATION
- 7.3.1 A Search and Evacuation Branch or Group should be activated if there are more than two floors above the fire that still contain building occupants. At least one company must be assigned to each of these floors to assess smoke and heat condition, size of the floor area, and the potential number of occupants. Based on the assessment of the first company additional units may be needed to carry out proper search and evacuation,
- 7.3.2 If available, a chief officer should be assigned to command the search and evacuation operation. This officer should set up the Search and Evacuation post at least two floors above the highest fire floor. This should be located inside the floor, and near the evacuation stairwell. The location inside the Search and Evacuation Command post shall be announced once it is established. The location must be specific as to what floor it is on and near what stairwell, e.g. “Chief 6B to Command, the Search and Evacuation post is located on floor 11 (one-one) and stairwell C.”
- 7.3.3 **ALL COMPANIES OPERATING UNDER THE SEARCH AND EVACUATION BRANCH OR GROUP SHALL USE THE “EVACUATION” STAIRWELL TO ASCEND AND TO REMOVE VICTIMS. THE STAIRWAY DOOR TO A FIRE FLOOR SHALL NOT BE OPENED INTO THE EVACUATION STAIRWELL. THE EXCEPTION WOULD BE TO CARRY OUT THE RESCUE OF A TRAPPED OR INJURED FIREFIGHTER!**

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- 7.3.4 The evacuation stairwell must be kept clear of as much smoke and heat as possible. This will facilitate the evacuation operation and prevent evacuees from becoming patients once that stairwell is entered. It should also help to reduce their already high anxiety level as a result of the circumstances they are in.
- 7.3.5 If a Search and Evacuation Group or Branch is established, the officer in charge of the function shall report directly to the IC. In the event an Operations Section is designated, Search and Evacuation will then report to Operations.
- 7.3.6 The Search and Evacuation Branch or Group will need equipment at the Search and Evacuation post. Items such as portable radios, extra air cylinders, hand lights, pens and pare, grease pencils, or markers, and a command board, should be available.
- 7.3.7 The Search and Evacuation Branch or Group should not imply that a complete evacuation of the floors above the fire is imperative. Rather, the officer in charge of this operation is responsible for the control and safety of occupants above the fire floors. This officer shall make decisions on evacuation or protect in-place tactics based upon conditions on each individual floor, progress being made on the fire itself, and through consultation with Command.
- 7.3.8 The purpose of the search and evacuation operation is to control occupants. To do so, members operating in this assignment are responsible for preventing panic, controlling evacuation, and ensuring that primary and secondary searches are properly completed. Additionally, changes in conditions regarding smoke, heat, or fire must be monitored and reported through the Search and Evacuation post to Command.
- 7.3.9 The Search and Evacuation Officer should use the fire service telephones to communicate with the fire control room or station. By doing so, information and directions can then be announced by members in the fire control room using the P.A. to building occupants on selected floors. This is one more tool that is available to assist in the control of the occupants.

7.4 STAIRWELL SUPPORT

- 7.4.1 Stairwell Support is a function that should not only be anticipated on the incident, but may be one of the highest priorities during the early stages of the event. If the fire occurs in a building where we cannot use the elevators, or use of the elevators being used is lost, Stairwell Support becomes the “lifeline” to the operation, at and above the fire. If available, tower ladders may be used to transport equipment to upper floors.
- 7.4.2 A fire that involves more than one apartment, or that occurs in an office high-rise, will require a large amount of resources to be moved up. As a minimum, stairwell support will need a firefighter positioned every two floors.
- 7.4.3 Air cylinders are a priority. We should anticipate no more that 15 to 20 minutes, per air cylinder during firefighting operations. This means the Incident Commander MUST talk immediate steps to begin moving air cylinders and their equipment upstairs.
- 7.4.4 In addition to air cylinders, extra standpipe packs, lights, forcible entry tools, hooks, rope, and medical equipment will need to be moved up to the resource area at staging.

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- 7.4.5 Shuttle of equipment by elevator is ideal. However, elevators will be at a premium, if they can be used. Elevators will be used to take companies up and every effort must be made for companies going up after the first alarm units, to take spare cylinders.
- 7.4.6 The Stairway Support Unit may also have personnel operating on the exterior of the building. This function will be moving equipment from the Base area through the lobby and then up. This will require a significant commitment of staffing. At a major fire, and extra alarm assignment could be needed just for this operation.
- 7.4.7 An officer should be assigned to at least every fourth floor. Their responsibility is to supervise operations, keep equipment moving, and monitor the physical condition of members. Fatigue will become a factor and relief of these personnel may be necessary.
- 7.4.8 The Stairwell Support Unit will report to the Logistics Branch. If that has not been established, they will report to the IC. If Stairwell Support is activated, Logistics must be established by Command as soon as possible.

7.5 STAGING

- 7.5.1 Staging is the area for assembling resources close to the operations on the fire floor. An officer should be designated as the Staging Officer by Command.
- 7.5.2 As the incident escalates, it is likely that companies will be put right to work. However, the need for establishing Staging cannot be ignored and must be assigned. This may be delayed until a unit from the second or third alarm can be assigned, but does not diminish its importance.
- 7.5.3 The Staging area will be a point of significant activity. It is here that air cylinders, hose, tools, EMS equipment and the like will need to be assembled.
- 7.5.4 The Staging Area Manager will need to assemble and maintain a pool of available firefighting crews. Once Staging is established, a minimum of four (4) engines and two (2) support units (trucks or rescues), shall be maintained ready at this location.

7.6 MEDICAL UNIT

- 7.6.1 The Medical Unit is responsible for the care and treatment of our members. The Medical Unit is also responsible for the development of the Medical Plan, which should include a rehabilitation component. The Medical Unit may be located on the same floor as staging (space permitting), or one floor below. The REHAB manager reports to the Medical Unit leader. Rehab is responsible for ensuring members are rested and readied to return to an assignment.
- 7.6.2 Medical Unit and Rehabilitation Unit (REHAB). The rehabilitation function occurs under the direction of the Medical Unit. Companies will begin to be rotated to rehab after approximately 15 minutes of work. Rehab should be at a location that is safe and clear of the fire, yet within a reasonable distance. The advantage of having Rehab on the same floor as Staging is that units can receive necessary medical treatment and rest. As firefighters are available for reassignment, they can then move back to Staging.
- 7.6.3 An EMS supervisor should be assigned to manage the Medical Unit. In addition at least one Medic Unit should be assigned to work the Rehab Unit.

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The responsibilities of this unit are no different than any other fire and rescue incident.

- 7.6.4 The Medical and Rehab Units will report to the Logistics Branch. If that has not been established, they will report to the IC. If the Medical Unit is activated, Logistics must be established by Command as soon as possible.
- 7.6.5 **BASE:** The Base is the area where incoming fire apparatus and other vehicles park. Crews working in the Logistics Section may be sent to retrieve tools and equipment from the rigs parked in Base. The first officer assigned to Base should begin organizing units by function, and parking them in an orderly fashion. This would include parking units on diagonals along one side of the street to allow for easy egress and to keep a travel lane open. Parking all the engines, trucks, medics, and rescue in groups of like vehicles, helps facilitate the operation. Initially, the first person coordinating activity in Base shall be the driver of the first Howard County DFRS engine that arrives at Base without being assigned by Command to go directly to work. Using the driver for this job keeps the officer and the rest of the crew available for other duties. Equipment should be taken from the apparatus, particularly air cylinders, and assembled for movement up to the fire building as needed.
- 7.7 **EMS BRANCH:** The EMS Branch is responsible for managing all civilian patients. If units encounter civilian patients upon arrival that is a good indication of more patients to come. As a fire in an occupied high-rise where patients are found by the first due units, additional EMS resources should be ordered to the scene.
- 7.8 **SAFETY**
- 7.8.1 Safety Officer reports directly to Command. At the vast majority of high-rise incidents, this is the responsibility of the duty Safety Officer.
- 7.8.2 Safety on the fire ground is a responsibility of every officer and member. However, the Safety Officer is a specific need with overall fire ground safety responsibilities. This is a function that is critical to every operation. However, its complexity can be quite different at a high-rise fire.
- 7.8.3 Depending upon the complexity of the fire, the Safety Officer may have to be expanded to a Safety Unit and include assistants. The IC may assign a chief officer as the Safety Officer. Additionally, fire companies may also be assigned to operate under the command of the Safety Officer.
- 7.8.4 Exterior safety issues include concerns such as building perimeter control. Danger from falling glass and other objects must be evaluated, and access to the danger area controlled or denied as necessary.
- 7.8.5 The protection of members and hose lines from falling objects at the point or points of entry to the building, as well as, where water supply connections are made, is a major safety concern.
- 7.8.6 Protection for pump and ladder operators must also be addressed.
- 7.8.7 There are many interior safety concerns to consider. Even though Lobby Control should have checked and taken control of the elevators, this must be confirmed. Safety must also ensure that use of elevators has been cleared by Command. Members assigned to operate elevator cars must all have portable radios.
- 7.8.8 Safety shall also assist with the control of building occupants. Some may

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- have self-evacuated and their movements need to be controlled to prevent injury, and to ensure our safety with relation to crowd control within the building.
- 7.8.9 Safety must also confirm that “attack” and “evacuation” stairwells have been identified and announced by radio. It must also be ensured that Lobby Control and Command both have the same understanding, as to which is which. Confirm that stairwells on the entry level are marked on the outside and inside of the stairwell entrance door with a marker, e.g. ATTACK or EVACUATION.
- 7.8.10 In the area of the fire floor, Safety should evaluate the conditions at the Staging area. This area must have adequate room for at least six (6) companies of personnel as well as an area for assembling tools and equipment.
- 7.8.11 Safety should monitor the air quality in the areas below the fire where member are in staging, rehab, or involved in other activities. Additionally, crews from the Safety Unit might also be requested by Search and Evacuation to evaluate conditions on floors above in order to make proper decisions on evacuation, or protect in-place actions for building occupants. Strong consideration should be given to making a request through Command for the HazMat team to function under safety in providing some of these services.
- 7.8.12 Safety must constantly be checking for hazardous conditions that operating crews need to know about. Two examples are, situations such as an open elevator or other shafts, or windows that are broken out flush with the floor.
- 7.9 LOGISTICS
- 7.9.1 The Logistics Section is a command post function. This position must be assigned early in a high-rise incident. The Logistics and Planning functions might be shared by one officer initially. However, as the incident develops, they will need to be separated.
- 7.9.2 Logistics is primarily responsible for ensuring that adequate personnel and equipment are available. One of the most important tasks of this section is to establish, staff, and supervise the Stairwell Support Unit. This role is crucial to ensure that operations on the fire floor(s) and above are sustained.
- 7.9.3 In addition to supporting the operations needs of the incident, supporting services must also be addressed. Operations that are extended over several hours or more may require meals, fuel, and additional relief personnel be provided.
- 7.9.4 Logistics must consider the needs of the building occupants. Different occupancies will impose different challenges. Residential, hotel, and commercial occupancy needs will create different problems, however, some may overlap. For example, an office building may include a child care facility for the employees’ children during work hours.
- 7.9.5 Water supply is another concern that Logistics may need to address. If multiple attack lines are being used, problems may be encountered with the ability of the standpipe system to provide the volume of water that is needed. Alternative means of getting supply up to the fire area may have to be considered. As buildings continue to be built taller and taller, this becomes an even greater challenge.
- 7.9.6 PLANS: The Planning Section is another command post function that must

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be staffed for serious high-rise fires. It is important to recognize that a high-rise fire is one in which the Planning Section must be implemented early.

8 CONSTRUCTION FEATURES

8.1 Modern high-rise buildings are of two basic occupancy designs:

8.1.1 High-rise buildings with living and sleeping quarters may be hotels, apartment buildings, condominiums, hospitals, or other assisted living facilities. These occupancies are characterized by center corridors, numerous interior compartments such as rooms, closets, etc. and 24-hour occupancy.

8.1.2 Commercial high-rises are characterized by center core construction, circuit corridors around the core of the building, and relatively large, open expanses on each floor. Occupancy loads are usually greater during normal business hours.

8.2 There are basically two types of high rise buildings found in the county. Those constructed before February of 1976, when modern high-rise requirements were enacted, and those that were constructed after the code change.

8.2.1 Fully sprinklered or compartmented.

8.2.2 A class III standpipe system. The outlets on this system will be 2 ½ inches in diameter and have 1 ½ inch reducers. Buildings may or may not be sprinklered. A compartmentation option existed for buildings built prior to April of 1991; however, the vast majority of our high-rise buildings in the region are partially or fully sprinklered.

8.2.3 Fireman's service to the elevators.

8.2.4 HVAC system capable of exhausting smoke.

8.2.5 At least two approved means of egress from each floor.

8.2.6 A local Fire Warning System.

8.2.7 A building communications system.

8.2.8 A fire control room.

8.2.9 Standby emergency power systems.

8.3 Fire resistance is intended to provide resistance to collapse of structural members and floors, and resistance to the passage of fire through floors and horizontal barriers. Fire resistance itself is not concerned with life safety or control and movement of toxic combustion products.

8.4 Buildings that we constructed before the 1976 code requirements took effect could have a wide variety of design features and systems. At a minimum, all occupied high-rise buildings in Howard County have:

8.4.1 At least two approved exits from each floor

8.4.2 Enclosed stairwells (except in a few of the older buildings)

8.4.3 Some type of smoke control or compartmentation. Either windows that can be opened, tempered glass panels on at least two sides of the building that can be broken out, or a modified HVAC system that can exhaust smoke to the outside without contaminating other floors.

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- 8.5 A few are non-sprinklered, without fire control rooms and modern alarm and elevator control systems. Some of these buildings have been, or are in the process of being retrofitted to meet modern standards. There are both office and residential occupancies that meet this description.
- 8.6 Newer style high-rises include the use of lighter weight materials, larger open floor spaces, and suspended ceilings. More of these buildings, especially commercial occupancies, are of core type design. Elevators, stairwells, and mechanical rooms are located in the middle core of the building. The office or residential space makes up the perimeter of the floor.
- 8.7 Within the parameters of these construction types, there are many unique configurations and fire protection systems. Company officers must see that all personnel are given the opportunity to get familiar with their response district and become familiar with the building layouts, and alarm and protection systems. Preplanning is paramount in anticipation of high-rise fire fighting.
- 8.8 ROOF
- 8.8.1 The roof may be of much lighter construction than the floors. It may consist of a typical insulated metal deck roof or be of the same construction as the floors below, but with a weather barrier installed.
- 8.8.2 A common type of flat roof construction utilizes composite Q deck with a rubberized or tad and gravel top layer (built-up roof [BUR]).
- 8.8.3 Facades that give the appearance of a decorative pitched roof or an additional floor may surround flat roofs. These may protrude high above the actual roofline such as mansard style facades.
- 8.8.4 Access to the roof area will normally be through a hatch or bulkhead at the top of the stairwell(s) or through the penthouse machine room areas. These must be indicated in the first due company's preplan.
- 8.8.5 HVAC units may be found on the roof area or on each floor. Shut-off switches will be found adjacent to these units and possibly in the fire control room. The building may also have HVAC units at a midway point of the structure if exceptionally tall.
- 8.8.6 Elevator control rooms are found at roof level in most cases. The control panel (shut off) for each elevator is in this room.
- 8.8.7 Vertical ventilation shafts for the occupancies below terminate at the roof level.
- 8.8.8 Roof Areas may contain helicopter pads, communications equipment, antennae, microwave dishes, and guy lines.
- 8.9 ATTICS AND CEILINGS
- 8.9.1 High-rise buildings generally do not have an attic. However, often the top floor or penthouse will consist of elevator and mechanical rooms. Companies must be familiar with these areas and realize that they could be found fully charged with smoke, as a result of a fire many floors below.
- 8.9.2 In older as well as newer construction the presence of suspended ceilings is prevalent. The steel truss and ceiling assembly provides an inherent and useful void. In older buildings, a suspended ceiling may be added to provide a

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passage for the new additions of piping, wiring for communications, and other building support systems.

- 8.9.3 Slab concrete floors don't have this inherent void. Because these voids are useful, they are created by the use of drop ceilings and then connected through poke-throughs and vertical utility shafts, providing avenue for vertical fire extension. This can create a void area providing avenue for vertical fire extension. This can create a void area that may account for up to 25 percent of the volume on a given floor. Suspended ceilings are more prevalent in commercial occupancies but are also found in many residential buildings.
- 8.9.4 The plenum area created by these voids is extensive, lacks fire stopping, and is often used for the return air side of the HVAC system.

8.10 WALLS

- 8.10.1 The interior walls of a residential high-rise, and when present in office use, will typically be of gypsum board. The gypsum is most often mounted on metal studs. Gypsum and masonry walls are used to enclose stairway, elevator, and other shafts. These will have two hour fire resistance ratings.
- 8.10.2 Many of the newer constructed buildings have exterior curtain walls constructed of glass or pre-cast panels.
- 8.10.3 Due to the way curtain walls are mounted to the floor sections or frame of a building, gaps of 6 to 12 inches are common. Fire-stops are required; however, the efficiency of this barrier is questionable at best.
- 8.10.4 Expect vertical extension between these curtain walls and floor sections. Downward extension should be anticipated as well, including into the plenum on the floor below.

8.11 FLOORS

- 8.11.1 Construction of floors can be reinforced or post-tensioned, cast-in-place concrete, or it may be of reinforced or pre-tensioned, pre-cast concrete.
- 8.11.2 Another type of floor found in high-rise construction actually forms both the floor and the ceiling area for the level below. This is a composite "Q" floor assembly. Francis Brannigan describes; "The whole assembly, including the ceiling, hangers, electrical fixtures, floor joists, left-in-place form-work for the concrete floor (corrugated steel), air ducts, and diffusers, and the concrete floor, make up the entire floor/ceiling assembly."
- 8.11.3 Fire officers and their crews should be aware that in buildings built prior to 1980, the presence of sprayed asbestos fiber, used in the "direct application" method of fireproofing steel support members, could exist.
- 8.11.4 Other examples of fire resistive measures for floor support systems are direct application of intumescent coating and suspended ceiling assemblies, known as membrane fireproofing. The membrane fire protection is prevalent in many of the office high-rise buildings encountered.
- 8.11.5 The effectiveness of fire proofing depends on the installation and the original building inspection. Fire department members should take note and document any compromise of these systems while on regular building familiarization visits.

8.12 BASEMENTS

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- 8.12.1 Basements or below grade areas contain a multitude of uses. Parking garages, trash compactors, mail rooms, dumpsters, storage areas and utility rooms or tunnels, are just some areas which may be located in the basement.
- 8.12.2 Parking garages present a number of problems. The garage may extend out beyond the main structure. The covering slab of concrete may be designed to carry only the weight of automobiles. Apparatus access to this area may be restricted or not possible at all.
- 8.12.3 All parking garages may not be sprinklered. A dry standpipe may be all that is present.
- 8.12.4 A fire condition in any of the areas identified above can lead to a smoke polluted building. An example of this potential is the explosion in 1993 in a below-grade parking garage in New York's World Trade Center.

8.13 WINDOWS

- 8.13.1 Many buildings have windows that cannot be opened. These are primarily found in newer constructed, office-use buildings. Heating and air conditioning concerns by the architect lead to fixed windows to control the loss of treated air.
- 8.13.2 Most of the windows in an office high-rise are covered with a sun-screening plastic coating, and may run from floor-to-ceiling and surround the building. These windows typically are plate glass, tempered glass, or Lexan.
- 8.13.3 Some of these windows may be opened with special keys or devices.
- 8.13.4 Many buildings with windows that can not be opened are required to be fitted with windows that can be broken in the event of an emergency. The window panes that CAN be broken are indicated or marked with a Maltese cross or a fire helmet etched in the lower corner of the pane.
- 8.13.5 Buildings with windows that can be opened are primarily residential occupancies. These can include casement and slider windows.

8.14 DOORS

- 8.14.1 Doors that separate the various occupancies within the high-rise are fire-rated metal or wood in metal frames. These are inward opening; that is the door swings into the apartment or office from the hallway. The presence of outward opening doors indicates an electric or telephone room, or other type of closet. Doors from the stairwell to the hallways swing into the stairwell. Members should keep this in mind as they plan a hose advance from the standpipe. Door chocks should be available.
- 8.14.2 Doors leading from the stairwell to the hall, roof, or mechanical room, may be locked above the lobby or first floor level. The first engine, truck, or rescue squad proceeding to the fire floor should be equipped with keys and always have forcible entry tools available.
- 8.14.3 Locked stairwell doors in buildings with fire control rooms and electric locks usually unlock automatically when the system goes into alarm. Once the alarm system activates, all stairwell doors on all levels of the building unlock to provide unimpeded access. Keep in mind that the doors will lock again if the alarm system resets. If the doors are locked, and members enter the

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stairwell from any floor above the first, it will be necessary to return to the main lobby level in order to exit the stairwell. A stair door unlock switch should be in the fire control room.

- 8.14.4 In occupancies such as hospitals, hotels, or assisted living facilities, sections of hallways are usually divided into compartments by self-releasing, fire-rated doors. These doors are usually held open by electromagnetic devices, and may be closed by manual means or by fire alarm activation.
- 8.14.5 Exterior doors at the entrance level of the commercial or residential high-rise are typically aluminum-style type construction with a mortise-type lock.
- 8.14.6 In buildings that contain balconies, the door from the office or residential unit is predominantly a sliding-glass type.

8.15 STAIRWAYS

- 8.15.1 Several different types of stairways can be expected in high-rise buildings.
- 8.15.2 Isolated stairs usually have individual entrances. Stairs access only one section of the building.
- 8.15.3 Wing stairs access only one wing of the building.
- 8.15.4 Transverse stairs connect to a common hall on each floor and are located at points remote from each other. Firefighters can go from one stairway to another via the hall, on all floors of the building.
- 8.15.5 Return stairs maintain the same relationship or location to each floor.
- 8.15.6 Scissors stairs may be found in core type construction, although rare. These stairs are simply independent stairwells on either side of the core. However, in some cases, each stairwell will only serve every other floor. In other words, one of the stairs may serve the even numbered floors and the other the odd numbered floors.
- 8.15.7 Access stairs may be present. These are an open, unprotected stairway leading from floor-to-floor within a single occupant's space. These are also known as accommodation stairs, or convenience stairs.
- 8.15.8 In buildings constructed after 1976, the stairways should contain hardwired communications with the fire control room. These are usually in the form of a red box containing a telephone handset labeled "Fireman's Use Only".
- 8.15.9 Openings for ventilation may be found at the top of some stairwells, and some will be equipped with fans that will pressurize the entire stair.
- 8.15.10 In the event of an alarm or fire, some stairwells may contain fans that are activated by manual means only, and some that may not be equipped with fans at all.
- 8.15.11 Each fire station should ensure that preplans exist for the high-rise structures in their area. A copy shall be placed in the fire control room at each building that has such a room. The stairwells in the building shall be clearly identified on the preplan and indicate whether natural openings are present for ventilation purposes.

8.16 STANDPIPES AND SPRINKLERS

- 8.16.1 Automatic sprinklers systems are in place in high-rise buildings constructed after 1976, unless the compartmentation option was chosen.
- 8.16.2 In earlier constructed buildings, the presence of sprinklers is intermittent. Companies must know prior to the alarm whether a particular building is

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- sprinklered.
- 8.16.3 Some older structures are equipped with dry standpipes. Be aware of added time requirements and the potential for foreign objects in the connections, when charging these systems with water. The majority of standpipes found in interior applications at a high-rise, are wet systems.
 - 8.16.4 For those buildings with standpipe and sprinkler systems, there is either a combination Siamese hookup, which will supply both systems, or individual hookups for each system. There have been instances where these connections have been incorrectly marked. Companies must Preplan and become familiar with the system.
 - 8.16.5 Generally, a hydrant should be located within 100 feet of the standpipe and sprinkler intake connections.
 - 8.16.6 The location of standpipe outlet connections in stairwells can vary depending on the stairwell type and location. Some stairwells may lack standpipe hookups due to the proximity to other risers in the building.
 - 8.16.7 Depending on the floor area and stairwell location, standpipe hookups may be located at midpoints in the hallways.
 - 8.16.8 Sprinkler control valves for each floor may be found at stairwell landings.
 - 8.16.9 There may be pressure-reducing valves (PRV) on some of the standpipe connections. These can severely restrict flow for fire streams being deployed in the fire attack. If possible, these must be bypassed for fire department use.
 - 8.16.10 Individual characteristics shall be identified in the first due company's preplan. Members must be familiar with the high-rises in their area as far as systems, locations, and the unique features of each.

8.17 ATRIUMS

- 8.17.1 A common feature in newer constructed hotel and office high-rise buildings is the atrium. These are typically located at the main entrance and are the focal point of the structure.
- 8.17.2 The atrium presents difficulty in the control of smoke and fire conditions. Many floors can be simultaneously exposed to smoke and fire conditions.
- 8.17.3 Normal requirements for buildings with atriums are full sprinkler protection and smoke exhaust systems.

8.18 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

- 8.18.1 Central air conditioning within a high-rise may interconnect multiple floors. Ducts, shafts, and poke-through holes penetrate fire resistive floors, walls, and ceilings. This allows smoke to spread throughout the floors.
- 8.18.2 HVAC ducts at perimeter windows of the building may be fed fresh air from the ducts located in the ceiling of the floor below. This permits rapid extension through this path.
- 8.18.3 Many modern systems have full exhaust capability, dampers, controlled fusible links that control fire spread through the ducts, and duct smoke detection systems which automatically shuts down the HVAC system.
- 8.18.4 Department officers must work with building engineers and the Life Safety Section members to become familiar with all the features of HVAC systems in their respective buildings.

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8.19 STACK EFFECT, REVERSE STACK EFFECT, AND STRATIFICATION

- 8.19.1 A natural occurrence, whose effects become multiplied in the presence of a high-rise building, is known as stack effect.
- 8.19.2 Stack effect is the natural movement of air within a relatively tightly sealed building due to the temperature difference between the air on the inside and outside of the structure.
- 8.19.3 Stack effect is more prominent in winter due to the potentially great difference between inside and outside temperatures. Hot air is less dense than cold, and tends to rise through stairways, elevator shafts, and utility chases. The common fireplace utilizes this effect to vent the by-products of the fire.
- 8.19.4 This effect can be reversed due to the outside temperature being higher than that inside. Such is the case in tightly sealed air conditioned buildings during summer. This reverse stack effect is less significant because the amount of stack effect is proportional to the differences between the two temperatures. The temperature differences between inside air and outside air are far less in the summer months than winter.
- 8.19.5 Stratification may occur in sealed buildings when the temperature of the smoke produced is not sufficient to cause it to rise all the way to the top of the building.
- 8.19.6 The products of combustions rise until the temperature is reduced to ambient temperatures, at which point it begins to settle, or stratify.
- 8.19.7 Sprinkler activation in a high-rise should be taken into account when considering reverse stack effect and stratification. “Cooler” lower-lying smoke characterizes fires brought under control by sprinkler systems.

8.20 ELEVATORS

- 8.20.1 Elevators in high-rise structures are of electric traction type. Control rooms are located at the top of the elevator shaft. Some shorter buildings may contain hydraulic elevators.
- 8.20.2 Elevator shafts and doors have a minimum two hour fire rating.
- 8.20.3 Express elevators, which bypass a portion of the building via a blind shaft, are found in many of the high-rises throughout the area. A blind shaft is one that has no openings at all onto specific floors, but serves a specified portion of the building.
- 8.20.4 Elevators shall be identified and have car number designations in the preplan of the building. The fire control room in newer core type construction, or lobby level will typically have a master locator panel for the elevator banks.
- 8.20.5 “Fireman’s service” may or may not be present. First-in companies shall not use the elevators, if not equipped with fireman service controls.
- 8.20.6 Independent service is not to be confused with fireman’s service. The elevator car doors, when in the independent mode, will open automatically when arriving at the specified floor. Whereas, the doors in the car under fireman’s service will not open until the “door open” button has been activated.
- 8.20.7 There are two phases associated with the fireman’s service control. Phase 1 is when the system has been activated to recall the elevators to the lobby level (if a smoke detector has activated at the lobby level, the cars may stop at an alternate floor). Phase 2 is when the fire department members take possession

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- of and operate the elevator car.
- 8.20.8 Communications to the fire control room is present in cars installed after February 1976.
- 8.20.9 Freight (oversized) elevators may be present in an area remote from the main bank. Freight elevators should not normally be used during emergency operations. However if the freight elevators are located in an area not affected by the fire, smoke, or products of combustion, officers can exercise judgment as to their use.
- 8.20.10 Post 1976 buildings should automatically recall the elevators to the lobby level or other recall level upon the system going into alarm. If there has been an activation of the smoke detector at the lobby or levels below due to fire, the elevator cars may stop at an alternate floor. Due to the fact that most modern high-rise buildings alarm the fire floor as well as the floor above and the floor below the fire floor, this alternate location may be two floors above or below the lobby. The location of the elevators in this instance must be confirmed.
- 8.20.11 Fire, heat, and water can cause elevators to malfunction. This can, and has occurred regardless of fireman’s service control. Firefighters should expect that if an elevator has been subjected to any of these conditions, there would be a malfunction. Even the smallest amount of water running into the shaft has the potential of causing elevator malfunction.
- 8.20.12 Members must also use caution not to mistakenly utilize the “independent service” function during alarm conditions. Independent service allows a car to be used for special service. This is often used when occupants are moving in or out of the building and need to retain possession of the elevator car. Independent service does not provide the safety characteristics, as does “fireman’s service”, or “fire service control.”

8.21 FIRE CONTROL ROOM AND ALARM SYSTEM FEATURES

- 8.21.1 The introduction of sophisticated electronics, sensors and control mechanisms, has altered the monitoring and suppression capabilities in the high-rise building. The features are incorporated throughout the building and terminate at the fire control room. A fire control room is used for any system in a high-rise where detection, fire protection communications, and air handling systems are centralized for fire department use. Status boards indicating operational modes for the systems present in the building are in the fire control room. These rooms are required in high-rises constructed after 1976.
- 8.21.2 Fire control rooms are usually located near, or at the main lobby entrance, typically at an outside wall.
- 8.21.3 Fire control rooms are required to be marked with a sign. However, companies must know the location from pre-incident planning and familiarization.
- 8.21.4 Annunciator panels indicate the location and type of detection. The panel indicates the area of the fire floor.
- 8.21.5 Telephone communication systems, known as “fire phones,” may be present. They consist of a system distributed throughout the building for fire department communications. Phones are located in elevator cars, floor lobbies, and stairwell landings on each floor. When a fire phone is taken is taken off of the hook in the building, it will annunciate by floor or elevator, in the fire control room.

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- 8.21.6 Public address and alarm systems are connected. This is designed to allow the fire control room to talk to any single floor, combination of floors, or the total building. Speakers are located in hallways, elevators, stairwells, rooms, or tenant space exceeding 1,000 square feet, and all dwelling units. In addition to the use of the public address system, individual floors can be placed into alarm to assist in the evacuation process.
- 8.21.7 Stairwell pressurization systems, if present, will activate upon alarm of the building.
- 8.21.8 Corridor pressurization may be present in some buildings. This utilizes fans to pressurize the fire floor hall to prevent the entry of smoke into the common area from the involved unit.
- 8.21.9 Elevator pressurization is also an additional feature found in some high rises. The elevator shaft becomes pressurized to prevent the entry of smoke.
- 8.21.10 Stairwell smoke ventilation systems. Some stairwells are equipped with smaller exhaust fans to compliment the larger pressurization fans, at the base of the well. This will remove any smoke that has entered the stairways.
- 8.21.11 Emergency elevator recall occurs when the building goes into alarm. This makes the cars unavailable for occupant use.
- 8.21.12 Air handling and exhaust systems. These can be controlled to assist in removing areas of smoke during an incident via H.O. A. (Hands-Off-Auto) switches in the fire control room.
- 8.21.13 Auxiliary power generators provide emergency lighting and power when needed. The generators are designed to operate the elevators one at a time in order to bring each car to the lobby and open the doors in the event of a power failure.
- 8.21.14 A fire pump installed in the building is designed to assist with water flow for standpipes and sprinklers.
- 8.21.15 Automatic door unlocking systems activate when the building goes into alarm. These electric locks must also receive an alarm from any manual pull box, sprinkler flow switch, smoke detectors, and heat detectors located throughout the buildings.
- 8.21.16 Fire control rooms are designed to receive an alarm from any manual pull box, sprinkler flow switch, smoke detectors, and heat detectors located throughout the building.
- 8.21.17 Upon receipt of alarm in equipped buildings:
 - 8.21.17.1 A prerecorded announcement is broadcast to the floor issuing the alarm, the floors above and below, and all elevators and stairs. Occupants are directed to exit through the nearest stairs.
 - 8.21.17.2 Elevator recall is initiated and activates the flashing signs near all elevator landings. Elevators are programmed to return to the main lobby floor level, or a secondary floor, if the lobby is in alarm, the elevators will go to the secondary floor and the entire building will be placed into alarm.
 - 8.21.17.3 Stairwell pressurization is activated (if this feature is present).
 - 8.21.17.4 Shut down or change in mode of HVAC on the floors in alarm.
 - 8.21.17.5 Alarm is transmitted to a central monitoring system or 24-hour security, if present in the buildings.

9 HAZARDS

9.1 LIFE HAZARD TO OCCUPANTS

High-Rise Building Fires – Attachment A

- 9.1.1 Life hazard to occupants varies greatly with the type of occupancy as well as with the location and extent of fire within the building. Fires in commercial type occupancies have the ability to involve an entire floor or large portion thereof, since often there is little or no compartmentation. This feature is due to the use of workstations rather than separate, divided offices. Fires that occur in either hotel or residential occupancies have the advantage of a greater level of compartmentation and therefore have significantly less potential for both horizontal and vertical fire extension.
- 9.1.2 Experience has shown that potential for a high loss of life is possible in any high-rise building. This has been demonstrated in buildings of various occupancies. Fires in both office and hotel situations, such as the MGM Grand fire in Las Vegas, have had disastrous outcomes.
- 9.1.3 The Los Angeles City Fire Department’s Emergency High-rise Operations manual lists three sources of danger to occupants in high-rise buildings.
- 9.1.3.1 Direct exposure to fire. “This is most likely to occur in residential high-rise buildings through careless activities, e.g., smoker fires, etc. These fires are generally confined to the unit of origin. Direct exposure to fire could also result from a fast spreading fire sweeping through a public area of a high-rise building.”
- 9.1.3.2 Panic is the second threat. “...Panic could result from the knowledge or belief that a fire is in progress in the building. Occasionally, individuals will react to a high-rise fire situation in an irrational manner and may show some degree of panic. The best defense against this situation is public education. People who have been trained to do the right thing are much less susceptible to panic or irrational actions under stress.”
- 9.1.3.3 “The third and by far the gravest threat to building occupants in high-rise fires is exposure to smoke and the products of combustion. Building design features such as compartmentation, pressurized stairwells, and elevator vestibules are intended to minimize smoke travel within the building. However, these efforts may not be entirely successful. Smoke may be transmitted through the air systems of older buildings lacking automatic shutdown devices. Smoke will also communicate through elevator shafts, stairwells, utility alleys, or almost any vertical or horizontal opening. Smoke could also escape the building and be carried back in at other levels by exterior air current”
- 9.1.4 Evacuation alone of a high-rise building requires the commitment of a large amount of resources. If a large-scale evacuation is necessary, a Search and Evacuation Branch should be established with a chief officer in charge. An evacuation of a smaller scale may only require the use of an evacuation group.
- 9.1.5 Often times, the best way to accomplish control of occupants and maintain their safety will be to “protect in place.” That is, a total evacuation will not normally be initiated, rather a controlled movement of occupants on floors where fire is present or directly above the fire.
- 9.1.6 **COLLAPSE:** Members should not view a high-rise as being impervious to collapse hazards. Structural members exposed to a serious and long term heat load may pose partial or complete collapse hazards to members. The collapse of just a suspended ceiling with its spider web-type maze of cross tees will trap firefighters, rendering escape impossible. If the membrane of the suspended ceiling has been compromised, firefighters should expect at

High-Rise Building Fires – Attachment A

least a partial failure of the ceiling assembly.

9.2 SMOKE MOVEMENT

- 9.2.1 Awareness of the probability of a panic situation is imperative for units responding to high-rise fires. Building occupants who are self-evacuating are obviously already aware of the fire and trying to escape. Problems for fire crews moving up the interior stairs while evacuees are trying to move down may be substantial. Gaining early control of this situation is necessary, and as mentioned earlier, will require a heavy commitment of resources.
- 9.2.2 Smoke contamination of stairwells is reason for identification of evacuation routes to enable the safe and orderly movement of building occupants to locations below the fire.
- 9.2.3 Smoke entering elevators and other vertical shafts will cause panic to those individuals in the elevators being recalled to the lobby. This vertical extension can also result in smoke contamination of any floor above the level of the fire. Smoke entering any floor will likely cause occupants to attempt self-evacuation. Communication via the public address system, if available, can help to allay some of the fears of the occupants. Firm direction from the fire department is crucial.
- 9.2.4 The evacuation process in itself can present hazards to the building occupants. Fire department supervision of the movement of evacuees down the stairways is imperative. Firm and clear direction must be given all the way to the point of assembly. Members must be aware that excited building occupants, particularly those in a residential setting, will stop and talk with acquaintances when exiting a stairwell into the lobby or other point of exit. This must not be allowed to occur. These people must be continually guided to a safe place of assembly. This may include provisions being made for safe passage away from the building to avoid undue confusion in a lobby, falling glass, or other debris.

9.3 BACKDRAFT AND FLASHOVER

- 9.3.1 A backdraft or flashover can occur in any structure. In a high-rise, hazards associated with these phenomena are primarily related to the contents but can include interior finishes.
- 9.3.2 Although fire codes have changed over the years to more closely regulate what interior finishes can be used, situations that allow rapid fire spread over wall and floor coverings may still be encountered.
- 9.3.3 The contents of the building, particularly those in office type occupancies, provide a moderate to heavy fire load. The heat released from the extensive use of plastics and other petroleum-based products can be more than twice that of true “class A” materials. While “class A” materials release about 8,000 Btu per pound of burning material, the materials encountered today can easily produce twice that amount of heat. Thus, the fires burn hotter and grow more rapidly. The situation leads to the possibility of flashover early in the incident. The added fact that high-rise structures tend to be built more tightly increases the possibility of flashover or backdraft. Crews must be cognizant of the fact that either of these events can occur at any time.
- 9.3.4 Since ventilation of almost any area of a high-rise is difficult, if not

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impossible, it is imperative that the overhead is cooled with hose streams. This is the most effective method for controlling and preventing flashover. Additionally, since crews are dealing with enclosed or confined spaces, even if somewhat large, straight or solid streams must be used.

- 9.3.5 In office or other commercial situations, much of the fire loading is exposed due to the lack of compartmentation. An advancing fire quickly heats the products that have not yet ignited which leads to rapid fire spread. Since the area is often not vented, nor able to be, temperatures within the involved area rise rapidly. As the contents continue to be heated, large amounts of smoke and other fire gases are produced. As these ignite, rollover extends outward from the seat of the fire, in turn causing radiant heat to expose much more of the contents, quickly leading to flashover conditions. Since the area is often undivided, this phenomenon is self-perpetuating until a large area is involved. This can rapidly spread over an entire floor, depending upon the layout.
- 9.3.6 Members must also be cautious and aware that a backdraft can occur in any enclosed area within a structure. The area above a ceiling is one possibility.

9.4 FIRE EXTENSION

- 9.4.1 Horizontal fire extension in commercial occupancies can quickly involve a large portion of a floor area since there may be little or no separation. The use of workstations rather than individual wall-separated offices has resulted in these large open areas. Tenants pay high rent per square foot and the workstation makes more use of available floor space than the office concept. However, this approach sets up a situation where instead of having many small rooms within the tenants, the entire space is undivided. Since floor areas of 15,000 square feet per floor and larger are not uncommon, if a fire goes unchecked by sprinklers or early extinguishment by other means, fire involvement of large areas is likely.
- 9.4.2 Vertical fire extension can occur by several means: fire lapping out of windows and extending into windows above; fire extending up through unprotected or compromised void spaces; fire extending up the space between the floor and curtain wall; fire entering elevator and other shafts; and fire extending upward within an occupancy that occupies more than one floor and has installed and access or convenience stairway.
- 9.4.3 It is recognized that fire resistive construction is designed to limit the spread of fire and not contribute to the fire load. Additionally, the extensive use of sprinkler systems in Howard County minimizes the threat of large-scale fires. However, the concern is for those situations where, for whatever the reason, the sprinklers do not control the fire or are turned off. Contents of these buildings have a rate of heat release that can allow a fire to double in size about every 90 seconds!
- 9.4.4 An even greater hazard for fire spread is obviously present in the remaining buildings where sprinklers are not present or non-existent. The reaction time involved for fire to be discovered, the alarm turned in, dispatch and response time, verification of fire location, and units to get into position to operate, can allow fire to increase in size exponentially.
- 9.4.5 Fire extension can also be a high concern if the fire is located in the lower two or three floors of a hotel high-rise. In hotels, mercantile occupancies including restaurants, bars, sundries, hair salons, gift shops and even clothing

High-Rise Building Fires – Attachment A

stores may be present. Meeting rooms, ballrooms, storage areas, and recreation areas may also contribute to the fire problem that is more similar to a commercial situation than what would be confronted on the floors containing guest rooms. For this reason, locating the fire and identifying what is involved is paramount in making strategic and tactical decisions. These same occupancies can occasionally be found in some office buildings.

- 9.4.6 In residential high-rises, many of the same problems listed above may also exist. These various occupancies are often viewed as amenities for the occupants of the complex, yet add a different dimension to the fire problem than would be expected in the residential part of the building. Since these occupancies may have a greater fire load, units must be prepared for rapid fire extension in larger undivided spaces than on the floors that are highly compartmentalized.

9.5 HAZARDS ASSOCIATED WITH HOSELINE ADVANCEMENT

- 9.5.1 Most hose line operations in high-rise buildings will involve the use of standpipes. However, crews stretching lines for fires that are located on the first or second floor or below grade will most often not use the standpipe, but stretch directly from the apparatus. In his book “Fire Officer’s Handbook of Tactics,” John Norman states that “just because the fire is in a standpipe-equipped building does not mean that the first hose line should be stretched from the standpipe. In many cases, notably fires on the ground floor, it may be better to have the first hose line stretched off the apparatus rather than the standpipe. Normally, the routine handline stretch will be much faster, especially if pre-connected lines are used, than if standpipe lines are used. An evaluation should be made of the locations of the fire in relation to the access.” (Norman, 2nd ed. p. 143-144). The hazard is that crews may not be able to get to the standpipe; this must be communicated to other units. Later, hose lines may be deployed from the standpipe as the need for more lines is identified.
- 9.5.2 Crews must drill on the deployment and use of standpipe lines. Standpipe packs provide the officers a great deal of flexibility in deciding the appropriate line for the attack. Lines that are deployed and charged in the stairwells must be deployed in such a way as to allow the line to be advanced onto the fire floor as easily as possible. Hose lines in stairwells are a tripping hazard, but a necessary part of the operation and one with which members must contend. This is also a reason for clearly identifying what stairwell is being used for fire attack and which for evacuation.
- 9.5.3 In some circumstances, such as in commercial (office) buildings, the fire area may be several thousand square feet. At least 100 feet of 2 ½-inch hose will be part of every pack in these occupancies in order to ensure that proper flow and nozzle pressure is delivered. More members will be needed to handle a large attack line than a smaller one, and intense manual labor can be expected. Command officers will need to ensure that two engine crews are paired up to deploy and operate 2 ½ inch hose lines.
- 9.5.4 Although not required, officers should give strong consideration to 2 ½-inch lines in advanced fires or fires above the 8th floor in residential high-rises. A significant fire will require the use of 2 ½-inch lines and command officers will need to ensure that two engine crews are paired up to deploy and operate

High-Rise Building Fires – Attachment A

2 ½-inch hose lines.

9.5.5 Crews must also deal with the obstacles encountered in the various floors and rooms while advancing the lines. Office layouts using workstations will present a maze of furniture and partitions around which crews will have to negotiate. Fires that are located in other areas can present a myriad of obstacles that include stored and stacked furniture, stock, food handling carts, and bell station luggage carts.

9.5.6 Firefighters advancing hose lines into areas with suspended ceiling assemblies should always check for fire in the plenum above. The hazard here is the possibility of the ceiling assembly dropping on the crew resulting in their being trapped in the maze of cross-tees, hanging wire and electrical cable. Firefighters have died in situations where a suspended ceiling assembly dropped and escape was impossible.

9.6 OTHER HAZARDS

9.6.1 Floor length windows. Some buildings have windows that extend from floor to ceiling. These can be found in any occupancy type. Cases have been documented where windows have either failed or were taken out by firefighting crews. Members operating in these areas have nearly crawled right out of an open space. Extreme caution must be exercised when visibility is significantly reduced or non-existent. Members must be aggressive in their operations, while at the same time exercising caution, ensuring they do not crawl or walk out of an opening such as this.

9.6.2 If roof operations are required, beware of the presence of communications equipment, antennae, microwave dishes, and guy lines. Firefighters must be extremely cautious not to walk off the roof.

9.6.3 Open shafts. Open shafts have unfortunately led to serious injuries and firefighter fatalities. Members must be vigilant while carrying out their assignments in low or zero visibility environments. This caution must be exercised at all locations and floor levels in the building.

9.6.4 Grease ducts. Grease ducts may be present anywhere there is a food processing operation. Restaurants may be located off the lobby or mezzanine levels as well as the top of the building. However, other kitchen areas may be present for food preparation for banquet halls and ballroom facilities. All of these will have grease ducts leading to the outside. In some cases, these ducts may run great distances, including the full height of the building exiting at the roof level. A fire in such a duct can lead to fire extension far removed from the cooking area should the duct be compromised or combustibles be close enough to be ignited.

9.6.5 Laundry, trash, and mail chutes. These building features exist for the convenience of building occupants. However, they also provide an unobstructed path for fire travel upward. Cigarettes and other tobacco products are sometimes placed into one of these chutes, whether intentionally or not, and a fire results. Smoke can then spread to any level of the building and the alarm turned in to the fire department can be very misleading. Smoke may be reported on a floor far removed from the actual location of the fire, which is most likely in the basement or first floor loading dock area. An additional problem with laundry and trash chutes is the possibility of a bag of clothing or trash becoming suspended in the shaft. If this occurs just at or

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below the access door of the shaft, fire could enter the floor area if the door is opened to investigate. Sprinklers protect some of these shafts. Smoke from one of these fires will be cold and may show in some unexpected places as a result of its loss of buoyancy.

- 9.6.6 Utility shafts. As with other vertical shafts, utility shafts often run the entire height of the building. Plumbing and electrical components must enter and exit every floor level and these voids provide this access. Should fire or smoke enter these areas it can be transmitted upward, but may also move downward as well. In particular, fires involving kitchen and bathroom areas should be a signal that extension into one of the shafts is a possibility.
- 9.6.7 Dumpsters and compactors. These containers can be a particular hazard when attached to the building. Often, trash chutes allow rubbish to be deposited from any floor level and the shaft leads directly into the dumpster or compactor. A fire in such a container can contaminate a large part of the building with smoke and gasses from the burning of anything that may have found its way into the container. While the possibility of fire extension exists, smoke and gas being communicated into the structure is the greatest concern.
- 9.6.8 Hazardous storage. Due to the wide variety of occupancies found in high-rises, many different products are often found within these structures. However, the greatest concern is for the storage of products used in the operation of the building and its amenities. Many hotel and residential high-rise buildings have pool facilities and the storage of the associated chemicals is just one example of what may be encountered. Additionally, paints and janitorial supplies are likely to be present at various locations in the building.
- 9.6.9 Access or convenience stairways. Stairways which are installed for the convenience of its occupants traveling from floor-to-floor, are referred to as “accommodation stairways” and are installed for those tenants which may occupy more than one floor. These stairs allow the tenant to move throughout their space without using public stairwells or elevators. There is no requirement for these stairs to be enclosed. Should fire occur within this type of occupancy, it can easily spread to all floors serviced by these stairs. Obviously, this hazard is most significant if the fire occurs on the lower floor of the specific tenant space.
- 9.6.10 Electrical vaults. These rooms may be present almost anywhere within the building. High-rise buildings are obviously large structures, and the infrastructure necessary for these buildings is quite extensive. High voltage electrical vaults are necessary to service the vast electrical needs of high-rise buildings. Firefighters operating in obscured visibility must be extremely careful not to inadvertently enter one of these rooms. Firefighters that come across a metal door that opens toward them should suspect one of these type rooms. While most have been removed, members must continue to beware of the possibility of the presence of Polychlorinated Biphenyls (PCBs).
- 9.6.11 Falling glass and debris. As fires become more severe and the outer skin of the building is compromised, great care must be exercised in the protection of firefighters, evacuees, and spectators from falling materials. Shards of glass have been known to travel great distances in windy conditions and can be extremely dangerous. Protection must be provided for firefighters operating apparatus, hose lines, and those entering and exiting the building.
- 9.6.12 Buildings that are under construction. Units that respond to fires in high-rise buildings under construction must carefully evaluate the stage of completion

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of the building.

- 9.6.12.1 If concrete work is still underway and the formwork is in place and burning, members must be committed to the interior for operations. Every effort must be made to fight the fire from exterior positions as the formwork holding the not yet cured concrete up is being destroyed.
- 9.6.12.2 Heavy caliber streams will probably be necessary if the fire is located on upper floors. Use of tower ladders, ladder pipes and squirts are recommended. A severe hazard associated with this situation is falling debris. Construction materials, tools, and other items not attached may be washed off the building by these streams. Officers must ensure that the perimeter of the building is secured to avoid injury from these falling items.
- 9.6.12.3 Members must also consider the possibility of propane cylinders being involved. In addition to the possibility that cylinders are the source of the fire, explosion hazards and the threat of cylinders dropping off the building, must be considered.
- 9.6.12.4 The potential collapse of walls or portions of walls must also be taken into account. Buildings under construction often have sections or pieces of the outer skin of the building fastened into place along floor lines. Fire impinging on these wall sections can cause the connections to fail and drop the section.
- 9.6.13 High security areas. Various businesses and agencies have the need for high level security. Accessing these areas for search or fire attack may be challenging and forcible entry may be necessary. Additionally, due to security needs, occupants of these areas may be very stubborn in evacuating even though the fire department deems it to be in their best interest.
- 9.6.14 Radio communications. Many companies will be conducting operations at a high-rise fire. Communications between these operating units and command functions is imperative for a successful outcome. However, due to construction of the buildings, fire department radios often do not function as well as they might under normal circumstances. This must be recognized and addressed as best as possible. Use of the other building communication systems, when available, can enhance our ability to communicate.

INCIDENT COMMAND SYSTEM

HIGH RISE STRUCTURE FIRE OPERATIONAL SYSTEM DESCRIPTION

ICS-HR-120-1

July 1, 2007

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INTRODUCTION

The High-Rise module describes an all hazard organization designed to provide effective management and control of essential functions at incidents occurring in large, multi-story buildings. These incidents may present significant management, logistical and safety challenges to emergency personnel.

The size and complexity of the interior spaces; limited, sometimes arduous access, with extended travel and response times all contribute to the problems faced by emergency responders.

Additionally, most high-rise structures are equipped with various environmental, fire protection, and life safety systems that require support and control. Successful emergency operations in these types of buildings also require preplanning and technical competence on the part of emergency responders.

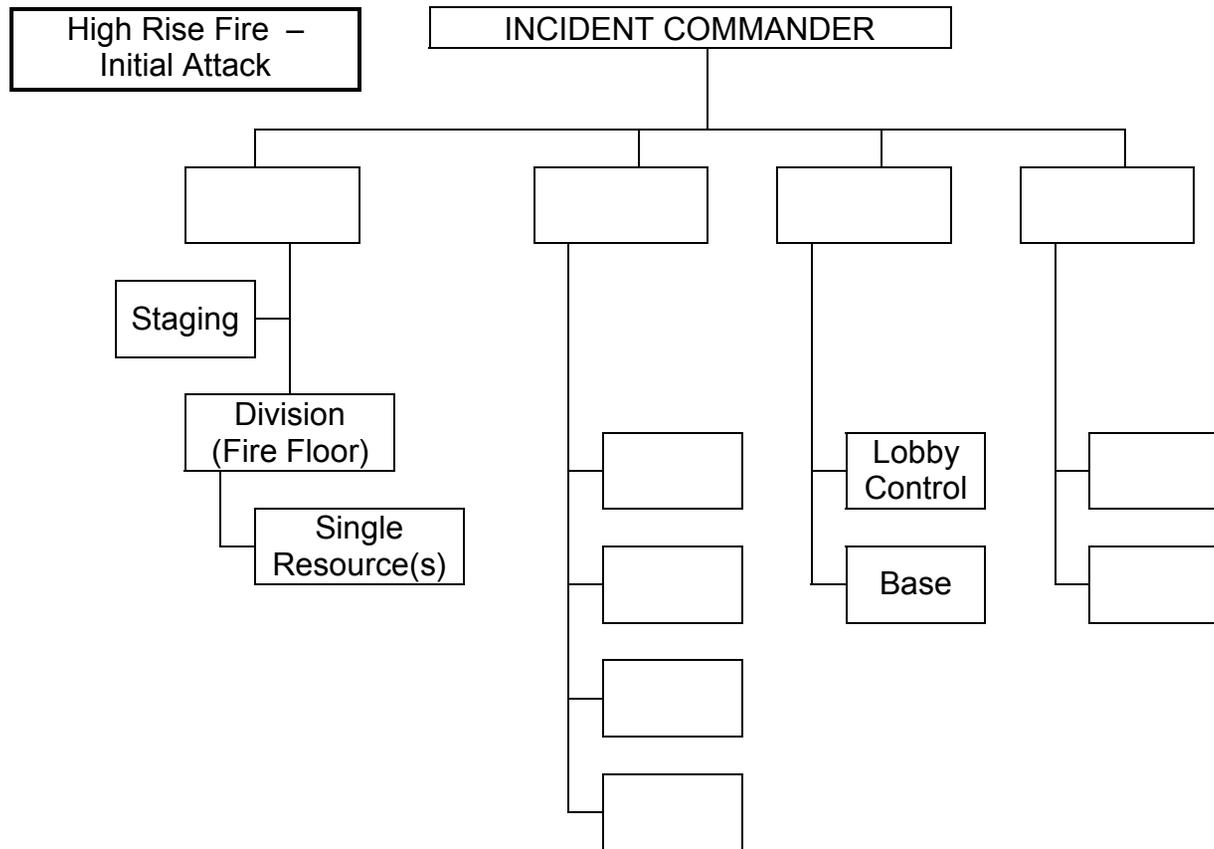
MODULAR ORGANIZATION DEVELOPMENT

The order in which the ICS organizational structure develops may vary with the type and scope of the incident. Following are examples of modular development of the ICS that serve to illustrate typical methods of expanding the management organization at a high-rise incident. These examples reflect the size and complexity of the incident and the available resources at a given time in the incident:

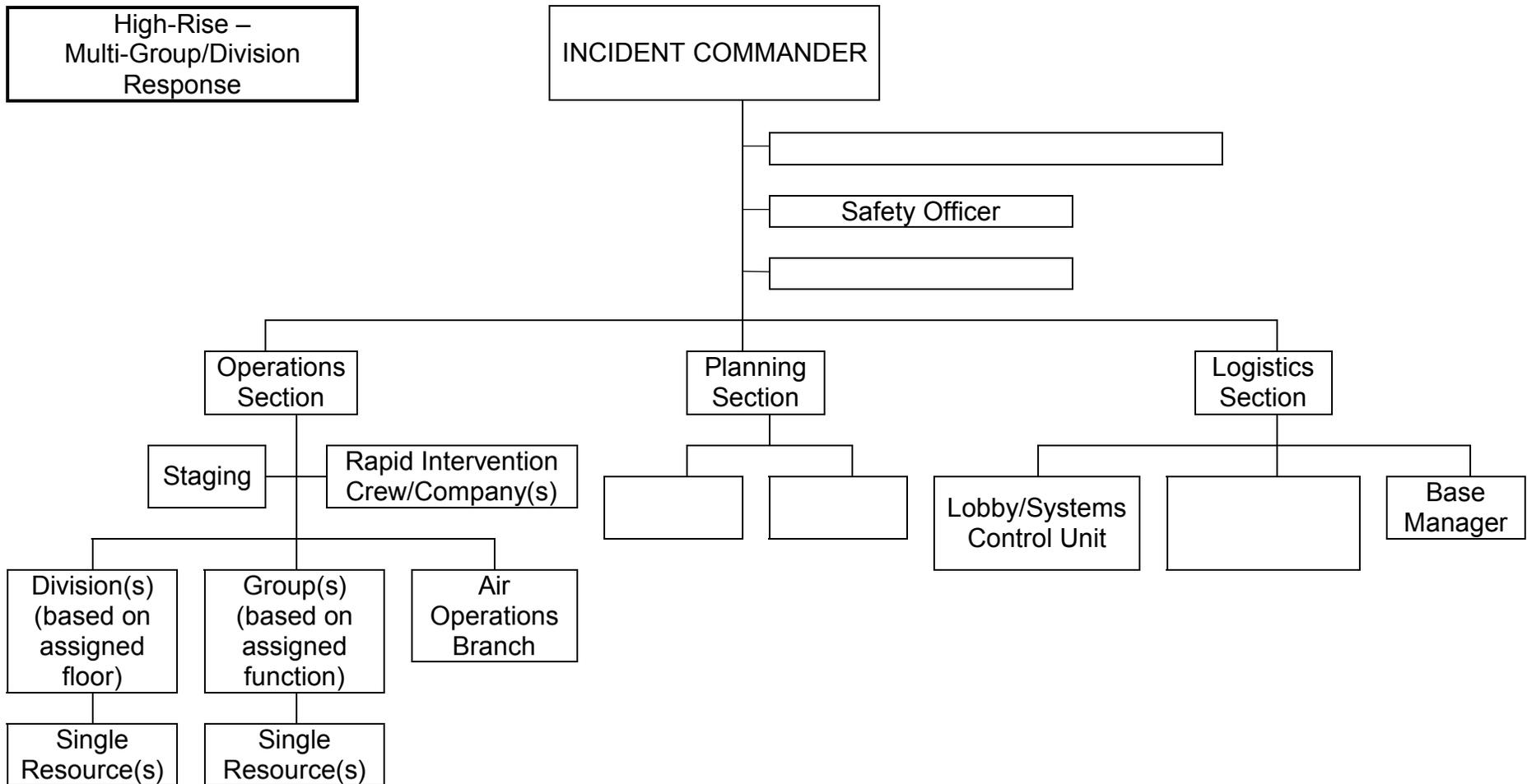
Initial Response Organization: The Incident Commander manages the initial response resources as well as all Command and General Staff responsibilities.

Multi-Group/Division Organization: The Incident Commander has established most Command and General Staff positions and has established a combination of divisions and groups to reflect the location and nature of the incident.

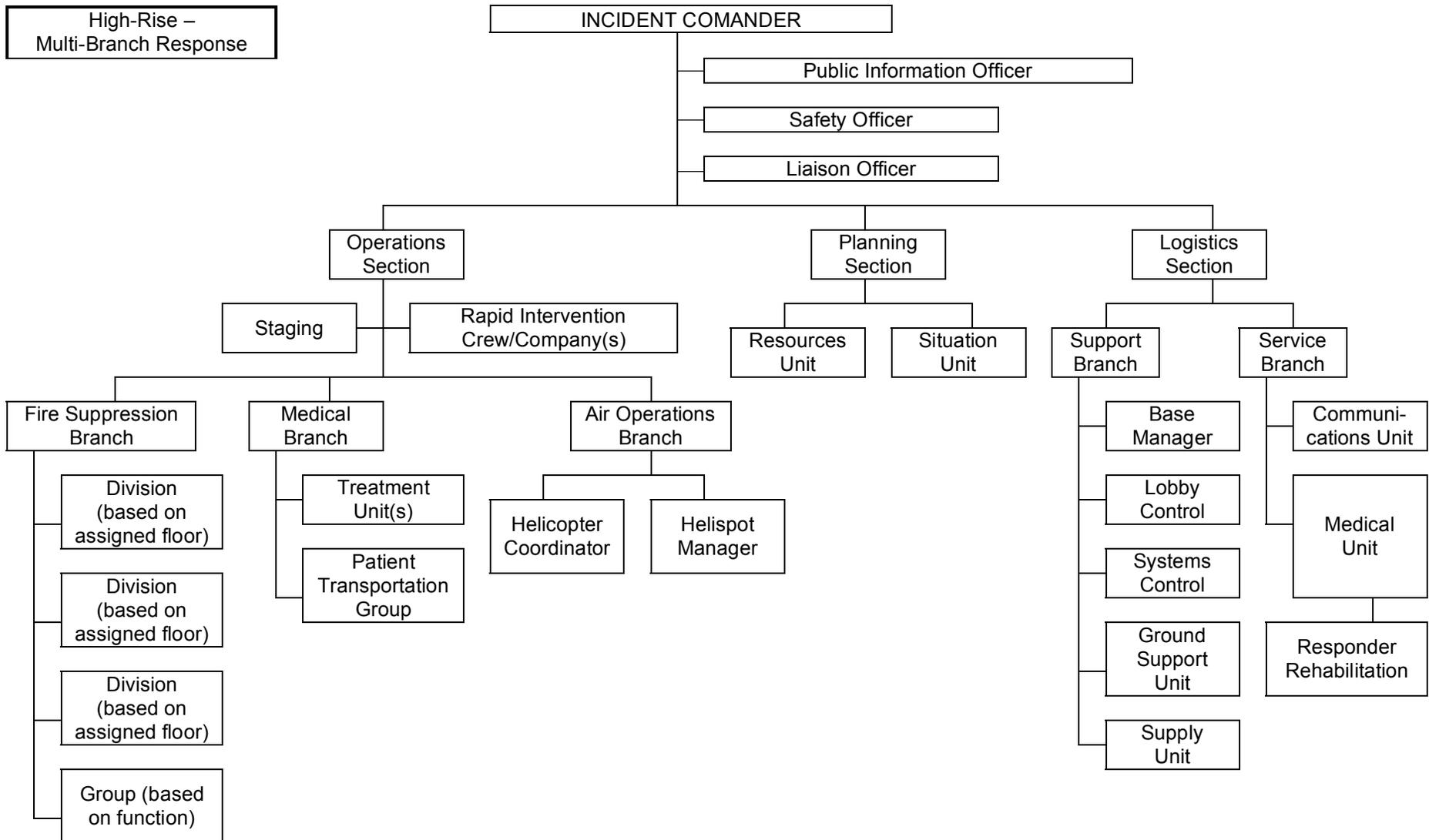
Multi-Branch Organization: The Incident Commander has identified a number of actual or potential incident challenges and has established all Command and General Staff positions. The IC has also established several branches to effectively manage the problems and the resources required for mitigation.



High-Rise Fire Initial Attack (example): This chart depicts the initial assignment including a Command Officer on a fire involving a single floor of a high-rise building. The IC has deployed resources to Fire Attack, Lobby Control, Staging, and Base (ALS-BASE).



High-Rise Multi-Group/Division Response (example): As additional resources arrive, the IC has activated the Operations Section Chief along with multiple Divisions to supervise action on each involved or threatened floor. Rapid Intervention Crews/Companies are assigned as determined most effective by Operations. Groups may be assigned certain functions such as medical care for victims, or stairwell pressurization/ventilation. Air Operations Branch will coordinate helicopters used for evacuations or reconnaissance. The Planning Section is activated with selected units. Logistics is assigned to manage Lobby Control, Systems Control, Ground Support, and the Incident Base.



High-Rise Multi-Branch Response (example): The fire has involved multiple floors with various Divisions and Groups assigned. This complexity has led the Operations Section to create a Fire Suppression Branch to manage these Divisions and Groups. A Medical Branch is established and the Air Operations Branch is expanded. The Planning Section has expanded to include the Resources Unit and Situation Unit. Logistics Section has activated the Support and Service Branches as well as various Units within each Branch to accommodate the extensive logistical requirements for this size incident.

DESIGNATED INCIDENT FACILITIES

Base and Staging have modified functions and locations in high-rise incidents:

Staging Area: The challenging nature of high-rise incidents requires modification to the standard ICS concept of a Staging Area. The limited access and vertical travel distance of large high-rise buildings require establishment of a resource Staging Area within the building. The high-rise Staging Area must also serve multiple functions. The Staging Area is generally located a minimum of two floors below the emergency, as long as the atmosphere is tenable. The specific changes are described in the Staging Area Manager's Position Description.

Base: The Base at a high-rise incident resembles a ground level Staging Area. The main difference between Base and a typical Staging Area is that Base must be expanded to perform the functions inherent to supporting large numbers of personnel and equipment. Base should be located away from away from the incident building to provide for the safety of personnel and equipment.

ORGANIZATION AND OPERATIONS

Modified ICS Positions: Certain existing ICS positions and functional units within the high-rise incident organization have modified responsibilities that require full descriptions. These positions include: Staging Area Manager, Rapid Intervention Group Supervisor, Base Manager, Ground Support Unit Leader and Evacuation Group Supervisor.

Specialized High-Rise ICS Positions: Lobby Control and Systems Control Unit Leaders are specialized functional positions specific to a high-rise incident.

Lobby Control Unit is established to provide access control, accountability, and routing inside the building. As the incident escalates, a separate Systems Control Unit may be established to operate, supervise, and coordinate the vital operation of specialized systems incorporated into modern high-rise buildings. These systems may include electrical supply and smoke removal systems. Systems Control Unit coordinates the efforts of various Technical Specialists who might be required to assist in the operation and/or repair of the various systems. During the initial period of an incident, or in a less complex building, the Lobby Control Unit may assume the functions of the Systems Control Unit as shown in the basic organization chart.

The positions and modifications are described in the position checklists that follow. The major responsibilities and procedures for each are further explained in the position manuals.

POSITION CHECKLISTS

HIGH-RISE INCIDENT LOBBY CONTROL UNIT LEADER - The High-Rise Incident Lobby Control Unit Leader's primary responsibilities are as follows: maintain an accountability system, control all building access points and direct personnel to correct routes, control and operate elevator cars, and direct building occupants and exiting personnel to proper ground level safe areas. As directed by the Incident Commander or agency policy, this unit may be

assigned the responsibilities of the Systems Control Unit. The Lobby Control Unit Leader reports to the Support Branch Director/Logistics Section Chief. The Lobby Control Unit Leader should be prepared to provide the Incident Commander or Planning Section with current information from the personnel accountability process.

The safest method of ascending to upper floors is the use of stairways. The use of elevators for emergency operations should be determined by department policy. This determination is the ultimate responsibility of the Incident Commander; however, the Lobby Control Unit Leader coordinates the actual use of elevators:

- a. Check in and obtain briefing from Support Branch Director, Logistics Section Chief or Incident Commander.
- b. Make entry, assess situation, and establish Lobby Control position.
- c. Request needed resources.
- d. Obtain building access keys.
- e. Establish entry/exit control at all building access points.
- f. Maintain accountability for personnel entering/exiting the building.
- g. Assure personnel are directed to the appropriate stairways/elevator for assignment.
- h. Control the elevators and provide operators if approved for use by the Incident Commander.
- i. Provide briefings and information to Support Branch/Logistics Section or the Incident Commander.
- j. Perform the functions of the Systems Control Unit when directed by the Incident Commander or agency policy.
- k. Secure operations and release personnel as determined by the Demobilization Plan.
- l. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT SYSTEMS CONTROL UNIT LEADER - The High-Rise Incident Systems Control Unit Leader is responsible for evaluating and monitoring the functions of all built-in fire protection, life safety, environmental control, communications and elevator systems. The Systems Control Unit Leader may operate, support or augment the systems as required to support the incident plan. The Systems Control Unit Leader reports to the Support Branch Director (if established) or to the Logistics Section Chief. Working with the building's engineering staff, the System Control Unit Leader may respond directly to requests from the Operations Section Chief by using the manual operation modes of the various built-in systems. The Systems Control Unit Leader must establish and maintain a close liaison with building's engineering staff, utility company representatives, and other appropriate technical specialists:

- a. Check in and obtain briefing from the Lobby Control Unit, Support Branch Director, Logistics Section Chief or Incident Commander:
- b. Briefing must include the type and performance of built-in systems.
- c. Introductions to building's engineering staff should occur at briefing.
- d. Evaluate current situation and request needed personnel and resources.
- e. Establish communication with the building engineer, utility company representatives, elevator service personnel or others to coordinate the operation of selected systems.
- f. Assign personnel to monitor all building fire protection/life safety systems.
- g. Evaluate the status and operation of the building's fire and domestic water pumps and water supply (support as needed).

- h. Evaluate the operational effectiveness of the heating, ventilation, and air-conditioning system (HVAC); the smoke removal system; and stairwell protection system (support as needed).
- i. Evaluate the building's electrical system, emergency power systems, and security systems (support as needed).
- j. Evaluate the public address, telephone, emergency phone, and other building communications systems (support as needed).
- k. Secure operations and release personnel as determined by the Demobilization Plan.
- l. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT STAGING AREA MANAGER - The High-Rise Incident Staging Area Manager is responsible for the management of all functions at the Staging Area, and reports to the Operations Section Chief.

- a. Obtain briefing from Operations Section Chief or Incident Commander.
- b. Proceed to selected location and evaluate suitability:
 - Make recommendations regarding relocation, if appropriate.
- c. Request necessary resources and personnel.
- d. Establish Staging Area layout and identify/post each functional area i.e., Crew-Ready Area, Air Cylinder Exchange, Equipment Pool, and Medical Unit if collocated within the Staging Area.
- e. Determine, establish, or request needed facility services i.e., drinking water and lighting.
- f. Coordinate with Logistics Section or Systems Control Unit to maintain fresh air.
- g. Maintain a personnel accountability system for arriving and departing crews.
- h. Request required resource levels from the Operations Section Chief:
 - Maintain levels and advise the Operations Section Chief when reserve levels are reached.
- i. Coordinate with the RIC Group Supervisor to designate area(s) for Rapid Intervention Crew (RIC) to standby if collocated within the Staging Area.
- j. Direct crews and equipment to designated locations as requested by the Operations Section Chief or Incident Commander.
- k. Secure operations and release personnel as determined by the Demobilization Plan.
- l. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT RAPID INTERVENTION GROUP SUPERVISOR – The High-Rise Incident Rapid Intervention Group Supervisor is responsible for the management of Rapid Intervention Crew(s). The High-Rise Incident Rapid Intervention Group Supervisor's organizational responsibilities vary from the standard ICS position due to the potential for above ground operations, extended response times, and RIC(s) operating on different floors/stairwells. This position reports to the Operations Section Chief and requires close coordination with the Division/Group Supervisors and the Staging Area Manager:

- a. Obtain briefing from the Operations Section Chief or Incident Commander.
- b. Participate in Operations Section planning activities.
- c. Determine Rapid Intervention Group needs (personnel, equipment, supplies and additional support).
- d. Evaluate tactical operations in progress.
- e. Evaluate floor plans, above and below emergency operations.

- f. Assign and brief Rapid Intervention Crews based on number of stairwells and floors used for emergency operations.
- g. Verify potential victims and hazard locations and insure that Rapid Intervention Crew(s) are prepared for possible deployment.
- h. Notify Operations Section Chief or Incident Commander when Rapid Intervention Crew(s) are operational or deployed.
- i. Develop Rapid Intervention Crew(s) contingency plans.
- j. Secure operations and release personnel as determined by the Demobilization Plan.
- k. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT BASE MANAGER -The High-Rise Incident Base Manager is responsible for the management of all functions at the Base location. This position within the organization differs from the standard ICS in that a Facilities Unit is not appropriate for this type of incident and the Base Manager reports directly to the Support Branch Director (if established) or Logistics Section Chief:

- a. Obtain briefing from Support Branch Director, Logistics Section Chief, or Incident Commander.
- b. Participate in Support Branch/Logistics Section planning activities.
- c. Determine Base needs (personnel, equipment, supplies and additional support).
- d. Evaluate layout and suitability of the selected Base location:
 - Make recommendations regarding relocation, if appropriate.
- e. Establish Base layout and identify functional areas to support the incident i.e., Apparatus Parking, Crew Ready Area, Equipment Pool, Rehabilitation Area, Command Post, and Sanitation.
- f. Provide for safety, security and traffic control at Base and Command Post.
- g. Provide facility services at Base and Command Post i.e., sanitation, lighting and clean up.
- h. Maintain accounting of resources in Base. Periodically update Logistics Section, Planning Section or Incident Command.
- i. Direct personnel and equipment to designated locations as requested.
- j. Provide an auxiliary water supply to the building, if required.
- k. Update Support Branch, Logistics Section or Incident Commander as directed.
- l. Secure operations and release personnel as determined by the Demobilization Plan.
- m. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT GROUND SUPPORT UNIT LEADER - The High Rise Incident Ground Support Unit Leader is responsible for providing transportation for personnel, equipment, and supplies refilling of SCBA air cylinders; providing fueling, service and maintenance of vehicles and portable power equipment and tools; and implementing the ground level Traffic/Movement Plan at the incident including marking safe access routes and zones. The Ground Support Unit Leader reports to the Support Branch Director (if established) or the Logistics Section Chief:

- a. Obtain briefing from Support Branch Director, Logistics Section Chief, or Incident Commander.
- b. Participate in Support Branch/Logistics Section planning activities.
- c. Identify, establish, and implement safe movement routes and exterior Safe Refuge Areas identified in the Traffic and Personnel Movement Plans.

- d. Assign personnel to transport services including stairwell, ground level, and general motor transport.
- e. Assign personnel to fueling, maintenance, and support of apparatus and portable power equipment and emergency power systems as appropriate.
- f. Assign personnel to SCBA air cylinder refilling, maintenance and support.
- g. Maintain inventory of support and transportation vehicles, maintenance and fuel supplies.
- h. Update Support Branch, Logistics Section, or Incident Commander as directed.
- i. Secure operations and release personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

HIGH-RISE INCIDENT EVACUATION GROUP SUPERVISOR - The High-Rise Incident Evacuation Group Supervisor is responsible for managing the movement of building occupants through designated evacuation route(s) to a safe location. This position reports to the Operations Section Chief or Branch Director if established:

- a. Obtain briefing from the Branch Director, Operations Section Chief or Incident Commander.
- b. Participate in Operations Section planning activities.
- c. Determine Evacuation Group requirements (personnel, equipment, supplies).
- d. Ensure the evacuation in progress is to a safe location.
- e. Confirm evacuation stairwell(s) with the Operations Section and Ground Support.
- f. Ensure ventilation of evacuation stairwell(s) and Safe Refuge Areas.
- g. Coordinate evacuation message with Systems Control Unit utilizing the building's Public Address System.
- h. Assign personnel in the evacuation stairwell(s) to assist/direct building occupants to a safe location.
- i. Secure operations and release personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

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BASE MANAGER- HIGH RISE INCIDENT

ICS-HR-222-1

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time actions while others are ongoing for the duration of an incident.

HIGH RISE INCIDENT BASE MANAGER CHECKLIST:

- a. Obtain briefing from Logistics Section Chief, Support Branch Director or Incident Commander.
- b. Participate in Support Branch/Logistics Section planning activities.
- c. Evaluate layout and suitability of previously selected Base location. Make recommendations regarding relocation, if appropriate. Request necessary resources and personnel.
- d. Establish Base layout and identify/post each function area as appropriate to the incident size and expected duration - Crew Ready Area, Equipment Pool, Rehabilitation Area, Command Post, Apparatus Parking, Restrooms.
- e. Provide safety, security and traffic control at Base and Command Post.
- f. Provide facility services - sanitation, lighting and clean up at Base and Command Post.
- g. Maintain accounting of resources in Base and periodically update Planning Section or Incident Command.
- h. As requested by Operations, Logistics or Incident Command, direct crews and equipment to designated locations.
- i. Maintain records of activities and submit reports as directed.
- j. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- k. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION: The High Rise Incident Base Manager is responsible for the management of all functions at the designated Base and Command Post locations.

The High Incident Rise Base Manager reports to the Logistics Section Chief or Support Branch Director (if established). The position within the organization differs from the standard ICS in that a Facilities Unit is not appropriate for this type of incident, and the Base Manager reports directly to the Support Branch Director or Logistics Section Chief and may assume some of the responsibilities of the Facilities Unit position (Figure 2.1).

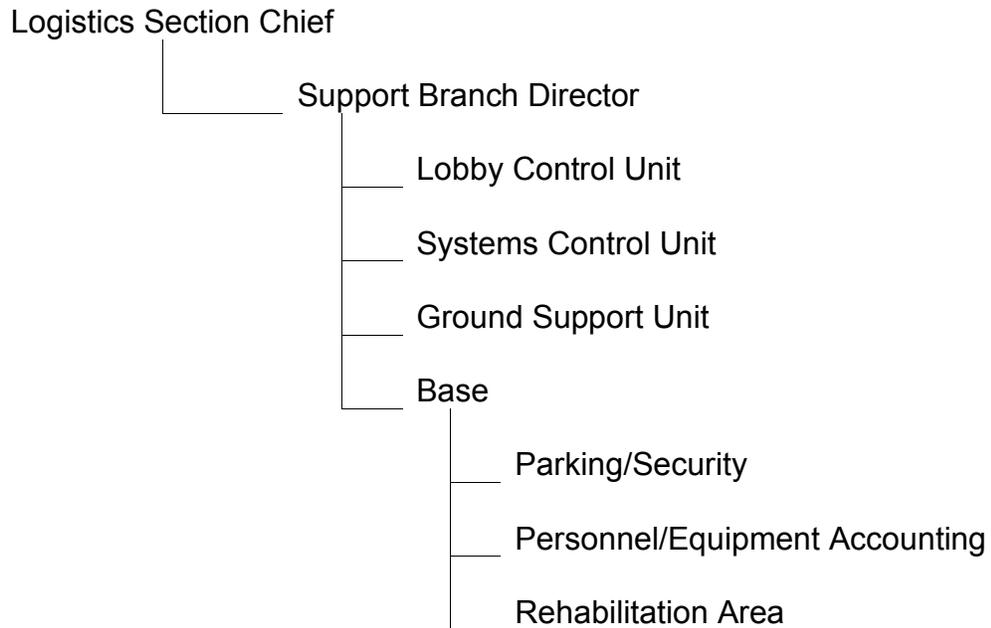


Figure 2.1 Base Organization Within the Logistics Section

PERSONNEL: The number of personnel needed to perform the major responsibilities assigned to the unit will vary based upon the size, duration and complexity of the incident. The minimum number of personnel may be estimated from the information presented in 2.3, below.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the High Rise Incident Base Manager are stated below. Following each activity are listed the procedures for implementing the activity.

- a. Obtain briefing from Logistics Section Chief or Incident Commander:
 - 1. Determine the estimated size and duration of incident.
 - 2. Identify current location, and existing assignments and commands relating to the Base.

- b. Participate in Support Branch/Logistics Section planning activities:
 - 1. Attend Support Branch/Logistics Section operational planning meetings as requested.
 - 2. Provide information and advice concerning Base activities.
 - 3. Obtain Incident Action Plan and updates.

- c. Evaluate layout and suitability of previously selected Base location. Make recommendations regarding relocation if appropriate. Base should be located away from buildings to provide personnel safety from falling glass and debris. Request necessary resources and personnel:
 - 1. Assume control of existing personnel and resources assigned to Base functions.
 - 2. Evaluate area hazards and predicted weather. Identify optional locations and plans as appropriate.
 - 3. Establish routes into the Base parking area. Communicate with Ground Support regarding the traffic plan as developed. Coordinate with law enforcement agency for area and access control. Provide incident dispatch center with needed information.
 - 4. Obtain needed personnel, supplies and equipment from Logistics Section.
- d. Establish Base layout and identify/post each function area as appropriate to the incident size and expected duration - Crew Ready Area, Equipment Pool, Rehabilitation Area, Command Post, Apparatus Parking, Restrooms.
 - 1. Brief and assign personnel to implement plan. Provide signs, barriers and written materials as needed.
 - 2. Marshal equipment, supplies and personnel in identified locations. Identify specialized equipment or personnel.
 - 3. Coordinate with Logistics Section and Medical Unit Leader regarding staffing of the Rehabilitation Area. Provide needed food, drinks and shelter.
- e. Provide safety, security and traffic control at Base and Command Post.
 - 1. Coordinate with law enforcement agency for security and access control.
 - 2. Provide environmental shelter and barrier protection as needed.
- f. Provide for facility services such as toilets, lighting and clean up at Base and Command Post.
- g. Maintain accounting of resources in Base and periodically update Planning Section or Incident Command.
- h. As requested by Operations, Logistics or Incident Command, direct crews and equipment to designated locations.
 - 1. Obtain incident traffic plan and incident layout from Logistics Section or Ground Support Unit Leader.
 - 2. Maintain ongoing communications with Ground Support Unit for the transport of equipment and personnel as needed.

- i. Maintain records of activities and submit reports as directed.
- j. Secure operations and demobilize personnel as determined by the demobilization plan.
 - 1. Based upon the demobilization plan, transfer control and responsibility for any building or facility used to appropriate property management.
 - 2. In coordination with Logistics Section return any rented or borrowed or requisitioned equipment or supplies.
- k. Maintain Unit/Activity Log (ICS Form 214).

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Position Manual

GROUND SUPPORT UNIT LEADER- HIGH RISE INCIDENT

ICS-HR-222-2

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time actions while others are ongoing for the duration of an incident.

HIGH RISE INCIDENT GROUND SUPPORT UNIT LEADER CHECKLIST:

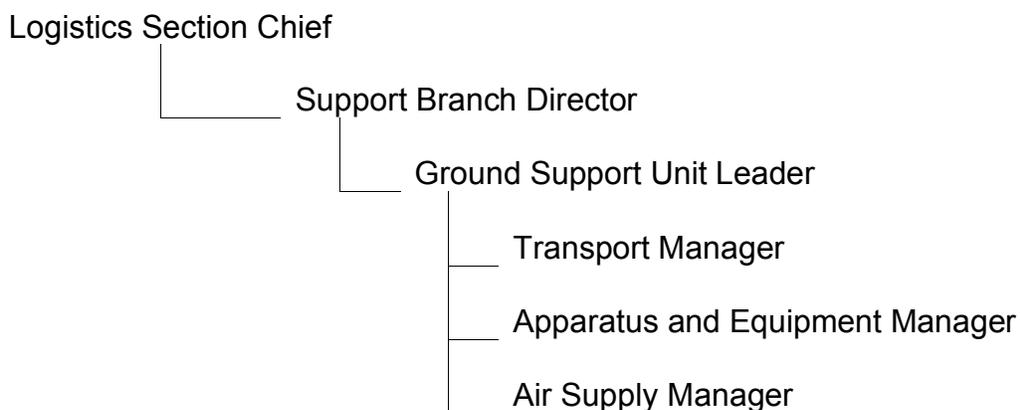
- a. Obtain briefing from Logistics Section Chief, Support Branch Director or Incident Commander.
- b. Participate in Support Branch/Logistics Section planning activities.
- c. Implement Traffic/Movement Plan, including ground level movement and building primary support stairs, as developed by Planning Section or Incident Commander.
- d. Post or mark ground level safe movement routes and outside safe refuge areas identified in the Traffic/Movement Plan.
- e. Appoint personnel and activate transport services including stairwell, ground level, and general motor transport.
- f. Appoint personnel and activate fueling, maintenance and support of apparatus and portable power equipment, and building power plant as appropriate.
- g. Appoint personnel and activate SCBA air cylinder refilling, maintenance and support.
- h. Maintain inventory of support and transportation vehicles, and maintenance and fuel supplies.
- i. Make reports to Support Branch/Logistics Section or Incident Commander as directed.
- j. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- k. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION:

- a. The High Rise Incident Ground Support Unit Leader is primarily responsible for:
 1. Providing transportation for personnel, equipment, and supplies.
 2. Providing refilling of SCBA air cylinders and maintenance of SCBA's.
 3. Providing fueling, service and maintenance of vehicles, and portable power equipment and tools.
 4. Implementing the ground level Traffic/Movement Plan at the incident including marking safe access routes and zones.

- b. The Ground Support Unit Leader reports to the Support Branch Director (if established) or the Logistics Section Chief, and may organize the unit as illustrated below:



PERSONNEL: The number of personnel needed to perform the major responsibilities assigned to the unit will vary based upon the size, duration and complexity of the incident. The minimum number of personnel may be estimated from the information presented in Table 2-1, below. Ground Support Unit personnel will be located in all areas of the incident.

Table 2-1 H.R. Ground Support Unit Minimum Personnel Requirements

Ground Support Unit Leader	- 1
Transport Manager	- 1
Ground Level Personnel	- as needed
Stairwell Personnel	- 1 per alternate floor/per 30 - 60 minute shift ¹
Equipment Manager/Personnel	- as needed
Air Supply Manager	- 1
Air Supply Personnel	- Air Cylinder Refill Units as needed ²

¹ Duration of work periods should be based on stairwell conditions and workload. For fires involving upper floors (above 10th) a stairwell manager may be appointed.

² Determine a cylinder use rate based on active divisions, etc. Determine a fill rate per SCBA Cylinder Refill unit.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the High Rise Incident Ground Support Unit are stated below. Following each activity are listed the procedures for implementing the activity:

- a. Obtain briefing from Support Branch Director, Logistics Section Chief or Incident Commander. The briefing should provide information or direction on the following:
 - 1. Location of areas to be serviced by the Ground Support Unit, including Staging, Incident Command Post, and Base.
 - 2. Existing traffic/movement plan, falling debris problems, assigned stairways, stairway conditions, and elevator use restrictions.
 - 3. Approximate number of companies or personnel assigned to tasks requiring SCBA use, and expected duration of fire and rescue operations.
- b. Participate in Support Branch/Logistics Section planning activities:
 - 1. Attend Support Branch/Logistics Section operational planning meetings as requested.
 - 2. Provide information and advice concerning Ground Support Unit activities.
 - 3. Obtain Incident Action Plan and updates.
- c. Implement ground level Traffic/Movement Plan, including ground level movement and primary support stairways, as developed by Planning Section or Incident Commander:
 - 1. Assume control of existing personnel and resources assigned to Ground Support functions.
 - 2. Provide input into the Traffic Plan as developed and as modifications become necessary.
 - 3. Review plan to determine activities, supplies and personnel needed to implement the plan.
- d. Post or mark ground level safe movement routes and outside safe refuge areas identified in the Traffic/Movement Plan:
 - 1. Obtain needed supplies and equipment from Logistics Section.
 - 2. Obtain needed personnel by request to the Support Branch/Logistics Section.
 - 3. Brief and assign personnel to implement plan. Provide written materials or fire ground maps as needed.
- e. Appoint personnel and activate transport services including stairwell, ground level, and general motor transport:
 - 1. Obtain needed personnel by request to the Support Branch/Logistics Section.

2. Activate routine, ongoing transport functions:
 - Establish stairwell transport function.
 - Establish ground transport function.
 - Establish scheduled personnel shifts and movement schedules
3. Respond to specific transport requests:
 - Receive requests.
 - Determine ability to satisfy request. Act to fulfill.
 - If unit cannot satisfy the request, inform the requestor.
- f. Appoint personnel and activate fueling, maintenance and support of apparatus and portable power equipment and building power plant as appropriate:
 1. Schedule fueling and maintenance activities.
 2. Respond to direct/immediate requests.
- g. Appoint personnel and activate SCBA air cylinder refilling, maintenance and support:
 1. Estimate cylinder refill capacity compared to needed cylinders-per-hour.
 2. Obtain needed personnel, equipment, and cylinder refilling apparatus by request to the Support Branch/Logistics Section.
 3. Establish cylinder movement schedule and methods.
- h. Maintain inventory of support and transport vehicles, and maintenance and fuel supplies based upon Incident Action Plan.
- i. Submit reports to Support Branch/Logistics Section or Incident Commander as directed.
- j. Secure operations and demobilize personnel as determined by the Demobilization Plan. Release and return rented and borrowed equipment.
- k. Maintain Unit/Activity Log (ICS Form 214). The responsibilities of the Ground Support Unit require effective use of check sheets, notes, and records to track unit efforts. Provide such documents to the branch or section supervisor for incident analysis.

INCIDENT COMMAND SYSTEM

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LOBBY CONTROL UNIT LEADER- HIGH RISE INCIDENT

ICS-HR-222-3

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist of activities below should be considered as a minimum requirement for those positions. Users of this manual should feel free to augment this list as necessary. Note that some activities are one-time actions and others are ongoing or repetitive for the duration of the incident.

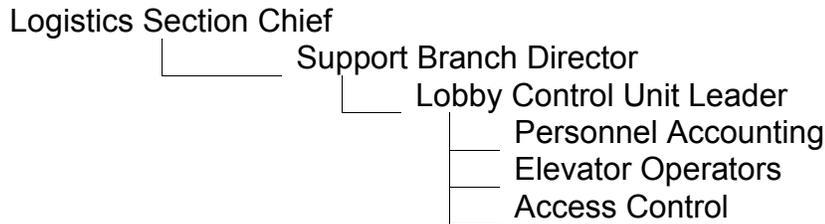
LOBBY CONTROL (HIGH RISE) UNIT LEADER CHECKLIST:

- a. Check in and obtain briefing from Support Branch Director, Logistics Section Chief or Incident Commander.
- b. Make entry, assess situation and establish Lobby Control position. Request needed resources.
- c. Establish entry/exit control at all building access points.
- d. Establish personnel accounting system for personnel entering/exiting the building.
- e. Assume control of elevators and provide operators.
- f. Provide briefings and information to Incident Command Post.
- g. Direct personnel to the appropriate stairways/elevator for assignment and direct evacuees and exiting personnel to safe areas or routes from the building.
- h. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- i. If agency policy or the Incident Commander has assigned Systems Control functions to the Lobby Control Unit, the unit may respond directly to requests from the Operations Section Chief in the manual operation of the various built-in systems.
- j. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL, AND PROCEDURES

ORGANIZATION:

- a. The Lobby Control Unit Leader's primary responsibilities are to:
 1. Operate a personnel/crew accounting system for all building entry and exit.
 2. Direct incident personnel to correct stairway, elevator, or route as assigned.
 3. Control and operate elevator cars.
 4. Direct building occupants and exiting personnel to proper ground level safe areas or routes.
 5. Control all building access points and prevent unauthorized entry or re-entry.
 6. As directed by agency policy or the Incident Commander, perform the functions of the Systems Control Unit.
- b. The Lobby Control Unit Leader reports to the Support Branch Director/Logistics Section Chief. The unit should be prepared to provide the Incident Commander or Plans Section with current information from the personnel/crew accounting record. In buildings without complex building systems, the Lobby Control Unit may perform alarm system monitoring and building communication system monitoring functions. The Lobby Control Unit Leader may organize the unit as illustrated below:



PERSONNEL: The number of personnel needed to perform the functions and responsibilities of the Lobby Control Unit (High Rise) varies with the size and complexity of the building and of the incident. All ground level access points must be secured or staffed to maintain safe egress, personnel accounting and correct routing of arriving resources. All elevators identified for use must be supplied with operators. Adequate personnel must be assigned to maintain accurate and useful accountability records. Relief requirements should be identified. Access control may be performed in conjunction with law enforcement and appropriate building staff.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the Lobby Control Unit (High Rise) are stated below. Following each activity are listed the procedures for implementing the activity. Note that the Lobby Control Position should be set up early in the incident and a standard initial briefing may not occur. As directed by the Incident Commander or agency policy, this unit may be assigned the responsibilities of the Systems Control Unit in the early stages of an incident or in less complex incidents/buildings.

- a. Obtain briefing from Support Branch Director, Logistics Section Chief or Incident Commander. The briefing should provide, or establish the need to identify, the listed information. In the absence of the briefing, the Lobby Control Unit Leader conducts the necessary assessment to determine needed information:
 - 1. Crews and other personnel resources currently inside the building
 - 2. Primary stairways for attack, evacuation and resource movements
 - 3. Current elevator status, use, approved use, and control capabilities
 - 4. Occupant evacuation routes to safe areas and medical treatment areas
 - 5. Incident communications channels
- b. Make entry, assess situation and establish Lobby Control position. Request needed resources appropriate to the incident and building complexity and size.
- c. Establish entry/exit control at all building access points. All points of access into the building should be identified. Access points that are not in use should be secured with security, fire, or law enforcement personnel, or flagging tape, etc. Primary access point for arriving resources should be identified, posted, and controlled. Notify the Base Manager and Ground Support Unit of the primary access point.
- d. Establish personnel/crew accounting system for personnel entering/exiting the building. The personnel accounting system should provide at a minimum the unit numbers and number of members, and the assignment/destination/route (elevator or stair). Record keeping should be done in such a manner as to allow effective transfer of the information to the Incident Command Post.

- e. Assume control of elevators and provide operators. Elevator operations must include the following actions:
 - 1. Confirmation of Incident Commander approval for the use of elevators, including specific elevator cars or banks. Follow jurisdictional agency policy regarding elevator use.
 - 2. Control of the elevators using the recall function and Firefighter Service, unless otherwise approved by the Incident Commander.
 - 3. Provide elevator operators with full protective equipment, operational instructions and communications.
 - 4. Close coordination with the Systems Control Unit to resolve routine and emergency operational problems.
- f. Direct personnel to the appropriate stairways/elevator for assignment. Direct evacuees and exiting personnel to safe areas or safe routes from the building. Coordinate with Operations Section to identify specific stairway for arriving resources and location of safe areas and medical treatment areas. Coordinate with Logistics Section/Ground Support Unit to identify safe routes to rehabilitation areas, Base, and command post.
- g. Secure operations and demobilize personnel as determined by the Demobilization Plan. Based upon the Demobilization Plan, transfer responsibility for building access and security to building management. Return control of elevators to building management.
- h. Maintain unit records and Unit/Activity Log (ICS Form 214). Provide personnel accounting records to Plans Section and unit log to Logistics Section Chief.

INCIDENT COMMAND SYSTEM

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SYSTEMS CONTROL UNIT LEADER- HIGH RISE INCIDENT

ICS-HR-222-4

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time actions while others are ongoing for the duration of an incident.

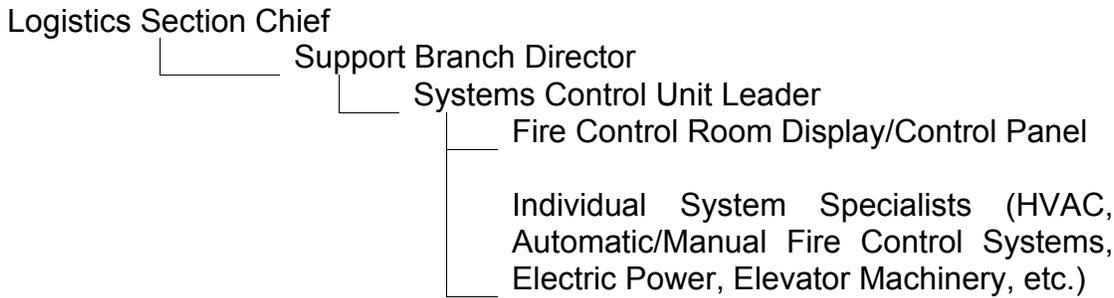
SYSTEMS CONTROL (HIGH RISE) UNIT LEADER CHECKLIST:

- a. Check in and obtain briefing from the Logistics Section Chief, Incident Commander, or Lobby Control Unit (if initial responsibility set by agency policy). Briefing will include the type and performance of built-in systems.
- b. Assess current situation and request needed personnel and resources.
- c. Request response, and make contact with, the building/facility engineer, utility company representatives, elevator service personnel and others as appropriate.
- d. Appoint personnel to monitor and operate building/facility system display/control panels.
- e. Evaluate the status and operation of the fire and domestic water pumps and water supply. Support or repair as required.
- f. Evaluate and operate as required the heating, ventilation and air conditioning system (HVAC) and the smoke removal and stairwell protection systems.
- g. Evaluate, support and control as needed the building electrical system, emergency power plant, and security systems.
- h. Evaluate and support as needed the public address, telephone, emergency phone and other building communications systems.
- i. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION:

- a. The Systems Control Unit Leader monitors and maintains built-in fire control, life safety, environmental control, communications and elevator systems. The Systems Control Unit may operate, support or augment the systems as required to support the incident plan. The Systems Control Unit Leader reports to the Support Branch Director if established, or to the Logistics Section Chief. The unit may respond directly to requests from the Operations Section Chief in the manual operation of the various built-in systems. The Systems Control Unit Leader must establish and maintain close liaison with building/facility engineering staff, utility company representatives, and other appropriate technical specialists. Systems Control Unit functions may be performed in the initial stages or in simple buildings by the Lobby Control Unit as directed by agency policy.
- b. The Systems Control (High Rise) Unit Leader may organize the unit as illustrated below:



PERSONNEL: The number of personnel needed to perform the Systems Control Unit functions will depend upon the complexity and number of built-in systems, the duration of the incident, the availability of specialists, and the performance of the systems.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the Systems Control (High Rise) Unit Leader are stated below. Following each activity are listed the procedures for implementing the activity:

- a. Obtain briefing from Logistics Section Chief or Incident Commander, and building staff. The briefing should provide information or direction on the following:
 - 1. The type of built-in systems and their current performance
 - 2. Priorities for the Systems Control Unit as identified in the Incident Action Plan
 - 3. Incident communications channels
 - 4. Current incident situation

- b. Assess current situation and request needed personnel and resources:
 - 1. Examine building/facility layout, system display/control panels, and meet with currently assigned personnel and on-scene building/facility management and engineering staff. Obtain system layout/operation documents from preplan or management representatives.
 - 2. Determine needed staff and supplies and make requests.

- c. Request response of, and make contact with, building engineer, utility company representatives, elevator service personnel and others as appropriate. In a major incident, anticipate the failure of important systems by the following actions:
 - 1. Have needed technical specialists/assistance en route or available.
 - 2. Establish a meeting location for building/facility technical staff and other specialists, and advise the ICP and Lobby Control Unit of the location.
 - 3. Assign a fire department member with communications capability to technical specialists assigned to problem systems.
 - 4. Communicate and plan with Support Branch Director/Logistics Section regarding solutions to systems failures so that plans and resource needs can be prepared.

- d. Appoint personnel to monitor and operate system display/control panels. Personnel assigned should understand the panels and their operation. Provide assigned personnel with communications capability and a radio designator.
- e. Evaluate the status and operation of the fire and domestic water pumps and water supply:
 - 1. Support or repair system as required. The Systems Control Unit monitors and supports the water supply *after the meter*. The Logistics Section handles coordination with the public water system.
 - 2. Protect fire pumps from flooding and power loss.
 - 3. Investigate and remedy any failure of automatic fire suppression systems, and conditions of inadequate water pressure or volume within the building/facility.
- f. Evaluate and operate, as required, the heating, ventilation and air conditioning system (HVAC) and the smoke removal and stairwell protection systems. Operation of these systems must be closely coordinated with the Operation Section to minimize smoke and fire spread, and protect occupants and fire fighters.
- g. Evaluate, support and control as needed the building electrical system and emergency power plant. Plant engineers and utility company personnel should be positioned early in the incident to control, and restore power as required by the Incident Action Plan. Protect ground level and basement electrical rooms from flooding.
- h. Evaluate and support as needed the public address, telephone, emergency phone and other building communications systems:
 - Personnel at the system display/control panels may operate these systems as required by the incident.
- i. Secure operations and demobilize personnel as determined by the Demobilization Plan. Based upon the Demobilization Plan, transfer authority and responsibility for building/facility system operations to property management.
- j. Maintain Unit/Activity Log (ICS Form 214). The complexity of the Systems Control Unit responsibilities requires effective use of check sheets, notes, and records to track unit efforts. Provide such documents to the branch or section supervisor for incident analysis.

INCIDENT COMMAND SYSTEM

Position Manual

STAGING AREA MANAGER- HIGH RISE INCIDENT

ICS-HR-222-5

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time actions while others are ongoing for the duration of an incident.

HIGH RISE INCIDENT STAGING AREA MANAGER CHECKLIST:

- a. Obtain briefing from Operations Section Chief, or Incident Commander.
- b. Proceed to selected floors and evaluate layout and suitability. Select Staging Area floor, and advise Operations and Logistics Sections Chiefs. Request necessary resources and personnel.
- c. Establish Staging Area layout and identify/post each function area as appropriate to the incident size and expected duration - Crew Ready Area, Air Cylinder Exchange, Equipment Pool, Rehabilitation/Aid Area.
- d. Determine, establish or request needed facility services - sanitation, drinking water, and lighting. Coordinate with Logistics Section or Systems Control Unit to maintain fresh air. Maintain Staging Area in an orderly condition.
- e. Establish a check-in function for arriving and departing crews.
- f. Determine required resource levels from the Operations Section Chief.
- g. Designate area(s) for Rapid Intervention Crew or Company (RIC) to standby in a state of readiness.
- h. Maintain accounting of resources in Staging and periodically update Operations Section Chief and Resources Unit. Advise the Operations Section Chief when reserve levels reach pre-identified minimums.
- i. As requested by Operations Section Chief or Incident Commander, direct crews and equipment to designated locations.
- j. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- k. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION: The High Rise Incident Staging Area Manager is responsible for the management of all functions at the in-building Staging Area, and reports to the Operations Section Chief. The High Rise Incident Staging Area Manager's organizational responsibilities vary somewhat from the standardized ICS position, in that; the area also provides a safe refuge/support function within the building. An air cylinder exchange and a rehabilitation/aid function are typically established as part of the area.

PERSONNEL: The number of personnel needed to perform the major responsibilities assigned to the unit will vary based upon the size and duration of the incident. The minimum number of personnel may be estimated from the information presented below.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the High Rise Incident Staging Area Manager are stated below. Following each activity are listed the procedures for implementing the activity:

- a. Obtain briefing from Operations Section Chief or Incident Commander:
 1. Determine the estimated size and duration of incident.
 2. Identify current location, and existing assignments and commands relating to an already established Staging Area.
 3. Obtain assigned communications channels.
- b. Proceed to selected floors and evaluate layouts and suitability. Select Staging Area floor, and advise Operations and Logistics Section Chiefs. Request necessary resources and personnel:
 1. Select a floor free of atmospheric contamination with adequate open spaces for the needed functions.
 2. Protect occupant furnishings, equipment and records from damage.
 3. Provide personnel for check-in/accounting, air cylinder exchange, communications, and support. Coordinate with Medical Unit for staffing of the Rehabilitation/Aid area.
- c. Establish Staging Area layout and identify/post each function area as appropriate to the incident size and expected duration - Crew Ready Area, Air Cylinder Exchange, Equipment Pool, Rehabilitation/Aid Area:
 1. Locate Crew Ready Area and Rehabilitation/Aid areas away from stairwell doors. Locate Air Cylinder Exchange adjacent to the stairwell door or doors.
 2. Post or write directions to Staging Area on stairwell walls, advise Lobby Control and Operations of location. Post clear directional signs to Staging Area functional areas.
- d. Determine, establish or request needed facility services - sanitation, drinking water, and lighting. Coordinate with Logistics Section or Systems Control Unit to maintain fresh air. Maintain Staging Area in an orderly condition:
 1. Check the operation of building systems. Order alternative water supplies if not functioning.
 2. Order back-up power and lighting sources in anticipation of building power failure.
 3. Maintain workable spaces and passageways. Coordinate with Ground Support for empty air cylinder rotation.
- e. Establish a check-in function for arriving and departing crews:
 - Record crews or personnel assigned to report to Staging in an available status. Record crews or personnel departing Staging Area to assignments or locations.
- f. Determine required resource levels from the Operations Section Chief:
 1. Maintain ongoing communication regarding appropriate personnel levels and readiness.
 2. Brief Staging Area Check-In/Accounting personnel regarding target levels.

- g. Designate area(s) for Rapid Intervention Crew or Company (RIC) to standby in a state of readiness.
- h. Maintain accounting of resources in Staging and periodically update Operations Section Chief and Resources Unit. Advise the Operations Section Chief when reserve resource levels reach pre-identified minimums:
 - 1. Track individual personnel or crew designation as appropriate.
 - 2. Track assembled equipment resources. Coordinate with Ground Support Unit to provide air cylinder rotation. Coordinate with Logistics Section Chief or Base Manager, as appropriate, for needed equipment.
- i. As requested by Operations Section Chief or Incident Commander, direct crews and equipment to designated locations:
 - Obtain necessary information regarding selected stairwells, use of elevators, reporting locations, and organizational elements. Confirm required accompanying resources and equipment.
- j. Secure operations and demobilize personnel as determined by the Demobilization Plan:
 - 1. Based upon the Demobilization Plan, transfer control and responsibility for any building or facility used to appropriate property management.
 - 2. Coordinate with Ground Support Unit for the return of all equipment to Base.
- k. Maintain Unit/Activity Log (ICS Form 214).

INCIDENT COMMAND SYSTEM

Position Manual

MEDICAL UNIT LEADER- HIGH RISE INCIDENT

ICS-HR-222-6

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time actions while others are ongoing for the duration of an incident.

HIGH RISE INCIDENT MEDICAL UNIT LEADER CHECKLIST:

- a. Obtain briefing from Logistics Section Chief, Service Branch Director or Incident Commander.
- b. Participate in Service Branch/Logistics Section planning activities.
- c. Assess current situation and request necessary resources.
- d. Prepare the Incident Medical Plan (ICS Form 206).
- e. Establish aid stations, arrange emergency transport units and equipment, and assign personnel.
- f. Establish Rehabilitation locations, assign personnel and equipment as required in the Incident Action Plan.
- g. Coordinate plans and activities with the Operations Section Medical Branch or Group.
- h. Prepare Medical Reports and forms as needed or requested.
- i. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION: The Medical Unit Leader is primarily responsible for the development of the Medical Emergency Plan, providing medical aid and transportation for injured and ill incident personnel, providing Rehabilitation services, and preparation of reports and records. The Medical Unit may also assist Operations in supplying medical care and transportation to civilian casualties, but this is normally limited to situations where civilian casualties are few or not anticipated. The Medical Unit Leader reports to the Service Branch Director (if established), or the Logistics Section Chief (see Figure 2-1). The Medical Unit Leader may interact with Agency Representatives if injuries or illness involves another agency's personnel.

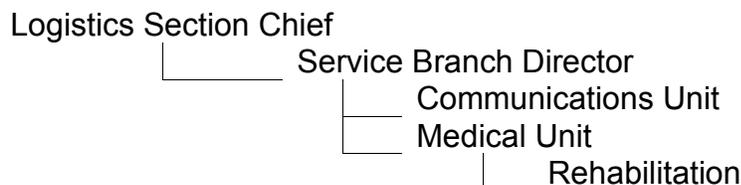


Figure 2-1 Medical Unit and Incident Command System Organization.

PERSONNEL: The number of personnel needed to perform the major responsibilities assigned to the unit will vary based upon the size, duration and complexity of the incident. The minimum number of personnel may be estimated from the information presented below.

MAJOR ACTIVITIES AND PROCEDURES: The major responsibilities of the High Rise Incident Medical Unit Leader are stated below. Following each responsibility are general procedures for implementing the activity:

- a. Obtain briefing from Logistics Section Chief, Service Branch Director or Incident Commander. The briefing should provide information or direction on the following:
 1. Determine expected scope and duration of incident.
 2. Identify location of fire operations, Staging Area, Base, and approved usable stairwells. Determine which elevators are approved for use.
 3. Obtain information regarding injuries or illness that occurred prior to arrival.
 4. Obtain information regarding participating agencies and on-scene resources.
- b. Participate in Service Branch/Logistics Section planning activities. Provide input on medical related situations and conditions.
- c. Assess current situation and request necessary resources:
 1. Evaluate current fire conditions and building layout with reference to injury potential and medical evacuation limitations.
 2. Identify number of personnel needed to staff medical aid stations in Staging, Rehabilitation Area assessment, and Advanced Life Support Teams.
 3. Identify medical equipment and victim evacuation equipment needed at aid stations.
 4. Determine the number of ambulances needed on standby and available in the area.
- d. Prepare the Incident Medical Plan (ICS Form 206):
 1. Identify incident treatment, evacuation and transportation plans.
 2. Identify closest hospitals for routine treatment, trauma treatment, and burn injury treatment.
 3. Establish the notification and response communications plan for medical emergencies.
 4. Complete the written Incident Medical Plan (ICS Form 206).
 5. Request Safety Officer review of the Incident Medical Plan.
 6. Distribute, or submit for distribution, the plan to Section Chiefs, Branch Directors, Division and Group Supervisors.

- e. Establish aid stations, arrange emergency transport units and equipment, and assign personnel:
 - 1. Staff and equip aid stations in the Staging Area in cooperation with the Staging Area Manager and in Base. Aid stations should be staffed at the Basic Life Support/EMT level as a minimum.
 - 2. Position stretchers, evacuation chairs or other suitable equipment in the Staging Area, Lobby or other appropriate locations.
 - 3. Staff and equip an Advanced Life Support level team and position according to the incident needs and conditions.
- f. Assign personnel and equipment to Rehabilitation locations as directed or required in the Incident Action Plan:
 - Assign Medical Unit personnel to perform basic crew health checks as suppression personnel rotate into the Rehabilitation areas. This function may be combined with aid station functions if care is not significantly compromised.
- g. Coordinate plans and activities with the Operations Section Medical Branch or Group:
 - 1. Consult with Operations Section regarding civilian casualties and expectation. If appropriate, add necessary resources to Medical Unit.
 - 2. Obtain information on Operations Section Medical Branch or Group activities and resources for integration of resources as needed.
- h. Prepare Medical Reports and forms as needed or requested:
 - 1. Provide appropriate follow up for each incident injury or illness to assure proper completion of records and reports, such as Workers Compensation, and care provider reports.
 - 2. Assure that reports are submitted as required. Coordinate with Agency Representative of other responding agencies regarding injured personnel. Prepare requested reports for the Incident Commander regarding all injuries.
- i. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

INCIDENT COMMAND SYSTEM

Position Manual

SAFETY OFFICER- HIGH RISE INCIDENT

ICS-HR-222-7

January 28, 1999

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CHECKLIST

CHECKLIST USE: The checklist presented below should be considered as a minimum requirement for the position. Users of this manual should feel free to augment these lists as necessary. Note that some of the activities are one-time action while others are ongoing for the duration of an incident.

HIGH RISE INCIDENT SAFETY OFFICER CHECKLIST:

- a. Check in and obtain briefing from the Incident Commander.
- b. Assess situation and request needed personnel and resources.
- c. Participate in planning meetings.
- d. Evaluate the Incident Action Plan for organizational safety elements.
- e. Review and sign the Incident Medical Plan (ICS Form 206).
- f. Monitor the fire ground and communication channels for hazards, unsafe acts and improper activities.
- g. Take action to limit hazards or correct or stop unsafe actions.
- h. Initiate as needed and confirm the ongoing investigation of any incident related accidents or personnel injuries.
- i. Secure operations and demobilize personnel as determined by the Demobilization Plan.
- j. Maintain Unit/Activity Log (ICS Form 214).

ORGANIZATION, PERSONNEL AND PROCEDURES

ORGANIZATION: The Incident Safety Officer is a member of the Command Staff and reports directly to the Incident Commander. The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures for assuring personnel safety. The Safety Officer will correct unsafe acts or conditions through the regular line of authority. The Incident Safety Officer or his or her assistants have emergency authority to alter, suspend or terminate unsafe acts or conditions when imminent danger is involved.

Assistant Safety Officers may be appointed as required and will report directly to the Incident Safety Officer. Due to the complexity of the operation and dangers inherent in high-rise firefighting, a Safety Group may be implemented to manage operational safety issues. Until a Safety Officer is assigned, the Incident Commander has responsibility for monitoring incident safety.

PERSONNEL: The number of personnel needed to perform the functions of the Safety Officer will depend upon the complexity of the incident, the size of the building and of the fire fighting organization. All incident activities and locations will require monitoring. A single Safety Officer will likely be unable to oversee all areas and perform the duties adequately. When fire involves areas above the fourth floor, or multiple floors are

involved, additional Assistant Safety Officers should be appointed to cover the interior activities. It is recommended that individual acting as Safety Officer should be ICS 401 or National Fire Academy Incident Safety Officer trained.

MAJOR RESPONSIBILITIES AND PROCEDURES: The major responsibilities of the High Rise Incident Safety Officer are stated below. Following each activity are listed the procedures for implementing the activity:

- a. Check in and obtain briefing from the Incident Commander. The briefing should provide information on the following:
 1. The location, current size and estimated potential of the fire incident.
 2. A copy of the Incident Action Plan or current plan components including the incident organization and objectives, the building layout and location of the various organizational units, and the radio communication channels being used.
- b. Assess situation and request needed personnel and resources:
 1. Survey the building and fire ground and assess the progress of control and rescue efforts. Identify potential hazards in the fire area, in the Staging Area, stairwells, and ground level areas. These should include the Base, Incident Command Post, and at the various Logistics functions.
 2. Review the Incident Action Plan. Identify span of control problems, risk elements, communication weaknesses and other safety related items.
 3. Determine needed staff and supplies and make requests.
 4. Brief Assistant Safety Officers on the potential hazards, work locations, operational and safety priorities. Provide appropriate communications devices. Organize resources for the most effective operation.
- c. Participate in planning meetings with Command and General Staff:
 1. Review proposed strategy and control operations to identify potentially hazardous situations to command officers. Suggest means to abate identified hazards.
 2. Summarize safety concerns as requested by the Incident Commander. Prepare a Safety Message if required for long duration incidents.
 3. Confirm jurisdictional agency and Incident Command policy on elevator use, and procedure.
- d. Review and sign the Incident Medical Plan (ICS Form 206). Insure that all elements of the medical plan are addressed including removal of injured personnel from the building, treatment and evacuation to medical facilities. Assure that personnel rehabilitation and health monitoring are included in the plan.
- e. Monitor the fire ground and communication channels for hazards, unsafe acts and improper activities.

- f. Take action to limit hazards or correct or stop unsafe actions:
 - 1. Identify hazards to the line officer in control of the area or at the next planning meeting as appropriate.
 - 2. Correct or stop unsafe actions through the normal chain of command as appropriate to the situation. Without delay control immediately threatening situations.

- g. Initiate as needed and confirm the ongoing investigation of any incident related accidents or personnel injuries:
 - 1. Respond to the location of reported accidents or personnel injuries.
 - 2. Ensure that appropriate medical attention is being provided. Arrange for the preservation of the scene and items related to the injury or accident. Confirm that the Incident Commander has initiated the appropriate investigation team.
 - 3. Identify actions that can be taken to prevent re-occurrence of similar injuries or accidents. Communicate findings to the Incident Commander and other line officers.

- h. Secure operations and demobilize personnel as determined by the Demobilization Plan.

- i. Maintain Unit/Activity Log (ICS Form 214). The Safety Officer position requires the use of notes, check sheets, and records to remain effective. Provide such documents to the Incident Commander for incident analysis.