Pewee Valley Fire Department

Standard Operating Guideline for High Rise Structure Fire Response

rev. 03/22/04

1. Purpose

Effective Draft

This SOG details how PVFD will organize and control fires occurring in high rise structures. For the purpose of this SOG, a high rise is defined as a building that is four stories or greater in height.

2. Response

Fire incidents in high rise structures will be dispatched the same as any other structure, unless a pre-plan is in effect for the specific structure. All high rise fire responses shall include at least 3 command units. First alarm responses shall also include at least 3 apparatus of the following types:

2 pumpers to act as engine companies

1 pumper, ladder, or rescue to act as a truck company

The Response Guide posted at the station shall determine the order of response for each unit. Command or Company Officers may alter this order if necessary for a particular incident.

Responses to high hazard structures may also include units from mutual aid departments. In this case, the mutual aid units will respond in addition to the units listed above.

The first arriving pumper shall position at the fire scene to be the primary attack unit. Their placement must not hinder the placement of an aerial truck. The second pumper will position at the closest hydrant, or at the siamese connection. The third pumper will position at the second closest hydrant. All other apparatus will stage near the scene and be placed as needed.

Automatic mutual aid responses to neighboring districts for high rise structure fires will be the same as any other structure response, which is one command unit, and the apparatus specified on the Response Guide. Other apparatus shall have crews assigned, but shall not respond until requested. Apparatus placement on mutual aid incidents should take the building's pre-plan into consideration. However, all companies must be prepared to operate in different positions based on their arrival time, as specified above.

3. Size-Up

The first arriving unit shall give a radio report detailing what the situation appears to be. This size-up should include the following details:

-Address of the incident

-Brief description of the building including: number of stories, construction type, occupancy

-Brief description of fire conditions as seen from outside

-Statement of first actions to be taken

-Who is in command

4. Incident Command Considerations

Command of the incident shall be governed by the principles of the Incident Command System. Initial command will begin with the officer of the first arriving company. It shall automatically pass to the first arriving command officer, if the command officer arrives first, or soon after the first fire company. If the first command officer will be significantly delayed, the officer of the first arriving company shall identify their self as Command and begin making assignments to other companies. All further transfers of command shall be done after a briefing between the officers involved. The transfer of command shall then be communicated to all personnel. Floors in the fire building will be referred to as ICS divisions that correspond to the floor number or name. For example, floor 2 = *division* 2; mezzanine = *mezzanine division*; etc.

If divisions must be established for activities occurring on the exterior of the building, the divisions shall be referenced using the side on which they occur, and the phrase "exterior". For example; a division established on the exterior of side 3 will be referred to as "exterior division 3".

5. Scene Survey

The first unit to arrive will begin a scene survey based on the nature of the dispatch and conditions seen when arriving. One of the following three modes of operation will be selected, and the survey made accordingly.

1. <u>Investigation mode</u>: If there is nothing showing on arrival, check the scene based on the nature of the dispatch. Be prepared in case the situation escalates.

-The first arriving crew should check the alarm *enunciator panel* and tell all responding units what it shows. They should then proceed to the alarm location to investigate. The next arriving company or officer should stand by at the *main alarm panel* with a radio and be prepared to operate the panel as needed.

-Civilians should be kept from entering the building until the scene is verified to be safe. If the investigating crew finds smoke or fire, the next company should begin evacuation of the structure. The mode of operation shall immediately switch to Offensive, as listed below.

-If the alarm shows multiple locations, each should be checked, starting with the lowest level indicated. Additional crews should be requested to assist with this. Beware, as this is an indicator of a possible working fire.

-Each crew entering the structure shall have the following equipment with them, at a minimum: Full PPE and SCBA on and ready to use; high rise hose pack; irons set; flashlight; extinguisher.

-Elevators shall only be used if the fire crew has phase 2 control of the car. Crews shall exit the elevator at least 2 floors below the alarm location, then use the stairs.

2. <u>Offensive mode</u>: This is where a working fire is evident or strongly suspected. In this case, a second alarm should be requested immediately.

-The first arriving crew shall check the alarm enunciator panel, and tell all responding units what it shows. They shall then proceed to the fire floor and begin evacuating the floors above that location. Before searching, they shall check the smoke and fire conditions at the doorway to the fire floor WITHOUT ENTERING and make a report to the IC. If there is significant smoke or visible flame, the IC shall immediately request a third alarm. If there is still visibility at head level on the fire floor, the crew may enter the floor and evacuate as much as possible. If conditions become untenable before additional crews arrive for fire attack, the floor shall be abandoned and evacuation continued on the floors above the fire floor.

-The second arriving crew shall support the sprinkler and standpipe system, then make sure the ground floor lobby and stairways are being evacuated as efficiently as possible. They shall also arrange a holding area away from the building for evacuated civilians. This crew will then be in position to set up ground level PPV of the stairways when needed.

-The third arriving crew shall take the necessary equipment to establish Level 1 RIT, including a high rise hose pack, and go to the floor below the fire. They will establish the Attack Staging Area, at the stairway door directly below the entrance to the fire floor.

-The fourth arriving crew shall go to the attack staging area and deploy 2 hose lines: one for attack and one for a safety line. The fourth crew can then enter the fire floor and assess the situation, using the RIT team to staff the safety line.

-The fifth arriving crew shall report to the forward staging area, and prepare to search the floor above the fire with a hoseline, then work upward. -If the fire is not immediately controlled with one attack line, the incident shall progress to Extended Operations, as described in section 7.

3. <u>Defensive mode</u>: This is where the fire is too advanced to allow interior firefighting on the fire floor.

-Survey the same as if in Offensive mode, then include the following: -Evaluate the potential for exposure problems or collapse.

-Evaluate the feasibility of conducting a primary search on floors above the fire.

-Determine a location where the fire can be stopped.

-Determine the need to abandon the building and evacuate all fire personnel.

6. Strategy and Tactics Considerations

The scene will be organized based upon accomplishing tactical priorities and continuing the actions that were initiated in the size-up. The overall goal is to establish a forward operations area just below the fire floor, where rescue, fire control, and support activities can be coordinated and carried out effectively. To achieve this goal, there must be an efficient movement of personnel and equipment from ground level to the fire area, while accomplishing evacuation of civilians from the structure.

Special emphasis must be placed on minimizing firefighter fatigue during travel to the forward operations area. There must also be careful coordination of rescue, fire attack, and ventilation to minimize life loss and the spread of fire and smoke further through the building. During all interior activities, it is paramount that firefighter safety be considered, especially escape routes, safe havens, and availability of personnel and equipment to rescue firefighters in distress.

7. Scene Layout Definitions

The following are the different parts of a high rise fire scene, and the activities associated with each:

-<u>Floors above fire floor</u>: These are the floors which must be searched and evacuated as soon as possible. If the building is unoccupied, entry to these floors by fire crews is not permitted if there is significant smoke or visible fire on the fire floor and the RIT team is not yet established. If there is significant smoke and heat on any of these floors, they shall not be entered without an attack line.

-<u>Fire Floor</u>: The floor where the fire is located. This and all floors should be designated by their floor number, since the fire may spread to more than one floor.

-<u>Attack staging area</u>: The floor immediately below the fire is where crews will stage before entering the fire floor or floors above. This is the last area fire crews may occupy without having a RIT team deployed. All personnel in this area must have all PPE, including SCBA, on and ready to use.

-<u>Forward operations area</u>: This term is used to refer to the overall area where forward fire control activities are occurring, including staging areas, command post, rehab, etc, inside the building on floors immediately below the fire.

-<u>Forward command post</u>: This is a command post that is located 2 floors below the fire floor. The forward operations officer, forward accountability officer, and forward safety officer are located here. All command and control related to operations on or above the fire floor will occur here.

-<u>Forward staging area</u>: This is a staging area that is located 2 floors below the fire floor. If there is not adequate room on this floor for both staging and forward command, staging shall be moved to 3 floors below the fire floor. In forward staging, there should be at least 2 crews ready for action at all times until the fire is controlled.

-<u>Forward rehab area</u>: This is a rehab area that is located 2 floors below the fire floor, near the staging area. If the staging area is moved due to lack of space, the rehab area should be moved with it. When crews leave the fire floor, they should report to the forward rehab area for rest, water, and new air cylinders. If crews need further rehab, they should be moved to the Outside Rehab Area, and replaced with a fresh crew.

-<u>Stairway support group</u>: Each floor of the building shall have a crew assigned to it that will move equipment up and down the stairway, from their floor to the floor above. Crews that are walking to the forward operations area should let the stairway support group carry their equipment (other than PPE). All equipment should be relayed in this fashion, to prevent firefighter fatigue. If the elevators are used for fire service, stairway support shall focus on moving equipment from Forward Staging to floors above that location.

-Elevator support group: If it is determined that the elevators can be utilized to safely move personnel and equipment, a crew shall be assigned to coordinate the loading and use of the elevator cars. One person shall be assigned to each car to operate the car and assist with loading and unloading. Each car operator shall have a radio. A member of Lobby Control shall have radio communication with the elevator group to coordinate loading of the cars at the lobby level. The "Elevator Group Leader" shall take a position at the forward staging area and coordinate car usage with Lobby Control. The elevators shall be referred to by their car identifier (a letter or number). If the cars are not already identified, such identification shall be assigned to them. The car operators shall have full turnout gear and SCBA on while operating the car. Equipment and personnel should be delivered to the Forward Staging Area, then move upward via the stairs. If Elevator Group Leader and Forward Operations Officer determine it is safe for the cars to pass the fire floor, the cars may be used to assist with evacuation and personnel movement to floors above the fire. No personnel shall travel above the forward staging area in an elevator without full PPE and SCBA on and ready to use - including mask. Elevator cars shall not stop or open on the fire floor or the floors immediately above or below.

-<u>Stairway PPV group</u>: The crew assigned to provide PPV in the stairways shall accomplish it in the following manner:

 Attempt to use the building's HVAC system to pressurize the stairways and exhaust through the roof. Coordinate this activity with the building facility supervisor, if possible.
Set up tandem PPV fans at the base of each stairway, blowing upward.

3. If the building has roof hatches in the top of any of the stairways, send a crew to open them as soon as possible.

4. If the fire is not vented through a window on the fire floor, a stairway with a roof hatch may be used as a vent exit. If this is done, a crew must be sent to this stairway to open the hatch, then make sure the stairway is evacuated to below the fire floor, and all stairway doors in this path are closed.

5. If there are no roof openings available for ventilation and the fire is not vented on the fire floor, windows on a floor immediately above the fire floor may be removed to provide a vent exit. This must be carefully planned, to prevent unnecessary fire or smoke spread. After these windows are opened or removed, the vent crew must open doors in

the same stairway at the fire floor and vent exit floor, and make sure no stairway doors are open elsewhere that lead to the vent exit floor.

-<u>Main command post</u>: The overall command of the incident shall be coordinated from a location away from the fire building. The Incident Commander, Scene Operations Officer, Scene Safety Officer, and any other ICS staff positions not listed as part of the forward operations command structure shall operate from this location.

-<u>Lobby control</u>: An accountability check point shall be established at the ground floor lobby. All personnel entering the structure must first check in with lobby control, who will record their identity and destination/assignment. Accountability tags shall be kept by the crew, who will give them to the forward accountability officer when they reach the forward operations area. If any personnel do not have their accountability tag, they shall not enter the structure until a tag has been assigned to them. All crews that exit the building must notify lobby control that they have left, and what their destination is. Lobby Control shall coordinate ground level use of the elevator system with Elevator Group Leader, who is located at the Forward Staging Area.

-<u>Safe haven</u>: An area inside the fire building that is close to the fire area where a crew can quickly go in case of emergency. To be a safe haven, the area must have the following:

-Be large enough to hold the entire crew

-There is fresh air available

-The area can be safely occupied for at least 10 minutes without concern of smoke or fire

Usually, the only safe haven areas are the stairways and floors below the fire. If crews operating on floors above the fire find a place to establish a safe haven, they should mark the location and notify Forward Operations of its location.

8. Rapid Intervention during high rise incidents

High rise fire scenes pose significant difficulties to accomplishing OSHA's mandated 2in/2out rule. In order to abide by this rule and provide firefighter safety measures without jeopardizing timely fire attack, the following procedures will be used to establish Rapid Intervention Teams (RITs).

Level 1 RIT Crew

The third crew to arrive at the Forward Operations Area shall deploy a safety line and will become the Level 1 RIT crew. Their primary purpose is to meet the requirements of 2in/2out and protect crews as they begin fire attack and operations at or above the fire floor.

Level 1 RIT shall be established at each point of entry (different stairwell) onto the fire floor before crews enter at that location, or go to floors above the fire floor. Level 1 RIT crews need 2 people per crew at a minimum. Level 1 RIT crews shall remain in place for the duration of the incident, or until Forward Operations determines they are no longer needed.

Each Level 1 RIT crew shall be identified by their company number, then the term RIT. For example, if Engine 4 is assigned to be a Level 1 RIT crew, they shall become "Engine 4 RIT" and shall use this identity on the radio for the duration of the assignment. They shall also notify Forward Accountability that they are now a Level 1 RIT crew. Level 1 RIT crews shall answer to Forward Operations until the RIT Leader position is established.

Level 2 RIT Team

The Level 2 RIT team shall be composed of 2 RIT crews, with at least 2 personnel on each crew. The Level 2 RIT crews shall be identified in the same manner as Level 1, with the company identification followed by "RIT". They shall notify Forward

Accountability that they are now a Level 2 RIT crew, and what crew will be paired with them.

If the Level 2 RIT has unhindered access to multiple stairwells from the Attack Staging Area, one RIT team may cover these areas. If this is not the case, a Level 2 RIT team must be established at each point of entry. Forward Accountability must be made aware of this situation and what RIT crews are staffing each entry point.

The level 2 RIT team's company officer shall assume the position of "RIT Leader". RIT Leader shall oversee the establishment of the RIT teams and direct them when called to action. After the teams are in place and prepared, RIT Leader shall report to Forward Operations and confer with him about the fire attack operations. RIT Leader does not enter the fire floor if a RIT crew goes into action.

RIT crews shall assist fire attack teams at their location with tasks such as flaking hose, but shall not engage in activities that will impede their ability to immediately go into action to rescue a firefighter in distress. RIT crews shall only receive direction from RIT Leader.

The level 2 RIT team(s) shall stage at the Attack Staging Area, with the following equipment in hand:

-Thermal Imaging Camera

-Search rope

-1 extra SCBA

-Forcible entry and pry tools (including long pry bars and rabbit tool kit) -Tool sled

The Level 2 RIT team(s) shall examine the Attack Staging Area floor, to gain information about the building layout. They shall then stand prepared for firefighter rescue. RIT crews only enter the fire area if a crew declares a MAYDAY, or RIT Leader calls on them to find a missing firefighter.

9. Firefighter Safety

All offensive or defensive mode fires shall require the use of a RIT team, in accordance with the PVFD Rapid Intervention Team SOP, and as described above. The crew staffing the safety line shall serve as the level 1 RIT team until another crew is designated as the RIT team. A Forward Safety Officer shall be appointed to monitor all offensive or defensive fire activities from the forward operations area, and a Scene Safety Officer shall be appointed to monitor the overall scene from the main command post, located outside of the structure.

Utilities serving the building and fire floor shall be secured as soon as possible. Firefighters shall disconnect electricity via circuit breakers or disconnect switches only. LG&E shall be requested if meters or high lines require disconnection. If possible, the building facility supervisor should be consulted to coordinate control of all utilities, including electricity, ventilation systems, and fire pumps.

Offensive fire attack shall be made with no more than one attack line until level 2 RIT is established, and there is at least 1 free crew in the forward staging area. The only exception is when there is a confirmed rescue requiring immediate entry to the fire floor.

A safety line shall be deployed and staffed at the same entry door as the first attack line, and before a second attack line is deployed. The safety line shall be charged and ready before the attack line enters the fire floor. The safety line shall not enter the fire floor unless requested by the attack line for emergency assistance.

If multiple points of entry to the fire floor are used, additional safety lines and RIT teams will be placed accordingly. Attack lines entering the fire floor from different areas must be carefully coordinated to prevent each line from pushing fire and smoke toward the other crews. If possible, all attack crews should enter the fire floor from the same side of the building. Safety lines must remain staffed until the fire is under control. Each safety line must be of equal or greater length and flow capacity than the attack line it is protecting.

10. Engine Company Tactics

The following are the basic types of engine company operations that will occur and the most common way they are carried out. Other companies may also perform some of these operations, depending on their arrival time to the scene. Therefore, all personnel should be familiar with the different types of company operations, regardless of the type of apparatus on which they arrived.

A. <u>Initial attack and safety line placement</u>: Attack lines will be deployed from a standpipe connection close to the fire floor. If the standpipe is located in the stairwell, the first attack line and safety line should be connected at the fire floor via a wye or water thief. Each line shall be at least 100' long, with consideration given to extending the line as necessary to reach all parts of the fire floor. The lines should be flaked out going up the stairway one floor, then back down, with the nozzles staged at the entrance to the fire floor.

If the standpipe cabinets are located within the floors (outside of stairwell) and are not readily accessible due to smoke or fire, the first hoselines should be connected at the floor below the fire. In this case, each line will need at least 150' of hose. The hoses are then flaked as described above.

B. <u>Second attack line placement</u>: The second attack line to be deployed should be connected at the next available standpipe connection above the fire floor. A wye or thief should also be used at this location, to allow additional line connection if needed. If the initial safety line is expected to cover the second attack line, it must be long enough to reach the same area as the second attack line.

C. <u>Water supply to the building's fire protection systems</u>: The sprinkler and standpipe connections should be supported by a pumper as soon as possible. This is usually done by the second arriving engine company. The sprinkler system gets first priority in being supported, followed by the standpipe. Each system should be supplied with at least 150 psi plus 5 psi per floor above the 1st. The pumper supplying these systems should be dedicated to this purpose, with no other lines supported by it. It is not recommended to use a quint to supply the siamese connections, since this may eliminate proper aerial placement.

D. <u>Water supply to the attack engine</u>: If an engine or quint is used to provide attack lines directly from the apparatus, another engine company should provide a supply line to the attack engine from a hydrant other than the one used by the pumper supplying the siamese.

11. Truck Company Tactics

Truck company operations such as ventilation, rescue, forcible entry, salvage, and overhaul will be much more difficult to accomplish in a high rise building, due to the limited working space, lack of access from outside, and lack of quick access to adequate personnel. The two most important truck company tasks to accomplish are the fast and efficient evacuation of civilians, and effective ventilation.

A. <u>Aerial ladder placement</u>: During high rise operations, aerial placement shall be made depending on the following criteria:

-Can the aerial be used effectively for access to upper floors or the roof, including for immediate rescue?

-Is the aerial master stream needed for attack from outside, or exposure protection?

-Can the aerial be placed near the building entry point to provide easier access to tools and equipment?

-Where is the best location to place the aerial to protect it from the collapse zone?

On most rectangular buildings, the best placement for an aerial is to have the turntable at the building corner. This allows the truck to be relatively protected from wall collapse, and allows the aerial to access 2 sides of the structure. For odd-shaped buildings, placement must be made based on the building shape, in addition to the criteria listed above. Use of the aerial's pre-piped waterway as an alternate standpipe should only be considered as a last resort, since this ties the aerial to one location and endangers it if fire conditions deteriorate.

B. <u>Ventilation</u>: Ventilation is one of the most important aspects of high rise fire control, and is one of the most difficult tasks to accomplish. Careful coordination is necessary to provide adequate fresh air to support rescue and fire control efforts (see sections 7 & 8). Positive pressure must be maintained in the stairwells to prevent smoke from exiting the fire floor. A direct vent exit path must be established to minimize smoke spread. If possible, the smoke should be vented from a window on the fire floor. This may mean removing a window on the fire floor by swinging a heavy tool into it from the window of the floor above.

C. <u>Rescue</u>: The first companies to arrive at the fire floor must size up the situation, then immediately begin to remove as many civilians from the fire area, and areas above, as quickly as possible. Crews should not place themselves in an IDLH area until level 1 RIT is established.

12. Defensive or Evacuation Mode Operations

If the IC determines that fire crews are not able to gain control of the fire in a reasonable amount of time using the available resources, the mode of operation shall switch to either "Defensive" or "Evacuation". The following criteria shall be used to determine which mode to use, and when to change modes.

- 1. Crews can't enter fire floor due to extreme heat and fire.
- 2. 3 large diameter handlines can't control the fire after 20 minutes.
- 3. The fire is spreading upward faster than can be controlled with available handlines.
- 4. The building presents signs of structural weakness.

During High Rise incidents, Defensive mode shall mean that the fire floor(s) are not safe to enter at all. In this case, all operations above the fire floor(s) shall be abandoned. All efforts shall be focused on deploying enough handlines and ventilation to regain control of the fire, starting at the lowest fire floor and working upward. This may also mean deploying large diameter handlines through windows from the standpipes of exposure buildings. If this mode is successful, Forward Operations shall notify the IC, and the mode will switch back to Offensive. If Defensive operations are not successful in a reasonable time, consideration must be given to changing to Evacuation mode.

Evacuation mode means that there appears to be no safe or effective way to continue firefighting operations inside the structure. Once declared, this mode shall not be reversed. If the IC determines that this is necessary, Fire Control shall be asked to sound the evacuation signal, and all crews shall immediately leave the building with due haste. Tools and equipment (other than PPE) shall be left in the building. All companies shall be ordered to evacuate to a safe haven outside of the collapse zone. The Scene Accountability Officer shall account for all personnel face-to-face. Any other buildings located within the collapse zone shall be evacuated immediately.

13. Secure the Scene

Before a fire scene is returned to the control of its owner or occupant, The IC shall order an inspection by members of PVFD. The inspection shall check for the following:

-No hazards are left which could injure a civilian. Barricade any areas unsafe for entry.

-The fire is not likely to rekindle.

-All fire department equipment is accounted for.

-The building is secured from trespassing as much as possible.

The owner or occupant shall then be briefed as to the condition of the property. Any potential hazards shall be pointed out. Utilities shall be reactivated as much as possible without affecting the fire area. If there is any doubt about this, the facility supervisor shall be given the responsibility for reactivating the utilities.

If the scene is turned over to another agency such as Police or Investigators, they must be specifically informed that they are responsible for leaving the scene safe for civilians.

If there is a significant chance of rekindle, the IC shall assign crews to return to the scene and inspect it on a regular basis. The inspections shall be done every few hours until the threat of rekindle has passed.

If there is any doubt as to the structural integrity of the building, a building inspector shall be requested to respond to the scene and determine the proper course of action for securing or barricading the building. No civilians shall enter the building until the inspector determines that it is safe to do so.