

<b>PHOENIX REGIONAL STANDARD OPERATING PROCEDURES</b>	
<b>Policy Name:</b> <b>FIREGROUND SAFETY</b>	<b>Policy Number:</b> <b>M.P. 202.05</b>
This policy is for internal use only and does not expand an employee's legal duty or civil liability in any way. This policy should not be construed as creating a duty to act or a higher duty of care, with respect to third party civil claims against employees or the Phoenix Fire Department (PFD). Remedies for violations of this policy, if proven, are limited to administrative disciplinary action against PFD employees.	
Related Policies: 201.01, 201.05A	
Other Reference: NFPA 1500-2018, NFPA 1521-	
Date Implemented: 12/2021-N	Review Date: 12/2026

**PURPOSE**

The purpose of this procedure is to establish general safety guidelines for operating personnel.

**TACTICAL POSITIONING**

Positioning of operating companies can severely affect the safety/survival of such companies. Personnel must use caution when placed in the following positions:

- In the direct flow path of the fire
- Working into wind-driven conditions
- Above the fire (floors/roof)
- Where fire can move in behind or above them
- Where position and retreat cannot be controlled
- When involved with opposing fire streams
- Combining interior and exterior attack
- With limited access--one way in/out
- Operating under involved roof structures
- In areas containing hazardous materials
- Below ground fires (basements, etc.)
- In areas where a flashover or backdraft potential exists
- Above/below ground rescue

The safety of firefighting personnel represents the major reason for an effective and well-timed offensive/defensive decision and the associate write-off by Command. THE TWO STRATEGIES ARE BASED ON A STANDARD RISK MANAGEMENT PLAN THAT IS TO BE EMPLOYED AT ALL STRUCTURE FIRES.

## **STANDARD RISK MANAGEMENT PLAN**

WE MAY RISK OUR LIVES A LOT, IN A CALCULATED MANNER, TO PROTECT SAVABLE LIVES

WE MAY RISK OUR LIVES A LITTLE, IN A CALCULATED MANNER, TO PROTECT SAVABLE  
PROPERTY

WE WILL NOT RISK OUR LIVES AT ALL FOR LIVES OR PROPERTY THAT IS ALREADY LOST

When operating in a defensive strategy, operating positions should be as far from the involved area as possible while still remaining effective. Position and operate from behind barriers if available (fences, walls, etc.). The intent is for personnel to utilize safe positioning where possible/available, in an effort to safeguard against sudden hazardous developments such as explosion, structural collapse, down-powerlines, smoke, collision of heavy equipment, etc.

When operating in an offensive strategy, a controlled aggressive attack is required for firefighter safety. An effective, coordinated interior attack operation directed toward knocking down the fire eliminates most eventual safety problems. The operational focus should be to get water on the fire from the most effective position available. Water on the fire improves interior conditions for savable victims and firefighters.

Due to the inherent hazards of the fire or incident scene, efforts must be made by Command to limit the number of personnel on the fireground to those assigned to a necessary function. All personnel shall be:

- Responding
- Positioned in Staging
- Assigned to a task or operating within a sector
- Released to in-service status

The intent of this procedure is to minimize fireground confusion/congestion and to limit the number of personnel exposed to fireground hazards to only those necessary to successfully control the operation. Individuals or crews shall be restricted from wandering about the fireground or congregating in non-functional groups. If personnel have not been assigned to a sector or do not have a necessary staff function to perform, they shall remain outside the fireground perimeter.

When it is necessary to engage personnel in exceptionally hazardous circumstances (i.e., to perform a rescue), Command will limit the number of personnel exposed to an absolute minimum and assure that all feasible safety measures are taken.

In extremely hazardous situations (e.g., flammable liquids, LP gas, special operations, etc.) Command will engage only an absolute minimum number of personnel within the hazard zone. Unmanned fire streams (typically master streams) will be utilized wherever possible.

In situations where crews must operate from opposing or conflicting positions, such as front vs. rear attack streams, roof crews vs. interior crews, etc., utilize radio or face-to-face communications to coordinate your actions with those of the opposing crew in an effort to prevent needless injuries. It is critical that opposing or conflicting operations are avoided whenever possible. Notification and coordination between Company Officers, Sector Officers, and Command is necessary to manage conflicting operations.

Ground crews must be notified and evacuated from interior positions before ladder pipes go into operation. Command or Sector Officers should consider obtaining a PAR prior to ladder pipes going into service.

Do not operate exterior master streams into an area where interior crews are operating. Caution needs to be used if exterior hand line application is flowing water into a compartment where interior crews are operating. This procedure is intended to prevent injuries to firefighters and structural collapse.

When laddering a roof, the ladder selected shall be one which will extend 2' - 3' above the roof line. This shall be done in an effort to provide personnel operating on the roof with a visible means of egress.

If possible, when laddering buildings under fire conditions, place ladders near building corners or fire walls as these areas are generally more stable in the event of structural failure.

The ROCC recommends that personnel should be tethered to a ladder/platform anchorage point on the platform any time the device is in motion and whenever you are off the ground unless you are actively climbing or descending the ladder or entering or exiting the platform.

When operating either above or below ground level, establish at least two separate escape routes/means where possible, (such as stairways, ladders, exits, etc.), preferably at opposite ends or diagonal corners of the building or separated by considerable distance.

### **Hot Zone**

The Hot Zone will be defined as any area that requires an SCBA, charged hoseline, special protective clothing, or in which firefighting personnel are at risk of becoming lost, trapped, or injured by the environment or structure. The following situations would be included inside the Hot Zone:

- Entering a structure reported to be on fire

- Operating in close proximity to an involved structure during exterior operations
- Confined Space
- Trench Rescues
- Operating close to crane operations or close to swift water operations
- Building collapse
- Operating close to helicopter operations
- Extrication

**ALL FIREFIGHTERS WORKING IN THE HOT ZONE SHALL BE IN CREWS OF A MINIMUM OF TWO PERSONNEL, WEARING APPROPRIATE PPE, WITH A RADIO ON THE CORRECT TACTICAL CHANNEL AND MUST HAVE AN ASSIGNED TASK OR FUNCTION. THE ACCOUNTABILITY SYSTEM WILL BE IN PLACE.**

### **Warm Zone**

The Warm Zone will be defined as the area just outside of the Hot Zone where the firefighters start their operations on the fireground. This zone is where the firefighter is not at risk of becoming lost, trapped, or injured by the environment or structure. The following functions could be done inside the Warm Zone:

- Forward fire apparatus working the incident (e.g., engines, ladders, etc.)
- Laying lines
- Hazmat and TRT developing strategies & tactics
- Utility trucks
- Special equipment needs
- Accountability Officer
- Fire Investigations

If at any time firefighters in the Warm Zone become threatened, this area would become a Hot Zone.

### **Cold Zone**

The Cold Zone will be defined as outside of the Warm Zone where no one is at risk because of the incident. The following functions could be done inside the Cold Zone:

- Command
- Level I & Level II staging
- Support and staff personnel
- Canteen
- Rehab
- Media

All operating personnel must remain vigilant on emergency incidents. Just because your operating in a Cold Zone does not mean there is no risk. Apparatus movements, traffic, and unforeseen violence are just a few examples of potential hazards at all incidents.

### **No-Entry Zone**

The No-Entry Zone is defined as the area at an incident that no person shall be permitted to enter due to an imminent hazard, dangerous condition, or the need to protect evidence. Operating personnel need to be informed of the No-Entry Zone; during nighttime operations consideration should be given to illumination of the No-Entry Zone.

When possible, control zones should be identified with colored hazard tape or other appropriate means parallel to NFPA 1521 guidance.

- Hot Zone: Red
- Warm Zone: Yellow
- Cold Zone: Green
- No-Entry Zone: Red and white diagonal-striped or chevron

### **SECTORS**

The safety of firefighting personnel represents a major reason for fireground sectorization. Sector Officers must maintain the capability to communicate with forces under their command so that they can control both the *position* and *function* of their companies.

Sector Officers and Company Officers shall be able to account for the whereabouts and welfare of all crews/crew members under their assignment.

Company Officers shall insure that all crew members are operating within their assigned sector only. Crews will not leave their respective sectors unless authorized by the Sector Officer.

When crews are operating within a sector, Company Officers shall keep the Sector Officer informed of changing conditions within the sector area, and particularly those changing conditions which may affect the safety of personnel.

Hazards that will affect only a specific sector area should be dealt with within that sector and need not necessarily affect the entire operation.

### **SAFETY SECTOR**

The recognition of situations which present inordinate hazards to fireground personnel and the proper response to safeguard personnel from those hazards is of critical importance to all Fire Department operations.

Command has the responsibility to recognize situations involving a high risk to personnel and to initiate appropriate safety measures.

Command shall establish appropriate additional safety oversight at incidents involving an inordinate danger to personnel. Command may consider establishing a Safety Sector on any situation where it may be advantageous to the overall safety of operations.

When the need for specialized assistance is identified, Command should confirm the response of the appropriate personnel (Safety Officer/Structural Engineer).

Command may designate any available personnel to establish a Safety Sector when the need is indicated. This should be a high priority assignment.

The establishment of a Safety Sector in no way diminishes the responsibility of all officers for the safety of their assigned personnel. Each and every member shall utilize common (safety) sense and work within the intent of established safety procedures at all times.

### **STRUCTURAL COLLAPSE**

Structural collapse has been a major cause of serious injury and death to firefighters. The possibility of structural collapse should be a major consideration in the development of any incident action plan. All fireground personnel should consider the possibility of structural collapse in the decision-making process.

Structural collapse is always a possibility when a building is subject to intense fire. In fact, if fire is allowed to affect a structure long enough, structural failure is inevitable.

Regardless of the age and exterior appearance of the building, the possibility exists that a principal structural supporting member is being seriously affected by heat and may collapse, inflicting serious injury to firefighters.

Example: A 100' length of unprotected steel will expand 9" when heated to 1100° F.

In the typical fire involved building, the roof is the most likely candidate for failure, however failure of the roof may very likely trigger a collapse of one or more wall sections. This is especially true if the roof is a peak or dome type which may exert outward pressure against both the bearing and non-bearing walls upon collapse. In multi-story buildings or buildings with basements, the floor section above the fire may collapse if supporting members are directly exposed to heat and flames.

A knowledge of various types of building construction can be invaluable to all firefighters from a safety standpoint as certain types of construction can be expected to fail sooner than others. For

example, light weight truss and bar joist roof construction can be expected to fail after minimal fire exposure.

Structures have been known to collapse without warning but usually there are indications which may tip off an alert firefighter. Action shall be taken to avert any imminent hazard.

Signs of building collapse may include:

- Cracks in exterior walls
- Bulges in exterior walls
- Sounds of structural movement--creaking, groaning, snapping, etc.
- Smoke or water leaking through walls
- Water accumulation on a roof
- Windows, doors, floors and stairs out of level
- Flexible movement of any floor or roof where firefighters walk
- Interior or exterior bearing walls or columns--leaning, twisting or flexing
- Sagging or otherwise distorted rooflines
- Time of fire involvement

The following construction features or conditions have been known to fail prematurely or to contribute to early structural failure when affected by fire.

Contributing Factors:

- Parapet walls
- Large open (unsupported) areas--supermarkets, warehouses, etc.
- Large signs or marquees--which may pull away from weakened walls
- Cantilevered canopies--which usually depend on the roof for support and may collapse as the roof fails
- Ornamental or secondary front or sidewalls--which may pull away and collapse
- Buildings with light weight truss, bar joist, or bow string truss, roofs
- Buildings supported by unprotected metal--beams, columns, et
- Buildings that are under construction, renovation or are otherwise not completed

Buildings containing one or more of the above features must be constantly evaluated for collapse potential. These evaluations should be a major consideration in determining the strategy, i.e. offensive/defensive.

It is a principal Command responsibility to continually evaluate and determine if the fire building is tenable for interior operations. This on-going evaluation of structural/fire conditions requires the input of Company Officers advising their Sector Officers and of Sector Officers advising Command of the conditions in their area of operation.

**Most structures are not designed to withstand the effects of fire and can be expected to fail if exposed to heavy fire involvement. If after 10-15 minutes of interior operations heavy fire conditions still exist, Command should initiate a careful evaluation of structural conditions, and should be fully prepared to withdraw interior crews and change to a defensive strategy.**

If structural failure of a building or section of a building appears likely, a No-Entry Zone must be established a safe distance from the area which may collapse. All personnel must remain outside this perimeter.

### **EVACUATION OF FIREFIGHTING PERSONNEL**

Interior firefighting operations should be abandoned when the extent of the fire prohibits control, or the structure becomes unsafe to operate within. When such conditions make the building untenable, evacuate, account for personnel, regroup, recommunicate, and redeploy.

Our primary concern, when a hazard which may affect the safety of fire personnel becomes apparent, is the welfare of those personnel. In an effort to protect personnel who may suffer the adverse effects of hazards such as structural collapse, explosion, backdraft, etc., a structured method of area evacuation must be utilized, one which will provide for the rapid/effective notification of those personnel involved, and one which will be able to accurately account for those personnel.

Crews retreating from interior operations often require hoseline protection. The protection afforded to firefighting personnel in such situations represents a major function of back-up lines.

The method of evacuation selected will vary depending on the following circumstances:

- Imminence of the hazard
- Type and extent of hazard
- Perception of the area affected by the hazard

The "Emergency Traffic" announcement is designed to provide immediate notification for all fireground personnel. The use of "Emergency Traffic" should be initiated only when the hazard appears to be imminent or has just occurred. Any member has the authority to utilize the "Emergency Traffic" announcement when it is felt that a notable danger to personnel is apparent; however, considerable discretion should be applied to its use - emergency traffic announcements become ineffective if overused.

When an imminent hazard has been realized, the emergency traffic process should be initiated. Usually, a Company or Sector Officer will be the initiator. The initiator should describe the apparent hazard and order a suitable response, usually to evacuate a particular area or section, according to the scope of the hazard.

If possible, the Sector Officers of those areas to be evacuated should request an acknowledgment of the emergency traffic dispatch from those crews to be evacuated.

Upon receipt of the emergency traffic evacuation order, Company Officers shall assemble their crews and promptly exit to a safe location, where the Company Officer will report a PAR for all crew members. Shortly after the evacuation order, Sector Officers shall begin the process of accounting for all evacuated crews. When all affected crews and crew members are accounted for, the Sector Officer will report a PAR for that Sector. At this time a more specific determination as to the reality/extent of the hazard can be made and efforts initiated to redeploy/redirect efforts.

Building evacuation generally involves a shift from an offensive to a defensive strategy. In such cases, Command must develop a corresponding operational plan and must communicate that plan to all operating companies. It is extremely important that everyone is notified and recognizes that a shift in strategy has been made. This transition can be time consuming based on company's interior positions.

Hazards of a less than imminent nature should usually be handled by a consultation of Command, Sector Officers, Safety Officers, Company Officers or other personnel. Personnel should make a determination of the nature and possible effect of the suspected hazard and advise Command so that a more well-informed decision can be made.

### **SEARCH AND RESCUE**

Search and rescue should be performed according to an efficient, well planned procedure which includes the safety of search crew personnel. The object of the search effort is to locate possible victims, not create additional ones by neglecting the safety of the search crew.

Fire victims are typically killed through thermal and/or toxic exposure. The closer a victim is to the fire the greater the chance of thermal exposure. Toxic exposure is not directly connected to the proximity to the fire but in any area affected by smoke and the products of combustion. In either form of exposure, the most survivable space in any structure or compartment is at the floor level.

Prior to entering the search area, all search team members should be familiar with a specific search plan including the overall objective, a designation of the search area, individual assignments, etc. This may require a brief conference among crew members before entering the search area to develop and communicate the plan. Individual search activities should be conducted by two or more members when possible.

For residential search and rescue operations, firefighters may search off the hoseline. Company Officers must maintain an awareness of the position and function of all members within their crew

during search operations. For non-residential fire operations, firefighters should not be operating off of the hoseline.

A brief look around the floor below the fire may provide good reference for the search team, as floors in multi-story occupancies usually have a similar layout.

Whenever a search is conducted that exposes search crews to fire conditions (particularly above the fire floor) the search team should be protected with a charged hose line.