

Policy Number: 2020-008

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# Waterloo Vol Fire Department Standard Operating Guidelines

## Fireground Operations

### Scope:

This guideline shall apply to all members of the Waterloo Fire Department and shall be adhered to by all members.

### Purpose:

This standard specifies common fire ground considerations that can affect the safety and survival of personnel on the fire ground. The purpose of this standard is to provide for a maximum level of safety while operating at emergency incidents.

### Definitions:

**Backdraft** - An "Explosion" or rapid burning of heated gases, resulting from the introduction of oxygen when air is admitted to a building that is heavily charged with smoke from a fire that has depleted the oxygen content of the building.

**Defensive Strategy / Mode** - Exterior attack directed to first reduce fire extension and then bring the fire under control.

**Flashover** - The simultaneous ignition of highly heated combustibles in an area.

**Offensive Strategy / Mode** - Interior attack and related support directed toward quickly bringing the fire under control.

**Shall** - Indicates a mandatory requirement.

**Standard Operating Guideline (SOG)** - Documents that help establish how an organization will operate and how its members are expected to carry out specific duties outlined in general terms.

### Guidelines:

Many of the standard safety requirements are considered to always be in effect on the fire ground. This requires that everyone involved understand where the boundaries of the fire ground are located. For safety purposes, the fire ground is defined by an imaginary line, which encloses the space where the fire situation creates a potential hazard to personnel. Unless otherwise designated by command, the fire ground will be that area within the perimeter of those vehicles operating at the fire scene.

Policy Number: 2020-008

Effective Date: 05/24/2020

Last Review Date: \_\_\_\_\_

# Waterloo Vol Fire Department Standard Operating Guidelines

## **Safety:**

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

- Above the fire (floors/roofs)
- Where fire can move in behind them
- When involved with opposing fire streams
- Combining interior and exterior attack
- Where division cannot control position/retreat
- With limited access - one way in/out
- Operating under involved roof structures
- In areas containing hazardous materials
- In areas where a back-draft potential exists
- In areas where live electricity exists
- Below ground level

The safety of firefighting personnel represents the major reason for an effective and well-timed offensive/defensive decision and the associated write-off by Command. When the rescue of savable victims has been completed, Command must ask, "**Is the risk to my personnel worth the property I can save?**" (**Risk versus benefit**).

When operating in a defensive mode, your operating position should be as far from the involved area as possible and still remain 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 back-draft explosion, structural collapse, etc.

When operating in an offensive mode is aggressive; effective interior attack operations directed toward knocking down the fire eliminate most eventual safety problems.

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

Policy Number: 2020-008

Effective Date: 05/24/2020

Last Review Date: \_\_\_\_\_

## Waterloo Vol Fire Department Standard Operating Guidelines

Be assigned to a task or division.

Having completed an assignment and no other assignment is available in that division crews should be assigned to a Resource, Manpower, or Rehabilitation Division until such time as they can be either re-assigned back to an operating division or released to in-service status.

The intent of this procedure is to minimize fire ground confusion/congestion and more importantly to limit the number of personnel exposed to fire ground hazards to only those necessary to successfully control the operation. Individuals or crews shall be restricted from freelancing on the fire ground or congregating in nonfunctional groups. If you have not been assigned to a division or you do not have a necessary staff function to perform, stay off the fire ground.

In extremely hazardous situation (large quantities of flammable liquids, LP gas, hazardous materials, difficult marginal rescues, etc.), Command will engage only an absolute minimum number of personnel within the fire ground perimeter. Portable master streams will be utilized wherever possible.

In situations where crews must operate from opposing or conflicting positions; such as, front versus rear attack streams, interior versus exterior streams, roof crews versus 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 injuries.

Ground crews must be notified and evacuated from interior positions before exterior streams go into operation.

Do not operate exterior streams, whether hand lines, master streams, etc., into an area where interior crews are operating. This procedure is intended to prevent injuries to personnel due to stream blast and the driving of fire and/or heavy heat and smoke onto interior crews.

When laddering a roof, the ladder selected shall be one which will extend 2' to 3'(3-5rungs) above the roof line. This shall be done in an effort to provide personnel operating from 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.

## Waterloo Vol Fire Department Standard Operating Guidelines

When operating either above or below ground level, establish at least two (2) separate escape routes/means where possible; such as: stairways, ladders, exits, etc., preferably at opposite ends of the building or separated by considerable distance. This will minimize fire ground confusion/congestion and more importantly to limit the number of personnel exposed to fire ground hazards to only that necessary to successfully control the operation. Individuals or crews shall be restricted from freelancing on the fire ground or congregating in nonfunctional groups. If you have not been assigned to a division or you do not have a necessary staff function to perform, stay off the fire ground.

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Interior firefighting operations should be abandoned when the extent of the fire prohibits or the structure becomes unsafe to operate within. When such conditions become untenable, evacuate, regroup, recommunicate, and re-deploy.

An accepted rule for knowing when to abandon interior operations is when 20 minutes has passed from the time the fire is believed to have **started**. Once this time limit is exhausted, the incident commander should consider going to a defensive mode. Communications should advise command of the 20-minute time limit.

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 such hazards such as structural collapse, explosion, back-draft, 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.

## Waterloo Vol Fire Department Standard Operating Guidelines

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

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

For hazards that affect the majority of the fire ground, the on-scene safety officer or the incident commander once notified of an imminent hazard shall advise all units to activate the emergency operations system SOG 2010-010 tones. Once this advisory is made all apparatus operators shall activate their air-horns in three long blast to provide notification to all on-scene personnel.

Hazards noted of a less than imminent nature should usually be handled by a consultation of Command, operation officers and/or Company officers or outside agency authorities. These officers or specialists should make a determination as to the nature and possible effects of the suspected hazard and advise Command so that command can make a more knowledgeable decision as to the proper course of action. Crews retreating from interior operations often require hose line protection. The personnel protection afforded to fire fighting personnel in such situations represents a major function of such back-up lines

### **Structural Collapse:**

In recent times structural collapse has been the leading cause of serious injuries and deaths to fire fighters. For this reason, the possibility of structural collapse should be a major consideration in the development of any tactical plan.

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

### ***Tactical Standard Operating Guidelines (SOG)***

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 which may exert outward pressure against both the bearing and non-bearing walls upon collapse. In two story buildings or buildings with a basement, the floor

Policy Number: 2020-008

Effective Date: 05/24/2020

Last Review Date: \_\_\_\_\_

## Waterloo Vol Fire Department Standard Operating Guidelines

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 the Fire Officer from a safety standpoint as certain types of construction can be expected to fail sooner than others. For example; under fire conditions, light weight truss and bar joist roof construction can be expected to fail after minimal fire exposure.

Trussed roofs are to be considered a primary risk to interior crews. Therefore the rule for going from an offensive attack to a defensive is **10 minutes** from the time the fire has entered the space **(attic or floor space)**

Structures usually collapse without warning but sometimes there are signs which may tip off an alert fire officer. Action might be taken to avert any imminent hazard.

Signs may include:

- Cracks in exterior walls
- Sounds of structural movement - creaking, growling, snapping, etc.
- Smoke or water leaking through walls
- Flexible movement of any floor or roof where fire fighters walk
- Interior or exterior bearing walls or columns, leaning, twisting, or flexing

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:

- Large open, unsupported areas - supermarkets, warehouses, etc.
- Large signs/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, etc.

Policy Number: 2020-008

Effective Date: 05/24/2020

Last Review Date: \_\_\_\_\_

## Waterloo Vol Fire Department Standard Operating Guidelines

Buildings containing one or more of the above features must be constantly evaluated for collapse potential. These evaluations should be of major consideration toward determining the tactical mode; (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 divisions and of divisions advising command of the conditions in their area of operation.

Structures of other than fire protected/heavy timber construction are not designed to withstand the affects of fire, and can be expected to fail after approximately twenty minutes of heavy fire involvement. If after 10 to 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 resort to a defensive position.

### **Tactical Standard Operating Guidelines (SOG):**

If structural failure of a building or section of a building appears likely, a perimeter must be established as a safe distance from the area that may collapse. All personnel must remain outside this perimeter.