Your
Seattle
Fire Department

MEMORANDUM

DATE: November 6, 2012

TO: Operations Deputy – A, B, C, D

FROM: Assistant Chief Michael E. Walsh, Operations MW

SUBJECT: **BASEMENT FIRE – TACTICAL CONSIDERATIONS**

Chief Officers' convened a "roundtable" recently to discuss residential basement fires and their associated strategic and tactical objectives. The goals of these meetings included:

- Clarifying Chief Officers' strategic and tactical operations at basement fires,
- Examining recent CDM and OSET sessions in the context of residential basement operations, and
- To discuss a recent U/L study on basement fires and their potential to cause floor collapse.

Following is a summary of this "roundtable" information and can be considered expectations.

Battalion and Deputy Chiefs shall lead facilitated discussions of this content with all of their assigned companies. After the discussions, Chief Officers can account for their members on a tab in their training folder (on-line) and the Officers should record the drill in TIMS by **no later than November 26, 2012**.

Basement Fire Attack – Challenges

Basement fires are challenging because the scenarios we encounter vary widely and many different multiple attack line and ventilation strategies exist. Careful consideration of building construction and basement layout are crucial to selecting and implementing a successful strategy. Generally, three types of residential basement configurations are found:

1. Basements with interior stair access and direct exit to outside.

2. Daylight Basements. (As defined by a house situated on a slope, so that part of the level is above ground, with a doorway to the outside.)

3. Basements with interior access and no exterior access.

Examples of common basement fire challenges include:

- Substantial ventilation challenges, both to protect potential victims, support the fire attack and protect unaffected parts of the building.

- Unprotected interior stairs that may be narrow, damaged by the fire and subject to early failure.
- Difficulty descending interior stairs due to smoke, heat and flames coming up a primary ventilation opening.
- Limited egress with the possibility that the fire can cut off exiting.
- Possible chimney effect and the potential for hostile fire events (flashover) caused by window failure or incorrect venting.
- Storage/fire load – many basements have a high fire load with items that may fall and entrap firefighters, and hinder firefighter and hoseline movement.
- Floor systems – May be unfinished, lightweight, contribute to fire growth, and susceptible to early collapse.
- Ceiling height – May be reduced in some cases or have entanglement hazards.

Formulating a Successful Strategy

As with all incidents, a 360° needs to be conducted prior to committing to the interior of a structure. A 360° will likely determine if there is a fire below grade. NOTE: It is far safer to assume all occupancies have a basement until determined otherwise.

The first-in company shall formulate a strategy and attack options based on their risk/benefit analysis (RBA), for life and property, before going offensive. For all structure fires, there needs to be a good reason members are in a building's interior. Officers need to be able to articulate the reasons why they chose to go offensive and have it be properly aligned with their risk/benefit analysis.

1. As an example, on a Form 55 for a PIA/PIR statement, an articulated RBA may be, "Heavy flames visible from four perimeter basement windows on the Alpha Bravo side of a 2 ½ story single-family dwelling with Charlie side access. Family was out of the house. Due to burn time and possible structural issues with no rescue profile, an interior attack was conducted through the Charlie side with no exposure line on floor one until water was on the fire. The risk of operating on the floor above is initially too high for savable property."

There has also been a cultural hesitation with putting a nozzle in a window and flowing water. It can be a very effective technique to reduce a risk or buy time and allow hose teams to subsequently enter. However, the Officer must know what impact it may have against the survivability profile in the space being impacted. NOTE: If there are flames that completely envelope a window opening, this isn't a space that will provide any viable life. For anyone to survive near flames they must be in a shelter space which means steam from applying water would not harm them. It's very different if there are firefighters in that space. Actions must be well communicated if an Officer opts to use this technique.

Items over the radio either from the interior or command that would immensely help define the strategy and make the RBA clear are:

- Victim probability
- Heavy Fuel Loads
- Impassable due to high contents
- Fire involvement
- Heat levels

- Estimated floor stability/integrity (burn through)
- Location, if any, of interior stairs
- Door control from the interior
- Exterior basement access
- Ventilation plan (PPV/vertical/hydraulic/natural)

Hoseline Placement Considerations

When possible, the best way to save lives and reduce hazards is to directly attack the fire from the same floor that the fire originated. Confining the fire to the basement and extinguishing it before it moves throughout the structure is a top priority.

<u>It is essential that hoseline placement be communicated to all on the fireground</u>. Options include:

1. Attack the fire directly, if available. (Many single family dwellings in this region, including 'plexes', have exterior entrances.) Taking the first hoseline to the fire in the basement doesn't preclude the second line from going to floor 1 (the floor above the fire). If it is safe to do so, the second line may go to floor 1 to provide:
   a. An exposure line to prevent fire extension.
   b. Basement door closure.
   c. Protection for occupants potentially on the floors above the fire and firefighters searching high probability areas.

2. The third hose team can then be used as a back-up line for the primary attack line in the basement or deployed to other areas of likely fire extension (e.g., the upper floors or attic of balloon-frame construction).

Note: Attack down the interior stairs. This strategy was heavily evaluated by U/L and heat ranges were very significant up the interior stairs with any appreciable fire volume. Some ranges were far beyond the capability of our PPE. Those that engage in this tactic in a well involved basement fire may be exposed to many of the risk factors discussed earlier in addition to being subject to a potential flashover with any window failure. However, this strategy may be effective for incipient content fires where there is no exterior access. Additionally, firefighters must be aware that any stairwell door will be open from the hoseline will allow smoke to the upper floors until ventilation is established.

Ventilation Considerations

When the first-in company officer (IC) is going to advance a hoseline, they must have a ventilation plan formulated, communicated, assigned and confirmed. Ladder companies must make contact with Command and confirm the location and attack approach of the primary line. They should also confirm door control, if any, and the location of any exposure line. Also, they should read the smoke conditions and communicate initiation, actions or changes in the ventilation plan.

Do not take out windows unless it aligns itself with the ventilation plan and is properly timed and communicated. Taking out windows in a basement, for a fire that has progressed past the incipient stage, can be quickly followed by a sharp rise in temperature as the fire grows exponentially. A main low pressure point is up the interior stairs (chimney effect - UL Study) and improper window ventilation can be catastrophic for any in the interior.

Ventilation for an exterior basement door attack (with interior stair door) may be:

- Measured PPV (reduced throttle) at the basement access out the foundation windows.
- For ventilation above the basement (if the basement stair door is CONFIRMED closed by the exposure line) consider PPV with an additional fan at the front door, or vertical ventilation of the upper floors if necessary.

  This ventilation strategy is to expedite and assist the search of the main and upper floors without affecting the basement crews.

Ventilation with no interior basement stair door, use:

- Hydraulic ventilation to rid the smoke and heat from the basement out of a basement window.
- The hose team on floor 1 can also use a floor 1 window to hydraulically ventilate since PPV without a basement stair door may push the smoke around the house and increase pressure down the basement stair.

  Initial PPV from the exterior basement access with no windows for an exit point can heavily charge the floors above and should be avoided.

Ventilation for basements without an exterior access:

- If a transitional attack through the foundation windows is used, PPV can be used after knockdown to assist crews in carefully advancing down the stairs for final mop up.
- If an initial stair attack is used, PPV can be used at the request of the interior company and after careful evaluation of the conditions by the Ladder Company.

Search

- Assess the building from the exterior for survivable spaces. Those survivable areas should be the focus for the targeted area searches.

- Search the closest area to the fire with the highest possibility for victims in a survivable space, whether that is the basement or the floors above.

Structural Integrity

Sounding of the floor above the fire will not conclusively determine if the entire floor will collapse, but it may help determine if the floor sheathing has burned to a point that will not support a firefighter. (*NOTE: Sounding doesn't always indicate if the floor structure will collapse or not.*)

Incident Command
Companies that self-deploy corrupt strategic planning. Do not self-deploy! This includes units assigned to the first 2 and 1.
Remember that face-to-face communication regarding strategy/tactics also needs to be relayed via radio.

Use clear text and paint the picture, such as: *"All units....we have a well involved basement fire. All occupants are out of the house. We are attacking/evaluating from an exterior Charlie side access. No fire units will enter floor 1 from side Alpha until we have evaluated floor stability. Ventilation plan is PPV from side Charlie out the perimeter windows on the basement level."*

Thermal Imaging Camera (TIC)
TICs have limitations in identifying high temperatures in basements from the floor above. They may not read accurate temperatures while trying to "see" through to the basement below due to layers of insulation. (There is a large difference between temperatures taken on the ceiling of the basement vs. those taken from the floor above.) Continue to look for other signs of a well-involved basement.

MEW:tmc

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Battalion 22 Chief – A, B, C, D
Battalion 4 Chief – A, B, C, D
Battalion 5 Chief – A, B, C, D
Battalion 6 Chief – A, B, C, D
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