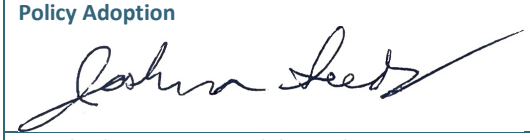
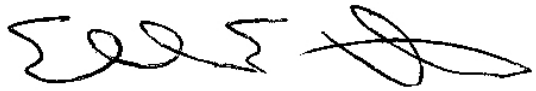
East County Fire and Rescue
Standard Operating Guidelines

Title	SOG #
Structural Firefighting Under Wind Conditions	4.3.6
Policy Adoption 	**Date** 3/5/2024
Standard Operating Guideline Adoption 	**Date** 3/5/2024

Purpose

Wind speeds of as little as 10 mph can significantly increase the thermal hazards presented by a structure fire during interior operations. Therefore, wind speed and direction needs to be considered as part of the initial size-up of the fire conditions and needs to be monitored and reported throughout the fire incident

Scope

This Standard Operating Guideline applies to all members engaged in structural firefighting operations.

Related SOGs: 3.1.1 *Rules of Engagement*. This SOG directly supports "Base action on current and expected fire behavior and structural stability" (SOG 3.1.1, p2-3) as a key rule of engagement for structural firefighting.

Policy

Members shall consider the potential effect of wind speed and direction on fire behavior in determining strategic mode, strategies, and tactics when engaged in structural firefighting operations.

Procedure

The following guidelines should be followed for structural firefighting operations when wind conditions exceed 10 mph (16 kph).

Identifying the Hazard

Wind speeds of as little as 10 mph (16 kph) can result in wind impacted fire conditions during structural firefighting operations. Members must maintain an awareness of wind conditions and their potential impact on fire behavior.

The following table from the National Oceanic and Atmospheric Administration identifies visual clues to wind speeds up to approximately 12 mph (19 kph).

Wind Speed (mph)	Description	Visual Clues
0	Calm	Smoke rises vertically with little if any drift.
1 to 3 mph (2 to 5 kph)	Light Air	Direction of wind shown by smoke drift, not by wind vanes. Little if any movement with flags. Wind barely moves tree leaves.
4 to 7 mph (6 to 11 kph)	Light Breeze	Wind felt on face. Leaves rustle and small twigs move. Ordinary wind vanes move.
8 to 12 mph (13 to 19 kph)	Gentle Breeze	Leaves and small twigs in constant motion. Wind blows up dry leaves from the ground.

Strategic and Tactical Considerations

Potential for wind driven conditions increases directly with wind speed. When wind speeds exceed a gentle breeze, 8 to 12 mph (13 to 19 kph) consider the potential for wind driven fire conditions and apply the following strategic and tactical considerations:

- If potential for wind driven fire conditions is identified, this should be identified and communicated to all companies and members working at the incident as a safety message.
- Whenever possible, operate from the exterior and apply water from upwind directly into the involved compartments prior to interior attack. Even a 1-3/4” (45 mm) handline applied from the upwind from the exterior can have a significant impact on controlling the fire prior to interior operations). The stream should be directed upward, bouncing it off the ceiling and walls to apply water directly to burning fuel.
- In a wind-driven fire, it is most important to use the wind to your advantage and attack the fire from the upwind side of the structure, especially if the upwind side is the burned side. Note that this may be contrary to conventional offensive tactics that place hoselines between the hazard presented by the fire and potential occupants and uninvolved property.
- When the fire is on the leeward (downwind) side of the structure, avoid pressurization of the building by maintaining door control and avoiding creation of other upwind ventilation openings. If the building will be pressurized by natural horizontal ventilation, it is essential to establishing adequate exhaust openings (2-3 times larger than the inlet) before opening the inlet. Remember that wind can create the same (or greater) positive pressure as a blower used in positive pressure ventilation (PPV). Pressurization without adequate exhaust can result in extreme fire behavior.
- Consider controlling the flow path by using tactical anti-ventilation such as door control and limiting the use of (horizontal and vertical) tactical ventilation prior to fire control (remember that opening the door is increases ventilation). However, it is essential to remember that unplanned ventilation resulting from fire effects (such as window failure) can have a significant and potentially unexpected impact on the ventilation profile and subsequent flow path(s).

- Avoid working in the exhaust portion of the flow path (between the fire and exhaust opening) or potential flow paths (between the fire and potential exhaust openings). Unplanned ventilation from fire effects can suddenly change the interior thermal conditions.
- Identify potential refuge areas, escape routes, and safety zones prior to and during interior operations. Taking refuge in a compartment with an intact and closed door may temporarily provide tenable conditions and a place of refuge until the fire can be controlled or another avenue of egress established.

These strategic and tactical considerations have been derived from research conducted by the National Institute of Standards and Technology (Madrzykowski & Kerber, 2009, Kerber & Madrzykowski 2009; Madrzykowski & Barowy, 2012) and by line of duty death investigations conducted by NIOSH (2008, 2009), Prince William County Department of Fire and Rescue (2007), and the Texas State Fire Marshal's Office (2007, 2009).

References

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