



A story of **Impact**



NIOSH Fire Fighter Fatality Investigation Helps Incident Commander Choose Strategy and Tactics to Control Flow Path and Protect Fire Fighters

Every time fire fighters enter a burning building they put themselves at risk of injury and death. Each year 80 to 100 fire fighters die in the line of duty.¹ To prevent these deaths, the NIOSH Fire Fighter Fatality Investigation and Prevention Program conducts independent investigations, analyzes information collected, and prepares a report with prevention recommendations.

In March 2014, a fire lieutenant and a fire fighter died fighting a structure fire in a residential, Brownstone. The fire started as a result of welders installing a hand rail at the rear (Side Charlie) of the building. The first fire fighters on the scene entered the building through the front door (Side Alpha) and moved to the basement, searching for the fire and a potential victim.

The fire grew quickly due to the rear door being left open after a maintenance worker checked the activated smoke detector and residents fled the building, and from 60 mile per hour (mph) winds. A wind-driven fire, like this one, is particularly dangerous to fight

▲ Residential fire in New York where tactics recommended by a NIOSH fire fighter fatality investigation report were used. Photo courtesy of the Nesconset Fire Department.

Relevant Information

Fire departments should:

- **ensure that fire fighters do not place themselves within a flow path** or between the fire and a ventilation opening.
- **identify weather conditions** and the impact they may have on how to best control a fire.
- **develop and use specific strategies and tactics** for fighting wind-driven fires.



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because of the potential for strong and sudden increases in fire, heat, and smoke conditions. The open doors at the front and rear of the Brownstone created a flow path for air pushed by the high winds to feed the fire, allowing the fire to spread quickly. This trapped the fire lieutenant and fire fighter in the basement.

NIOSH investigated the incident and published the report: *Lieutenant and Fire Fighter Die and 13 Fire Fighters Injured in a Wind-Driven Fire in Brownstone- Massachusetts*.² Using fire dynamics research conducted by the National Institute of Standards and Technology and Underwriters Laboratories,³⁻⁵ this report identified three key recommendations related to flow path: 1) incident commanders should conduct a risk assessment upon arrival and consider options to safely attack the fire, 2) incident commanders should adjust fire-fighting tactics based on weather conditions during structure fires, and 3) fire departments should educate fire fighters on the impact of wind.

Impact

As a result of the NIOSH report, the Nesconset Fire Department in Long Island, New York, considered wind direction and its effect on flow path when responding to a call, in April 2016, during a Nor'easter that produced winds gusts exceeding 60 mph. Chief, James Keane, stated "After reading the NIOSH report from the Brownstone fire in Massachusetts, I recognized the possibility of a wind-driven fire and sent hose lines to fight the fire from downwind and upwind, in addition to accessing the fire directly from Side B (the left side of the structure)." During the fire, conditions inside deteriorated rapidly. However, attacking the fire from upwind and keeping the doors of the home closed while fighting the fire, quickly reduced the heat and smoke, allowing fire fighters to safely exit.

The Chief shares the impact this NIOSH report had on the decision to fight the fire from upwind at fire service seminars and training sessions. Putting report recommendations into action can help keep fire fighters safe. As Chief Keane noted, "I'm confident that using this tactic during the high wind weather conditions we were experiencing helped to save lives and prevent injury of the fire fighters who responded to this call."

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For more information about the NIOSH Fire Fighter Fatality Investigation and Prevention Program and to see a complete listing of our reports, visit: (<https://www.cdc.gov/niosh/fire/>).

NIOSH thanks Chief James Keane for sharing the tactics the Nesconset Fire Department used to fight wind-driven fires.

¹⁻⁵For a complete list of references, see www.cdc.gov/niosh/docs/2017-200

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