In-Station Training

TM 23-31 Residential Attic Fire

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Purpose

The ventilation profile and flow paths have a major influence on fire development and spread within a building. It is essential to understand the relationship between available oxygen and heat release rate as well as the influence of flow path and convective and radiant heat transfer on fire development and extension.

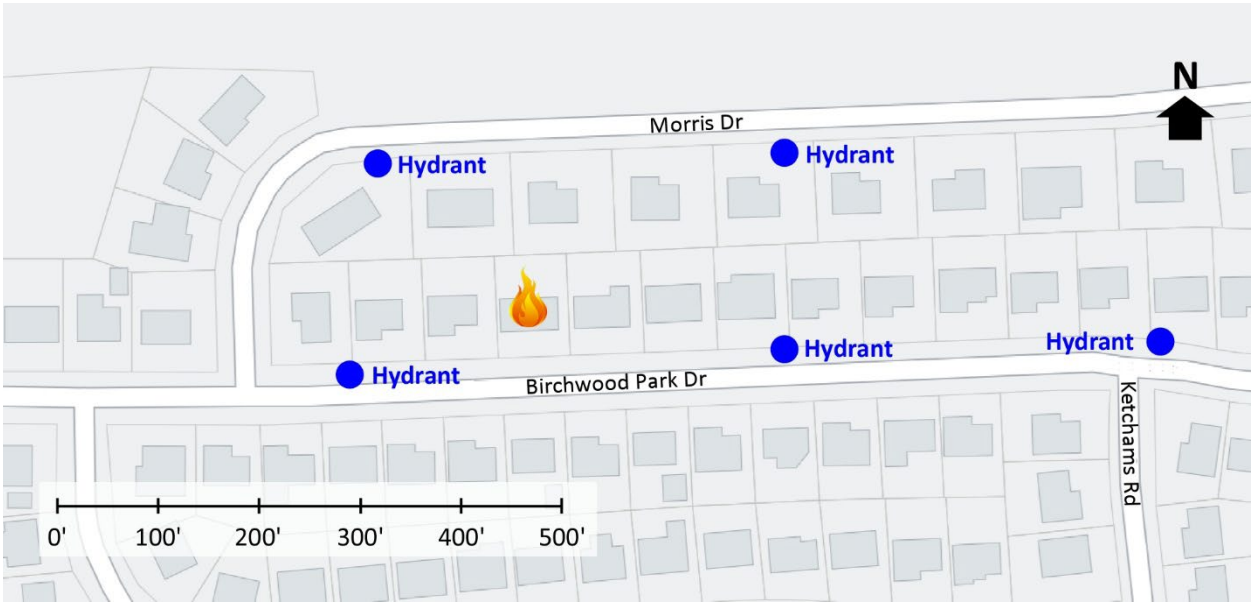
Learning Outcomes

Firefighters and officers perform an effective size-up; select an appropriate strategy, and implement tactics based on the strategic decision-making model.

Conducting the Drill

This incident involved a residential fire at 20 Birchwood Park Drive in Syosset, New York on June 6, 2023, at 17:11 (50 Response Videos, 2023 & Long Island Fire Wire, 2023, June). Review the map and photos (Figures 1-6) to gain an understanding of the area and building involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2023b). [Map, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/3K8Qzev.

Figure 2. Aerial View

Note: Adapted from Google. (2023a). [Aerial view, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/44SpVym.

There are hydrants within several hundred feet on either side of the incident location on Birchwood Park Drive. Several other hydrants are in the area as illustrated in Figure 1.

Figure 3. Alpha/Delta Corner

Note: Adapted from Google. (2017a). [Street view, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/44RN303.

Figure 4. Side Alpha

Note: Adapted from Google. (2017b). [Street view, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/44U0pc7.

Figure 5. Alpha/Bravo Corner

Note: Adapted from Google. (2017c). [Street view, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/3pR4TBD.

Figure 6. Side Charlie

Note: Adapted from Google. (2023c). [3d aerial view, 20 Birchwood Park Drive, Syosset, NY]. https://bit.ly/3pQIW5L.

Just prior to this response, a severe thunderstorm passed through the area (50 Response Videos, 2023) and the temperature is 71° F with wind from east at 13 mph (Weather Underground, 2023).You have been dispatched to 20 Birchwood Park Drive for a residential fire at 17:11. You are the company officer or AIC of the first arriving engine and have your company's typical staffing.

1. What critical factors would you consider when dispatched and during response and what conversations would you have with your crew while responding?

While responding you hear a command officer, another engine and advanced life support ambulance with typical staffing for your agency go enroute. Dispatch advises that an occupant of the building reported a possible lightning strike and a fire in the attic. The second engine and ALS ambulance just cleared another incident and are out of position, the second engine and ambulance will arrive approximately seven minutes after you followed by the command officer. All other units dispatched on the first alarm will arrive after the command officer. You are responding from the west on Birchwood Park Drive.

Watch the incident video (50 Response Videos, 2023) from 00:06 to 00:20 and examine Figure 7 illustrating conditions on arrival.

Figure 7. Conditions on Arrival

Note: Adapted from 50 Response Videos. (2023). *Early arrival at house fire-Syosset NY.* https://bit.ly/44MGkoa

2. State your initial radio report (IRR) exactly as you would transmit it to dispatch.

3. What specific actions would you take (as the company officer) immediately upon arrival and exiting the apparatus and what task orders you would give your crew?

Smoke is visible from the eaves on Side Charlie with smoke blowing towards Side Bravo. You are met by the occupant on Side Alpha who advises that they were the only one home. Looking inside through the open front door, you observe that there is no smoke on Floor 1. You observe no evidence of a basement and homes in this neighborhood are typically built on a concrete slab.

4. Would you change the action you are taking or modify the assignments given to your crew? If so, what task orders would you provide?

5. State your update report exactly as you would transmit it to dispatch.

6. State the tactical assignment you would give the next arriving engine exactly as you would transmit it.

7. Based on the anticipated effectiveness of your tactical operations, state your conditions, actions, and needs (CAN) report that you would provide to the first arriving command officer as part of command transfer to IC #2?

Watch the incident video (Response Videos, 2023) from 00:20 to 01:50 and examine Figure 8 illustrating conditions at the doorway shortly after the first arriving companies made entry.

Figure 8. Closeup of Side Alpha

Note: Adapted from 50 Response Videos. (2023). *Early arrival at house fire-Syosset NY.* https://bit.ly/44MGkoa

8. The first arriving engine stretched a line through the door on Side Alpha and assisted by the first arriving truck began pulling ceilings and applying water into the attic. Was this an effective fire control tactic.

9. Given the construction features of this building (look closely at Figure 8) could an eave attack from either Side Alpha or Charlie have been an effective initial fire control method? How may the hip roof configuration have influenced water distribution in an eave attack?

10. Would fog nails (small piercing nozzles) have been an effective initial fire control tactic in this incident? If so, where would you have placed them?

Watch the incident video (Response Videos, 2023) from 02:14 to 03:50 before answering the next several questions.

11. Firefighters operating on Side Charlie were taking multiple windows. Given incident conditions, was this an effective approach to tactical ventilation. Why or why not?

12. Interior crews hydraulically ventilated through a partially cleared window. Would the effectiveness of hydraulic ventilation have been improved if the firefighters simply opened the door on Side Charlie and used it as an exhaust opening? Why?

13. This home suffered considerable fire and fire control damage. How could companies operating at this incident have significantly reduced fire control damage while minimizing damage caused by the fire?

Additional Learning: Watch *Tactical Consideration: Get Water in the Eaves for Attic Fires* (UL FSRI, 2022). Discuss the factors that may have influenced the effectiveness of this type of tactic if confronted with conditions encountered in the incident presented in this 10-Minute Training (and how they may have been overcome). Also discuss the capabilities and limitations of this tactic with other types of eave design (e.g., bird blocking). Then get out and stretch some hose, practicing hose handling and attack line movement for an eave attack.

Watch *In this test video a Fog Nail (a small piercing nozzle at 75 l/m or 20 gpm) is used to suppress the fire* (Axelson, 2019).

Poudre Fire Authority has equipped all engines and trucks with fog nails and has developed an excellent training video illustrating their application. This video provides a good baseline of knowledge. Watch *Fog Nail Training Video* (Poudre Fire Authority, 2018b).

The Poudre Fire Authority Fog Nail Training Video refers to direct attack (offensive) and indirect attack (defensive) at 11:23 in the video. Use of these terms in the video is inconsistent with ECFR's use of offensive and defensive as strategies and direct attack and indirect attack as fire control methods.

> In this video "offensive" is used in a tactical sense when water is being applied to control the fire while "defense" is used in the tactical sense when water is being applied to protect uninvolved areas of the building. It can be a bit confusing when offense and defense are used in both a strategic and tactical sense. **In ECFR's context both applications would be part of an offensive strategy as they involve working inside the collapse zone.**
>
> The term "direct attack" is used in the video in reference to use of water for fire control. However, direct attack would be more correctly used when water is being applied to burning or pyrolyzing fuel surfaces. The video uses the term indirect attack when water is applied remote from the fire. This may or may not be the correct use of this term. As initially presented by Lloyd Layman (1952), indirect attack involves application of water to the upper area of a compartment, cooling the temperature to below 212° F (100° C) and producing a large volume of steam, displacing smoke, and hot gases from the space. This is in many cases inconsistent with the contraction of the hot gases within a compartment when fog nails are used (see gas contraction (Axelson, 2018)).

When administering medication during a medical response, emergency medical technicians must consider the five rights: right patient, right drug, right dose, right route, and right time. Firefighters and fire officers must consider a similar set of rights right tactic, right application method, right volume of water, applied at the right place, and at the right time (usually quicker is better)!

Conducting 360-degree reconnaissance using a thermal imager as well as your eyes and evaluating the building, smoke, air track, heat, and flame (B-SAHF) fire behavior indicators provides a basis to determine if use of one or more fog nails is appropriate and where the fog nail(s) should be placed.

References

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