



In-Station Training

TM 24-07 Odor of Gas-Inside



Author

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Purpose

Response to an odor of gas is often considered to be a “routine” response. The odorant used in propane and natural gas (commonly ethyl mercaptan) can be detected well below the lower flammable limit. This results in many responses where there may be a small leak or increased concentration of odorant due to low levels of propane in a storage tank or cylinder, but no flammable concentration of gas is detected. Don’t be complacent!

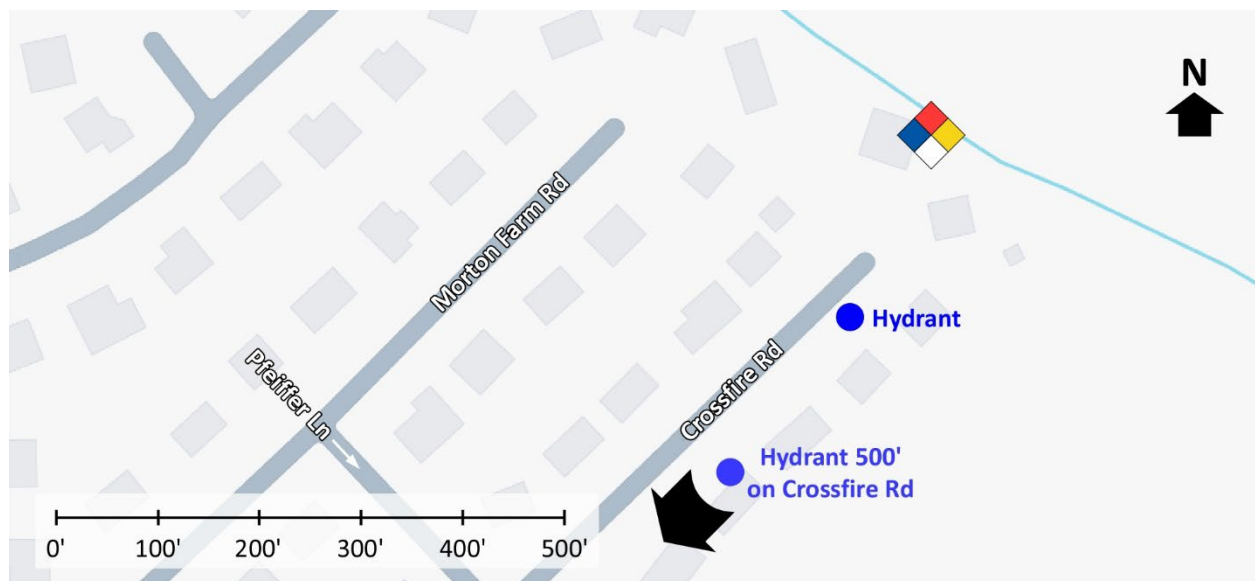
Learning Outcomes

Firefighters and officers perform an effective size-up, select an appropriate strategy, and implement tactics based on the strategic decision-making model when responding to an odor of gas incident.

Conducting the Drill

This incident involved a reported odor of gas inside a residence at 221 Crossfire Road in Holly Springs, North Carolina on the evening of December 25, 2023 (Jpope537, 2023). Review the map and photos (Figures 1-7) to gain an understanding of the area and building involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2023a). [Map, 221 Crossfire Road, Holly Springs, NC].

<https://bit.ly/4aMW2mR>.

Figure 2. Aerial View



Note: Adapted from Google. (2023b). [Aerial view, 221 Crossfire Road, Holly Springs, NC].
<https://bit.ly/3H6TpyK>.

The closest hydrant is just before the cul-de-sac at the end of Crossfire Road. An additional hydrant is located 500' southwest of the incident on Crossfire Road as illustrated in Figure 1.

Figure 3. Approaching the Incident Location



Note: Adapted from Google. (2022a). [Street view, 221 Crossfire Road, Holly Springs, NC].
<https://bit.ly/48Js2qo>.

Figure 4. Side Alpha



Note: Adapted from Google. (2012b). [Street view, 221 Crossfire Road, Holly Springs, NC]. <https://bit.ly/3TQ0US7>.

Figure 5. Side Bravo



Note: Adapted from Zillow. (2013a). 221 Crossfire Rd., Holly Springs, NC 27540. <https://bit.ly/4b1Z0Ei>.

Figure 6. Side Charlie



Note: Adapted from Zillow. (2013b). 221 Crossfire Rd, Holly Springs, NC 27540. <https://bit.ly/3Sgh7wg>

Figure 7. Side Delta



Note: Adapted from Zillow. (2013c). 221 Crossfire Rd, Holly Springs, NC 27540. <https://bit.ly/3Hoy6sK>.

A second garage bay was added on Side Delta after 2013.

The temperature is currently 60° F with wind from the east at 8 mph (Weather Underground, 2023). You have been dispatched to 221 Crossfire Rd for an odor of gas at 20:00. You are the company officer or AIC of the first arriving engine and have a staffing level of three.

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

Dispatch provides an update indicating that the occupants report smelling a strong odor of gas inside and that they have natural gas service to their house. You hear a command officer and another engine with typical staffing for your agency go enroute. You will arrive from the southwest on Crossfire Road. The second engine will arrive from the same direction two minutes after you, followed by the command officer. Any other units dispatched (based on your response plan for an odor of gas inside) will arrive after the command officer.

Examine Figure 8 illustrating conditions on arrival. This photo has been edited to remove the first arriving companies.

Figure 8. Conditions on Arrival



Note: Adapted from Jpope536. (2023). ****Pre-arrival**** Holly Springs gas leak 12-25-23 [video]. <https://bit.ly/48qjeWA>.

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?

The occupants are out of the house and report that they have been smelling gas for about the last half hour. As illustrated in Figure 8 one of the garage doors is open. You locate the gas meter on Side Bravo at the Alpha/Bravo corner of the house. Using a four gas monitor you do not obtain any reading above 0% of the lower explosive limit on the exterior of the house.

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. Engine 2 arrives and reports that they are Level 1 on the hydrant 500' southwest of the incident location. State the tactical assignment you would give them exactly as you would transmit it.
7. State the 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](#) (Jpope536, 2023) before answering the remaining questions.

8. Did the companies and command officer that responded to this incident position their apparatus appropriately? If not, where should they have been positioned (specify the appropriate position for the first and second engines and the command officer)?

9. What factors influence apparatus positioning at potential flammable gas leaks inside a building?

10. Complacency is a mindset where you become comfortable with an existing situation and stop looking for potential hazards. How do “routine” incidents potentially result in complacency. What steps can you take to minimize the impact of complacency on incidents that present significant risk such as releases of natural gas or propane?

It is unknown if the companies responding to this incident discovered a gas leak, but the incident was resolved without an adverse outcome.

Additional Learning: Consider the following news reports related to natural gas and propane explosions that occurred in buildings over the last three months (this is not a complete list):

- November 3, 2023, [15 injured after explosion levels house in Wappingers Falls](#) (ABC7NY, 2023).
- December 10, 2023, [Oneonta house explosion sets off fire, killing 1 resident, destroying multiple homes](#) (Al-Arshani, 2023).
- December 18, 2023, [Propane gas leak to blame for deadly explosion at Pennsylvania hotel](#) (WHP Staff, 2023)
- December 19, 2023, [West Park house reduced to rubble by explosion](#) (MacLauchlan, McAllister, & D'Oench, 2023).
- December 19, 2023, [Suspected gas explosion sparks fire, destroys Bothell home](#) (Smith, 2023).
- December 30, 2023, [Michigan house explosion: 4 dead, 2 injured after blast at Whitmore Lake home](#) (WLS TV, 2023).
- January 5, 2024, [Natural gas explosion destroys Hillsboro garage](#) (Deml, 2024).
- January 8, 2024, [21 Injured in explosion at Fort Worth hotel](#) (Jiménez, & Gahan, 2024)
- January 14, 2024, [Death toll rises to 3 after propane explosion in Mississippi](#) (D'Angelo, 2024)
- January 16, 2024, [One person injured when house explodes in northeast Lincoln](#) (Bane, 2024).
- January 19, 2024, [Two young children die in Defiance house explosion; two adults escape serious injury](#) (Associated Press, 2024).

These incidents occurred across the United States including two in the northwest (Bothell, WA, and Hillsboro, OR). While gas explosions are less common than some other types of incidents, they are not an unusual “freak” event.

In many of these cases, the fire and rescue service was notified after the explosion occurred, but this is not always the case. Review the following National Institute for Occupational Safety and Health (NIOSH) reports with your company or shift, one related to a natural gas leak and explosion in a building and the other related to a propane leak and explosion.

- [Death in the line of duty report 2018-12](#), One Firefighter Dies and Another Injured in Natural Gas Line Explosion-Wisconsin (NIOSH, 2021).
- [Death in the line of duty report 2019-16](#), Captain Killed and Six Firefighters Injured at a Propane Explosion in an Office Building–Maine (NIOSH, 2022).

Consider the contributing and causal factors in these two incidents and actions you can take to improve the safety and effectiveness of response to odor of gas and reported gas leak incidents occurring in or near buildings.

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