



In-Station Training

TM 22-32 Gas Major



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Purpose

The gas major call nature is used for an odor of gas or possible gas leak inside a building. In CWIFR's response area, the gas would be propane as we do not have natural gas service within the district boundaries. In many cases, these incidents end up being minor in nature such as a stove burner being left on or an excess of mercaptan odorant due to low propane tank level. However, these types of incidents have the potential to present a major life risk to civilians and responders as well as structural risk to the incident occupancy and exposures. Do not become complacent based on experience with minor incidents, maintain a high index of suspicion and consider the potential!

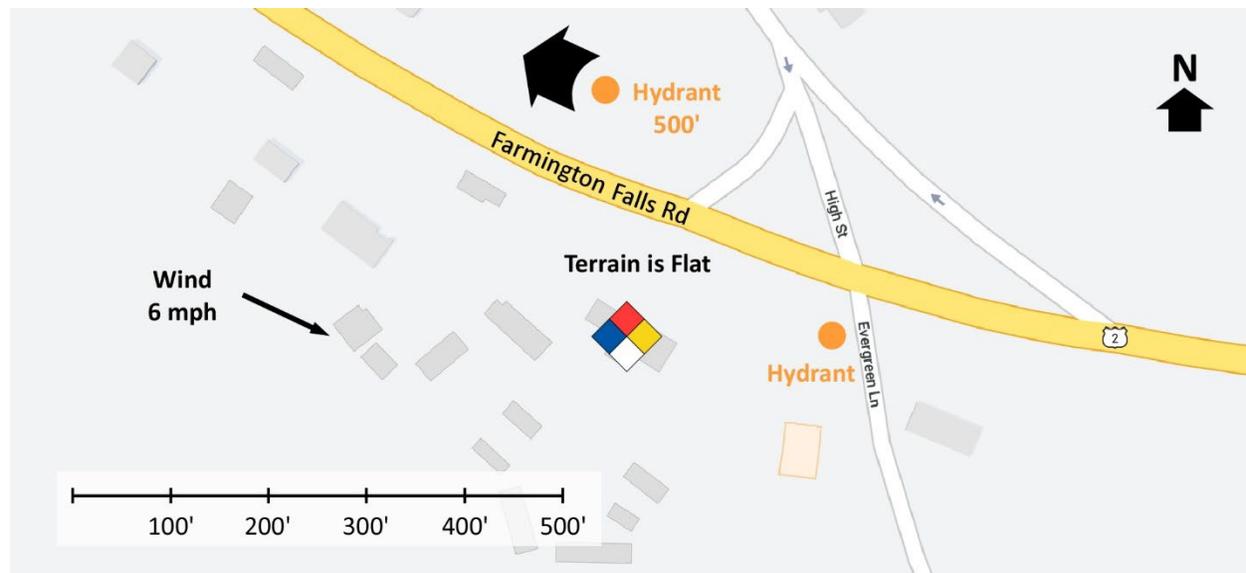
Learning Outcomes

Firefighters and officers select an appropriate strategy, and implement tactics based on the strategic decision-making model when responding to gas leak incidents.

Conducting the Drill

This incident involved a gas major at Life Enrichment Advancing People (LEAP) at 313 Farmington Falls Road in Farmington, Maine on September 16, 2019, at 08:00 (NIOSH, 2022, Wagner, Hayes, & Rocha, 2019, & Andrews, 2020). Review the map and photos (Figures 1-5) to gain an understanding of area and building involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2022a). [Google map 313 Farmington Falls Road in Farmington, ME]. <http://bit.ly/2kO0wFQ>.

The closest hydrant is on Evergreen Lane at Farmington Falls Road with an additional hydrant on Farmington Hills Road to the west of the incident location as illustrated in Figure 1.

Figure 2. Aerial View



Note: Adapted from Google. (2022b). [Aerial view 313 Farmington Falls Road in Farmington, ME]. <http://bit.ly/2IYwC1C>. This figure has been edited to approximate the configuration of the building and parking area at the time of the incident.

Figure 3. Alpha/Delta Corner (older section of the building)



Note: Adapted from Google. (2018). [Street view 313 Farmington Falls Road in Farmington, ME]. <https://bit.ly/3OzoXP0>.

Figure 4. Alpha/Bravo Corner (new addition)



Note: Adapted from Wagner, M., Hayes, M., & Rocha, V. (2019). Deadly explosion in Maine. <https://cnn.it/3PxV7vw>.

Figure 5. Bravo/Charlie Corner



Note: Adapted from News Center Maine (n.d.). Investigators release some findings in Farmington explosion. <https://bit.ly/3PDZHzy>.

The incident occupancy was renovated and expanded shortly prior to this incident. A two-story addition was added to Side Bravo. Figure 3 is the only available photo of the older section of the incident occupancy. In addition to the doors on Sides Alpha and Bravo, there are two additional doors on Side Charlie, one of which provides the closest access to the basement under the new section of the building

on Side Bravo. The basement under the older section of the building on Side Delta is accessed from the interior of the building. The two were not interconnected.

The maintenance supervisor of LEAP called the fire station to report a possible gas leak, stating that one of his employees had become lightheaded while in the basement. However, neither he nor the employee smelled gas inside, but did smell gas outside the rear door of the new addition. Maintenance workers have evacuated the building. You advised him to call 911 and subsequently you were dispatched for a gas major at 313 Farmington Falls Road at 08:00. You are the company officer or AIC and have your company's typical staffing. Temperature is 55° F with 6 mph wind from the west northwest (Weather Underground, 2022). The terrain in the immediate area is relatively flat.

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

You hear a command officer, an engine with typical staffing for your agency, and an advanced life support (ALS) ambulance with a staffing level of two go enroute. You estimate that the ALS ambulance will arrive after you. The second engine will arrive approximately four minutes after you followed by the command officer. All other units dispatched on the first alarm will arrive after the command officer. You will arrive from the northwest on Farmington Hills Road.

There is nothing showing from Farmington Hills Road on arrival.

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

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?

You are met by a maintenance employee who advises that his supervisor is at the back of the building (Side Charlie). The propane tank on Side Bravo shows evidence of frost on the bottom of the tank. You have the following readings on your atmospheric monitoring instruments: 21% O₂, 0% lower explosive limit (LEL), 0 ppm carbon monoxide (CO), 0 ppm hydrogen sulfide (H₂S), and 0 ppm on the

photoionization detector (PID) on the exterior of the building on Sides Bravo and Charlie and in the area of the propane tank.

Figure 6. Frost on Similar Propane Tank



Note: Adapted from Superior Propane. (2022). Propane tank sizes. Retrieved July 24, 2022, from <https://bit.ly/3BdFrt6>.

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 ICOM.

You have the following atmospheric monitoring readings on entry to Floor 1 through the door on Side Charlie. 21% O₂, 0% lower explosive limit (LEL), 0 ppm carbon monoxide (CO), 0 ppm hydrogen sulfide (H₂S), and 0 ppm on the photoionization detector (PID).

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

7. State your conditions, actions, and needs (CAN) report that would you provide to the first arriving command officer as part of command transfer to IC #2?

At the top of the stairs leading to the basement under the new addition to the building, your atmospheric monitoring instrument goes into alarm, indicating 10% of the LEL.

8. What action do you take based on the reading of 10% of the LEL?

In this incident, the captain, and a firefighter of the first arriving ladder company (aerial tower) proceeded down the stairs to the basement. They did not smell gas, but their atmospheric monitoring instrument indicated 100% of the LEL. An explosion occurred in the building approximately 30 seconds after ladder company members entered the basement. The captain was killed, and six other firefighters and officers were injured in the explosion.

9. Propane is odorless. As such a small amount of ethyl mercaptan is added to provide a warning odor. Why didn't the LEAP employees or the firefighters and officers in this incident smell an odor of gas (ethyl mercaptan)?

10. What was indicated by the frost present on the bottom of the propane tank?

Additional Learning: Read the National Institute for Occupational Safety (NIOSH) [Safety Advisory on Odor Fade in Natural Gas and Propane](#) (2021) to gain an understanding of odor fade and how this was a critical factor in this incident. Also watch [Propane auto-refrigeration video by Responder Training Enterprises LLC](#) (Huffman, n.d.) to learn more about what may cause frost on a propane tank

This incident will be presented as a case study in *Training Bulletin 22-43 Farmington Propane Explosion* (CWIFR, 2022) and discussed during in-service training on August 8th and 10th at 10:00 and August 25th at 19:00. In preparation for this training, read [NIOSH Death in the Line of Duty Report F2019-16](#) (2022) detailing the propane explosion incident in Farmington, Maine on September 16, 2019. The NIOSH report identifies the members of the Farmington Fire Department killed and injured in this incident by their rank and assignment. As you read this report keep in mind that the member killed was Captain Michael Bell and those injured were Chief Terry Bell, Sr., Deputy Chief Clyde Ross, Captain Scott Baxter, Captain Timothy Hardy, Firefighter Ted Baxter, and Firefighter Joseph Hastings (Maine Public Safety Family, n.d.). This incident also seriously injured a LEAP maintenance worker.

References

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