In-Station Training

TM 24-11 Odor of Gas-Outside

Author

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Purpose

As noted in 10-Minute Training 24-06, response to an odor of gas is often considered to be a "routine" response. Nothing could be further from the truth. In the week before this 10-Minute Training was written, 19 firefighters were injured, some critically, and another lost his life in natural gas related incidents (Lloyd, 2024 & Arancio & Deliso, 2024). There is a routine to response to flammable gas incidents, but there are no routine flammable gas responses.

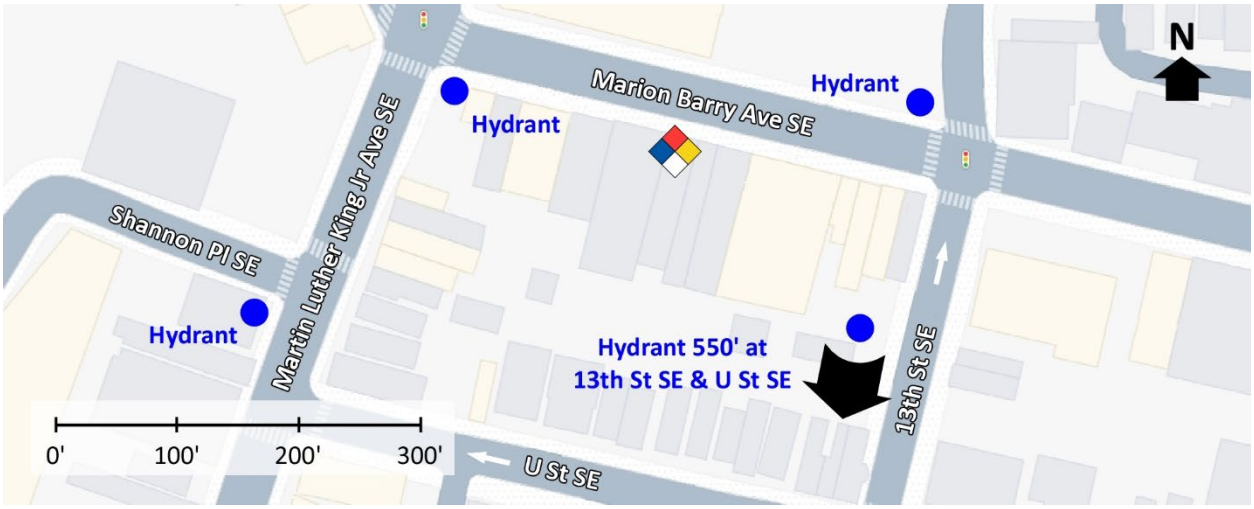
Learning Outcomes

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 or other incident involving a flammable gas.

Conducting the Drill

This incident involved a reported odor of gas outside a commercial occupancy at 1223 Marion Barry Avenue SE, Washington, DC on January 18, 2024, at 09:32 (Statter, 2024a & 2024b; DC Fire and EMS, 2024a & 2024b; ABC News, 2024; & Fox 5 Washington DC, 2024). Review the map and photos (Figures 1-5) to gain an understanding of the area and building involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2023a). [Map, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/3tPwyVC.

Figure 2. Aerial View

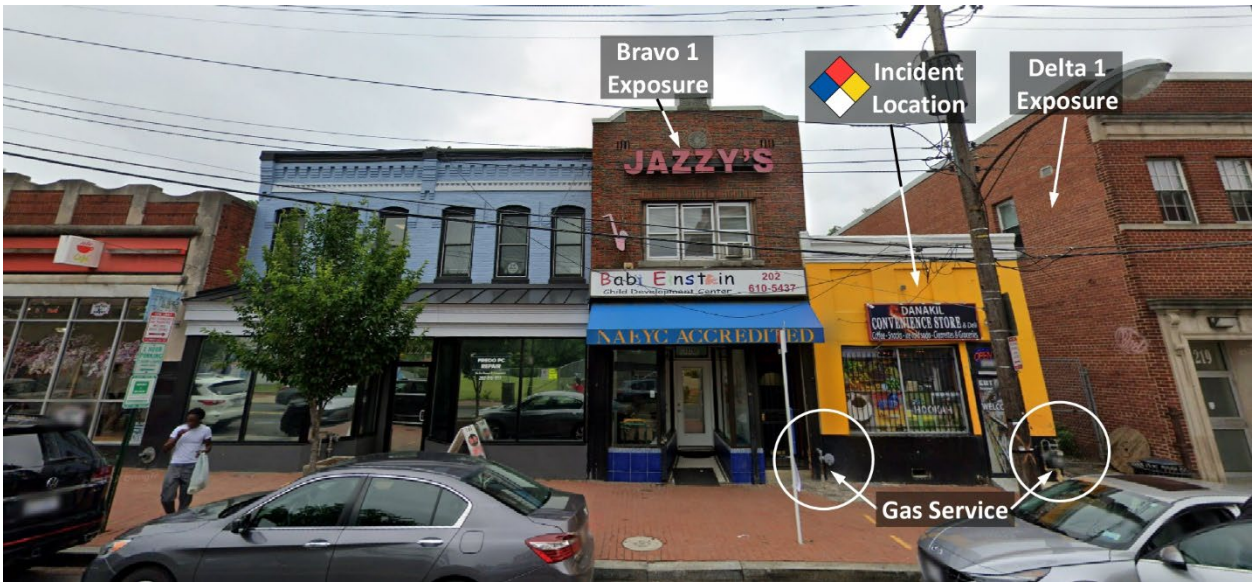
Note: Adapted from Google. (2023b). [Aerial view, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/3HueldT.

The closest hydrants are on Marion Barry Avenue Southeast at either end of the block. Other hydrants are located on Martin Luther King Junior Avenue Southeast and 13th Street Southeast as illustrated in Figures 1 and 2.

Figure 3. Alpha/Bravo Corner

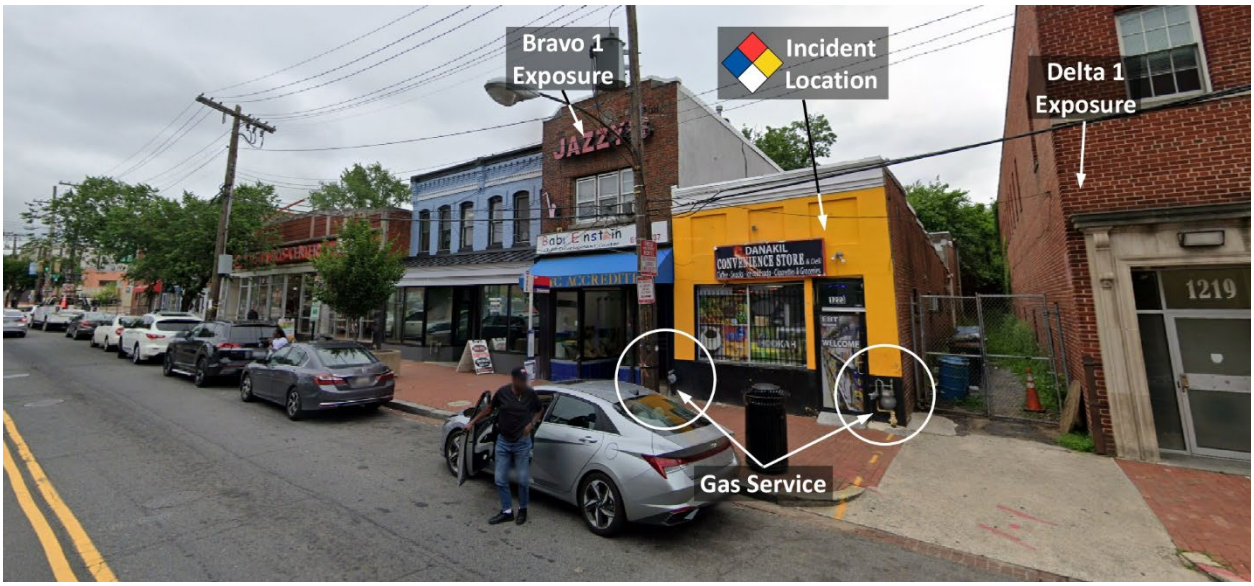
Note: Adapted from Google. (2022a). [Street view, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/48HpCc5.

Figure 4. Side Alpha



Note: Adapted from Google. (2022b). [Street view, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/4b7R9oT.

Figure 5. Alpha/Delta Corner



Note: Adapted from Google. (2022c). [Street view, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/3U2JCBz.

The temperature is currently 29° F with a slight breeze from the north (Weather Underground, 2024). You have been dispatched as a single company response to 1223 Marion Barry Avenue SE for an outside odor of gas at 09:32. You are the company officer or AIC of the first arriving engine and have staffing typical for your agency.

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 multiple calls for an odor of gas in the 1200 block. In an additional update, dispatch advises that a car "hit a gas pipe" and that "the building smells like gas at 1231 Marion Barry" and upgrades the response, adding another engine and chief officer. You hear another engine with typical staffing for your agency and a chief officer go enroute. You will arrive from east on Marion Barry Avenue Southeast. The second engine will arrive from the opposite direction six 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 6 illustrating conditions on arrival.

Figure 6. Conditions on Arrival

Note: Adapted from Google. (2022a). [Street view, 1223 Marion Barry Avenue SE, Washington, DC]. https://bit.ly/48HpCc5.

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?

Investigating, you determine that a passenger car hit the gas meter at 1223 Marion Barry SE, breaking off a two-inch gas line below the shutoff to the building. There is a strong odor of gas in the area. Occupants of the incident occupancy have evacuated, but Bravo and Delta Exposures are still occupied. The Bravo 1 Exposure houses a day care center. Atmospheric monitoring shows a reading of greater than 10% of the lower explosive limit when approaching the Bravo 1 Exposure.

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.

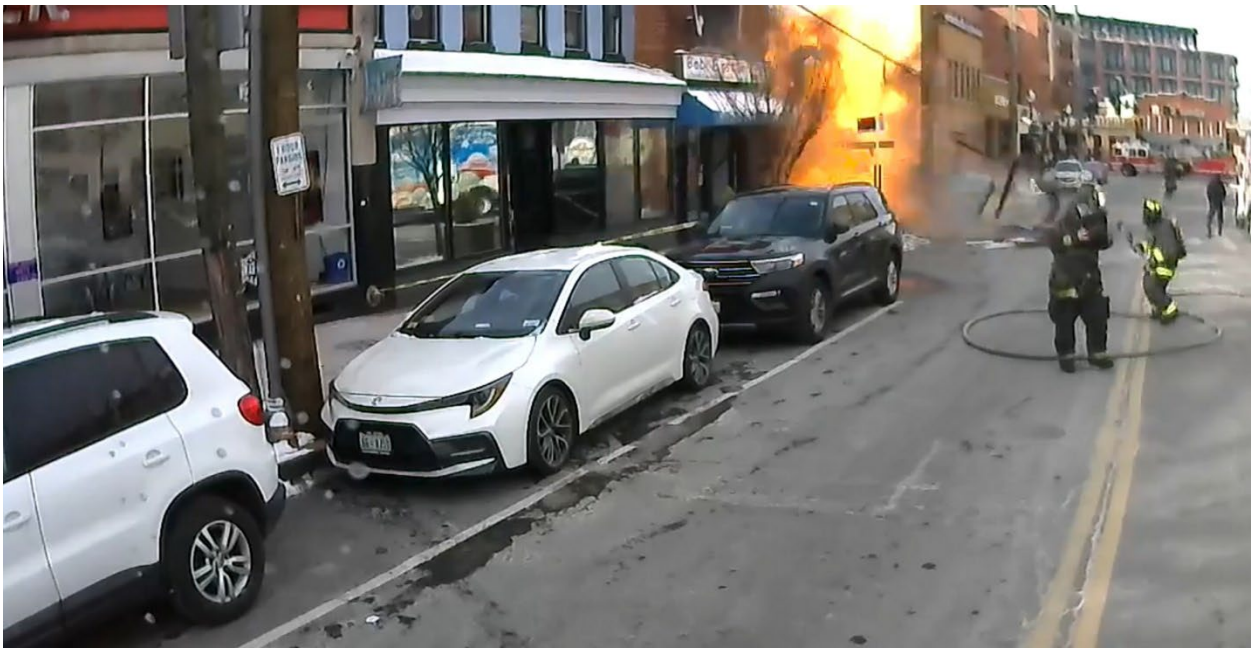
6. Engine 2 arrives and reports that they are Level 1 on a hydrant at Martin Luther King Junior Boulevard Southeast and Marion Barry Avenue Southeast. State the tactical assignment you would give them exactly as you would transmit it.

The following questions are based on the first arriving companies having evacuated the occupants of the Incident Occupancy and the Bravo 1 and Delta 1 Exposures. Just prior to the arrival of Chief 1, an explosion occurs in the Bravo 1 Exposure (day care occupancy) blowing out the windows on Floor 2. There is no smoke or fire evident in the Bravo 1 Exposure and no exterior evidence of structural damage. However, there is significant damage to the interior of the building that is visible from the exterior.

7. What action would you take based on this change in incident conditions? State the communications as you transmit them?

Watch the incident video (DC Fire and EMS, 2024a) and examine Figure 7 illustrating the change in conditions that occurred shortly after the explosion in the Bravo 1 Exposure.

Figure 7. Explosion in the Incident Occupancy



Note: Adapted from DC Fire and EMS. (2024a). *Video from the dash cam.* [X post, video]. https://bit.ly/42QR05u.

The second explosion severely damages the incident occupancy, resulting in collapse. Following the explosion, flames continue in debris on Side Alpha, approximately where the broken gas pipe was located. It is not immediately apparent if additional structural damage occurred in the Bravo 1 or if the Delta 1 Exposure was damaged from the explosion.

8. What action would you take based on this change in incident conditions? State the communications as you transmit them?

9. 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.

The initial response to this incident was Engine 15 and Truck 13 dispatched for an outside gas smell. Listen to the first 10:30 incident audio (Statter, 2024b) and interview with IC #1, Ryan Bolton (Fox 5 Washington DC, 2024). before answering the next several questions. Note that all "dead air" was removed from this audio recording. It was approximately 15 minutes from arrival to occurrence of the first explosion.

10. Based on the interview with Lieutenant Bolton, it appears that the initial arriving companies did not have the resources to monitor for the percentage of the lower explosive limit (LEL) present around the leak or in exposed buildings. Was the course of action taken by Engine 15 and Truck 13 reasonable? Why or why not?

11. If your company was confronted with similar circumstances, but was equipped with a four-gas monitor (%LEL, Oxygen, Carbon Monoxide, and Hydrogen Sulfide sensors) and encountered a reading of >10% of the LEL when accessing the Bravo 1 Exposure (day care center), would you continue entry to evacuate the occupants or immediately exit the building? Why would you choose this course of action? If you exited, how would you address the need to evacuate the building?

At 02:06 in the incident video, a reporter asks Lieutenant Bolton to compare this leak with others that he has encountered. His response was “I’ve never dealt with anything like this” and expanded that most leaks are easily controlled by shutting off the gas.

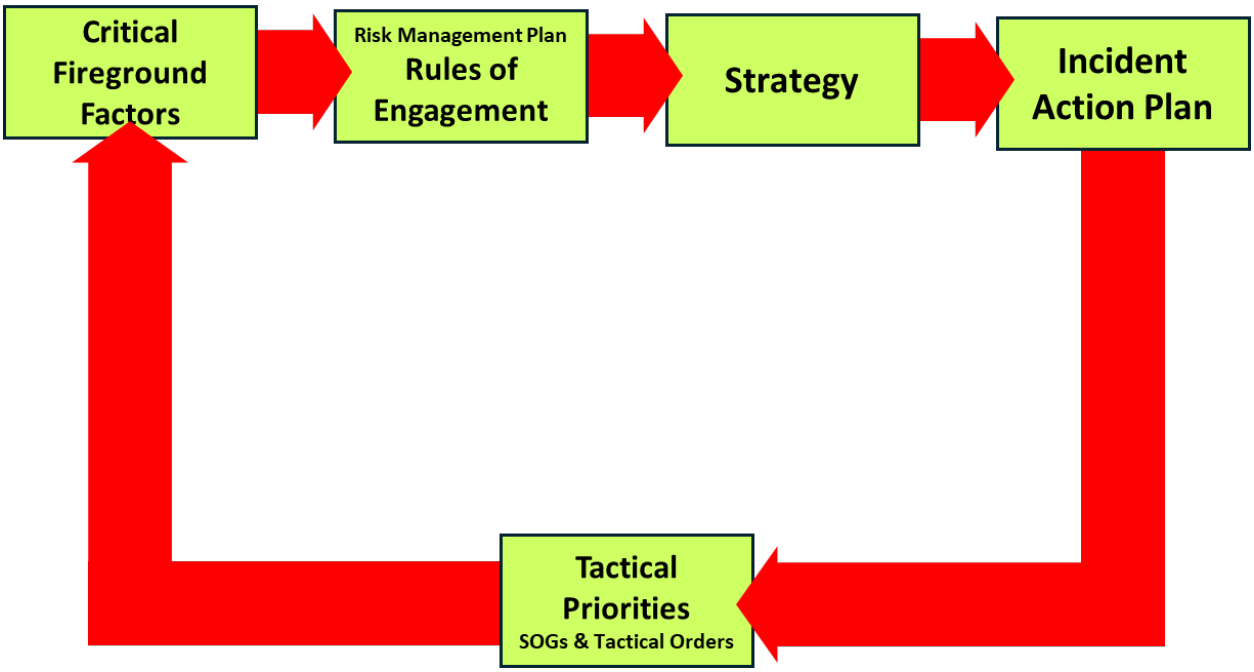
12. How might the experience of IC #1 have influenced his decision-making processes in the early stages of this incident?

Lieutenant Bolton, Engine 15 was the initial IC. Battalion 3 was also providing direction to companies responding and on-scene while still enroute. Both command and the responding battalion chief were identifying companies by order of arrival (e.g., first due truck, second due truck, etc.) as the DC Fire Department uses SOP driven, order of arrival response procedures (rather than critical factor driven assignments by the IC).

13. What are the challenges presented by having both “Command” and the responding battalion chief providing tactical direction to the companies operating at this incident?

Additional Learning: The strategic decision-making model is central to effective management of incident operations (Figure 8). The starting point for strategic decision-making is recognizing the critical factors.

Figure 8. Strategic Decision-Making Model



Note: Adapted from Blue Card (2020) Blue *card command standard operating guidelines (SOG).* Phoenix, AZ: Author

Consider the following three questions as a great staring point for examining the incident's critical factors:

1. What is the problem?
2. What is getting in the way of accomplishing the strategic priorities (these are the critical factors)?
3. Is there anything that can kill me (right now)?

Remember, if everything is critical, nothing is critical.

In structural firefighting there are eight basic categories of critical fireground factors as listed in Table 1. Recognition or assessment of the critical fireground factors is the first step in the strategic decision-making model.

Table 1. Critical Fireground Factors

Fixed Factors	Variable Factors
• Building • Occupancy • Arrangement	• Life Hazard • Fire Conditions • Resources • Impact of Tactical Action • Special Circumstances

As illustrated in Table 2, the critical factors for a hazmat incident are similar, with replacement of building with location and occupancy with container and product[1]. It is important to note that if a flammable product is released inside a structure, the building and occupancy fireground factors will also apply.

Table 2. Critical Hazmat Incident Factors

Fixed Factors	Variable Factors
• Location • Container(s) and Product (s) • Arrangement	• Life Hazard • Incident Conditions • Resources • Impact of Tactical Action • Special Circumstances

Much the same as in structural firefighting, there are fixed and variable factors for hazmat incidents. Homes and businesses using natural gas or propane and occupancies storing and using hazardous materials are a fixed factor. Similarly, the location and arrangement of gas pipelines and transportation routes are fixed factors, and it is possible to identify common materials transported via those routes in advance of an incident.

[1] This list of critical factors is somewhat different than that presented in the Blue Card hazmat module on the eight functions of command. This was done to more closely parallel the standard fireground factors used in structural firefighting. The Blue Card module on the eight functions of command lists the event trigger, arrangement and properties of the hazardous material, and access and arrangement of exposures as critical factors.

Also consider the risk management plan and rules of engagement as applied to structural firefighting and hazmat incidents. Use the three questions to frame consideration of the level of acceptable risk.

1. Is there potential that the building is occupied? For hazmat incidents, consider what is the hazard zone and if that area is occupied?
2. Are there searchable areas within the building (or within the hazard zone if a hazmat incident)?
3. Can you do anything about it?

Discuss the strategic decision-making model with a specific focus on critical factors and risk management and how they applied to the incident in this 10-Minute Training!

References

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