Propane Truck Fire on the Long Island Expressway

By Deputy Chief Robert McBride and Battalion Chief Tim Keenan

A rack truck carrying more than 300 propane cylinders produced a massive fire that endangered hundreds of residents in LeFrak City.

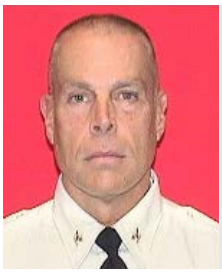
The Incident

Just before midnight on December 21, 2020, a trailer hauling 304 propane cylinders overturned on the westbound Long Island Expressway (LIE), directly in front of LeFrak Towers, a residential complex of 18-story multiple dwellings. There was a combined total of 6219 pounds of liquid propane on the vehicle. After striking a highway barrier, the vehicle overturned and caught fire. The impact of the accident caused the saddle tanks to fail and leak diesel fuel, which spread beneath the truck and across the outer roadway of the LIE. Lying scattered within the pool of fuel were the hundreds of propane cylinders that had been carried on the trailer.

Shortly after the vehicle overturned, a fire started. Soon thereafter, the pool of fuel ignited and engulfed the propane tanks. In a short time, relief valves started to activate and spray propane into the air, which also ignited and produced a fireball that at times reached the roof line of the 18-story multiple dwellings. Within minutes, propane tanks started to BLEVE and propel across the LIE into the eastbound traffic lanes, directly at the 18-story LeFrak apartment building at 97-05 Horace Harding Expressway North. Fire spread to vehicles parked directly in front of the LeFrak buildings and placed the multiple dwelling in severe danger. The heavy volume of fire, BLEVEs causing flaming projectiles and severe radiant heat all contributed to a significant life hazard and exposure problem in the middle of the night. A second alarm assignment was used to extinguish the fire, and a significant haz-mat operation was required to bring the incident under control.

Initial Response

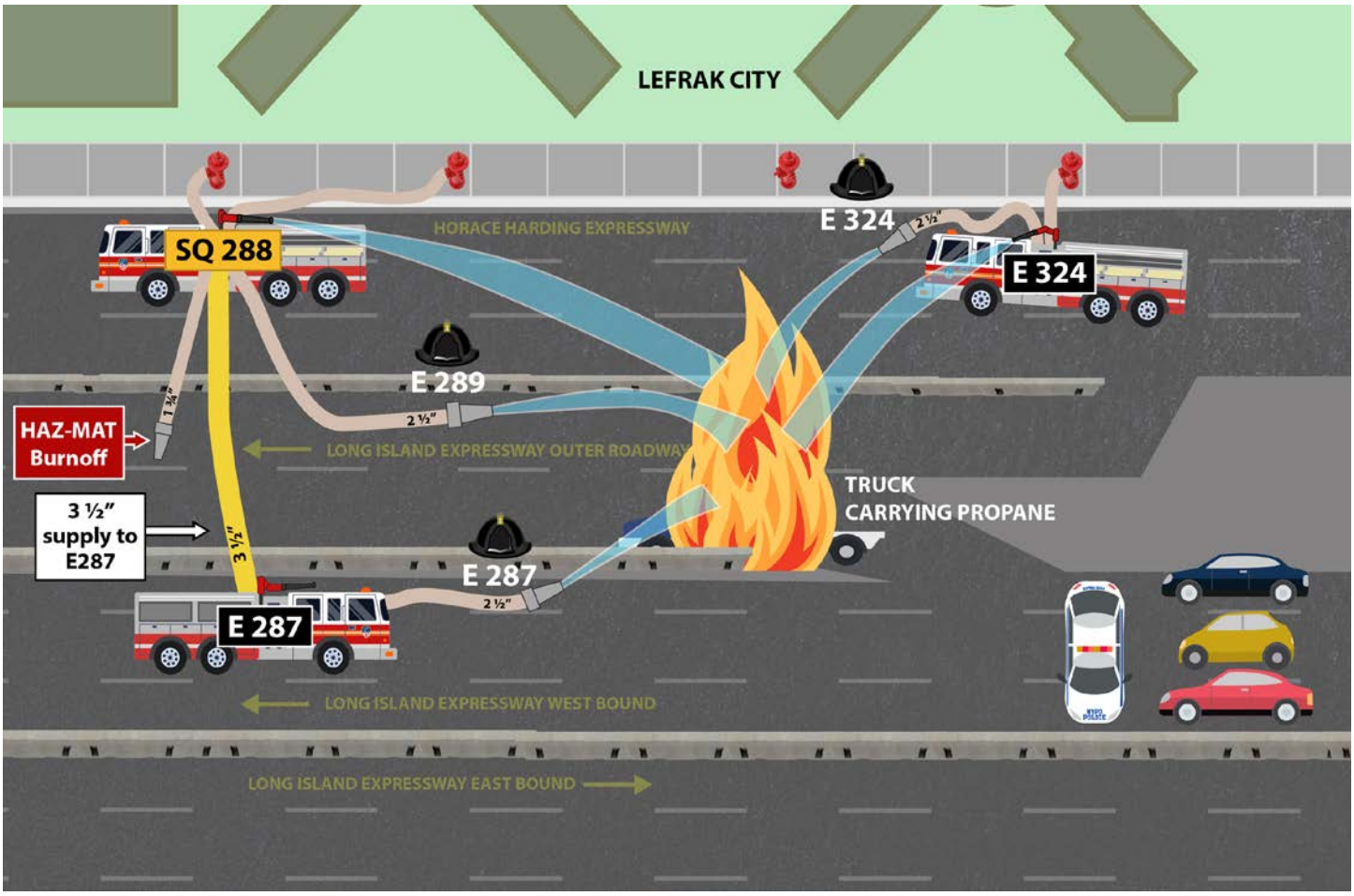
At 2357 hours, Box 8387 was transmitted, reporting an overturned truck with a pin eastbound on the Long Island Expressway near 108th Street. Engines 324 and 289, Ladders 136 and 138, Rescue 4 and Battalion 46 were assigned. As they responded, additional information indicated that the truck was



About the Authors

Deputy Chief Robert McBride has served in the FDNY since 1991. He is assigned to Division 14. Previous assignments include Ladder 120 as a firefighter, Engine 292 as a lieutenant, Division 15 as a captain and Battalion 46 as a battalion chief. He holds a Bachelor of Science from SUNY Empire State College. He is a graduate of Columbia University's Fire Officer's Management Institute (FOMI).

Battalion Chief Tim Keenan was appointed to the FDNY in 2000. He is currently assigned to Battalion 46, in Elmhurst, Queens. Previous assignments include Ladder 123 as a firefighter, Ladder 136 as a lieutenant and Ladder 113 as a captain. As a chief he covered in Division 3 and served as the Chief of Probationary Firefighter School before being assigned to Battalion 46. He holds a Bachelor of Arts in fire service management from John Jay College.



on fire and that propane tanks might be involved. Conflicting information was received about the location of the incident: callers reported it being on the highway, on the service road and at 97-05 Horace Harding Expressway North (LeFrak Towers), which cannot be accessed from the highway.

Special Calls

While responding, Battalion 46 requested—based on information received—that the dispatcher special-call Haz-Mat 1 because of the report of propane tanks involved, and Engine 287 as a third engine because the first two engines were responding from the same direction (westbound) on the LIE. Engine 287's response route would put them eastbound on the LIE from Queens Boulevard.

On Arrival

Engine 324 was the first unit on the scene. The location of the incident was confirmed to be the westbound outer roadway of the LIE, directly in front of the LeFrak apartment building near 99th Street. (The original ticket had the accident eastbound at 108th Street.) The truck was fully involved in fire, with significant BLEVEs occurring. This initially prevented Engine 324 from getting close enough to start an attack on the fire.

Battalion 46 arrived on the scene moments after Engine 324 but approached from the west. On arrival, Battalion 46 transmitted a 10-75.

NYPD had already stopped all westbound traffic on the LIE.

Special Instructions

Because of the heavy fire, it was difficult to see the truck and what was actually on fire. All one could make out was an extremely heavy volume of fire on the LIE in the westbound outer roadway. It appeared as though the pavement was burning around the vehicle and a huge fire was endangering both the apartment building and the civilians stopped in their cars on the LIE. Battalion 46 realized that units arriving on scene were unable to advance close enough to the fire to begin an attack because of the BLEVE activity and decided an attack could be initiated using the concrete Jersey highway barrier as protection. Battalion 46 gave orders to the dispatcher to have engines approach from west of the fire, from the wrong direction on the main roadway of the LIE, which had been shut down by NYPD. Battalion 46 also gave orders to have the 10-75 chief (Battalion 52) respond to the LeFrak apartment buildings to determine the exposure threat and oversee any operations there. Fire Alarm Dispatcher Mike Multari, #348, was on the Queens radio that night tour and relayed the orders to incoming units.

Engine Operations

Engine 287 arrived on scene as directed, against traffic in the main roadway of the LIE and approached from the west as Battalion 46 had. Large explosions originating at the seat of the fire could be seen and heard, with propane cylinders rocketing in various directions at high velocity—some of them striking the LeFrak City apartments to the north and others heading toward vehicles on the eastbound lane of the LIE to the south. Chief

Keenan of Battalion 46 made face-to-face contact with Lieutenant Tajalle of Engine 287, stressing the need to stretch a line and apply water to the fire using the concrete barrier as a shield.

Engine 287 did not have a positive water source but anticipated being supplied by later-arriving engines. The frequency of the BLEVEs and the extreme threat of fire extension demanded that action be taken to protect the residents and motorists exposed to the fire. With this information and scene size-up, Lieutenant Tajalle ordered his members to stretch a 2 ½-inch line to the fire knowing they only had 500 gallons of booster water, but it was the only option to quickly cool the propane cylinders and attempt a knockdown of the fire.

Engine 287 personnel crawled down the LIE while hugging the concrete barrier for protection as explosions were heard, seen and felt by the nozzle team. Once within range of the 2 ½-inch line's stream, the nozzle was placed just above the concrete barrier and opened up on the fire. The stream was initially operated on the visible pile of propane cylinders and, with precise accuracy, was successfully able to darken the fire down with tank water enough to temporarily delay additional BLEVEs from occurring. Lieutenant Hilke, Engine 324, recognized the window of opportunity and knew the subsiding of BLEVE activity would permit Engine 324 time to quickly advance close enough to the fire to begin an attack. He ordered Engine 324 to pull the rig up, hook up to a hydrant, operate the deck pipe and stretch and operate a hand-line to provide a continuous flow of water on the fire.

Before Engine 287 exhausted its booster water, Squad 288 arrived on the Horace Harding Expressway service road and was able to hook up to two separate hydrants. This was significant to the operation, as it allowed Squad 288 plenty of water to supply Engine 287 while simultaneously operating their own deck pipe on the fire, stretching a hand-line from their rig to the fire by Engine 289 with an additional line stretched to protect the Haz-Mat LPG burn-off operation.

Engine 324's line remained focused on the LPG truck until it was no longer required there, and then it was used to extinguish the parked vehicles on fire in front of LeFrak.

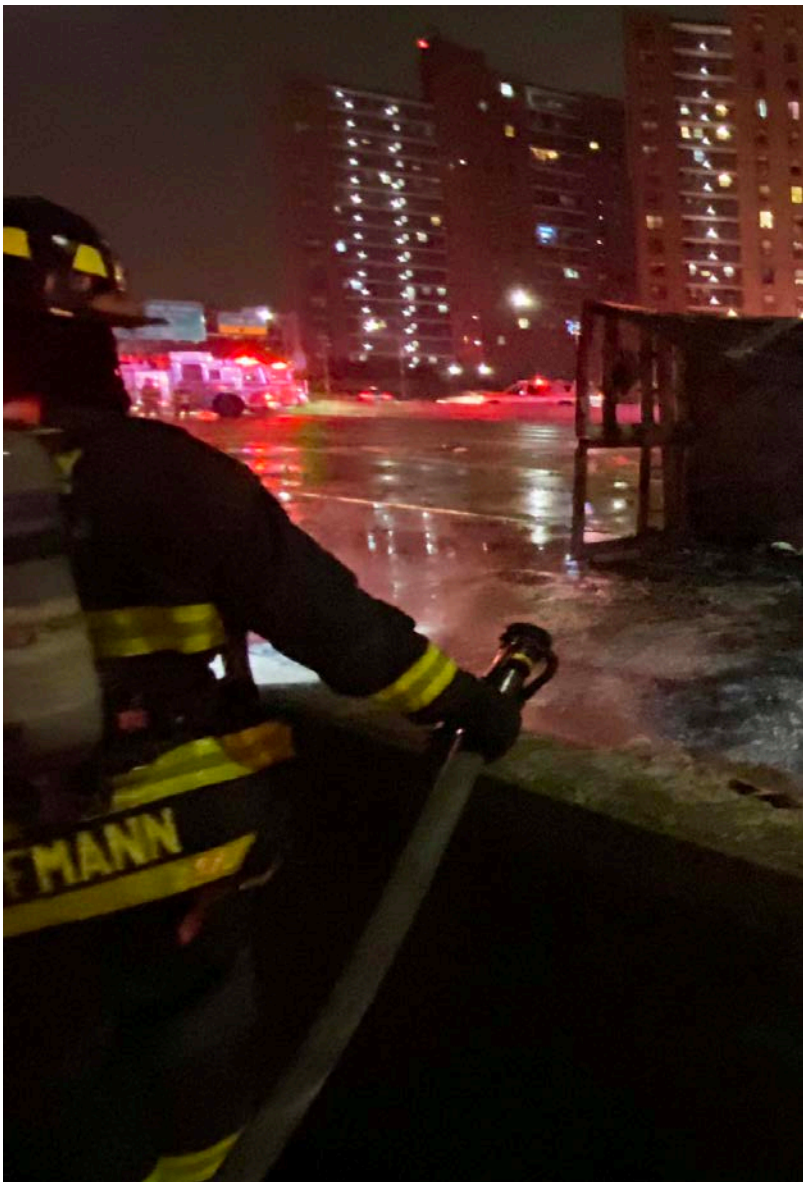
Ladder Company Operations

Initially, truck companies were positioned a distance from the fire due to BLEVE activity. Ladder 136, under the direction of Lieutenant Taldone, was able to access the LeFrak apartment building from a rear service entrance that was not too exposed. Once inside the building, members were faced with hundreds of people who had self-evacuated their apartments and were in the lobby of the building. Ladder 136 reported to command that the building was being hit with flaming propane cylinders that were being projected from the fire as they BLEVEd, and that vehicles parked in front of the LeFrak building were on fire.

Once the fire was knocked down, truck companies conducted searches of the fire vehicles, checked for extension in the MD, operated at the vehicle fires that were in front of LeFrak and assisted Haz-Mat 1 by providing support to augment the Haz-Mat operation.

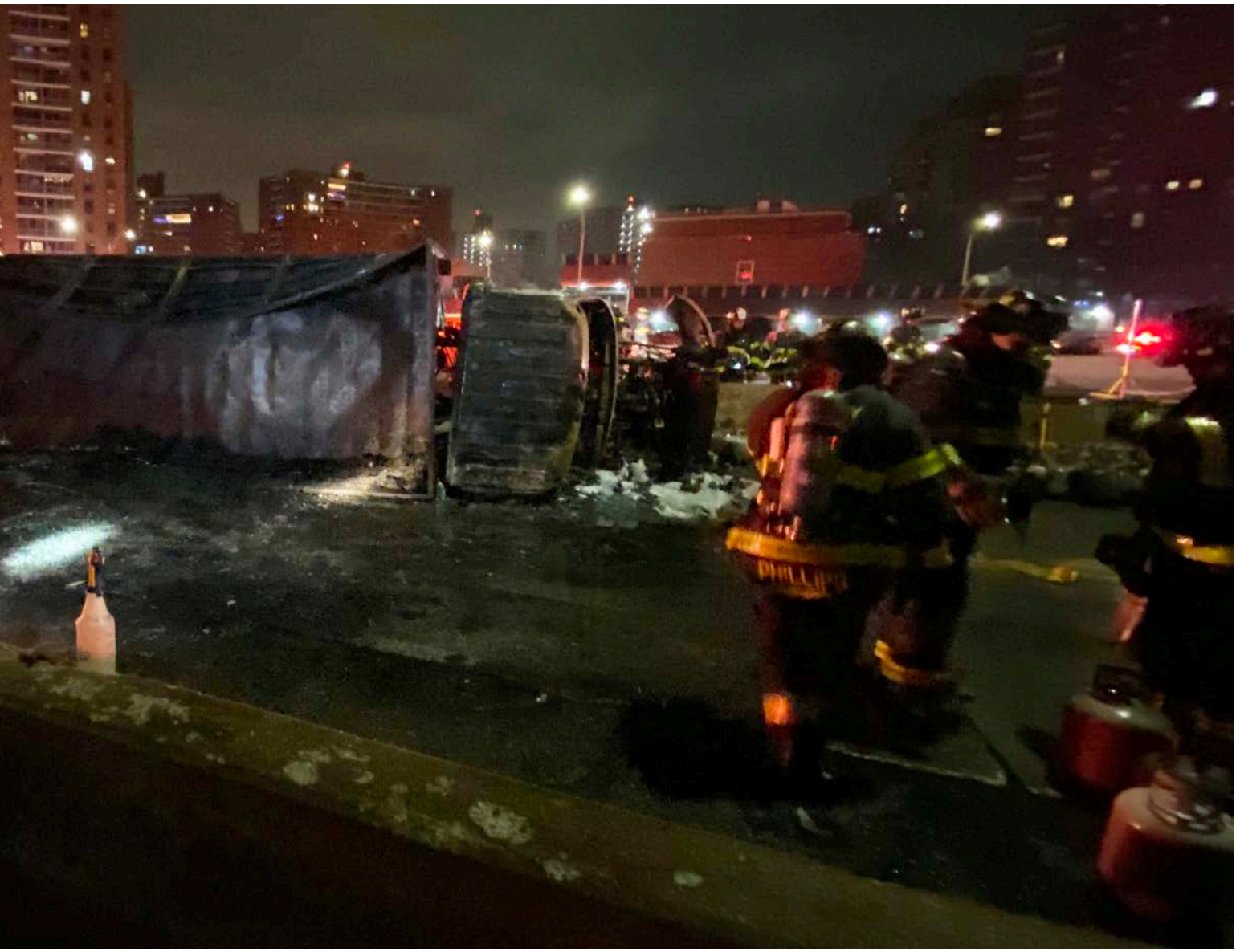
Haz-Mat Operations

A significant Haz-Mat operation was conducted to bring the fire under control. On their arrival, the members of Haz-Mat 1 immediately sized up the incident as Engine 287 and Engine 324 operated hand-lines and deck pipes on the fire. Once the



BLEVEs subsided, Haz-Mat 1 advanced and checked the cylinders with thermal imaging cameras, Fluke temperature guns and LPG meters while Lieutenant Hamilton of HazMat 1 had a face-to-face meeting with Chief Keenan, Battalion 46. Using special metering capabilities and thermal imaging equipment, the pair determined that although the fire was extinguished, LPG was now leaking from many cylinders and posing a re-ignition threat. With this information, Haz-Mat 1 was able to provide tactical direction to the engine companies with regard to using fog/broken streams to direct LPG vapors and provide information on hot spots that required more water application.

With the help of Haz-Mat Tech Engine 274, Haz-Mat 1 then began an examination and evaluation of each individual propane cylinder. This was a time-consuming and labor-intensive operation that required the assistance of many companies brought in on the second alarm. Each individual cylinder was located and accounted for by regular fire units and then evaluated by a Haz-Mat specialist. This evaluation determined which cylinders were still full, which were still leaking and which were BLEVEd or already completely empty.



Once the cylinders that were leaking or were damaged but still had gas in them were identified, Haz-Mat set up an operation to burn off the remaining propane in a controlled manner. The leaking cylinders were removed by hand and placed a distance from the incident in order to minimize the chances of the leaking propane finding an ignition source.

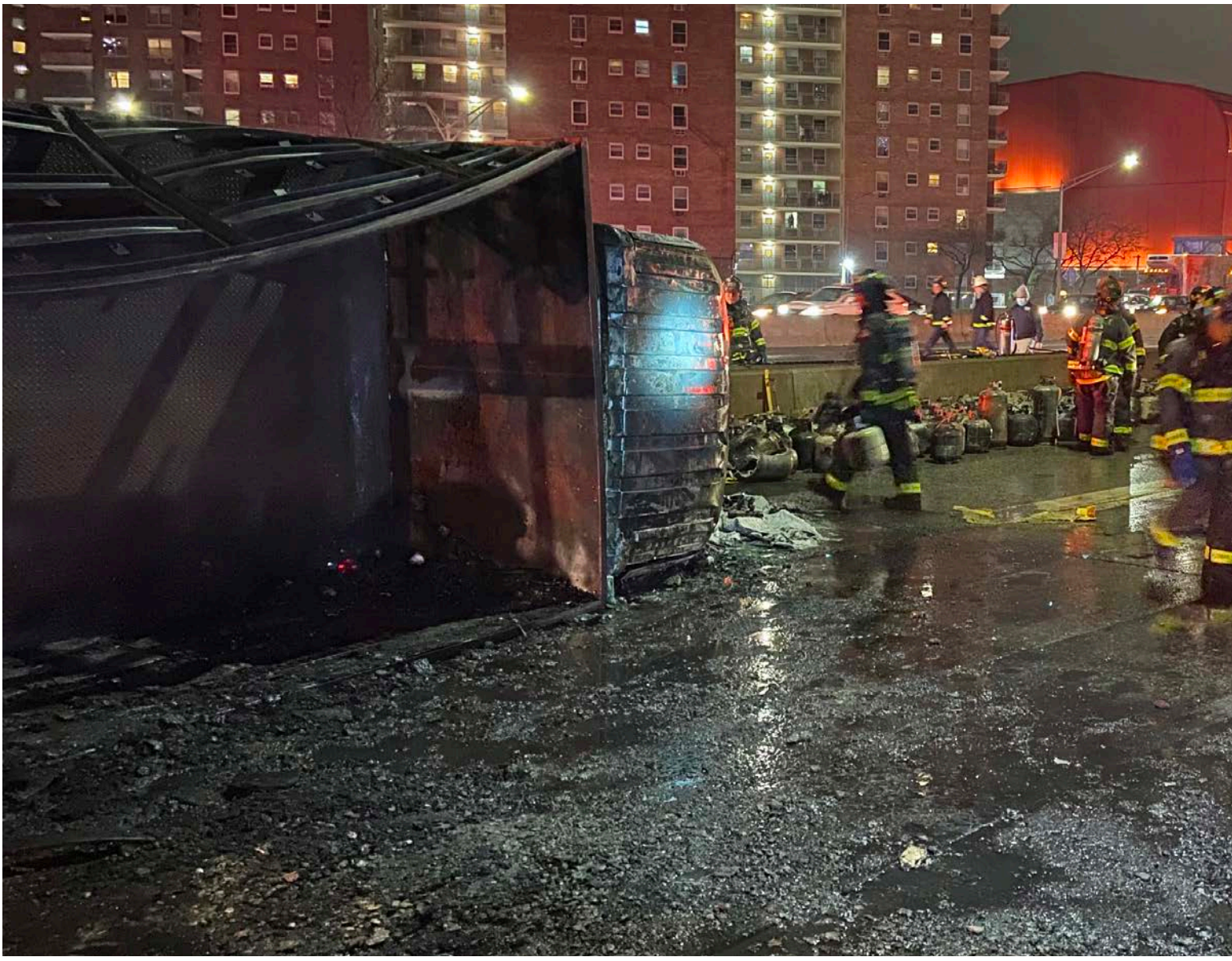
Haz-Mat 1 carries two flaring kits to evacuate cylinders deemed unsafe to transport from the scene. A flare kit burns off the contents of the cylinder and renders it safe. Both flaring kits were set up, and the majority of the cylinders were remediated this way. However, three of the cylinders had valves that were damaged in such a way that they could not be evacuated in this manner. This led Haz-Mat 1 to initiate a rarely used alternative flaring method that was developed and refined by its members. Using a salvage drum and a water bath to safely flare and evacuate the damaged cylinders that could not be connected to traditional flares, Haz-Mat 1 created a "burn barrel" that successfully mitigated the remaining hazard posed by the damaged cylinders. All of these operations were conducted under the protection of a charged hose-line.

Under Control

The fire was placed under control by DC McBride, Division 14, at 0258 hours: three hours and one minute from the time out. NYPD assisted with an authorized tow to remove the destroyed propane truck, and OEM assisted in the removal of the more than 300 propane cylinders on the highway. The original propane company reported that they did not have the ability to respond and recover the propane tanks from the incident, so OEM procured a new vendor to respond and assist. OEM also coordinated with the New York City Sanitation Department (DSNY) to remove destroyed cylinders. Relief companies were special-called and remained on the scene until all the cylinders were removed.

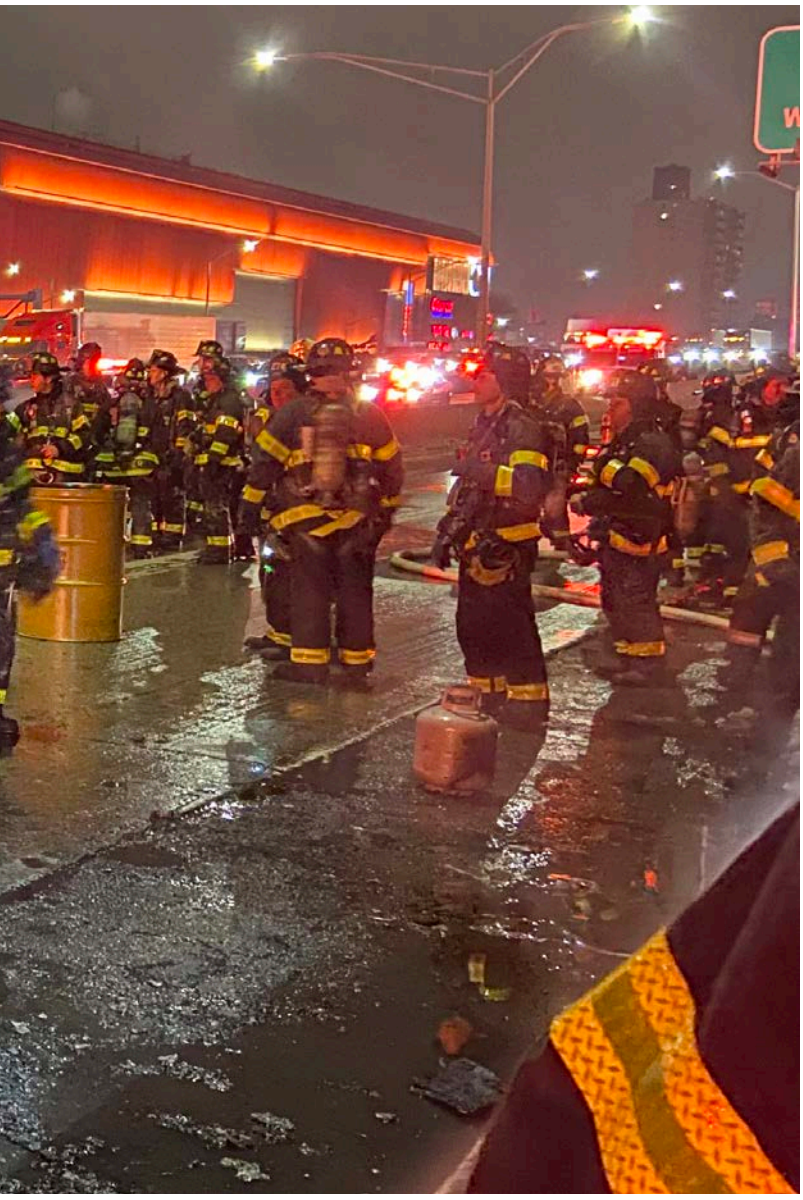
Things That Went Well

- The battalion chief recognized that both engines on the initial ticket were responding from the same direction on the highway and special-called an additional engine to respond from the opposite direction. The special-called engine, Engine 287, ended up being the first engine with water on the fire.
- Quick transmission of alarms and special calls provided



needed resources in a timely manner. Haz-Mat resources played an invaluable role at this incident, and the quick transmission of a 10-75 followed quickly by a second alarm brought in additional units to assist with water supply, protect exposures and supply needed manpower to handle both fire operations and support hazmat operations.

- Engine 287 attacking the fire while using the concrete Jersey highway barrier for protection. The barrier provided shielding to allow Engine 287 to advance close enough to get water on the fire while offering some protection from the BLEVE activity.
- Squad 288 operating primarily as an engine company. The squad secured two hydrants: an initial one and then a second one to augment themselves. They were able to supply Engine 287, operate their deck pipe and operate hand-lines as a result.
- Applying water to the fire. Almost immediately after water was applied, BLEVE activity stopped. With four hand-lines and two deck pipes in operation, the fire was knocked down shortly thereafter. In some situations, we are taught not to extinguish a gas fire but rather to cool the tanks and let the gas burn. In this situation, too many lives were at risk if the BLEVE activity continued, and a timely evacuation of the exposed multiple dwellings was not practical.
- Early Haz-Mat assessment of the incident. Haz-Mat 1 is located within the response area of Battalion 46 and arrived at the incident early on. Its ability to assess the cylinders and provide tactical direction to the engine companies applying water on the LPG vapors was an asset.
- Identifying and interviewing the driver of the vehicle. Units made contact with the LPG truck driver shortly after arrival on scene. The driver was able to provide accurate information regarding the number of cylinders and product involved. There were 304 cylinders of LPG in this incident.
- Large area search for BLEVEd cylinders. Engines and ladder companies were assigned to search the perimeter for BLEVEd cylinders so Haz-Mat 1 could account for each cylinder. Cylinders were found scattered around the LeFrak property and on the opposite side of the highway, quite a distance from the fire.



- Haz-Mat assessment and evaluation of the cylinders. Haz-Mat units individually evaluated each cylinder after they were cooled, and regular units moved the cylinders by hand and placed them in piles of 10. This allowed for quick identification of cylinders and accurate accounting of each cylinder.
- Sectoring the Incident. DC McBride arrived from the east within minutes of the 10-75 being transmitted. Battalion 46 was already operating west of the fire, and Battalion 52 was assigned to the LeFrak buildings. DC McBride established sectors early on in the incident, which significantly helped in the management of an overwhelming and complex incident.
- New York City Emergency Management (NYCEM) assistance with resource coordination. NYCEM responded on the second alarm. When the fire was under control, an issue developed regarding who would remove the 304 cylinders from the highway. The vendor involved in the fire did not have the ability to remove them. NYCEM was able to procure a new vendor to respond and remove any tanks that were still intact, and NYC Sanitation removed any BLEVEd cylinders that were obviously destroyed (no threat).

Challenges

- Command and control: The incident was overwhelming, and unlike a structural fire—where the Chief is in front of the building and can see each unit as they report in—it was complex in that units arrived at different sides of the fire and the BLEVE activity prevented them from passing the fire to report to the Chief. This made it extremely difficult to know who had arrived on the scene, where they were operating and what they were doing.
- Access: Because the incident occurred on the highway but exposed a building and spread to vehicles on the service road, it posed an access issue. Units that committed to the highway could not access the service road, including hydrants, and units that committed to the service road could not really operate on the highway. This posed some challenges, especially at first, when there was a limited number of resources on the scene.
- Traffic control: In the future, when NYPD has the highway shut down, FDNY units should be directed to shield our operations as well. Initially, NYPD had all traffic shut westbound on the LIE. But FDNY had no direct radio communication with NYPD units on the highway. When the fire was knocked down, NYPD reopened the highway, and cars began coming directly at Engine 287's members while a smoke condition obscured the highway. There were no FDNY rigs in position to protect Engine 287's members, and FDNY members were unable to communicate with the NYPD.
- Other agency operations: At this incident, NYPD Highway Patrol set up road flares in the vicinity of the fire. This was not noticed by command and was not reported to command during the incident. LPG is heavier than air, and when the fire was extinguished but the tanks were still leaking, vapors were travelling low to the ground. Road flares should not be used in this type of situation, and FDNY units should be alert to other agencies' operations that could be well intended but detrimental to fire operations.

Command considerations

- Conduct a scene size-up, which includes personal observation and communications with battalion chief and units.
- Evaluate potential life hazard and exposure issues, including securing the scene and evacuating civilians from danger areas.
- Establish a command post in a safe area and transmit its location to units and dispatcher. Set up a portable command post for unit accountability.
- Establish sectors early to address current and potential issues and centralize communications.
- Ensure that there are adequate resources on hand to mitigate the incident, including units in reserve.
- Be proactive in requesting outside agencies such as NYPD, OEM, Department of Transportation (DOT), DSNY, Con Edison and National Grid. ■