

Twist of Fate Proves Lucky for FDNY at Staten Island Incident

by Deputy Chief Richard J. Howe and Battalion Chief John A. Calderone

Friday, June 3, 2005, started as a rainy, overcast day. Prior to the 0900 tour change, Engine 158 was special-called to Box 1123 at South Avenue and the railroad in Mariner's Harbor. Engine 158 arrived to find Con Edison on the scene with a wooden utility pole on fire, burning from the inside. The pole carried 33,000 volts, but the primary problem was that this pole was located remote from the road on State-owned, protected wetlands. Con Edison advised that before anyone could approach the pole, it would be necessary to obtain an entry permit from the State Department of Environmental Control (DEC), as well as construct a "protective road" of felt and plastic out to the pole so that natural plants would not be excessively damaged. This would require an extended period of time to accomplish.

Battalion 22, Battalion Chief John Calderone, was requested to respond and evaluate these conditions. While the Chief was conferring with Con Edison personnel, a backhoe, operated by a contractor hired to construct the "protective road," swung around, striking the burning pole and causing the wires to fall and energize the backhoe. The operator jumped clear, but this action further complicated and extended the operation. Fortunately, this mishap, along with another twist of fate, may have prevented the deaths of or serious injuries to the members of Engine 156 and Chief Calderone later in the day.

Engine 166 initially relieved Engine 158 at this scene. Chief Calderone returned to re-evaluate conditions and at 1356 hours, he requested another engine company to relieve Engine 166. Engine 156 was assigned at that time. Just as Engine 156 arrived on the scene at 1413 hours, Box 399 was transmitted for a fire at 14 Van

Street, near Richmond Terrace, approximately 2¹/₂ miles away.

Engine 156 should have been the first-due engine for this assignment, which was located only several blocks from their quarters. Chief Calderone responded. While en route, the dispatcher advised of reports of fire and an explosion involving chemicals. The CIDS information indicated large quantities of hazardous chemicals, acids and poisons present. Based on this information, the Chief requested that Haz-Mat 1 be assigned to the incident.

Engine 157, normally second-due, arrived first and transmitted the 10-75. As Lieutenant Michael Butt made this transmission and was providing an initial size-up, a second explosion took place, resulting in shrapnel and debris falling on members and the apparatus, which was positioned at a hydrant on Van Street, approximately 75 feet north of the fire building. Had Engine 156 been in quarters and available to respond to this incident, in all probability, they would have been inside the fire building on the first floor, advancing the first line when the second explosion took place. Likewise, had Chief Calderone been in quarters, he and his aide would have arrived first at the scene and been positioned in front of the building, probably taking the full force of the second explosion.

The nuisance utility pole fire 2¹/₂ miles away prevented this. In another twist of fate, the first-due truck company, Ladder 79, was drilling on saw-cutting operations in the parking lot adjacent to their quarters when the alarm was received. This delayed their response slightly. They arrived immediately behind Engine 157 and were showered with debris from the second explosion before they dismounted their apparatus. Had they not been delayed by the drill, they would have arrived prior to Engine 157 and been positioned in front of the building, operating inside when the second explosion took place.

On arrival, units were confronted with an irregular, two-story, brick-and-joist, 20-by 60-foot industrial structure with a one-story, brick, 25- by 75-foot extension at the rear. Two large, horizontal exterior tanks in the storage yard at the exposure #2 side had exploded, causing substantial structural damage and a partial collapse on that side of the fire building, as well as the roof of the extension. These tanks were double-walled steel, with insulation contained between the inner and outer walls. The insulation inside both tanks was burning. When these horizontal tanks exploded, they failed at their ends, characteristic of their design.

The roof of the rear extension of the fire building consisted of tongue-and-groove roof boards. When the roof collapsed, it



Site of Staten Island Box 22-0399, 14 Van Street. This irregular, two-story, 20- by 60-foot, brick-and-joist structure featured a one-story brick extension at the rear. Exposure #4 is an attached, two-story, peaked-roof brick structure used as an auto repair shop. Exposure #2 included two large, horizontal exterior tanks in the storage yard.

all photos by Michael Oates unless noted otherwise

appears that the tongue-and-groove construction assisted in holding the roof together, rather than it being catastrophically destroyed in the collapse. Heavy fire conditions existed inside the rear extension of the fire building and were extending into exposure #4, an attached two-story, peaked-roof brick structure used as an auto repair shop.

Inside the storage yard on the exposure #2 side, there were numerous drums, vats, storage containers, a tractor-trailer tanker truck and containers filled with hazardous materials. Additionally, there was a thick, brownish-green liquid flowing freely from the yard, downhill and along the curbs for several blocks. Units responding from the west along Richmond Terrace also encountered a burning police car two blocks from the fire, caused by flaming debris from the second explosion.

After assessing these conditions, Chief Calderone transmitted a second alarm at 1422 hours. Battalion Firefighter Kenneth Pogan transmitted a message to the dispatcher to warn all incoming units to avoid what appeared to be water runoff from the fire. This "runoff" actually was the contents of the two tanks that had exploded and was unidentified at this point.

Engine 157 stretched the first hose, a 2½-inch line, to the exposure #2 side to extinguish fire and simultaneously cool exposed drums, tanks and containers. This action allowed for a rapid knockdown of heavy fire in the storage yard that was directly exposing other containers of chemicals and probably prevented additional explosions.

Ladder 79 initially set up for a tower-ladder operation. Engine 163 stretched a second 2½-inch line to the front of the fire building. Ladder 80 conducted a search of the second floor of the fire building and then operated in exposure #4 after reporting fire extending into that building. This fire quickly was controlled by Engine 155.

First reports indicated that all plant personnel were out of the building and accounted for. To verify this, the owner of the firm was questioned regarding workers. During repeated, direct questioning, he consistently assured operating units that all personnel were accounted for. Based on this information, the severity of the structural damage and the existing fire conditions, a defensive, outside attack was undertaken.

Several minutes later, a distraught worker approached units, advising that a contract employee had been working in the storage yard near the two tanks when the first explosion took place and could not be found. At this point, Deputy Chief Richard Howe, Division 8, arrived and assumed command. Chief Calderone briefed Chief Howe on existing fire and structural conditions and the status of the unaccounted-for worker. This information prompted an immediate re-evaluation of conditions and led to a change in tactics.

Ladder 79 and Rescue 5 were ordered to conduct a search inside the storage yard where the two tanks had exploded. Simultaneously, Ladder 83 was ordered to conduct a search on the first floor of the rear extension of the fire building. Conditions inside this extension were severe. The exterior concrete block wall on the exposure #2 side had been



The two tanks in the storage yard had exploded, which caused substantial structural damage and a partial collapse on the exposure #2 side of the fire building, as well as the roof of the 25- by 75-foot extension at the rear.

destroyed by the explosion. Most of the wall now was inside the fire building as piles of debris. The roof had collapsed and was partially supported by a vertical tank inside the building. Heavy fire existed inside the rear extension on the exposure #4 side and in numerous bays of the collapsed roof. It was necessary for Engine 163 to hold this fire back while Ladder 83 conducted the interior search under the direct supervision of Chief Calderone.

With fire burning in the collapsed roof over their heads and operating under the protection of Engine 163's line, Ladder 83 quickly located the remains of the worker partially buried under the collapsed wall on the exposure #2 side, between where the wall had been and the vertical tank holding up the roof. The body was quickly dug out and removed and all units were backed out of the building. Operations reverted to a defensive attack at this time and the fire subsequently was controlled.

Simultaneously with initial firefighting operations, attempts were being made to identify the products involved. The owner of the firm provided several conflicting statements regarding the



The storage tanks were made of double-walled steel, with insulation between the inner and outer walls. When the tanks exploded, they failed at their ends. The insulation continued to burn. Note how the tongue and groove roof flexed and bent, but did not fail.

photo courtesy of Rescue 5



Although FDNY members had been assured that *everyone was accounted for*, in fact, a contract employee had been working in the storage yard near the two tanks when the first explosion occurred. Ultimately, the worker was found partially buried under the collapsed wall inside the fire building on the exposure #2 side. He was blown through the wall. FDNY members remove him from the scene.

products present and their quantities. This resulted in his being removed from the scene by NYPD for further questioning in a more controlled atmosphere.

The firm that occupied this structure was involved in the production of biodiesel. This is an environmentally friendly alternate fuel that is produced from used vegetable oil. Typically, it is produced through the reaction of vegetable oil or animal fat with methanol in the presence of a catalyst. This reaction yields glycerin and biodiesel (called methyl esters). Biodiesel is registered with the United States Environmental Protection Agency (EPA) as a pure fuel or fuel additive and is a legal fuel for commerce. Biodiesel can be in neat form or blended with petroleum diesel for use in diesel engines. Its physical and chemical properties are similar to petroleum-based diesel fuel. Its appearance is a clear, amber liquid. Depending on the blend of biodiesel, the flash point ranges from 248 to 320 degrees Fahrenheit. The NFPA hazard classification is 1 for health, flammability and reactivity.

Haz-Mat 1 performed a hazard assessment with initial findings indicating a corrosive hazard in the water runoff. Isolation zones and a decontamination area were established. Operating units were evaluated and decontamination was performed as needed. Most contamination was isolated to the bottom of the boots of exposed members. The effectiveness of decontamination was verified before members were allowed to exit into the cold zone. To coordinate and implement this, a Haz-Mat Task Force, consisting of Haz-Mat 1, Rescue 5 and the Haz-Mat Battalion, was assigned.

To safely conclude this operation, two major issues still needed to be addressed: structural stability and removal of large quantities of chemicals remaining inside the building and at the site. To accomplish these tasks, multiple agencies (Buildings Department, Department of Environmental Protection, EPA, NYPD, Sanitation, U.S. Coast Guard) in addition to the FDNY and several private contractors were involved. FDNY units remained on the scene for several days while all chemicals were removed.

Lessons learned/reinforced

- Horizontal storage tanks exposed to external heat or fire will fail at their ends. Such tanks should be approached from the sides;

never from the ends. When these tanks failed, the pressure released from the ends was sufficient to cause the failure of the fire building's wall on the exposure #2 side.

- The tongue-and-groove roof construction was able to absorb a great deal of the force resulting from the explosion and collapse, twisting and flexing, rather than failing. This assisted in holding the roof together, lessening the impact of the explosion and collapse.

- Don't assume knowledgeable people have verified the information FDNY is requesting. They may be answering questions without being fully aware of circumstances. Additionally, do not accept information being provided without questioning. We have been trained to rely on knowledgeable people as advisors when dealing with topics where outside experts are needed. In this case, the knowledgeable person apparently had another agenda and was less than upfront in the information he was providing. At this incident, the owner consistently assured FDNY that all personnel were accounted for, while a contract employee had been killed in the initial explosion and was partially buried inside the structure.

- It may become necessary to change from an outside, defensive operation to an interior operation as information is received and processed. In this case, initial information indicated everyone was accounted for. Structural and fire conditions were not favorable for an inside attack. However, when advised that a worker was unaccounted for, it became necessary to reassess operations. A decision was made to conduct a limited, calculated interior attack under the direct supervision of a Chief Officer, in order to conduct a rapid primary search. Once this mission was accomplished, operations reverted to a defensive mode.

- Consider forming task forces to address different concerns that are necessary to manage an incident. In addition to the Haz-Mat Task Force, another task force--consisting of the Safety and Rescue Operations Battalions and representatives of the Buildings Department--was assembled to evaluate structural stability issues.

- With the assistance of OEM, inter-agency meetings were conducted at approximately 45-minute intervals. These meetings kept all involved agencies updated to current conditions, as well as strategies and tactics being employed to safely conclude this incident.

- The Command Post tent (each Division has one) is effective in providing a focal point for operating personnel, as well as representatives from other agencies.



About the Authors...



Deputy Chief Richard J. Howe (left) is a 27-year veteran of the FDNY. Currently, he is assigned to Division 8. This is his second contribution to WNYF.



Battalion Chief John A. Calderone (right) has served the FDNY since 1973. Currently, he

is assigned to Battalion 22. He holds a degree in Fire Protection from New York City Community College and has written extensively on the subject of fire apparatus. He is a regular contributor to WNYF.