Safety Concerns at Confined Space Operations

by Battalion Chief Eugene Vellia

On the arrival of Battalion Chief Eugene Vellia, Safety Battalion, confined space operations already had commenced by the first-arriving units. As the Safety Officer at Brooklyn Box 0068, 301 Greenpoint/Kingsland Avenues, September 24, 2008, Chief Vellia had to assess the potential hazards associated with a confined space incident in a large, enclosed concrete tank. The following information pinpoints the conditions during the operations with which Safety was concerned.

- Supervision--Due to the nature of the operation, there was a two-sided approach to the rescue; first, at the point of the victim at the bottom of the tank inside the building and secondly, on the roof of the tank. This was necessary in order to set up a high-angle rope operation at this location. The area was supervised by Battalion Chief Stephen Rasweiler, Rescue Battalion. Chief Vellia remained fluid to monitor all areas and Battalion Chief Kenneth Stefanak, Battalion 45, was the Operations Chief and coordinated via handie-talkie with Chiefs Rasweiler and Vellia.
- Chief Vellia remained inside the building at the point where the victim was stuck at the outlet pipe. Units operating at the area included Rescue 4 and many of the first-alarm units. At times, when Chief Stefanak was inside the building, Chief Vellia would go to the roof area to ensure there were no other safety concerns that needed to be addressed or were missed.
- Due to the nature of the sludge and possible hazardous environment, Haz-Mat Company #1 members set up monitoring equipment in the victim's vicinity. Members used their various meters to measure and monitor oxygen levels, flammability and toxic gases. During the introduction of water to the sludge, some elevated levels of hydrogen sulfide (sewer gas) were detected and exhaust fans were set up to ventilate the area. These fans remained on until the victim was removed.
- The nature of this rescue dictated an extended operation. The IC monitored conditions of members operating, rotated units and provided relief where and when needed.
- There were many members at the scene and numerous handie-talkies in operation, which--at times--caused some communications problems between SOC members, who were operating with the victim, and the members on the roof involved with the high-angle operation. These operations involved units performing critical tasks involving movement of the victim, which required instant feedback. It was decided to have certain SOC members switch to a handie-talkie secondary tactical channel that was dedicated only to them, so there would be no radio traffic to interfere with their operations.
- The sludge itself was a problem. There was a large amount of semi-solid sludge in the tank at the time of the incident. The only way FDNY members could remove it was by using a hand-line and liquefying the sludge so it could flow more easily and be removed from the tank and in and around the victim. This operation created hazardous working conditions inside the building near the victim. Many members were needed using brooms, shovels and whatever could be found to move the sludge away from the area of operation. This also created a very slippery area and members had to be constantly vigilant to make sure they did not slip and injure themselves. The other major concern with the sludge was that the victim was trapped in a pipe that had a diameter of approximately three feet. When liquefied, the sludge flowed around the victim, completely covering him at times. This necessitated use of a FAST PAK on the victim so he could breathe throughout the extended operation. Sometimes, the facepiece on the victim became coated with sludge and also leaked into the facepiece. This necessitated facepiece removal and replacement many times during the operation.

Base of the tank and the porthole within the building. The victim was partially within this porthole and exited here. Exterior tank operations took place at this location.

- During this operation, FDNY Officers consulted with plant personnel from time to time with regard to tank construction, sludge properties, access points, safety concerns and any other area in which their expertise would be advantageous.
- Throughout the operation, EMS personnel were placed near the victim to assess his condition. Concerns focused on this being an extended operation and members had to use water constantly to remove the sludge; the victim started to show signs of hypothermia. Additionally, on-scene was the EMS Medical Director, who was in charge of deciding treatment options for the victim. At one point during the operation, it was suggested that a sedative be given to the victim to assist with his removal. After evaluating the complexities of the victim's entrapment, it was determined that this would not work.
- Due to the hazardous nature of the sludge, decon of FDNY members and equipment was required. The appropriate units were special-called to the scene and set up a decon station outside the building. When operations were finished, any member who came into contact with sludge was deconned, along with any tools or equipment. The Safety and Haz-Mat Battalions supervised this process.

Points to remember in regard to confined space operations

- Hazards include engulfment, tapering shapes.
- Atmospheric hazards include asphyxiant, toxic, explosive.
- Treat every confined space as a deadly atmosphere until proved otherwise.
- Determine nature of response.
- Establish control perimeter.
- Begin hazard analysis.
- Control site hazards.
- Formulate rescue plan.
- Review the *Training Bulletin*, Confined Space.

About the Author...

Battalion Chief Eugene Vellia is a 27-year veteran of the FDNY. He is assigned to the Safety Battalion. This is his first article for WNYF.