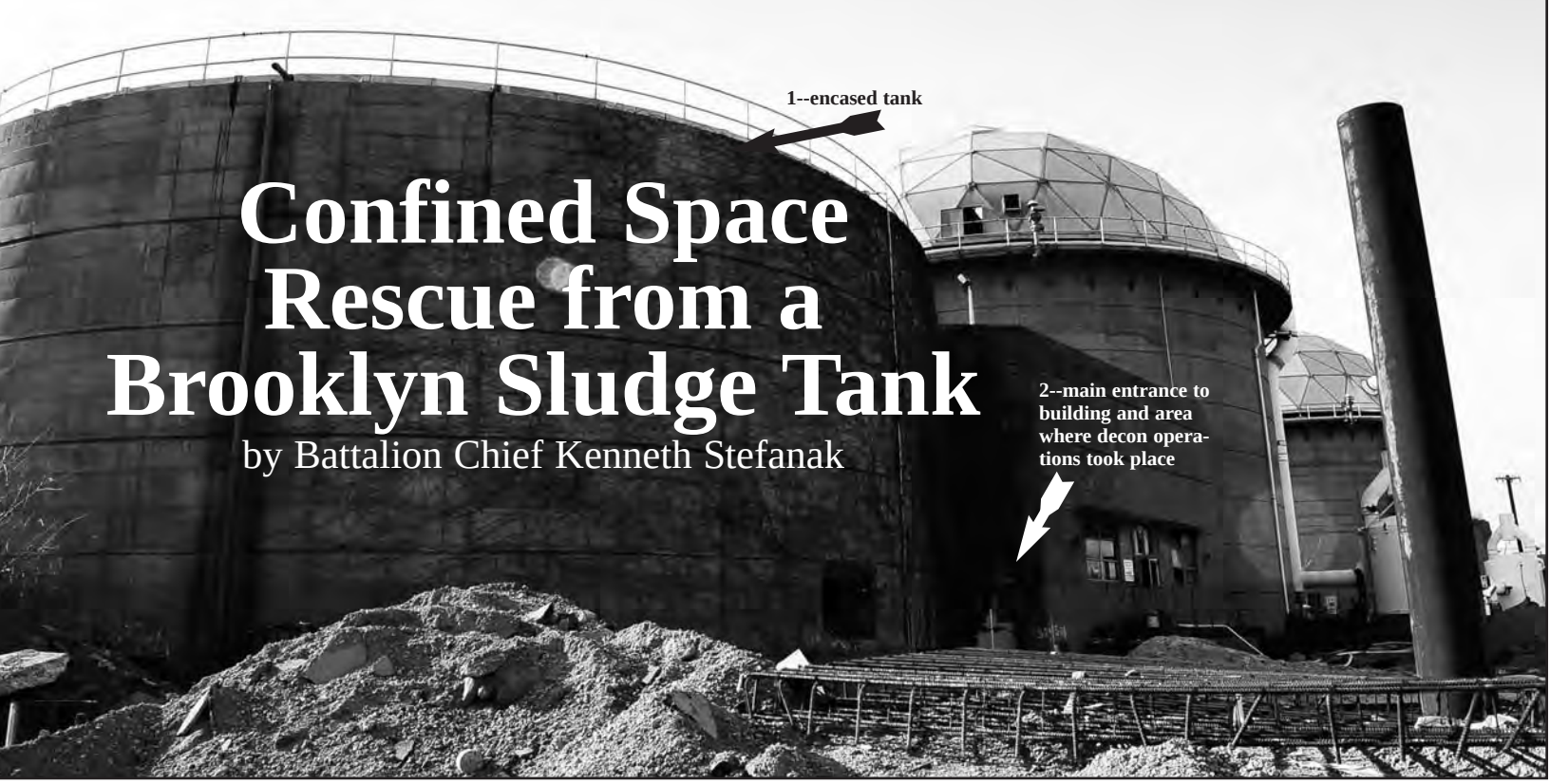

Confined Space Rescue from a Brooklyn Sludge Tank

by Battalion Chief Kenneth Stefanak

Photo shows exterior of the encased tank and the building housing the pumping installation--1; and main entrance and location of decon operations--2.

When Brooklyn Box 0068 came in on September 24, 2008, at 2128 hours, the initial call was for a one and one response that was upgraded to three and two with Battalion 45 for a trauma patient. No specific address was given, only the street location of Greenpoint and Kingsland Avenues. Updated information provided en route said there was a man stuck in a tank. Battalion 45's aide--working without a specific address--figured this must be the Department of Environmental Protection (DEP) site at 301 Greenpoint Avenue. Units were waved in by workers at the scene and the location was verified.

Verbal reports stated that an employee of Synagio Inc., a subcontractor for Skanska/Picone Inc. and the DEP, was trapped at the base of a storage tank. This was confirmed by members of Engine 238 and Ladder 106. Battalion Chief Kenneth Stefanak, Battalion 45, issued a report of a confirmed confined space rescue once contact with the injured was made. As SOC and other units arrived, Chief Stefanak gathered information and advised no entry into the tank prior to assessment of hazards and air quality and set up of the retrieval system.

Among the data gathered was that this sludge storage digestor was to be decommissioned and was being emptied of sludge. The sludge stored in the digestor had gone through preliminary, primary and secondary treatments and was the remaining byproduct of wastewater generated in New York City. It was awaiting transport onboard NYC DEP marine vessels for disposal. In the preliminary process, large trash items had been screened and removed to landfills. Primary treatment involved placement in sedimentation tanks and degritting. The resulting grit then was washed and removed to landfills. Primary sludge remains and then is sent for secondary treatment. Primary sludge is aerated, stimulating growth of microorganisms, which consume most of the remaining organic material. What is left is sewage sludge.

The tank contained a large amount of hardened waste (sludge) that was treated and sent to this tank for storage. Workers had entered the tank from the top to introduce water to soften the sludge and allow removal and cleaning of the tank. During this process, a large amount of softened sludge broke free and swept the worker downward to a porthole at the base of the tank. The porthole cover previously had been removed due to the impending demolition. Luckily, the victim was able to get his upper torso inside the porthole, with the bottom half of his body pinned within the tank.

The worker was a 43-year-old employee of Synagio. Units found him partially in the porthole access with his head facing outward. The lower half of his body was within the tank, with his legs at a 90-degree angle downward from the knees and a large amount of sludge pinning him.

Rescue companies assessed rescue attempts. Haz-Mat Company 1 and Squad members evaluated air quality and placed the victim on a positive pressure air source. EMS personnel from a Haz-Tac Medic unit assessed the victim and regularly monitored his condition.

After consulting with employees conducting the sludge removal, FDNY's initial strategy was to hydraulically loosen the sludge trapping the victim and attempt removal. The victim was

Members are urged to review Training Bulletin--*Confined Space*, plus the following *WNYF* articles:

- "*M.V. Cape Lambert*--A Most Unusual CFR-D Run," by then-Captain John Norman, in the 3rd/98 issue.
- "Operations at Brooklyn Box 386," by Captain Terence S. Hatton (killed on 9/11), in the 3rd/98 issue.
- "Special Apparatus--The Decontamination Unit," by Battalion Chief John A. Calderone, in the 1st/2001 issue.
- "Jerome Park Reservoir Operation," by Battalion Chief Michael A. Telesca, in the 3rd/2001 issue.
- "Staten Island Trench Rescue," by Battalion Chief John M. Moran (killed on 9/11) and Firefighter Hank Molle, in the 4th/2002 issue.
- "Beware: Confined Space," by Firefighter William Lake (killed on 9/11), in the 4th/2002 issue.
- "Buried in a Barge," by Deputy Chief James D. Daly, Jr., in the 3rd/2003 issue.
- "Fuel Oil Storage Tank Proves Deadly in the Bronx," by Battalion Chief Fred LaFemina, in the 1st/2004 issue.
- "Trench Cave-in Removal in Brooklyn," by Lieutenant Serge J. Burack, Jr., and then-Firefighter Peter W. Blaich, in the 1st/2005 issue.
- "Special Tools Used at Trench Operations," by Battalion Chief Joseph Downey, in the 1st/2005 issue.
- "A Primer on First-Due Trench Cave-in," by Captain William Boltja, in the 1st/2005 issue.

all photos by Randy Barron

Porthole at base of tank. Victim contact and removal took place at this location.

placed on a four-way retrieval system from the base of the tank. A high-point anchor was set up at the top of the tank, providing access for Rescue members to operate above the victim.

Deputy Chief Michael Marrone, Division 11 Commander, coordinated the incident from the Command Post. Chief Stefanak, Operations Chief, supervised operations at the base of the tank and was supported by Battalion Chief Stephen Rasweiler, Rescue Battalion, at the high-point location, and Battalion Chief Eugene Vellia, Safety Battalion, monitoring the operations at both locations. Engine 238 operated a hand-line at the exterior of the base of the tank to assist with clearing the liquefied sludge and Ladder 106 provided assistance to SOC units at the base of the tank. Remaining first-alarm units assisted with hose-line operations and provided equipment and manpower as needed.

Although some progress was made using these tactics, the continued use of water was causing sludge to backfill the area being cleared around the victim. The sludge was pooling around the base of the tank at the front of the porthole. The victim was showing signs of hypothermia, prompting a change of tactics.

The decision was made to attempt to isolate the victim by creating a framework around him to prevent backfill of sludge, removing the sludge from the immediate area and using webbing wrapped around the victim's legs in conjunction with the four-way retrieval system to slowly slide the man from porthole access. Line units, with hose-line and shovels, were used to clear removed sludge from around the area of operation. Operations from the interior and the exterior of the tank necessitated close coordination and communication. After some initial difficulties timing the application of water and the use of the retrieval system, those members were placed on a separate handie-talkie channel, facilitating their communication.

The change of tactics showed promise as the area surrounding the victim slowly was cleared of sludge, allowing placement of webbing underneath the victim's legs. Haz-mat recovery drums were cut in half and placed around the victim. Slowly, they were worked deeper around the man to allow removal of the sludge pinning him and prevent additional backfill. Coordinating the retrieval system and webbing efforts, the victim's legs were freed and he was removed from the porthole to the exterior of the tank. Immediate rapid decon and assessment by Haz-Tac Medics were initiated and the victim was immobilized, boarded and placed in a stokes basket for removal to the exterior of the building. At this point, a more thorough decontamination and evaluation by EMS personnel were conducted prior to transport.

During operations, the need for large-scale decontamination was evident. A Decon Task Force was requested, with Battalion 38 assigned as the Decon Task Force Leader, and deployed outside the area of operations. A decon corridor was set up directly outside the main entrance to the building housing the storage tank. Units were directed through this corridor upon exiting the building. Tools and equipment were placed in a separate area for decon and members were directed to the personal decon area. The Task Force set up water containment tubs and used brushes and decon solution in buckets to decon members' bunker gear. Low pressure garden hoses and a hand-line provided the necessary water for initial rinse and final wash.

Location at top of tank where high-point system was set up. Victim's entry was via a metal ladder that went into the tank. It is 40 feet from this entry point to the bottom of the tank where the victim was removed.

Members of Engines 280 and 283 (which brought the Decon vehicle) and Ladder 132 set up for and ultimately deconned approximately 25 Fire Department members, as well as the victim and a large amount of contaminated equipment and gear. They were assisted by SOC units. Grossly contaminated personal protective clothing and equipment were bagged and marked for removal and further decontamination.

Lessons learned/problems encountered

- Response of first-alarm units, as well as SOC units, Haz-Mat, EMS and Decon Task Force, required constant communication and coordination among the Incident Commander and Rescue and Safety Battalions. Units conducting technical rescue from two locations needed precise coordination during operations for the safety of the victim, as well as FDNY members.
- Communication proved difficult. This large-scale operation with numerous handie-talkies in use interfered with coordination of a smaller group attempting detailed tasks. This showcased the need for close communication and coordination. The difficulty was overcome by placing the smaller group of rescuers on a separate handie-talkie secondary tactical channel, 3, which allowed close coordination and communication without interference. It has been found beneficial to use channel 16 (emergency channel) as a secondary tactical channel for a rescue group.
- Recognize the need and have decon equipment and staffing called and in place early in the operation.
- With an operation that was conducted from two locations, it was necessary to ensure enough support to provide staffing, tools and equipment rapidly to both locations. This became more evident when the change in tactics dictated equipment and supplies be delivered to the top of and then the interior of the tank.
- Consider alternate tactics early in the operation and be prepared to implement these tactics with as little delay to the overall operation as possible.

About the Author...

Battalion Chief Kenneth Stefanak is a 23-year veteran of the FDNY. He is assigned to Division 14, covering. Previous assignments include Ladder 41, Engine 40 and Division 7. This is his first article for WNYF.