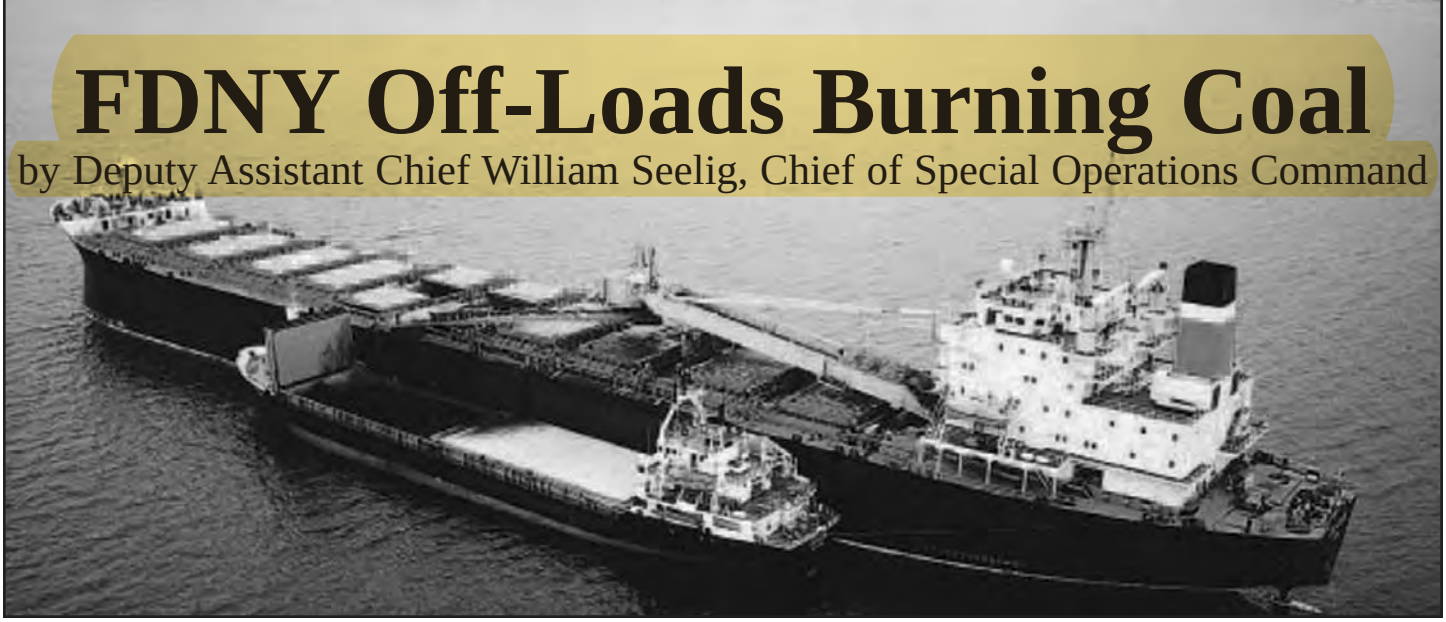
FDNY Off-Loads Burning Coal

by Deputy Assistant Chief William Seelig, Chief of Special Operations Command



On December 29, 2008, at 1754 hours, FDNY Marine Operations was notified by the U.S. Coast Guard (USCG) that a bulk coal carrier headed toward the New York Harbor was experiencing elevated temperatures in its #5 hold. The ship, the *CSL Atlas* (see photo above), en route to New York from Indonesia and approximately 100 miles out at time of notification, was carrying 60,000 tons of coal. The ship's master had informed the USCG that they were experiencing temperatures of 170 degrees in the #5 hold and were using a hand-line to cool the exterior of the hold.

FDNY Marine Operations made notifications to the Fire Department Operations Center (FDOC); Battalion Chief James Dalton, Chief of Marine Operations; Battalion Chief Michael Buckheit, Marine Battalion Commander; then-Deputy Chief William Seelig, Chief of Special Operations Command; and Assistant Chief Edward Kilduff, City-Wide Command Chief, and proceeded to obtain as much information as possible about the *CSL Atlas* from the internet. The information obtained by Marine Operations prior to arrival of the ship proved extremely useful in developing a plan of action and implementing subsequent operations.

Initial planning

Chief Kilduff, on notification of the incident, contacted Chief Seelig and ordered that a meeting be set up of all involved parties to decide on an action plan to deal with the ongoing situation. Participants notified to attend the meeting with Chief Kilduff were those listed above, plus Battalion Chief Donald Hayde, Rescue Battalion; Battalion Chief Ed Bergamini, Haz-Mat Battalion; Battalion Chief Daniel O'Gara, Battalion 22 and the Planning Section Chief; a USCG representative, an EMS representative, the ship's agent and a marine consultant. With additional information obtained on the ship's arrival time, the meeting was scheduled for 0500 hours on December 30, 2008, at Millers Launch in Staten Island, near Marine 9's quarters.

To observe conditions in the #5 hold, FDNY members were brought to the lower level of the *CSL Atlas*. Additionally, this is the area where Chiefs Buckheit (shown) and Hayde supervised operations and where the equipment was lowered.

Several options regarding how to deal with the situation were discussed. The initial thought was to have the ship proceed to the Homeport Pier in Staten Island and tie up adjacent to Marine 9's berth. The advantage of this action would be to minimize the logistical issues involved with fighting the fire "in stream." However, after reviewing the *CSL Atlas*' specifications--obtained by Marine Operations from the internet and confirmed by the ship's agent--it was determined that the ship's draft was approximately 40 feet and the depth at the Homeport pier could not accommodate this.

Additionally, the Coast Guard informed FDNY that, in general, they do not allow ships experiencing a fire to come into the New York Harbor unless there is a life safety issue that would require immediate entry. Thus, the ship was ordered to proceed to the Gravesend Anchorage, south of the Verrazano Bridge, and deal with the situation "in stream" at that location. Chief Kilduff ordered that a reconnaissance party be sent out to the ship, now anchored off Gravesend Bay, to assess the situation and develop a plan to fight the fire. A reconnaissance party--composed of Chiefs Seelig, Buckheit, Hayde and Bergamini, along with several Haz-Mat members--were transported to the ship at approximately 0600 hours by Marine 6 to perform an assessment.

Reconnaissance

Once aboard Marine 6, the reconnaissance party proceeded to the location of the *CSL Atlas*. En route, Marine 6 was hampered by high seas, temperatures in the teens and wind gusting up to 50 mph. The rough seas made it extremely difficult for Marine 6 to come alongside the *CSL Atlas*, but with some skillful maneuvering by the pilot, they were able to come alongside the gangway on the starboard side, allowing the reconnaissance party to board the ship. After boarding, FDNY members met with the ship's captain and chief officer (chief mate) to evaluate conditions. They informed the FDNY members that the conditions in hold #5 had worsened and temperatures were continuing to rise.

FDNY members were brought down to the lower level of the ship (see photo at left) to observe conditions in hold #5. Temperature readings were taken by Haz-Mat personnel, confirming that the steel temperature on the exterior of hold #5 had risen to 200 degrees Fahrenheit. The outside steel of the hold was being cooled by the ship's crew with a house line to keep the temperature of the steel down in an attempt to keep the fire from spread-

ing to the adjacent holds. The temperatures of the adjoining holds were not elevated at this time.

There was a slight steam condition on the lower level due to the hose-line being played onto the outside of hold #5, but the ship's ventilation system was keeping air conditions fairly clear. Readings taken by Haz-Mat personnel were within normal levels. Various options were discussed with the captain and chief engineer. One of the options discussed was flooding the #5 hold with water to extinguish the smoldering coal, but this option was quickly rejected by all parties for various reasons. (See sidebar on page 6.)

The captain recommended using the ship's conveyor system to offload the smoldering coal onto barges, which could be brought alongside the ship for transport of the coal to a landside location to be spread out and extinguished. This option seemed reasonable to Chief Kilduff, the Coast Guard and the ship's agent, who were informed via cell phone of this proposal. Unfortunately, the ship's boom could not be operated in winds greater than 25 mph and current conditions had gusts up to 50 mph.

Weather conditions called for wind speeds to diminish significantly in the afternoon, so the parties decided to wait and then proceed with offloading the hot coal. FDNY members returned to Marine 9's quarters to discuss the operational plan with Chief Kilduff and determine what FDNY resources would be required for this operation. Chief Buckheit remained onboard the *CSL Atlas* to keep apprised of conditions.

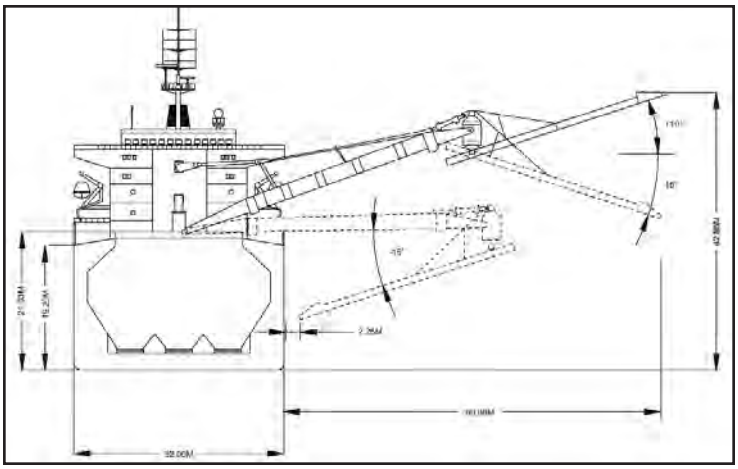
FDNY operational plan

When the reconnaissance team returned to Marine 9's quarters, a meeting was held with Chief Kilduff to develop an operational plan for FDNY units to ensure that the plan to offload the coal from hold #5 onto barges proceeded safely and smoothly. Factors considered in developing this plan included:

- Transportation of required resources to the *CSL Atlas*.
- Water supply issues.
- Air quality in below-deck areas.
- Access/egress to below-deck areas.
- Removal of potentially injured personnel from below-deck areas (high-angle setup).
- Potential confined space operations.
- Medical treatment of potentially injured personnel.
- Ability to control any below-deck fire issues caused by hot coal being removed on rubber conveyor belts.
- Transferring FDNY personnel and equipment from the *Fire Fighter* onto the ship and transporting relief personnel from shore to the *Fire Fighter*.

To address the above-mentioned factors, it was decided that Fire Department operations onboard the *CSL Atlas* would involve the following:

- Stretching and supplying two 2 1/2-inch hand-lines supplied by the *Fire Fighter*. One hand-line would be stretched below-deck to the lower levels via a mid-ship access shaft from the main deck. The other would remain on deck to control any possible problems posed by the hot coal being off-loaded on the ship's boom to waiting barges.

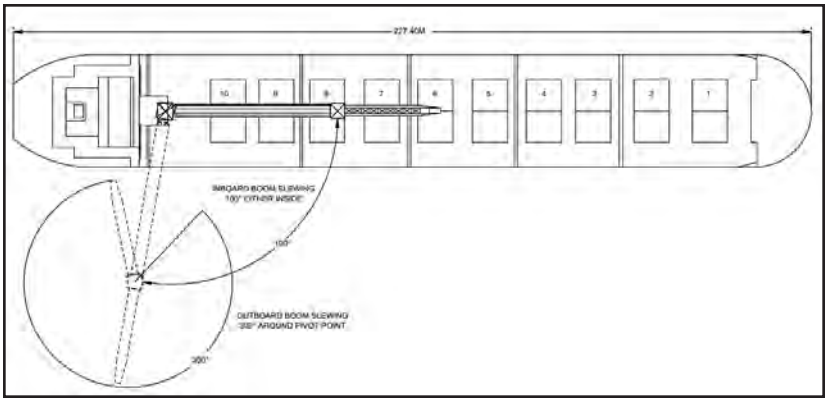


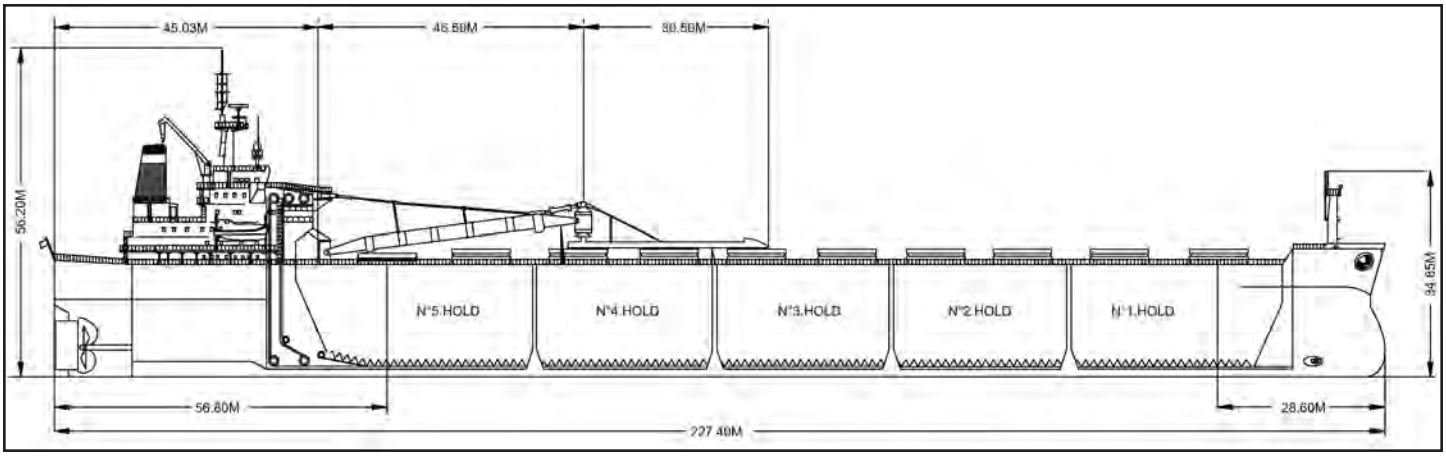
CSL Atlas--Facts and Figures

The *CSL Atlas* is a 745-foot-long by 105-foot-wide bulk carrier, capable of carrying various types of bulk cargo. The ship has five holds, each of which has two hatch covers, for a total of 10 hatches. The ship features a conveyor system consisting of three below-deck conveyor belts and a 250-foot articulating boom, capable of off-loading cargo from its holds to barges alongside or to pier-side facilities.

At the time of this incident, the ship was loaded with 60,000 tons of coal from Indonesia, scheduled to be off-loaded onto barges in New York Harbor and then transported to Connecticut for use in a power plant.

The three *CSL Atlas* schematics shown here depict the articulating boom, used to off-load cargo; and the five holds with the 10 hatch covers.





- Haz-Mat personnel would monitor below-deck and hold #5 conditions, including those of a possible explosive nature.
- In support of the below-deck operations, it was decided that high-angle and confined space operations should be set up and ready to go if needed by FDNY personnel or the ship's crew in below-deck areas. The mid-ship shaft used for stretching the hose-line to the lower level also would be used in the event of a high-angle operation.
- EMS personnel onboard the *Fire Fighter* and *CSL Atlas* would deal with any medical issues that might arise.
- A FAST unit would be required to deal with any developing situations or problems.
- Use of the ship's system to haul equipment from the *Fire Fighter* to the deck of the *CSL Atlas*.
- Using Marine 6 to shuttle members and equipment from Marine 9's quarters to the operation aboard the *CSL Atlas*.

Operations

At approximately 1200 hours, the units listed below (see box, Required Resources) were dispatched to the quarters of Marine 9 to be transported with necessary equipment to the *CSL Atlas* aboard Marine 9. At this time, the wind had subsided to a level that would allow operation of the ship's boom. Chief Buckheit, who had remained aboard the *CSL Atlas*, was instructed to notify the ship's crew that operations would commence on arrival of FDNY resources at the ship. When FDNY resources arrived at the ship, Chief Seelig was notified by the ship's master that the conveyor systems had to be run through a test cycle prior to commencing operations and that this would take approximately 30 minutes.

During the conveyor test cycle, a hydraulic hose on the boom burst, requiring shutdown of the system for repair of the burst hose. Further complicating issues, the ship had no spare hoses on hand and, therefore, a replacement hose had to be fabricated by the ship's crew. By the time the new hose was fabricated and the system repaired and tested, it was approaching 1600 hours. With the boom repaired and operating, FDNY members proceeded to establish a water supply from the *Fire Fighter* to the *CSL Atlas*.

Two 2 1/2-inch hand-lines were stretched, with one line brought to the lower level via an escape shaft that ran from the main deck to the lower level. This line was charged and manned by Engine 153, standing by near hold #5, while the burning coal was dropped onto conveyor belts and transported above deck to the ship's boom and onto waiting barges.

The purpose of this hand-line was to protect personnel operating on the lower level in case the hot coal being removed via conveyor belt should start a fire in the conveyor system. Ship's personnel wet the hot coal as it was dropped onto the conveyor with fresh water from a small house line to keep the coal from flaring up. Care was taken in applying the fresh water to the hot coal since too much water could cause the conveyor to slip, preventing rapid removal of the hot coal.

To decrease the chance of the hot coal igniting the rubber conveyor belt, cool coal from adjoining holds was dropped onto the conveyor belt prior to dropping the hot coal onto the belt. This cool coal coated the conveyor belt, preventing hot coal from directly contacting the rubber belt.

Required Resources

To accomplish the FDNY operational plan, the following resources were required:
- Two Marine Companies (Marine 9 and 6)
- Two Engine Companies (Engines 153 and 155)
- One Ladder Company (Ladder 77)
- One Rescue Company (Rescue 5)
- One Squad Company (Squad 18)
- Marine Battalion
- Rescue Battalion
- Haz-Mat Battalion
- Battalion 22 special-called as a Planning Section Chief
- Additional Haz-Mat personnel
- Chief of Marine Operations
- Chief of Special Operations
- Several EMS Rescue Medics

Hazards of Flooding Hold to Extinguish a Coal Fire

There were several reasons not to flood hold #5 with water to extinguish the smoldering coal. They include:
1. Ship stability issues--By flooding a ship's hold with water, Firefighters introduce a tremendous amount of weight into the vessel, which could affect the ship's stability. As a general rule, when introducing water into a ship, Firefighters must ensure there is an adequate dewatering capability available to remove excess water.
2. Introducing water into smoldering coal can cause acid formation, steam explosions, hydrogen generation/explosion and overstress the vessel. These concerns, expressed by the captain and ship's agent, were confirmed with additional investigation and discussions with marine consultants.
3. The use of salt water on coal can cause possible chlorine gas generation and could render the coal useless.
4. Chemical reaction between water and high-sulfur content coal can produce oxygen, further intensifying a fire.

The other 2 1/2-inch hand-line remained charged and manned by Engine 155 on deck to protect members on deck in case of a fire caused by the hot coal on the rubber conveyor belt above deck. Rescue 5 and Squad 18 set up equipment on deck, adjacent to the ship's escape shaft in preparation for a possible high-angle or confined space operation. Ladder 77 positioned members along the escape route for members below deck in order to assist with any required withdrawal of personnel operating below deck or in emergency situations.

The Haz-Mat Battalion and other Haz-Mat personnel monitored conditions below deck and in the #5 hold throughout the operation. The Marine Battalion supervised the water supply and operations and coordination of all Marine units. The Rescue Battalion supervised set up of the high-angle and confined space operations and then supervised units in below-deck locations. EMS personnel were stationed onboard the *CSL Atlas* and the *Fire Fighter* in the event of an injury to an FDNY or civilian crew member.

Safety concerns
- One of the most hazardous aspects of an "in stream" shipboard operation is transferring personnel from the fireboat to the ship involved. Members never should wear bunker gear when boarding or disembarking a boat or ship. Additionally, when using a Marine unit for transport, members should not wear bunker gear onboard. Bunker gear should be brought onboard the fireboat in gear bags and hoisted to the deck of the involved ship, using a ship's crane or hoisting equipment.
- When proceeding up a gangway onto a ship, members should not bunch up, but maintain sufficient spacing to prevent overloading of the gangway.
- All members operating at a shipboard operation should wear personal flotation gear while making access or egress from a ship and when operating near the water's edge.
- SCBA always should be worn in below-deck areas until air monitoring by FDNY personnel has proved an area to be safe. Continuous air monitoring must be provided throughout the operation.
- Initial discussions with ship's crew should address what hazardous materials may be onboard or involved in the incident. The chief officer is the crew member with the most information on the ship's cargo.

Lessons learned
- The logistics of fighting a shipboard fire "in stream" present major problems not encountered in a pier-side operation. Whenever possible, the pier-side option should be taken, although Coast Guard concerns and the absence of suitable pier-side locations might preclude this option.
- When requesting FDNY units to augment an "in stream" Marine operation, the time lapse between the request for required units and their actual arrival at the point of operations is great and

(continued on page 8)

Members are urged to review the following references:
- "Introducing the MSA Altair Multigas Meter," by Captain Carlos Vazquez, in the 1st/2009 issue of *WNYF*.
- *Responding to Routine Emergencies*, by Battalion Chief Frank C. Montagna.
- *Carbon Monoxide, The silent killer*, by Roy J. Shepard.
- *Carbon Monoxide and Human Lethality*, by Marcelo M. Hirschler.

CO readings will be extremely toxic and dangerous, long before it reaches the range of carbon monoxide flammability.

Can the GasAlert CO detector record the level of CO to which I was exposed?

The newer version of the GasAlert Extreme CO Meter has the ability to record data. These data can be retrieved later, which can identify how many ppm and for how long a member was exposed. This detector also has the ability to record any key action touched by the user. The data-logging feature records every stroke of a key; it will even record if the back light was illuminated.

At a recent incident, the Department was able to visually see the data-logging portion indicating when the Firefighter left the toxic environment and then re-entered. This information is being used and analyzed by FDNY's Safety Battalion to better understand CO and its effects on our bodies.

What is the best way to handle a CO incident/emergency?

Do not lose sight that Firefighters are searching for an invisible, lethal gas. They must find the source of this gas and not leave the building until the source is identified. Otherwise, the results could be devastating. Although the area must be vented, it may be wiser to slowly walk throughout an area, searching with the detector before ventilation begins.

Obviously, if civilians are present, interview them and ask some basic questions, such as:
- Do they or any member of the family have any ailments/symptoms?
- Have they been (or are they) cooking?
- Have they left the car warming/idling in the garage?
- Have they had any recent work done on their heating system?
- Have they recently opened a window?

Some initial actions that Firefighters should take include:
- If necessary, call a second unit to confirm meter readings.
- Get readings in adjoining apartments or buildings.
- Have someone account for all members of the family.

There has been a construction renaissance in New York City within the past several years. Almost every area of the City has experienced some form of revitalization. This can be in the form of garden apartments, condos, duplexes and one-, two- and multi-family attached homes, with garages located in the rear, alongside or underneath these dwellings. Where victims are symptomatic and there is no known source present, a diligent search must be made of these surrounding areas.

Remember, the source of carbon monoxide gas may be an automobile that is silently idling in a garage located several units away from where the call originated. The critical issue in dealing with carbon monoxide is identifying the source of this lethal gas. The GasAlert detector is one of the tools available to identify carbon monoxide gas. Ultimately, it is the Fire Department's professionalism and early intervention at CO incidents, which are responsible for saving a significant number of lives in this City.

About the Author...

Lieutenant Richard Curiel is a 19-year veteran of the FDNY. He is assigned to Haz-Mat Operations. Prior assignments include Ladders 130 and 26 as a Firefighter and Engine 15 as a Lieutenant. He is a Fire Instructor, Level Two, with New York State and National certification. He is studying Biology at Queens College. This is his first article for WNYF.

*(**Seelig**, continued from page 6)*

must be considered in planning an operation. Travel time to the pickup site, loading required equipment and boarding members onto the fireboat can result in unplanned delays.
- A reconnaissance onboard ship by FDNY Chief Officers prior to development of an operational plan and deployment of personnel is extremely important when dealing with a fire or emergency situation aboard a ship.
- Initial discussions with the ship's crew and/or agent are essential when dealing with a shipboard incident. Although officers aboard ships entering U.S. ports are required to speak English, language barriers could still exist. Boarding the ship, Fire Department members immediately should request to meet with the captain or chief officer and verify that all crew members have been accounted for. A ship's crew list should be requested and accountability of all members listed verified. A copy of the ship's crew list, along with the ship's fire safety plan, usually can be found in a weather-tight box adjacent to the gangway on either side of the ship. (See photo at right.)
- Shipboard operations tend to be very lengthy. Rotation of and plans for relief of members must be considered in the planning stages. Logistical considerations, including food and water for operating members, must be anticipated for prolonged operations.

The ship's fire safety plan usually is found in a weather-tight box, adjacent to the gangway on either side of the ship.

Conclusion

The off-loading of the burning coal onto the last barge finally was completed at 2100 hours on December 30, 2008, 27 hours after the initial notification by the Coast Guard on December 29. The extreme weather conditions encountered during the operation tested the stamina and determination of all members involved. The professionalism and adaptability of FDNY personnel resulted in the successful conclusion to this unusual, but challenging, incident.

About the Author...

Deputy Assistant Chief William Seelig is a 31-year veteran of the FDNY. He is the Chief of the Special Operations Command. Before becoming a Staff Chief, prior assignments included Chief of Rescue Operations and Division 6. He was an original member of the FDNY Incident Management Team, serving as an Operations Section Chief. He holds a bachelor's degree in civil engineering from Manhattan College. This is his second article for WNYF.