

A Command-Level Critique of the West 57th Street Crane Collapse

by Assistant Chief John Sudnik, Manhattan Borough Commander

FDNY units responded to a reported crane collapse on West 57th Street, between 6th and 7th Avenues, at 1433 hours on October 29, 2012. On arrival, members found that a section of the boom was hanging precariously from the crane at the 75th-floor level, obviously the result of the near-hurricane-force winds from Hurricane Sandy.

Engine 23 was the first FDNY unit on the scene and immediately began taking action to establish a collapse zone. Members employed the PA system on the apparatus and yellow barrier tape to clear civilians from the area of greatest concern on West 57th Street. On arrival, Battalion 9 directed other units to block incoming traffic, further setting up and expanding the collapse zone.

Engine 23, Ladder 4, Squad 18, Rescue 1 and Battalion 8 took the construction hoist to the 18th floor and walked up to the 75th floor to survey the damage and structural integrity, search for unaccounted workers and secure loose debris. Wind conditions were so severe that the members were required to be secured with safety rope and personal harness before exiting onto the open floor area. The units were able to take smart phone pictures of the damage and text them to the Command Post for the benefit of the Incident Commander (IC). New York City Department of Buildings (DOB) engineers were escorted to the crane location so that they could assess the damage.

When Con Ed representatives arrived on-scene, they apprised the IC of the utilities running directly below the hanging crane on West 57th Street: a high-pressure steam main and a 12-inch, high-pressure gas main. Con Ed reported that the resulting steam explosion would be “catastrophic,” with steam, asphalt and concrete projecting 20 stories into the air and from 6th to 7th Avenue. Similarly, any gas explosion and resulting fire would be equally devastating. The immediate evacuation of all buildings in the general vicinity of the hanging boom became the highest priority. It took approximately 30 minutes for Con Ed to shut down the steam main and almost two hours to shut off the gas and purge the main.

In collaboration with DOB representatives on-scene, the IC determined that the collapse zone should be expanded to include West 57th Street, the north side of West 56th Street and the south side of West 58th Street from 6th to 7th Avenue. In total, 34 buildings—including a 42-story hotel, a 62-story office building and a 62-story, high-rise multiple dwelling—were fully evacuated.

A fourth-alarm assignment was needed to accomplish this task and the incident was placed *Probably Will Hold* at 1946 hours, approximately five hours after the first unit arrived. It took several more hours, however, to completely evacuate all remaining buildings within the collapse zone. In the absence of any other alternative, the evacuated civilians were directed to shelters at nearby

public schools designated by the Office of Emergency Management (OEM). There were no injuries reported as a result of the evacuation of an estimated several thousand people.

During the next several days, FDNY kept a watch line to maintain command of the incident, continued to enforce the collapse zone with the assistance of NYPD resources and attended daily inter-agency meetings. A plan to secure the boom to the crane was



The crane collapse in midtown Manhattan necessitated evacuation of thousands of people across an area covering multiple City blocks.

formulated by the DOB, the general contractor and the crane owner/operator.

On Saturday, November 3rd, the crane operator tied back the crane mast to the building to reduce the potential for crane failure/collapse. With Rescue 1 members equipped with high-angle equipment standing by as a precaution on the 75th floor, the crane was manually turned and the hanging boom section was securely lashed.

On Sunday, November 4th, the DOB deemed that the collapse potential was mitigated and determined that the surrounding buildings could be re-occupied. Division 3 then placed the incident *Under Control* at 1849 hours, six days after Hurricane Sandy hit New York City.

Size-up

Emergency operations at incidents where a structure either has collapsed or is in imminent danger of collapsing generally are similar. Since the imminent collapse can, and sometimes will, result in a collapse or structure failure, the strategies, tactics and safety precautions prescribed for both scenarios are standardized.

A major structural collapse normally will create numerous hazardous conditions that must be recognized and handled by responding FDNY units. The potential hazards to both FDNY members and civilians alike include, but are not limited to: the structural instability of adjoining structures; ruptured water, high-pressure steam and natural gas mains; downed electrical wires; and respiratory exposure to dust and asbestos.

In both the imminent collapse situation and at those where collapse already has occurred, operating units must consider all such hazards in their size-up, while simultaneously taking immediate action to address the impending threat to life. Confronted with near-hurricane-force winds, the first-arriving FDNY Chief and company Officers quickly determined that the hanging boom section of the crane at the 75th-floor level was in danger of imminent collapse, which would create significant exposure to several life-threatening hazards.

Safety considerations

Establishing the initial Collapse Danger Zone is the most essential safety precaution to be taken at any collapse incident. Immediate action is crucial during the initial stages of an operation to control site access and reduce the risk of exposure to the aforementioned potential hazards. Physical barriers should be set up to keep civilians out of the danger zone and also to prohibit them from interfering with emergency operations. Equally as important, the IC must provide for personnel accountability by establishing and maintaining control points and granting access only to authorized personnel and resources.

FDNY units accomplished these tasks by using the public address feature on the apparatus to quickly evacuate West 57th Street in the area immediately below the hanging boom and apparatus, along with yellow barrier tape, to control access from West 57th Street at 6th and 7th Avenues. When the danger zone was eventually expanded to include West 56th and 58th Streets, the IC requested the assistance of NYPD resources to secure the entire perimeter.

Much of the inherent danger at collapse incidents often is attributed to factors that responding fire department units find difficult to predict, identify or control. Since it is virtually impossible to determine the exact point of additional failure of a compromised structure, life safety operations are conducted using an ongoing risk/benefit analysis. The evacuation of West 57th Street directly

below the hanging boom initially was given the highest priority and operations in that extremely dangerous area were warranted, given the significant potential for loss of life.

The next incident objective was to gain access to and begin evacuation of exposures from areas of relative safety. The IC made an assessment of the potential damage resulting from boom failure and occupants were removed from the most exposed buildings first.

Although the hazard potential from utilities is always a concern at collapse incidents, it is the extent of such that is not always readily apparent. Having emergency crews from all involved utility companies present at the Incident Command Post (ICP) is necessary to accurately assess and mitigate the hazard potential.

Con Ed representatives on the scene briefed the IC early in the incident about the "catastrophic" secondary events that likely would occur as a result of a falling boom piercing the high-pressure steam and natural gas mains running under West 57th Street. Since a breach of utility lines would endanger occupants and FDNY members in and around the nearby buildings, mitigation of these hazards became a primary incident objective. It is important to note that FDNY units are not trained or equipped to isolate and purge high-pressure steam and gas mains. Only qualified utility company personnel must handle these tasks.

Since these two separate mitigation operations had to be performed inside the collapse zone, FDNY units were assigned to assist Con Ed personnel and provide for their safety and accountability.

Incident Command

In addition to performing an initial size-up of conditions and addressing any immediate safety concerns, the IC must establish command and take control of the collapse incident. According to the New York City Citywide Incident Management System (CIMS), a structural collapse is considered a single command event (as opposed to Unified Command) and the FDNY ranking Officer is designated as the IC.

One of the initial considerations for the IC at any incident is to ensure the prompt establishment of the Incident Command Post. The location of the ICP should be in the immediate vicinity of, but outside, the Collapse Danger Zone. If inclement weather or other factors affect the efficient operation of the command element, it may be advantageous to relocate the ICP to the inside of a building. Regardless of the location, the area must be large enough to accommodate representatives from other agencies. Obviously, the heavy wind and rain from the storm created adverse conditions and the ICP at this incident promptly was moved to the inside of a retail store on the corner of West 57th Street and 7th Avenue.

As in any kind of large-scale emergency operation, clear and concise inter-unit communications on the handie-talkie tactical channel are vitally important. Due to the number of resources deployed at a confirmed collapse incident, the FDNY IC also must ensure that a separate handie-talkie frequency is established solely for command-level communications.

Experience has proved that the implementation of a command channel provides for streamlined communications, making for a safer and more efficient operation. Battalion Chiefs, with the assistance of their assigned Aides, monitored both the tactical and command channels, providing the Operations Section Chief with situational awareness from each of their respective Sectors on West 56th, 57th and 58th Streets.

Operations

The obvious differences between initial fire department operations at incidents where a structure is in danger of collapsing and that at which a collapse already has occurred are the search/rescue and evacuation components. In the latter case, immediate search, rescue and removal of surface victims is a high priority; and in the former, more attention should be dedicated to the evacuation of civilians in exposed buildings. After removing all people in imminent danger from the street in the area directly below the hanging boom, units were directed to begin full evacuation of the adjoining buildings. Operating in the most severely exposed buildings first, the plan was for an orderly, but expedient evacuation of all buildings on West 57th Street, between 6th and 7th Avenues.

However, after closer evaluation by DOB engineers, the IC and Operations Section Chief (OSC) determined that the potential existed for the tie-backs securing the crane to the building to dislodge and the entire 75-story mast to collapse. The collapse danger zone then was expanded to include all buildings on the south side of West 58th Street and the north side of West 56th Street, from 6th to 7th Avenues. Evacuation of all 34 buildings in the designated area required the use of a fourth-alarm assignment and several hours to complete.

Every major collapse operation requires the use of special resources to support the responding engine and ladder companies. The FDNY is fortunate to have highly trained Rescue and Collapse Rescue Units assigned to each of the five boroughs and are available to respond at all times. These units are equipped with all the necessary equipment to perform the tunneling, trenching and shoring commonly required at such operations.

Other special and support units from the FDNY Special Operations Command (SOC) available to provide expertise, tools and equipment at a major collapse operation include Haz-Mat Co. 1, SOC Support Ladder Companies, the Tactical Support Unit, the Dewatering Unit, the SOC Compressor Truck and the Logistics Support Vehicle. Additionally, FDNY EMS will dedicate to the incident Advanced Life Support (ALS) and Basic Life Support (BLS) resources, including Rescue Paramedic Ambulances with personnel trained to provide patient care within collapse zones and confined spaces.

With no immediate need for search and rescue, the first-arriving engine, ladder and Rescue companies proceeded to the 75th floor to assess the damage at that level.



Close-up view of the crane's disabled boom.

The extreme conditions made the task of evaluating the damage to the crane and the condition of the hanging boom section much more precarious than under normal circumstances. Safety lines were deployed to secure FDNY members and DOB engineers as they approached the perimeter of the building to take photos and make an appraisal.

Once this initial assessment was completed, all operating personnel were ordered out of the building until the next day when conditions were forecast to be significantly better. A surveyor's

transit was deployed but proved ineffective for monitoring purposes because it was continuously alarming. All units were advised until further orders that the swaying boom constituted a continuous collapse hazard. The IC determined that there would be no attempt to secure the boom until a certified crane engineer formulated a plan that was acceptable to DOB. During the next six days, Rescue 1 members provided technical advice to DOB and a safety team for the contractors working to secure the crane.

Planning

At large-scale incidents, especially those with the potential to extend past one operational period, the IC must ensure that the Planning Section is established. The FDNY accomplishes this by assigning a Battalion Chief to assume the role of the Resource Unit Leader (RUL) to all incidents requiring a second or greater alarm and major emergencies, such as building collapses (signal 10-60). The RUL reports to and remains at the ICP and performs the following duties: accounts for all resources at the scene, maintains the Command Board, records and updates the status of all resources, ensures adequate resources are held in reserve and identifies the Sectors/Groups to which Chief Officers and units are assigned.

When an incident reaches the level of a fourth alarm, a special-trained Battalion Chief is assigned and designated the Planning Section Chief (PSC). To assist the PSC, a trained engine company will respond with a well-equipped Planning Vehicle that can produce various documents--such as maps and Incident Action Plans--and is also large enough to comfortably host approximately eight to 10 people for an inter-agency meeting. With FDNY units engaged in the evacuation of 34 buildings, the RUL was charged with the challenging task of providing accountability for each unit on the scene, recording this information on the Command Board and providing situational awareness for the IC and PSC.

Lessons reinforced

- The IC must ensure that the Collapse Danger Zone is strictly enforced for both FDNY and civilian personnel. No one should be allowed to enter that restricted area without approval from the IC. This message should be reinforced during the safety briefing held at every inter-agency meeting.
- Representatives from utility companies are a tremendous resource for the IC at major fires and emergencies. It is important that FDNY Chief Officers build working relationships with these utility emergency crews before the incident occurs. Site-familiarization, table-top and large-scale exercises offer ideal opportunities to make these connections.
- The early identification of Sectors and Groups according to Incident Command System (ICS) guidelines provides for manageable span of control and more efficient use of incident resources. Also, establishment of a command channel frequency affords the IC with greater control of incident communications and more complete situational awareness.
- The evacuation of thousands of occupants--many of whom are transient--from exposed buildings is a considerable challenge under normal circumstances. In hurricane-like conditions, it is significantly more difficult to move civilians out of their residences. The IC should task OEM with identifying temporary shelters for evacuees. Nearby schools, armories, churches and similar-type institutions have been used with good success in the past.

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Members are urged to review the following articles in this issue of WNYF:

- “A Command-Level Critique of the West 57th Street Crane Collapse,” by Assistant Chief John Sudnik, Manhattan Borough Commander, on page 19.
- “Queens Fires and Floods,” by Deputy Assistant Chief Robert R. Maynes, Queens Borough Commander, on page 14.
- “Special Operations Command Response to Hurricane Sandy,” by Assistant Chief William C. Seelig, Chief of SOC, on page 32.
- “Hurricane Sandy Sparks Conflagration in Breezy Point,” by Assistant Chief Joseph W. Pfeifer, on page 24.

(major emergency) for a collapse and notified the dispatcher that members were in the structure at the time of the collapse. He ordered Squad 18 and Ladder 8 to evacuate the building immediately and account for their members. Rescue 1 members climbed past the debris on the sidewalk and entered the building to assist the units and any civilians with evacuation.

Tower Ladder 9 was proceeding to relocate and was in the vicinity of the building when the Officer heard the 10-60 transmission for a collapse. As they passed the building, the Officer asked Chief Fahy if his company’s services were needed. Chief Fahy ordered Ladder 9 to set up in front of the building and use their bucket; first, to help any member or civilian who had to be removed from the upper floors and, later, to remove and secure portions of brick and cornice that were hanging precariously.

Simultaneously, Engine 3 stretched a precautionary hand-line to cover the entire site. Using the handie-talkie, Chief Fahy then conducted a roll call for Squad 18, Ladder 8 and Rescue 1. All members safely evacuated the building and there were no civilians left in the structure at the time of the collapse.

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- The incident should not be placed *Under Control* until all potential hazards are deemed secure. At large-scale incidents, such as building collapses, the IC should anticipate the FDNY being in command as the lead agency for many hours, even days. If necessary, the IC should assign resources (i.e., high-angle rescue) to stand by while civilian engineers and contractors work to stabilize the hazard.
- The IC is responsible for scheduling periodic inter-agency meetings; the frequency of such will depend on the level of activity at the scene. At these briefings, representatives from governmental agencies and numerous other entities will seek to provide input into the resolution of the incident from their own perspective. To ensure that incident safety is maintained, the IC must begin each briefing by clearly reiterating the incident objectives, especially the strict enforcement of the Collapse Danger Zone.
- Potential collapse incidents normally will be placed *Under Control* when the DOB has provided the necessary resources to support the incident and otherwise has made a determination that the hazard is safely secured. The IC then can conclude FDNY operations and transfer command to the ranking DOB official on-scene.

Conclusion

How does an IC prepare for the potentially catastrophic incident? Obviously, it is not every day that units operate at a crane boom dangling precariously from a building 75 stories tall, in near hurricane-force winds, with the potential for mass casualties. At all incidents--routine or otherwise--an IC must rely on knowledge, experience and training. When incidents become increasingly complex, it is advisable to remain focused on the basics. This particular incident

When Deputy Chief James Hodgens, Division 1 Commander, arrived, Chief Fahy told him all members were accounted for and the primary search of the structure was complete and negative. This information then was transmitted to the Manhattan dispatcher.

Chief Hodgens ordered the collapse zone enlarged and monitored by Battalion 1, the Safety Officer. He then ordered primary and secondary searches of exposure #2, a three-story, non-fireproof multiple dwelling. All searches were completed and found to be negative.

The Department of Buildings (DOB) and Con Edison were called to the scene. Once the DOB engineer determined that the structure was not in danger of further collapse, FDNY members re-entered the building and assisted Con Edison personnel with shutting the utilities. Additionally, Chief Hodgens ordered the members of Ladders 18 and 9 to remove the unsecured brickwork. Ultimately, 10 adults and four children were displaced due to the collapse. Once the immediate hazards were mitigated, units were placed back in service as a long night was just beginning.



About the Author...

Battalion Chief Michael Fahy is a 14-year veteran of the FDNY. He is assigned to Battalion 20. Previous assignments include Engines 35, 224 and 83 and Ladders 14 and 11. Holds BA, JD and MA degrees from SUNY at Binghamton, New York Law School and the Naval Postgraduate School, respectively. This is his first article for WNYF.



Members are urged to review “Midtown Manhattan Crane Collapse Wreaks Havoc,” by Deputy Chief James Hodgens, “The Safety Perspective at Crane Collapses,” by Assistant Chief Allen S. Hay, Chief of Safety, “SOC Operations at the March 15, 2008, Crane Collapse,” by Battalion Chief James Harten, and “Comparing and Contrasting the two Manhattan Crane Collapses,” by Deputy Chief James Hodgens, all in the 3rd/2008 issue of WNYF.

became significantly more challenging by the adverse conditions caused by Hurricane Sandy, yet FDNY units successfully accomplished the primary objective of protecting life and property by following the standard procedures for safety, ICS and collapse operations.

This prolonged operation was just one of the many notable events that took place during the 9x6 and 6x9 tours on October 29th. Many members operating at this incident for many hours on the day tour also worked arduously throughout the night. As history proved, FDNY units were well-prepared, determined and faced every challenge with resolve. By all accounts, once again, they exceeded the high standards the citizens of New York City have come to expect from the FDNY.



About the Author...

Assistant Chief John Sudnik is a 27-year veteran of the FDNY. He is the Manhattan Borough Commander. Previously, he was the Queens Borough Commander. He holds a bachelor’s degree in Finance and Economics from CUNY-Baruch College and a master’s degree in Homeland Security from the Naval Postgraduate School. He writes occasionally for WNYF.

