Mill Structures--Their Features and Firefighting Operations, Part II

by Assistant Chief Ronald R. Spadafora

Editor's Note: *This second part of a two-part article focuses on firefighting operations at mill structures.*

Firefighting operations

Fires in mill-constructed buildings pose a tremendous operational challenge. Firefighters must be prepared to engage heavy fire conditions. To fight fires in mill buildings effectively, two major concerns must be dealt with: 1. the large, open area containing a heavy fuel load, which allows small fires to escalate rapidly to multiple alarms and 2. the high collapse potential due to age. In addition, many of these buildings have undergone major renovations, resulting in high occupancy residences, business spaces and ground-level commercial occupancies.

The first-arriving Chief Officer must assume command as the Incident Commander (IC). This Chief normally establishes the location of the Incident Command Post (ICP) on the exposure #1 side of the structure. However, the ICP should not be placed too close to the fire building since radiant heat and flying brands from an advanced fire can make the surrounding area untenable. The IC will be responsible for making an initial size-up to determine adequacy of the response and the need for additional resources. To formulate a basic strategic plan, the IC on arrival should contact all units already on the scene.

The Chief must ascertain unit locations, life hazard, hose-line placement, status of searches/occupant evacuation, fire location/severity, heat/smoke conditions and supplemental actions being implemented. Does the engine have a positive water supply? Additional responsibilities of the IC include establishing a command channel when warranted and controlling ladder company and HVAC ventilation.

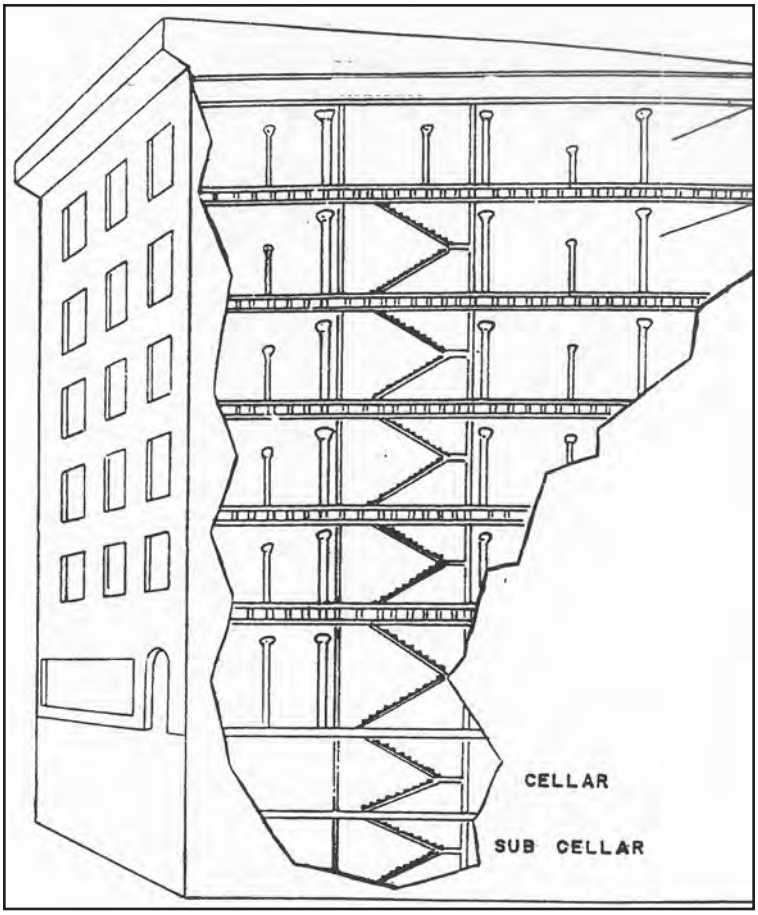
Battalion Chief duties at fires in these type buildings are predetermined only for the IC and Fire Sector Supervisor or Branch Director. Battalion Chief assignments after these positions are filled are determined by the IC. Establishing additional ICS Command and General Staff positions, when needed, will facilitate the coordination and control of operating forces.

Long stretches of 2½-inch hose reinforce the need for engine companies to team up in order to get hose-lines in position to fight the fire. Back-up hose-lines should be of equal diameter to the first hose-line. Setting up and supplying a water manifold in front of the fire building will help manage additional hose-lines being stretched and utilized.

Standpipe operations for upper-floor fires require hooking up hose to the outlet on the floor below the fire from the relative safety of an enclosed stair. It is of utmost importance that the standpipe siamese be supplied and augmented. Additional hose-lines can be employed through the use of interior stairs, fire escapes, exterior

Heavy fire conditions in mill-constructed buildings dictate defensive operational strategy and the use of large-caliber streams. *photo by Steve Spak*

FDNY archives material



Drawing denotes sub-grade level floors of a mill-constructed building.

Sliding-type fire door at fire wall opening. Note the functionality of the fire door has been compromised by storage materials up against it.

screened stairs and utility ropes. Engine companies arriving on greater alarms can be used to reinforce and relieve hose-lines already in operation.

High ceilings and large uncompartmented areas can mask heat conditions. Be aware of the possibility of heat and smoke passing overhead and fire breaking out to the rear of operating forces. To warn and protect members on interior hose-lines, it may be wise to post a member as a lookout on the floor. Engine Officers should communicate with the IC when their hose-lines are applying water on the fire. There is potential for a backdraft on floors where proper ventilation cannot be attained.

Use the reach of the hose stream and begin the attack with Firefighters crouched low. The hose-line should be operated upon arrival into the fire area. Taking this action may allow the water stream to cool hot gases in the ambient air. This tactic should be coordinated with exterior ventilation. Fire doors must be secured in the open position when hose-lines pass through them.

Remote cellar entrance. Forcible entry will require the power saw with a steel-cutting blade.

photos this page by Assistant Chief Ronald R. Spadafora

Crowned cobblestone street in disrepair includes train rails that no longer are used. Ladder apparatus setup can be hampered.

Below-grade strategy and tactics

Sub-grade fires require the first-arriving engine company to attempt access via the interior. If conditions prevent this hose-line from reaching the fire, the Officer must inform the IC and take a defensive position inside the building to prevent upward fire extension. The second engine company should assist in stretching the first hose-line. Standpipe operations require siamese supply and augmentation. Also, don't forget to feed the sprinkler siamese.

Additional engine companies should stretch a back-up line. If the first hose-line is not advancing on the fire, the second hose-line should seek an alternate route (interior or exterior) to the fire area. Additional hose streams may be operated into exterior openings if the interior attack fails.

Note: *In cellars and sub-cellars equipped with perforated pipe sprinkler systems, sometimes it is possible to feel the heat or see the smoke at the siamese connection, indicating the location of the fire.*

Stubborn sub-level fires can be attacked and vented by cutting through flooring and installing cellar pipes, distributors, high-expansion foam generators and smoke ejectors on the floor directly above the fire. They also may be fought by placing multiversals or generators in front of the building and applying extinguishing agent from the exterior via cellar entrance stairs, sidewalk elevator lift or freight elevator shaft. Cellar entrance stairs may be located remotely from the front of the building.

Saving lives is a primary duty of ladder companies, followed by locating and identifying the fire. Life hazard can exist in cellars and sub-cellars, as well as all above-grade floors of mill-constructed buildings. Ladder company Officers must size up the types of occupancies present to evaluate the life hazard potential. Due to the large dimensions of these type buildings, ladder companies also should be directed to team up inside the building to perform required duties to enhance efficiency and safety. All ladder companies should carry search ropes and thermal imaging cameras into the building.

Buildings must be well laddered to rescue occupants, perform vent/enter/isolate/search (VEIS) operations and provide roof access/egress. In historic districts, crowned cobblestone streets in various states of disrepair can hamper apparatus setup, positioning and ladder placement.

Specialized units

The IC should make full use of special units responding in on alarms for fires in mill loft buildings. A good example of this is using Rescue and Squad company hydraulic, pneumatic, electrical and hydrocarbon-fueled tools and equipment to augment entry operations into the fire building. Forcible entry into locked building

photo by Steve Spak

Fireboat operation at Greenpoint Terminal Market conflagration, Brooklyn Box 10-10-0036, West/Quay Streets, Greenpoint, May 2, 2006.

entrances and individual occupancy doors will be extremely labor-intensive. Exterior and interior doors equipped with multi-lock devices will be difficult to force conventionally. The through the lock method may be preferred for multi-lock doors. Forcible entry at the rear and sides of mill buildings can be even more arduous due to limited access and the use of roll-down gates.

Horizontal ventilation also will be hindered by a multitude of obstructions that both restrict access, as well as protect building openings. Razor wire, wrought-iron fences, shed coverings, window bars, window gates and grills, iron shutters, bricks, cement blocks, wired glass and hardened glass cubes are just some of the impediments that Firefighters may encounter when venting the building.

Hazardous Materials Company 1 also may prove helpful with their expertise during fires encountered in mill loft manufacturing and warehouse occupancies. These specialists can provide technical information regarding the toxicity and flammability potential of building contents. For fires on the waterways, the IC should fully utilize fireboat large-caliber streams when warranted.

Collapse potential

For heavy fire conditions on arrival, consider initially attacking the fire using engine apparatus deck guns and ladder pipes. Exterior streams should be used only as long as necessary to extinguish visible fire. A quick fire knockdown using these large-caliber streams may facilitate an aggressive interior attack. Use the 20-minute rule as a warning sign that imminent structural collapse during firefighting operations can occur. A large, open-floor area with a heavy body of fire burning out of control for 20 minutes or the inability of interior firefighting forces to make successful headway against a heavy fire condition within 20 minutes should alert the IC to consider removing all members from the fire building and changing to a defensive mode of attack on the fire.

Members are urged to review the following references:

- Loft Building Fires and Addendum 1 (Reference Figures and Photos), *Firefighting Procedures*, May 17, 2011.
- Loft Building Operations, by Howard J. Hill, *UFOA Health and Safety Newsletter*, Volume 13, No. 1, April/May, 1999.
- "Firestorm at the Greenpoint Terminal Market," by then-Deputy Assistant Chief Joseph W. Pfeifer, in the 4th/2006 issue of *WNYF*.
- *Lofts* (unpublished training manual), by Philip Ruvolo, circa 2000.
- "Loft Buildings: Unusual Features and Chief Concerns," by then-Deputy Assistant Chief Ronald R. Spadafora, in the 1st/2006 issue of *WNYF*.
- "What Firefighters Should Know About Gravity Tanks," by Assistant Chief Ronald R. Spadafora, in the 2nd/2012 issue of *WNYF*.
- "What Firefighters Should Know About Pressure Tanks," by Assistant Chief Ronald R. Spadafora, in the 3rd/2012 issue of *WNYF*.
- "Mill Structures--Their Features and Firefighting Operations, Part I," by Assistant Chief Ronald R. Spadafora, in the 2nd/2014 issue of *WNYF*.

Summary

Mill structures have a variety of unique construction features that will prove challenging to firefighting forces. Today, mill lofts still remain as manufacturing and storage warehouses or have been converted to a wide array of other occupancies. Fires in mill loft buildings often are discovered in the advanced stage upon arrival, especially at night in desolate industrial and commercial neighborhoods.

In May 2006, a conflagration involving a complex of 10 vacant, mill-constructed, loft factory and warehouse buildings located at the Greenpoint Terminal Market in Brooklyn took 12 hours and 10 alarms to be brought *Under Control*. It was the largest fire in New York City since 9/11.

About the Author...

Assistant Chief Ronald R. Spadafora has served the FDNY since 1978. He is the Chief of Logistics. He holds a Masters degree in Criminal Justice from LIU-C.W. Post Center, a BS degree in Fire Science from CUNY-John Jay College and a BA degree in Health Education from CUNY-Queens College. He is an Editorial Advisor and regular contributor to WNYF.