

FDNY Safety and Health Issues at the World Trade Center Complex (Ground Zero)--Part II

by Deputy Assistant Chief Ronald Spadafora

Editor's Note: Part I of FDNY Safety and Health Issues at the World Trade Center Complex (Ground Zero) appeared in the 1st/2002 issue of WNYF.

Fall protection

OSHA standards require workers to be protected from falls at elevations more than six feet above ground. The Site Safety Officer (SSO) often discussed fall hazards with the FDNY Operations Chief because conditions on the debris pile changed on an hourly basis. The placement of fall protection then was coordinated with the Prime Contractor Safety Representative responsible for the area.

Jersey (cement) barricades and wooden barriers were the primary systems used. When primary fall protection systems were impossible to install due to terrain, Chief Safety Officers identified fall hazards and instructed Recovery Team Leaders (Company Officers) to have members back away from exposed edges. Chief Safety Officers were authorized to suspend all operations if debris/rubble piles began to shift or falling debris from surrounding structures became a hazard.

Heavy demolition equipment safety

All Recovery Team personnel remained a minimum of 50 feet away from the operating radius of debris-removal equipment. Additionally, in areas of known instability (Restricted Work Zones) established by structural engineers, recovery operations were limited strictly to one spotter per machine.

Confined space entry protocol

Any void or recessed area uncovered by demolition operations was evaluated by the FDNY's Special Operations Command (SOC) prior to entry. A confined space is defined as a space (pipe, duct, tank, excavation, tunnel, vault, conduit, pit, void or recess, etc.), large enough for a person to enter and perform work. It has a restricted means of entry or exit and is not designed for continuous occupancy.

Contractor or agency personnel seeking entry into confined spaces with the potential to contain a hazardous atmosphere, dan-



(Above) Lone spotter (debris removal observer) wore reflective vest (arrow) and stayed 50 feet from the operating radius of a demolition grappler.

gerous physical configuration or any other recognized serious safety/health hazards had to submit a written plan (permit). The plan then was reviewed by SOC and engineers from the New York City Department of Design and Construction (DDC) and OSHA for approval. The FDNY had to be notified 24 hours in advance for all permit-required confined space entries. SOC determined whether an FDNY escort was required. If not, SOC either monitored entrant activity from outside the entrance with retrieval devices, life lines and/or mechanical lifting equipment or allowed the contractor/agency to provide its own trained employees as attendants.

Hazardous material management

A number of different chemical substances, compounds and associated wastes were used or stored at the WTC. These materials were required for various reasons, including maintenance and janitorial operations. Material Safety Data Sheets (MSDS) for all chemicals at the WTC were obtained by the SSO from the Port Authority (PA).

The PA also supplied chemical inventory lists for each building inside the WTC complex. This information was used when unmarked containers (cylinders/drums) were uncovered by demolition machinery on the debris pile. All undamaged containers were removed by the FDNY to designated steel cages located at safe areas. Then, they were examined and identified by the EPA and taken from the site.

The FDNY Hazardous Materials Unit was special-called to respond by the Operations Chief for mitigation purposes when



(Above) Fall protection--Jersey (cement) barricades along the Tully Roadway protected vehicle operators and recovery workers from fall injuries.

all photos by Heather Smith

damaged/leaking containers were encountered. They worked in conjunction with on-site SOC personnel and the New York State Department of Environmental Conservation (DEC).

Fire Prevention Bulletins, formulated specifically for the WTC project, enabled the Fire Department to safely manage interior steel-cutting and welding operations. They also regulated the transportation, storage and use of flammable and combustible liquids and gases. Tube trailers, containing large amounts of compressed oxygen and portable liquid oxygen cylinders, were included in FDNY's enforcement policies.

Dust suppression

Many contaminants, including asbestos, metals, silica, organic compounds, aromatic hydrocarbons and others, were contained within the tremendous amount of debris and dust at Ground Zero. The prime contractors, employing water tankers for dust suppression on the debris pile, safeguarded workers and the surrounding community. The FDNY assisted in this operation with the use of tower ladder streams, multiversals, stangs and hand-lines. However, the primary focus was on extinguishing fires uncovered during the debris removal process.

Weapons, ammunition and explosives protocol

WTC 6, Customs House, contained two pistol ranges (B-1 and B-6 sub-levels). Approximately one million rounds of live ammunition were stored inside these ranges. Ammunition consists of case material (brass or aluminum), lead projectile and the primer and propellant. Exposed to fire or temperatures above 392 degrees Fahrenheit, the primer and propellant can ignite, causing the case to fragment and act as a low-velocity projectile.

It is also possible to strike the primer to cause the ammunition to discharge. Steel-cutting in places where weapons, ammunition and explosives (small amounts used by PA police to train dogs) are located is strictly regulated. Recovery Team members examining the rubble in these selected areas were issued full-face shields for optimum eye protection. All discovered weapons were assumed to be loaded and FDNY members gave all explosives the hands-off treatment. Firefighters were instructed to evacuate the area a minimum of 100 feet in all directions and notify the PAPD or NYPD immediately through the FDNY chain of command.

Manual lifting safety

Recovery Teams handled, lifted and moved objects of varying weights and sizes. Improper manual lifting can cause back pain and injury. Proper lifting techniques were stressed during orientation training and include:

- Restrict lifting in a kneeling/crouched position to minimize weight and repetition.
- Keep loads centered and close to the body.
- Avoid repeated one-hand lifting.
- Arrange lifting tasks to keep the load between knuckle height (arms hanging at sides) and shoulder level.
- Avoid twisting motions during load transfer.
- Take breaks at a minimum of every two hours.

Rehabilitation and creature comforts

During unusual warm/cold weather, the SSO ensured the FDNY Operations Chief was aware of the need



(Above) Dust suppression--Water tanker sprayed hot spot in debris field.

for timely and additional relief periods for Recovery Team members. In warm weather, Firefighters were directed to shelters/rest havens, away from the debris pile, where cold drinks were available for rehydration.

Cold stress and hypothermia are concerns during the cold winter months. Cold stress can cause workers to be distracted, preoccupied and irritable. Symptoms of hypothermia include poor coordination, which impairs a Firefighter's ability to work safely. To counteract the ill effects of cold weather, members were supplied with insulated underwear and coveralls. Sweatshirts also were issued for additional clothing layers required to counteract low temperatures. Warm-up shelters supplied with electric heaters were located throughout the site. Food and warm beverages were available to all workers, courtesy of the Salvation Army, at a light-weight metal and canvas structure known as the Biosphere.

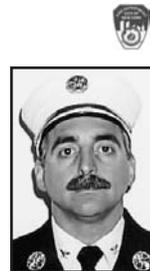
Conclusion

Ground Zero has been called the most dangerous work site in America. An error in judgment, a misstep in the wrong direction or faulty rigging hardware could have precipitated grave consequences. From the onset of the attack, however, phenomenal cooperation among Federal, State and local agencies, the construction industry and the City's uniformed emergency service workers permitted a safe and successful rescue and recovery operation. In fact, during the recorded period of October 1, 2001, through April 30, 2002, members worked a total of 1,017,600 man-hours and sustained 187 injuries--a tribute to those doing the work and their supervisors.

Note: Deputy Assistant Chief Spadafora responded to Ground Zero from home via the FDNY mustering site located in Flushing, Queens (Shea Stadium), on the morning of September 11, 2001. (See "How FDNY Mustering Site Supplied WTC Site with Fresh Troops," by Deputy Chief Alexander Parzych in the 1st/2002 issue of WNYF.) In October 2001, he was detailed to the WTC Incident Command and designated the FDNY Site Safety Officer with ultimate responsibility for the safety and well-being of all Recovery Team personnel.

About the Author...

Deputy Assistant Chief of Fire Prevention Ronald Spadafora is a 23-year veteran of the FDNY. He was detailed to the WTC Incident Command as the Site Safety Officer. He holds a Masters of Professional Studies degree in Criminal Justice from LIU-C.W. Post Center, a Bachelor of Science degree in Fire Science from John Jay College and a Bachelor of Arts degree in Health Education from Queens College. A former adjunct instructor of Fire Science at John Jay College, he is currently an instructor for Fire Technology, Inc.



(Above) Full-face shield protection-- Firefighters sifted through debris containing ammunition.