Firefighter Challenges in Terrorism

by Captain Andrew M. Trabanco (retired)

Editor's Note: *A similar article on terrorism by Captain Trabanco appeared in the May 2003 issue of* Fire Engineering. *He has tailored each of the five terrorist scenarios to benefit FDNY members. The first of these five scenarios follows.*

Firefighter Challenge 1: The Subway

Terrorists enter a midtown subway system through a subway emergency exit. The terrorists have an empty beer barrel, half-filled with ricin liquid. (Ricin is a water-soluble constituent of the castor bean, from which castor oil also is made.) The terrorists use a pump to put air in the barrel and then extend a spray bar over the track area. At 8 a.m.--at the height of the morning rush hour--the terrorists release the ricin liquid through a spray bar. The liquid now is aerosolized and pushed through the subway system by the moving trains.

Subway emergency exit closed.

Subway emergency exit open. Note panic bar used by Firefighter to open door.

all photos by Captain Andrew M. Trabanco, unless stated otherwise

photo by FF Ben Cotten

New York City Transit moves 3 1/2 million people through its systems every working day.

Environment

The temperature is 19 degrees Fahrenheit. The wind is from the northeast at 10 mph, gusting to 20 mph. It is sunny and blustery.

Resources

Numerous terrorist activities are being reported throughout the City. Two Engine Companies, a Ladder and the Battalion, special-called, are responding to this incident for an *unknown liquid and funny "odor" in the subway* line at 42nd Street and Fashion (7th) Avenue.

Firefighter response

As the first-due Engine arrives, several civilians exiting the subway report being exposed to a mist of liquid that smells funny.

- The Lieutenant already has ordered all members to don personal protective equipment (PPE). He calls the Chief and reports the incident.
- The Chief orders all train traffic on this subway line halted.
- The Chief orders the second Engine to go to the second entrance/exit serving the same subway station and direct the

Green globes signify that the subway entrance is open 24 hours. Red globes signify that the entrance is closed at non-peak hours of operation.

Fire command station can be used to make announcements throughout a high-rise building.

people out of the exit to the street.

- Because of the cold weather, the Chief orders the Ladder Company to guide the affected civilians to a high-rise building for shelter.
- The Chief orders the Captain of the Ladder Company to contact the building engineer and the fire safety director.
- The Chief then orders the fire safety director to announce over the loudspeaker system that no one in the building is to use the lobby area. He tells the engineer that the Fire Department is going to activate the sprinkler system, secure the stairwells and lobby doors and recall the elevators. Because of the high terrorist activity, mobile decon will not be available.

Members of the Ladder Company fuse several sprinkler heads in the lobby of the high-rise building. The HVAC system is shut down. People who are contaminated are asked to disrobe and then walk through the sprinkler. Building staff personnel provide different rooms or offices, isolating men and women. Fire Department members isolate discarded clothing. The Captain asks building personnel for the location of the nearest hospital and then calls to obtain hospital gowns for the exposed civilians. Firefighters prepare for a mass casualty incident.

Points stressed

- Responding Companies do not know whether they are responding to a biological agent or a chemical release. However, the responding members assume that this is a distinct possibility and act accordingly.
- Firefighters knew they probably were not going to receive additional assistance within a certain period of time and the lives of several thousand people might be at stake.
- The Company Officers take immediate action by having all members don PPE. The Chief immediately reduces the hazardous environment by stopping train traffic. Moving trains generate 50 percent of all air circulation in the subway system.
- People are not allowed to leave the area and are moved into decontamination showers in the form of fused sprinkler heads in a heated building while in subfreezing conditions.
- Uncontaminated people are kept away from the incident. A hot zone was created in the lobby of the high-rise building. The lives of thousands of people could be saved by the quick actions of a limited number of Firefighters with few resources.

photo by New York City Transit Authority, circa 1902

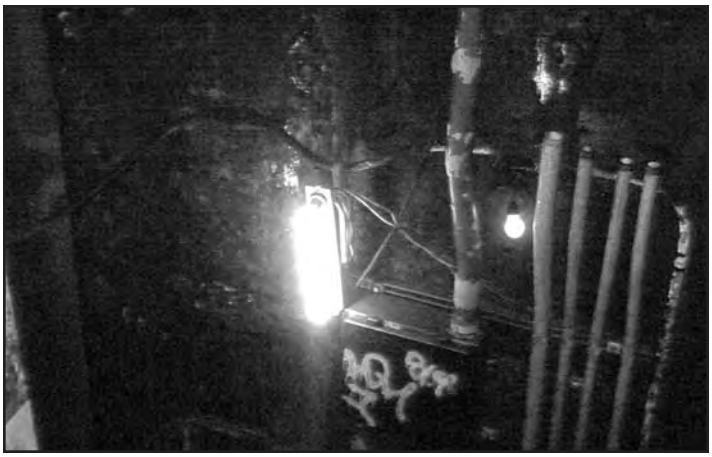
Cut-and-cover method of construction.

Additional points to consider

- To decon victims in bad weather, libraries, schools, museums and churches also can be used as areas of refuge and decontamination stations. Many of these occupancies also have sprinklers. The first preference is a sprinklered building. The standpipe systems in a high-rise building also can be used for decontamination. Use a fog nozzle with low pressure.
- Exterior speakers on fire apparatus can be used to guide people in the proper direction and to the right location. Additionally, the Battalion and Division Chiefs can employ their bullhorns. Announcements can be made over the speaker system in the fire command station in high-rise buildings.
- Hospitals store thousands of gowns for patients, which can be used to clothe people after they have undergone decontamination. Additionally, FDNY has Tyvek suits, which can be used as temporary clothing.
- If radiation contamination is suspected, all FDNY units now carry radiation detection devices to determine its presence.
- In many parts of the City, subway stops are connected into buildings. Contamination of the subway station also may contaminate

The tunnel right of way is kept dark so train operators can better observe signals. People exiting trains and walking in tunnels will be in the dark.

Reflective prism leads to subway emergency exit.



A cluster of five lights also will lead to exits. One is shown here.

the building.

Historical perspective

The 1994 sarin attack in the Tokyo, Japan, subway system produced numerous fatalities and injuries. The incident would have been much worse had the terrorist been able to aerosolize the sarin liquid. Most of the sarin release resulted from the liquid spilled on the floor or thrown on the victims. The attack was compounded by the fact that the first responders were not properly equipped with PPE. There was cross-contamination between rescuers and victims. Sarin liquid was brought into ambulances and even into hospital emergency rooms. Decontamination proved to be a formidable operation after the attack.

Explosive devices

Explosive devices are the weapons of choice for terrorists. Getting explosives into the rail systems is relatively easy. New York City Transit moves close to three and one-half million people per workday via its rail systems. There are no metal detectors or checkpoints. People are allowed to bring luggage, briefcases and backpacks with them. An explosive device easily could be hidden and detonated. The potential for an attack is high, particularly for bombings executed by suicide squads or individuals.

All the underground railway systems in New York City were constructed with the cut-and-cover method of tunnel construction. A ditch is dug and stations, tracks and ventilation and switching equipment are installed. The ditch is covered with steel beams, which are covered by concrete. Asphalt is used to cover this area, creating streets.

Some railway systems go under parks and buildings, but the right of way primarily is under streets. These tunnels are relatively shallow in depth. Ventilation grates serve as air exchanges. In the event of a bombing, grates, shafts and station entrances may relieve some of the blast pressure.

In contrast to underground tunnels, rail systems constructed under rivers go very deep. Tunnels are bored under the riverbed and do not lie on the bottom of the river. The tubes that are under the river are very strong, since they carry thousands of tons of weight above the tunnel. Numerous subway lines run underneath the river.

Because of this design, a bomb blast will be devastating, since the full force of the blast will be confined to the tunnel under the river. Picture a rifle discharging a bullet. The force of the projectile travels out of the gun's barrel. The barrel retains the force until the bullet leaves the barrel. The same force would travel laterally in the explosion in a tunnel under the river. The lethal effects of a bomb blast under a river tunnel would be considerably more severe than one under land. Also, since under-river tunnels are long distances from exits, it would take more time for the FDNY to reach the victims.

Indeed, if terrorists strike the New York City subway system, the consequences could be especially lethal--for both victims and rescuers. The subway system presents unique challenges to FDNY members attempting those rescues.

Emergency evacuation device--ladder side. Used to evacuate people from subway trains.

About the Author...

Captain Andrew M. Trabanco (retired) is a 27-year veteran of the FDNY. His last FDNY assignment was Captain of Ladder 11. He is an FDNY instructor in terrorism response for the Department of Justice. He has written manuals for FDNY on Ladder Company operations and subway fires. He holds a BS degree in Fire Science from Empire State College. This is his first article for WNYF.