

Tiered Response: Preparing for Novelty

By Assistant Chief Joseph W. Pfeifer

First responders are expected to have emergency response plans in place and periodically test these plans through exercises to ensure that the procedures work. But after years of preparedness, what happens when they are faced with an event that goes beyond specific plans? Are first responders prepared for novelty? On October 23, 2014, New York City was hit with such a novel event when a doctor, working with Doctors Without Borders, returned from Guinea with signs and symptoms of the Ebola Virus Disease (EVD). Suddenly, first responders and health care professionals were challenged to adapt to a new threat environment with possibly deadly and widespread consequences.

During this crisis, FDNY dispatched a Haz-Mat Chief, Haz-Tac ambulances and Haz-Mat Tech Units as part of a tiered response to the doctor's residence and used personal protective equipment (PPE), originally purchased for chemical terrorism as bio protection, to transport the patient by ambulance to Bellevue Hospital. The patient then was handed off to the hospital staff in bio protective gear and, within a short period of time, was receiving treatment that saved his life. This system-wide response contained a potentially fatal epidemic and proper decontamination procedures ensured the safety of all emergency responders.

Tiered Response Model

Such a state of preparedness did not happen by chance. For well more than a decade, FDNY has been developing a new approach to hazardous material response. Instead of having just one highly trained Haz-Mat unit, the Department created a Tiered Response Model that divides response duties into layered groupings, with each subsequent layer containing resources trained incrementally to a higher response capability. Thus, a tiered response model graphically is depicted as a triangle. With each tier as a set of building blocks, many more people are trained with basic-level skills and provide support for those with technical skills, allowing the organization to boost overall response. The vertical axis of the triangle represents an increase in capability, while the horizontal axis indicates greater capacity.

A typical hazardous material incident illustrates how a multi-tiered response works (see Figure #1). The entire FDNY has been trained to the Operational Level for hazardous material (chemical, biological, radiological and nuclear) events and members are likely to arrive first to initiate lifesaving efforts. This is enhanced with a Mission Specific Tier of selected units receiving special training in agent identification, chemical protective equipment and decontamination. These two tiers are fol-

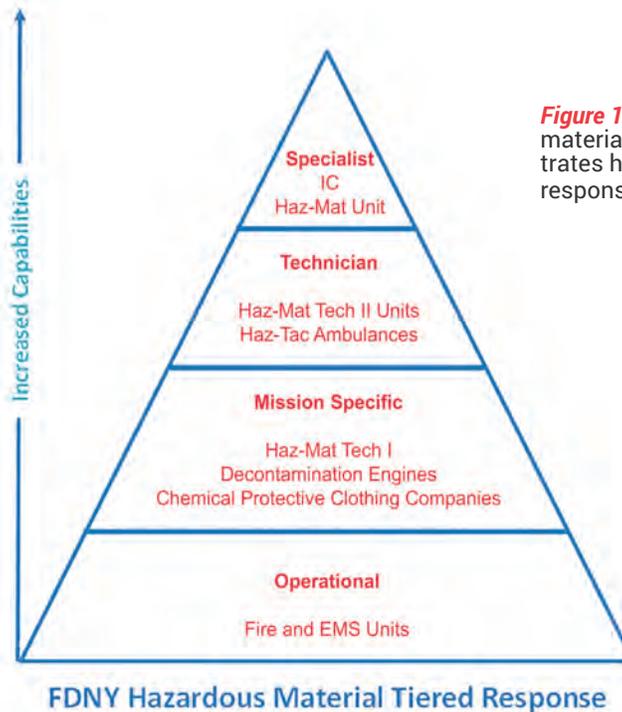


Figure 1. Typical hazardous material incident illustrates how a multi-tiered response works.

Note: Haz-Tac ambulances are staffed by EMT or Paramedic Haz-Mat Technicians.

lowed by the Technician Tier of Haz-Mat Tech II Units for mitigation and Haz-Tac ambulances for medical care and patient transport. This response then is elevated to the highly trained Specialists in Haz-Mat Unit I and the Haz-Mat Battalion.

The Tiered Response Model increases FDNY's capability and capacity to deliver timely services by integrating each tier into a response matrix. For routine hazardous material incidents, the tiered response has a proven track record, which is cited as a best practice by the Department of Homeland Security (DHS) for effective incident mitigation and life safety. But tiered response was developed for more than just the predictable; it also was created for the unexpected and unprecedented events.

The Ebola case demonstrated how well the Haz-Mat Tiered Response Model performed in the face of novelty. The incident demanded four operational elements.

- Command—Bio-incident operations were under the strict supervision of an Incident Commander and a Haz-Mat Operations Chief, assisted by an EMS Officer.
- Pre-Hospital Care—EMS ambulance personnel (Haz-Tac) were deployed in donned chemical protective clothing (CPC) before making contact with the patient and stayed in CPC during patient care and transportation to the hospital.
- Patient Transfer—The patient was handed off by EMS personnel in

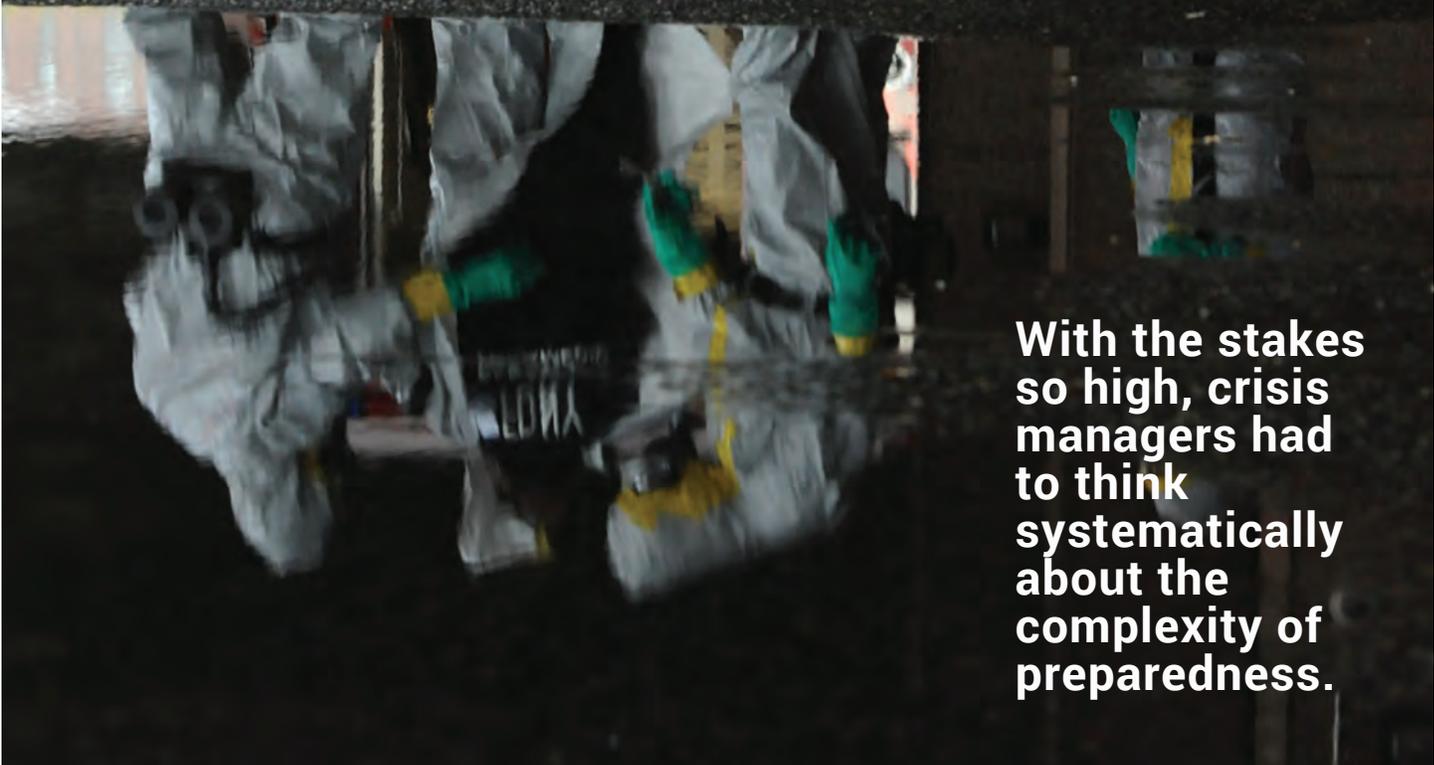
protective gear to hospital personnel, who had the proper personal protective equipment.

- Decontamination—Haz-Mat Technicians in CPC were used to properly decontaminate responders and equipment at the end of the incident to ensure no cross contamination.

The Department's Tiered Response managed the unique operational demands of this one Ebola case by adapting chemical preparedness to an urgent bio-response. But New York City as an international hub for people around the world still was at risk for other Ebola cases. In the hope of containing this disease, anyone returning from an Ebola-infected country with a fever was treated as a possible Ebola patient. FDNY, as the lead pre-hospital emergency care provider, could not just wait for the next case, but instead prepared the Department and hospitals for potentially many more Ebola patients. Any failure to meet this challenge to create surge capacity for bio-responses could spread the disease with national consequences.

Reconfiguring Tiered Response

With the stakes so high, crisis managers had to think systematically about the complexity of preparedness. The whole response system had to be considered, from EMS' initial contact with fever-travel patients to working with the hospital staff. To do this, FDNY's Tiered Response was leveraged and, simultaneously, reconfigured to manage the risk of an Ebola outbreak in one of the world's most densely populated cities.



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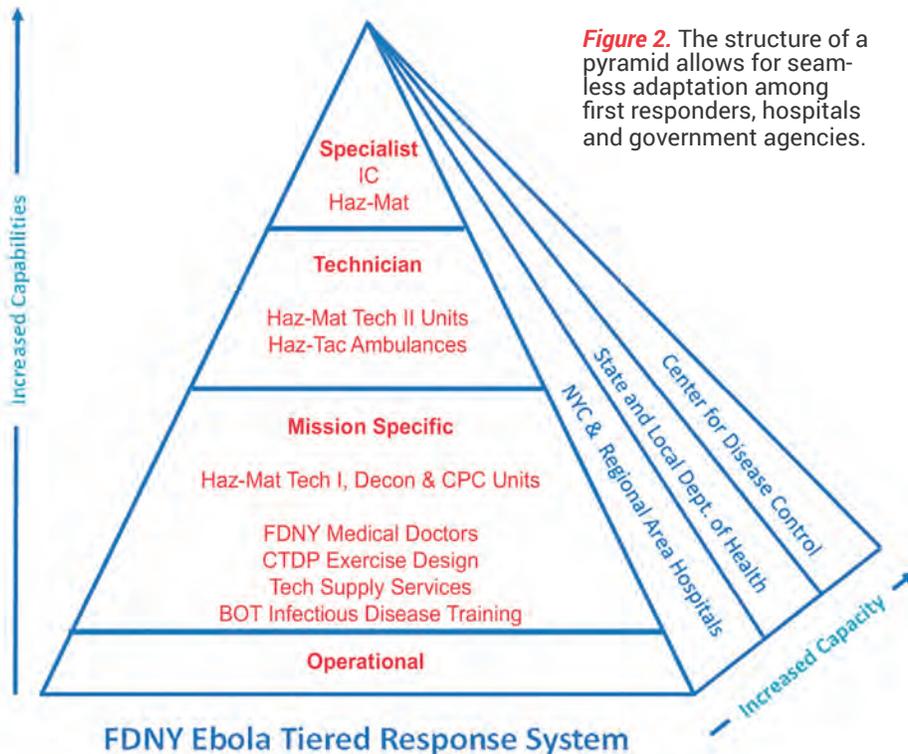


Figure 2. The structure of a pyramid allows for seamless adaptation among first responders, hospitals and government agencies.

responders and hospital staff to work together to provide patient care and avoid spreading the disease. The systematic reshaping of response was developed from agency-centric brainstorming sessions and inter-agency meetings, tabletops and full-scale exercises. It was through experiential learning and a feedback loop of what works that first responder and hospital staff were able to create a system to manage the Ebola crisis with three simple principles:

1. Provide patient care.
2. Don't get contaminated.
3. Clean up when you are done.

New levels for preparedness emerged from collective interactions as a bottom-up process of self-organization and the emergence of a Tiered Response Pyramid.

Preparedness is the process of adapting to perpetual novelty by reconfiguring and reshaping the building blocks of tiered response into a pyramid form for interacting with multiple agencies. Public awareness of how novel crises are managed is critical for maintaining confidence in government. By containing the Ebola Virus Disease to one patient and preparing a health care system to manage additional patients, FDNY provided confidence in government, which reduced national anxiety about Ebola becoming an epidemic event that could kill thousands in the United States. On January 14, 2016, the World Health Organization (WHO) declared the end to the deadliest Ebola outbreak on record, which killed more than 11,300 and infected more than 28,500. FDNY's ability to adapt its tiered response system to the threat of Ebola contributed to the mitigation of the disease and is the new model for preparedness. ■

The Technician and Specialist tiers, made up of units from the Department's EMS Bureau and Special Operations Command, easily adapted to this biological event and played a pivotal role in preparedness and response. But as we examined possible expanding demands, tiered response had to be reconfigured for a new level of preparedness. Reconfiguring involved discovering how a different part of the Department could contribute to preparedness and then add these skills to the Mission Specific Tier to enhance response.

FDNY Emergency Medical Doctors from the Office of Medical Affairs were added to ensure patient care, as were doctors from the Bureau of Health Services, to monitor the health of first responders. Dr. Dario Gonzalez, an FDNY Emergency Medical Doctor, even traveled to Western Africa to care for patients. Such experience enhanced the disease monitoring. The Center for Terrorism and Disaster Preparedness was used to design joint tabletop and full-scale exercises for FDNY and the hospital. The Department's Tech Services ordered thousands of sets of PPE and medical supplies. Extensive training in donning and doffing PPE was provided by the Bureau of Training. Crisis managers reconfigured the Tiered Response Triangle by rearranging the building blocks of tiered response with new elements in the Mission Specific Tier.

Reshaping Tiered Response

Understanding the urgent need to avoid a pandemic, FDNY's preparedness efforts were extended to hospitals and coordinated with City and State Departments of Health and the Center for Disease Control. Extreme events, such as the Ebola outbreak, are about inter-agency collaboration and coordination, which required reshaping the graphic of the Tiered Response Triangle to a Tiered Response Pyramid. (See Figure #2.) The structure of the pyramid allowed seamless adaptation among first responders, hospitals and government agencies.

Moving toward a Tiered Response Pyramid encouraged organizations to consider not only their own core competencies, but also the proficiencies of other agencies. By using the Tiered Response Pyramid, crisis managers can better visualize the system-wide response and anticipate incident management requirements. When done as part of preparedness analysis, it drives crisis managers to think more systematically about what can be done (capacity), how much can be done (capacity) and when it can be done (delivery).

Fire Commissioner Daniel A. Nigro, aware of this overarching need for coordination, appointed Dr. David Prezant as the Ebola Czar to work with senior leaders across the Department and other agencies to develop response protocols, acquire protective equipment and prepare first

About the Author:



Assistant Chief Joseph W. Pfeifer is a 34-year veteran of the FDNY (with 27 years certified as an EMT) and the Chief of Counterterrorism and Emergency Preparedness. He holds

Masters Degrees from the Harvard Kennedy School, Naval Postgraduate School and Immaculate Conception. He is a Senior Fellow at the Combating Terrorism Center at West Point and the Ash Center for Democratic Governance and Innovation at Harvard University. He writes frequently and is published in various books and journals.