TESTIMONY

Protecting Emergency Responders at Large-Scale Incidents

Lessons Learned from the Response to the Attacks on the World Trade Center

BRIAN A. JACKSON

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1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213
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Brian A. Jackson[1]
The RAND Corporation

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Before the Committee on Education and Labor
United States House of Representatives

September 12, 2007

Mr. Chairman and distinguished Members of the Committee: Thank you for inviting me to participate in today's hearing on this important subject. With the collapse of the Twin Towers of the World Trade Center, the attacks of September 11, 2001, claimed the lives of more than 400 emergency responders. From its first moments, one of the defining features of this attack was the toll it took on the emergency response community—men and women we rely on to protect us when disaster strikes. The health consequences that have continued to develop for response and recovery workers in the years since the attacks have meant the impact of 9/11 on the responder community and on the nation is continuing to mount. Assessing the breakdowns that led to this situation is important for understanding what happened that day and in the months that followed but is also critical in preventing history from repeating itself in future responses to large-scale terrorist events or disasters.

In the weeks after September 11, a research team at the RAND Corporation—in cooperation with, and supported by, the National Institute for Occupational Safety and Health—initiated a quick-response study of responder safety issues at the 9/11 response operations. In December 2001, while the response and recovery operations were still ongoing, we held a group discussion with responders in New York City. The goal of the discussion was to collect information and gather firsthand insight from the individuals directly involved in the safety problems that were occurring while the knowledge was still immediate and fresh.

That effort was the beginning of more than four years of in-depth research that examined emergency responder safety concerns in much more detail, all of which was carried out in close collaboration with members of the emergency response community. The results of that work have been published in a set of RAND reports, which contain much more detail on the issues and

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[2]This testimony is available for free download at http://www.rand.org/pubs/testimonies/CT291.

recommendations summarized in my testimony.[3] Today, I will focus on the findings reported in the first and third volumes of that series. My remarks therefore draw both on my work and that of my co-authors, as well as on the contributions of all the members of the responder community who participated in the projects; of course, the specific content of my testimony is my responsibility alone.

For the remainder of my remarks, I will address two questions: First, the question posed in the title of this hearing, “Why weren't 9/11 recovery workers protected at the World Trade Center?” and second, drawing on the lessons from that response and other disaster response operations, “What do we need to do to ensure responders are protected at future large-scale incidents?”

The basic message I want to convey today in answering those questions is two-fold. First, to protect emergency workers at any major disaster, there must be an incident safety management structure in place that can make difficult safety decisions and has the equipment, capabilities, and authority needed to implement and enforce them effectively. This did not happen at the World Trade Center response for a number of reasons, and, as a result, the response workers there were left unprotected from many of the risks at the site. Second, although the experience of the 9/11 responses taught us a great deal about what needs to be done to protect workers at future incidents, many of those lessons are not yet reflected in current practice. Some steps have been taken, and a number of federal policy and preparedness documents now contain a much better blueprint for responder safety management at major incidents. But to actually protect responders at future disasters we can’t just describe what the system to do so should look like, we actually need to build it and make sure it can work effectively before the next disaster strikes.

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[3] *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks*, B.A. Jackson, D.J. Peterson, J.T. Bartis, T. LaTourrette, I. Brahmakulam, A. Houser, and J. Sollinger, RAND Science and Technology Policy Institute, CF-176-OSTP/NIOSH, 2002, available at: http://www.rand.org/pubs/conf_proceedings/CF176/.

Protecting Emergency Responders, Volume 3: Safety Management in Disaster and Terrorism Response, B.A. Jackson, J.C. Baker, M.S. Ridgely, J.T. Bartis, and H.I. Linn, RAND Science and Technology and National Institute for Occupational Safety and Health, MG-170-NIOSH, 2004, available at: http://www.rand.org/pubs/monographs/MG170/.

Protecting Emergency Responders, Volume 4: Personal Protective Equipment Guidelines for Structural Collapse Events, H.H. Willis, N.G. Castle, E.M. Sloss, and J.T. Bartis, RAND Infrastructure, Safety, and Environment, MG-425-NIOSH, 2006, available at: http://www.rand.org/pubs/monographs/MG425/,

Protecting Emergency Responders, Volume 2: Community Views of Safety and Health Risks and Personal Protection Needs, T. LaTourrette, D.J. Peterson, J.T. Bartis, B.A. Jackson, and A. Houser, RAND Science and Technology Policy Institute, MR-1646-NIOSH, 2003, available at: http://www.rand.org/pubs/monograph_reports/MR1646/, and

Review of Literature Related to Exposures and Health Effects at Structural Collapse Events, E.M. Sloss, N.G. Castle, G. Cecchine, R. Labor, H.H. Willis, and J.T. Bartis, RAND Infrastructure, Safety and Environment, TR-309-NIOSH, 2005, available at: http://www.rand.org/pubs/technical_reports/TR309/

Why Weren't 9/11 Recovery Workers Protected at the World Trade Center?

Based on information we received directly from responders themselves in 2001 and data gathered in the years since, along with the benefit of hindsight and additional study, the reason why response workers were not protected at the World Trade Center is that the plans and preparedness measures in place for protecting them were simply not designed for an incident of that magnitude and complexity.

Protecting responders is not just a concern at large events like the 9/11 attacks. Emergency responders face risk when they respond to “routine emergencies” like fires or traffic accidents. As one responder put it to us, “If things were safe, we wouldn’t need to be there.” Response organizations have procedures to address the danger that is inherent in what they do. But a disaster like the World Trade Center collapse was unprecedented in the experience of every emergency response organization involved in the response. At such major disaster response operations, many routine strategies for protecting responders break down, and, if they are not replaced with approaches better matched to the situation, responders are put at risk. When the attacks occurred, the nation did not have a safety management system in place to effectively make that transition from routine ways for protecting responders to approaches that would work at a major disaster like the collapse of the Twin Towers. Unfortunately, despite useful steps that have been taken since 2001, that is still the case.

Protecting emergency workers requires four things: (1) figuring out what dangers exist in the response environment, (2) making decisions about tolerating or mitigating known risks, (3) getting the equipment or other resources needed to address the danger, and (4) implementing and enforcing the decisions.

Given the publicity about shortages of safety equipment at the World Trade Center immediately after the attacks, when RAND went to New York in December of 2001 we expected that the main problems we would hear about would be in the third category, e.g., that the responders did not have the right facemasks and respirators to protect them from the hazardous smoke and dust at the scene. However, although there were equipment problems, the responders told us that equipment problems were not the most important safety problem. Instead, they told us that serious breakdowns in assessing risks, making decisions about what protective actions should be taken, and implementing those decisions—which we group together here as problems in the way safety was *managed*—were at least as important, if not more critical.

Based on the experiences and insights provided by the responders who participated in our workshop, I will now discuss some of the problems in both of these areas and their impacts on responder safety.

Equipment Problems

It is well known that there were major problems with safety equipment available at the World Trade Center. Responders to the incident faced a major structural collapse scene with a huge variety of dangers—fire, rubble, dust, biological hazards, and other hazardous materials. At the World Trade Center and other major disaster operations, the definition of responder must expand beyond the groups we usually think of when we say that word to include members of the construction trades, health and safety agencies, and other federal and state organizations. For those responders who had protective equipment, much of that gear was not designed for such a complex hazard environment. Some other responders came to the scene with limited or no protective equipment or the training to use it when it was provided.

Much of the equipment that was readily available was not practical to use. Firefighters operating at the scene came with structural firefighting gear, designed to be worn for short periods and designed for firefighting, not for rubble removal and search operations that stretched into weeks and months. One firefighter said, "Firefighting equipment is designed to work well for firefighting operations that typically last 30 minutes . . . or an hour. But when you have fires burning for six, eight, or nine weeks, bunker gear gets to be pretty cumbersome."[4] Wearing such heavy gear could result in fatigue and heat exhaustion; as a result, some responders told us they just took it off. Similar problems were observed for respiratory protection. The equipment that could provide complete protection—the self-contained breathing apparatus that firefighters use to enter burning buildings—was impractical for extended use; moreover, there were not enough units to protect all responders at such a large incident in any case. Even less cumbersome respiratory protection, when it became available, was sometimes viewed as impractical. Said one firefighter, "I have to be able to talk to my guys. . . . [s]o five times a day I'm pulling [the respirator] off just to tell them something. Next thing you know, it comes off one time and it doesn't go back on."[5]

There was also major uncertainty about even what equipment was needed because of the lack of definitive information about the hazard environment. Responders spoke of "waves of concern" going through the site about different hazards as assessments changed. Said a firefighter, "We went from 'there is asbestos' to 'there isn't asbestos,' to 'there is this, 'there isn't that,' and the

[4] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 22.
[5] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 24.

levels of protection changed." [6] Even when some organizations did have data on hazards, there were not always clear ways of getting that information either into incident decisionmaking or to responders. A representative of a federal organization involved in assessing hazards told us he saw a greater change in safety behavior when risks were reported in the media than when there was an attempt to pass safety information through the incident command system. [7]

Finally, systems were not in place to manage the logistics of keeping such a large response operation supplied with the needed safety equipment over long time periods; for example, there was the need to make sure there were replacement cartridges for the respirators that were being used as the operation stretched into weeks and months. Because logistics plans were not in place before the event occurred, organizations had to improvise, and the end result was not as effective as it should have been. An equipment supplier told us: "We got calls from every federal agency you can possibly name, and some that I've never even heard of, saying that they were in control of two, three different [logistics] sites. . . . And [you just had to] take your best guess that that product was going to get out to the World Trade Center site." [8] There was similar chaos for those receiving equipment; one discussion participant described trying to manage the influx of supplies as "a nightmare. People were offering everything and stuff was coming from everywhere. I didn't know who had what, where it was, or how to get it to where it was needed if I did know where it was." [9] The lack of an organized management system meant that responders who needed safety equipment had to spend time searching for it and, as a result, some chose to go without.

Breakdowns in Safety Management

Even though having the right equipment is necessary to protect emergency workers at events like the response to World Trade Center attacks, responders to that event and to other disasters emphasized that just having equipment is not enough. The responders stressed that there must be a safety management or command authority responsible for the safety of responders at the scene who can effectively assess risks, make safety decisions, and ensure those decisions are implemented and followed.

The scale and the complexity of the World Trade Center site required that many separate response organizations were involved in the operations there. Some brought capabilities for the large-scale tasks that were required, such as moving rubble, others brought specialized abilities for search and rescue, and others brought technical skills for assessing the environment and helping understand

[6] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 39.
[7] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 52 and personal interviews.
[8] *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks Workshop,* December 2001, previously unpublished comments.
[9] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 10.

the scene. Ideally, all these separate organizations should have been managed by a single, unified incident management structure so their activities—and the management of the safety of the people they brought to the scene—could be coordinated effectively. However, responders told us that this did not happen quickly at the World Trade Center site for a variety of reasons, not least of which was the loss of key individuals from the Fire Department of New York in the collapse of the towers.[10]

For safety management, *ad hoc* committee structures were developed over time to coordinate across organizations, but responders we spoke with differed about how effective they thought those structures were and whether they were even linked to the operational management of the response and recovery operations.[11] In any case, the fact that they had to be developed *during* the incident delayed coordination and hurt efforts to protect the responders at the scene. Without a clear safety management structure for the entire operation, organizations in many cases adopted more routine approaches to safety where they focused on their own activities and the safety of their own members. While all organizations have clear responsibilities for protecting their own, this approach is not sufficient for large-scale operations like this one that involve many organizations working together.

Not all response organizations have the capabilities to assess the complex hazards that were present at the World Trade Center—and they should not be expected to. Putting every possible technical capability that might be needed in every response organization would be prohibitively expensive and unlikely to succeed in any case. Therefore, many organizations needed to rely on the results of hazard monitoring by other technical organizations that responded to the incident. However, since there was no unifying structure and authority that brought everything together and coordinated the effort, independent technical organizations reported different results, which added to the confusion about the risks and what equipment choices should be made.[12] As one responder put it: "[A]ll the experts have got to come up with a common theme. I can't have [one federal agency] telling me, 'You need Level A protection for this,' and [another agency] telling me that a half-face respirator and latex gloves are sufficient." [13] Some of the disagreement and confusion was even ascribed to turf battles among the safety organizations operating at the scene.[14] There were also problems in "translating" the results of technical monitoring into something responders could

[10] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 45-6; *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks Workshop,* December 2001.
[11] *Protecting Emergency Responders, Volume 3: Safety Management in Disaster and Terrorism Response*, p. 75-6.
[12] *Protecting Emergency Responders, Volume 3: Safety Management in Disaster and Terrorism Response*, p. 25-6
[13] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 39.
[14] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 39-40.

use: “We would ask them to interpret [safety information] into plain English for us. Please stop speaking OSHA-speak [or] EPA-speak. Speak English so we know what to do.” [15]

Responders told us that the absence of a single, unified management authority also meant that some of the most difficult decisions about responder safety did not—or could not—get made. Early-stage response operations at any disaster are driven by the goal of saving lives, and—as responders repeatedly told us—it is appropriate “to risk a life to save a life.” As a nation, we need and depend on responders who are willing to put themselves at risk to save others. The fact that many of the missing were fellow responders themselves made the situation all the more emotional. Put simply by one responder at the workshop, “All we were worried about was getting our guys out.”[16] This singular focus contributed to individuals working to the point of exhaustion and making the choice to discard protective equipment that they perceived as hindering their ability to search quickly.[17]

However, in all disasters, at some point rescue must transition to recovery where it is no longer acceptable for responders to take on as much risk themselves. Responders told us that transition came too late at the World Trade Center, if it ever came at all. As one safety and health agency responder put it:

> We understood completely that when people are running in initially to try to potentially save someone’s life, there’s a lot of health and safety protocols that you would normally follow that are going to get thrown right out the window. . . . But there came a point in this effort where it became brutally clear to everyone that you are not going to save anybody’s life. There was no one left to save. And at that point, I think some things needed to change from the health and safety point-of-view. And they didn’t. Not as fast as they should have.[18]

Put more simply by two of the responders at the workshop, even after it was relatively clear there would be no more survivors found, “You had to pry people off the piles for the first two or three weeks. You had to pry them off the pile . . . [b]ecause you had hopes that there was going to be someone in there.” [19]

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[15] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 61.
[16] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 12.
[17] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 21-22.
[18] *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks Workshop,* December 2001, previously unpublished comments; also *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 47.
[19] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 17.

At virtually every significant incident, the decision will have to be made that operations need to transition from rescue to recovery, when the chance that there are still lives to be saved is no longer high enough to justify responders putting themselves at high risk of injury, illness, or death. For that difficult—but critically important—decision to be made there must be a command authority in place to make it. Furthermore, for the decision to have an effect on responder safety, the organizations participating in the response, as part of that unified command structure, must take the actions needed to implement it. Given the high pressure environment that exists after any large disaster—and even more so after the September 11 attacks—unless the groundwork for such a unified approach to safety has been put in place beforehand, it is doubtful whether it could be imposed in the period after the disaster has occurred.

Finally, responders told us that the lack of clear and unified command authority significantly hindered the enforcement of safety measures at the site. All organizations have responsibilities for protecting their members and for enforcing compliance with the safety measures that are necessary to do so. However, responders told us that the participation of many separate response organizations at a large incident scene can make safety enforcement very difficult. If one organization does not require particular measures (respiratory protection, for example), members of others may wonder why they should use them—essentially, "He isn't wearing it, why should I?" [20]

Responders also indicated enforcement issues were linked to challenges in controlling the perimeter of a site as large as the World Trade Center area. Even in a complex multi-agency response, control of the perimeter can be a powerful way to enforce safety measures across organizations if a central authority sets clear rules for what protective measures workers must have as their "admission ticket" to the scene and remove workers who do not follow them. [21]

What Do We Need to Do to Ensure Responders are Protected at Future Large-Scale Incidents?

Given the problems in protecting emergency responders at the World Trade Center—the price of which we are only now beginning to fully understand—the second important question is, what must be done to ensure that responders are protected at future large-scale incidents. As a country, we should not allow this to happen again. This was the specific focus of one of the other research efforts RAND carried out in collaboration with and supported by NIOSH in the years since September 11, 2001. Again, in direct cooperation with members of the responder community, that

[20] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 51.
[21] *Protecting Emergency Responders, Volume 1: Lessons Learned from Terrorist Attacks*, p. 48-49. Responders participating in our research drew a distinction between responses at the Pentagon on 9/11 and at the site of the Oklahoma City bombing, where perimeters were successfully put in place and safety enforcement was therefore much easier.

project developed recommendations describing what is required to manage responder safety at disaster and large-scale terrorism response operations.[22]

My remarks here describe four of the recommendations based on the results of that study: one strategic-level recommendation, and three specific recommendations. Since September 11, 2001, some steps have been taken to implement these recommendations, but much more remains to be done. Congressional direction and support could make key contributions in completing the process to reduce the chances that similar safety management problems will affect responses to future incidents.

An Integrated Approach to Safety Management

For managing the safety of emergency responders to disasters and large-scale terrorist attacks like the World Trade Center, our most important overarching recommendation is that safety must be approached as a multi-agency effort that is part of overall incident management, not something that individual organizations do on their own for their own members. We refer to this as an integrated approach to safety management. Protecting responders at large events requires not just addressing the complexities of having many agencies involved in a response operation but also taking advantage of the full range of technical, protective, and other capabilities all those organizations bring with them to the event. All the responders at a disaster should be able to benefit from the best safety capabilities available.

Building on the concept of unified command for the operational elements of response, integrated or unified safety management requires that all responding organizations at an incident be part of a single safety management structure that can coordinate the safety assets of different organizations, that can manage hazard assessment and build a common view of protective choices, that is vested with the authority to resolve problems and address safety concerns, and that is linked to the incident management structure, so safety decisions can be implemented and enforced.

While this is easy to say, past experience has taught that interagency coordination at major incidents is often difficult to put into practice. For it to work effectively in the chaotic environment after a disaster or major terrorist incident, it must be planned for and practiced beforehand. Responder organizations and agencies with responder safety responsibilities must be prepared to put the necessary coordination and management structure in place that all organizations can "plug into" when they get to the scene.

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[22] *Protecting Emergency Responders, Volume 3: Safety Management in Disaster and Terrorism Response*, B.A. Jackson, J.C. Baker, M.S. Ridgely, J.T. Bartis, and H.I. Linn, RAND Science and Technology and National Institute for Occupational Safety and Health, MG-170-NIOSH, 2004, available at: http://www.rand.org/pubs/monographs/MG170/.

To protect responders, this structure must be stood up and activated very quickly. In many incidents, and the World Trade Center was no exception, the environment is at its most dangerous in the earliest hours and days of the incident, perhaps before exact analysis information on the specific hazards that are present is even available.[23] During those initial phases of response, state and local response organizations will likely be largely on their own, given the deployment time required for federal response and safety assets to arrive at a disaster scene. As a result, to protect responders, the key initial steps must be taken by state and local response organizations, both to manage safety during those first phases of the response and to put the structure in place so federal resources can reinforce the effort at the scene and productively contribute to safety efforts when they arrive. This requires that safety management efforts be a planned and practiced element of preparedness efforts, not an *ad hoc* activity that is developed after an incident already has occurred.

Important steps have been taken since September 11 that provide key parts of the blueprint for such a multi-agency safety effort:

- The *National Response Plan* (NRP) specifies that safety management must be coordinated across organizations at major incidents. It includes the position of Safety Coordinator to ensure federal incident managers receive "coordinated, consistent, accurate, and timely safety and health information and technical assistance," coordinate safety and health resources for other response managers, and ensure the safety of the federal personnel at the joint field office.[24]
- The *Worker Safety and Health Support Annex* (WSHSA) to the NRP emphasizes response organizations should "plan and prepare in a consistent manner and that interoperability [of their safety efforts] is a primary consideration for worker safety and health."[25] It also defines federal roles for helping to assist in coordination among organizations at the "Federal, State, local, and tribal governments and the private sector involved in incident characterization, stabilization, and cleanup." [26]
- In the *National Incident Management System* (NIMS), the responsibilities given to the safety officer at large incidents include "coordination of safety management across jurisdictions, across functional agencies, and with private-sector and nongovernmental

[23]See *Protecting Emergency Responders, Volume 4: Personal Protective Equipment Guidelines for Structural Collapse Events.*
[24]*National Response Plan*, December 2004, pp. 35-36.
[25]*National Response Plan*: *Worker Safety and Health Support Annex*, December 2004. p. WSH-1.
[26]*National Response Plan*: *Worker Safety and Health Support Annex*, December 2004. p. WSH-2.

organizations," with the intention that "each entity [contribute] to the overall effort to protect all responder personnel involved in incident operations."[27]

- Other DHS planning documents, notably the current draft of the *Target Capabilities List* (TCL), define responsibilities, performance targets, and capabilities needed for safety management personnel and resources.

These documents include some of the key elements required for effective safety management, but not all of them; for example, although effective safety enforcement is mentioned in the draft TCL, none of the documents addresses how that key function would be put in place at future incidents. Furthermore, there is a big difference between addressing issues in policy and planning documents and being ready to put those plans into practice. Safety management performance at subsequent incidents such as Hurricane Katrina has demonstrated that there is a great deal more that must be done before the components necessary to effectively protect emergency responders are truly in place.[28]

Implementing an Integrated Approach to Safety Management: Key Ingredients

What is needed for safety management to be implemented effectively at future incidents? The basic structures are in place for doing so, but using them successfully requires efforts to implement and practice so that we are ready for future disasters. Based on our research and the input we received from the responder community, part of the answer to that question is captured in three practical recommendations from our study:

- Pilot efforts implementing integrated safety management. Although our research lays out the principles for integrated safety management, more is required to employ this approach in future incidents. Response organizations must work out all the practical implementation requirements to effectively protect responders at different types of incidents: what safety and response organizations need to cooperate, what safety capabilities they need to bring and how rapidly they are needed, what plans must be modified or written, what agreements must be put in place, and so on. This process must take into account the real differences that exist across the country, but it must also build the national commonality needed so other response organizations can plug in to reinforce a local effort when they come to assist at a large-scale disaster. This learning and testing effort cannot happen inside the federal government, but it could be facilitated and supported by federal action. More specifically, we viewed this pilot effort as one involving federally funded efforts to implement safety management structures and preparedness measures in a number of

[27] *National Incident Management System*, March 1, 2004, p. 17.
[28] See, for example, Government Accountability Office, "Disaster Preparedness: Better Planning Would Improve OSHA's Efforts to Protect Workers' Safety and Health in Disasters," GAO-07-193, March 2007.

representative areas, from large metropolitan to rural areas, with information-sharing mechanisms to transfer the lessons learned from those areas to other responder organizations.

- Conduct preparedness exercises that address responder safety management. Emergency preparedness exercises are a key part of both building and testing the systems and capabilities in place to respond to disasters. However, because the focus of most preparedness effort is on the operational elements of response—what is needed to help the victims of disasters or terrorist incidents—responders who participated in our research told us exercises often ignore or give only cursory attention to responder safety concerns. This means that key organizations with responsibility for protecting responders are frequently left out of planning or out of the exercises themselves, meaning these key functions are seldom—if ever—practiced or assessed.[29] Given the importance of exercises for building the interagency links needed for effective multi-agency response, safety concerns and safety management processes must be realistically included in exercises. If we do not provide the chance for individuals and organizations to practice safety management, we cannot expect them to perform well after a disaster has struck.
- Identify and train disaster safety managers to play central roles for safety management at major incidents. Although planning is a necessary ingredient for performing in incident response, it is not a sufficient condition for success. Execution of even the best plans relies on people with the right knowledge and expertise. Our work suggested the need for a specific group of individuals, who we called *disaster safety managers*, to play the central role for managing responder safety and coordinating safety effort across organizations at a multi-agency response operation. These individuals would be trained and experienced responders that could play the coordinating and "bridging" role among different agencies and organizations with safety responsibilities and capabilities in incident management. Playing this role successfully requires knowledge and expertise that most members of the response community are unlikely to get in the standard training available to them and their day-to-day operations; this suggests the need to develop specialized training and preparation efforts. Our work did not specify where such individuals should be drawn from, although they would need to be based around the country to build and maintain relationships across response organizations likely to participate in disaster operations in their region. Such responders are needed to fill key safety roles described in the NRP and NIMS. The current draft TCL specifically calls out the need for a group of such individuals, although it also acknowledges that their characteristics and role have not yet been completely defined. We need to do so and take the steps needed to prepare these key people to respond to future incidents.

[29]This remains a problem. See, for example, discussion about the inclusion of safety organizations in preparedness exercises in Government Accountability Office, "Disaster Preparedness: Better Planning Would Improve OSHA's Efforts to Protect Workers' Safety and Health in Disasters," GAO-07-193, March 2007, p. 31.

Conclusions

When disasters strike, members of the public rely on emergency responders to protect them from harm. For responders to play that critical role, systems and equipment must to be in place to protect them as they do their jobs. The safety management system that was in place at the World Trade Center after the 9/11 attacks was not sufficient to the task, and the country is still paying the price.

In the years since, some progress has been made. In addition to multi-agency safety management being included in the planning documents I mentioned earlier, other efforts have also contributed to addressing equipment problems that made protecting responders at the World Trade Center site so difficult. For example, changes in respirator standards made since then have made it technically possible for cartridges from different brand respirators to be used interchangeably in an emergency response operation, thus simplifying the challenge of providing respiratory protection to emergency workers at such incidents.

The experience at the World Trade Center response and recovery operation—and the serious breakdowns in safety management that occurred there—have also taught us lessons about what we must do to protect responders in future large-scale incidents. We now know what we need to do. When the results of our studies came out, they were broadly supported by key safety federal organizations, such as OSHA and NIOSH, as well as by lawmakers on both sides of the aisle and representatives of the responder community. But despite that broad agreement, many steps that are needed to actually implement the recommendations have not been taken. For there to be a system in place to protect responders to future disasters, we cannot just describe what that system should look like—we actually have to build and maintain it. Performance at more recent disasters like Hurricane Katrina demonstrates that the system that is needed has not yet been built and, as seems all to often the case, the lessons about what we need to do to protect responders that were bought so dearly in the 9/11 response operations may be yet another set of *lessons collected*, but not yet *lessons learned*.

I would like to thank you again for the opportunity to address the committee today on this important topic, and look forward to answering any questions you might have.