

# Introduction

The World Trade Center tragedy on September 11, 2001 was unparalleled in nature and magnitude. Never before had anyone intentionally flown commercial jetliners carrying thousands of gallons of fuel into a skyscraper. Never before had such buildings been so severely damaged by explosion and fire that they collapsed to the ground. Never before had a single terrorist act caused such a massive loss of life – 2,823 people in all. It was the worst terrorist attack in the history of terrorism.

In the aftermath of this extraordinary event, the enormous heroism of the members of the Fire Department of the City of New York stands out as an inspiration in the face of calamity. Three hundred forty-three FDNY personnel sacrificed their lives while trying to save others. They facilitated the safe evacuation of more than 25,000 people, the largest rescue operation in United States history.

This tragedy has reshaped our expectations about future threats and created a new urgency to increase preparedness. Many people believe that more large terrorist attacks on the United States are a certainty. The president and Congress are seeking to increase the nation's preparedness through a massive reorganization of homeland security agencies. The state, the city, and the FDNY must also take steps to prepare for the future.

At the Fire Department's request, McKinsey & Company spent five months working with Department personnel to develop recommendations for change to enhance the FDNY's preparedness. To do this, we studied the Department's response to the attack on September 11 in detail. Our goal was to learn from this incident and to define specific recommendations that the Department should implement. We did not attempt to reconstruct an exhaustive, minute-by-minute history of what the Department and its members did and did not do as they responded to the incident.

As our work progressed, we found many examples actions by FDNY personnel that saved lives, but we focused on identifying procedures, organization, and technology that should be improved to increase the Department's preparedness in the future.

Our team conducted more than 100 interviews with FDNY personnel who responded to the attack. We also examined the transcripts of hundreds more interviews that the Department conducted internally, and we reviewed a large number of dispatch records and about 60 hours of communications tapes. Throughout our effort, we had unfettered access to FDNY records and personnel, including the Fire Commissioner, his staff and all senior operations personnel. We spent more than 1,000 hours working closely with FDNY personnel who

responded to the World Trade Center attack, and with personnel who will be involved in implementing the recommendations of this report.

We also spoke with more than 100 experts in the United States and abroad, including those in other fire departments, emergency agencies and the military, as well as researchers and technology vendors. This helped us understand the diverse methods and best practices used around the world in responding to major disasters.

During the last three months of this effort, multiple FDNY task forces, involving about 50 Fire and EMS personnel (see Exhibit 1), joined us to develop detailed recommendations for change on a broad set of issues. Many of these recommendations were based directly on work and ideas that the FDNY developed. Even as this report was being prepared, several recommendations were already being implemented.

This report contains recommendations to the Fire Department in these key areas: operations, planning and management, communications and technology, and family and member support services. As background, the report also contains a description of the key events related to these areas during the Department's response to the attack on September 11.

The Fire Department now faces two major challenges: implementing the recommendations successfully and helping the city improve its inter-agency planning and coordination. Implementing these recommendations will bring about substantial change in the Department, requiring a renewed commitment to leadership, accountability, and discipline. But internal change is not enough. The FDNY and other government agencies must improve inter-agency planning and coordination if they are to fulfill their mission to protect the citizens of New York City. The last section of our report discusses this challenge.

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The response to the World Trade Center attack was tremendously complex. We hope that this report will help the Fire Department, the city and the country be better prepared should we ever be forced to face such a crisis again.

# Executive Summary

The terrorist attacks on the World Trade Center on September 11, 2001 reshaped expectations about future threats and created a new urgency to increase preparedness. At the Fire Department's request, McKinsey & Company spent five months working with Department personnel to develop recommendations for change to enhance the FDNY's preparedness.

These recommendations stem from the lessons that emerged from our detailed review of the Department's response on September 11, and from the many interviews we conducted with FDNY personnel and with other emergency service agencies, experts in fire operations, the military, and technology vendors. Many of the recommendations represent the joint efforts of several McKinsey-FDNY task forces involving approximately 50 FDNY members.

This Executive Summary contains recommendations to the Fire Department in these key areas: operations, planning and management, communications and technology, and family and member support services.<sup>1</sup> As background, the Executive Summary also contains a description of the key events related to these areas during the Department's response to the attack on September 11.

## **FIRE AND EMS RESPONSE: KEY EVENTS OF SEPTEMBER 11**

The FDNY's response to the attack began at 8:46 a.m., the moment the first plane hit Tower 1 of the World Trade Center. The FDNY's First Battalion Chief witnessed the first crash from a nearby street and was the first arriving chief officer on the scene. In accordance with FDNY protocols, he established an Incident Command Post<sup>2</sup> in the lobby of World Trade Center 1 (WTC 1) at approximately 8:50 a.m.

<sup>1</sup> Family and member support services are the infrastructure and processes used to notify families of death or injury to FDNY personnel, along with post-incident peer and family counseling and support.

<sup>2</sup> The Incident Command Post is the location from which all aspects of an incident response are managed.

## **Chief of Department establishes command**

At about 9:00 a.m., the Chief of Department took over as Incident Commander. At that time, he moved the Incident Command Post from the lobby of WTC 1 to a spot across West Street, an eight-lane highway, because of falling debris and other safety concerns. Chief officers considered a limited, localized collapse of the towers possible, but did not think that they would collapse entirely.

After the Incident Command Post was moved to West Street, several fire chiefs remained behind in the lobby of WTC 1, which became an Operations Post for fire units operating in that building. Their presence in the lobby was necessary so they would have access to important building systems, such as controls for alarms, elevators, and communications systems.

Within minutes, the chief officers in WTC 1 decided to focus efforts on rescue and evacuation. They sent firefighters up into the building to help the hundreds of people trapped in elevators, stairwells, and rooms, along with those who were unable to evacuate because they were injured. They also ordered firefighters to make sure that floors were fully evacuated.

At the same time, EMS commanders began to set up geographic areas around the scene where ambulances could be staged and patients triaged, treated and transported to hospitals. The EMS Assistant Chief of Operations assumed overall EMS Command at the Incident Command Post, reporting to the Incident Commander.

At 9:03 a.m., the second plane hit World Trade Center Tower 2 (WTC 2). Chiefs immediately called in additional Fire units<sup>3</sup> and deployed units from WTC 1.

## **Chiefs designate staging areas**

As the mobilization escalated, dispatchers instructed responding Fire units to report to staging areas<sup>4</sup> that senior chiefs had designated near the World Trade Center. However, as these units approached the area, many failed to report to the staging areas and instead proceeded directly to the tower lobbies or other parts of the incident area. As a result, senior chiefs could not accurately track the whereabouts of all units. In addition, the failure to stage prevented Fire units from getting necessary information and orientation before going into the towers. For instance, several units that were not familiar with the World Trade Center layout

<sup>3</sup> A Fire unit is a group of firefighters who have the same assignment, e.g. an engine or ladder company. Most units include four to five firefighters and one officer.

<sup>4</sup> A staging area is a resource management area in close proximity to the incident. Units directed to stage are expected to respond to the staging area and await further deployment instructions.

had problems differentiating WTC 1 from WTC 2. Also, because some units did not stage and chiefs were unsure of their location, additional units, that might not have been required at that time, were deployed to the incident.

Units arriving at the lobby of WTC 1 checked in with the chief officers at the Operations Post to obtain their assignments. Chief officers sent these units up into the building in an orderly, controlled way. We believe the same happened in WTC 2.

### **Communications limitations emerge**

A number of communications difficulties hindered FDNY chief officers as they coordinated the response.

For instance, problems with radio communications left the chief officers in the lobby of WTC 1, and probably those in WTC 2, with little reliable information on the progress or status of many of the units they had sent up into the buildings. The portable radios that were used by the FDNY on September 11 do not work reliably in high-rise buildings without having their signals amplified and rebroadcast by a repeater system. The World Trade Center had such a system, but chief officers deemed it inoperable early in the response after they tested it in the lobby of WTC 1. With the repeater malfunctioning, the chiefs in the lobby of WTC 1 would not have been able to communicate with any units whose radios were tuned to the repeater channel, even if such units were just a few feet away from them. On the other hand, the command and tactical channels<sup>5</sup> on these radios do support some, albeit unreliable, communications in high rises. Therefore, the chiefs decided to use their command and tactical channels for operations in WTC 1.

Radio communications between chief officers in the lobby of WTC 1 and the units they sent in the building were sporadic. The chiefs were able to get through to some units sometimes, but not others. Some units acknowledged receiving radio communications some times, but not others. This left the chiefs not knowing whether their messages failed to get through, whether the units failed to acknowledge because they were busy with rescue operations, or whether the units did acknowledge, but the acknowledgement did not get through. Because information about civilians in distress continued to reach the Operations Post in the lobby, the chief officers decided to continue their attempts to evacuate and rescue civilians, despite the communications difficulties. We believe that the chiefs and units in WTC 2 faced similar communications problems.

<sup>5</sup> Tactical radio channels are used for on-scene communications among chiefs and the units they command. Chiefs provide directions to units on this channel while units provide status reports to the chiefs and each other and request assistance. Command channels are used by chiefs at an incident to communicate with each other.

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