

---

# FIRE DEPARTMENT CITY OF NEW YORK



## MARINE OPERATIONS STRATEGY

December 1, 2010

Mayor Michael R. Bloomberg  
Fire Commissioner Salvatore J. Cassano  
Chief of Department Edward S. Kilduff





**FIRE DEPARTMENT**  
9 METROTECH CENTER      BROOKLYN, NY 11201-3857

**S**ince 9/11, the Department has made significant progress in preparing for fires, emergencies, natural disasters and terrorist events. On the water, Marine Operations has worked consistently to develop and expand its preparedness for a multitude of hazards in the Port of New York and New Jersey. The constantly shifting challenges of protecting the City's Harbor mandate that we address today's threats, while keeping an eye to the future. To that end, we have developed a vision and strategy that will define our preparedness objectives and clarify our lifesaving response objectives. As we move toward full realization of those objectives, we recognize that grant funding from the Department of Homeland Security has been critically important in the FDNY's ability to modernize its fleet and build the resources necessary to meet the demands of the post-9/11 environment.

Using the cross-sector experience of the FDNY and Harvard Business School, the Department has developed this *Marine Operations Strategy*. This document provides a vision for enhanced prevention, response and recovery. The strategy presents a coordinated approach to planning, training and equipping initiatives to meet the dynamic needs of the Harbor community. As we consider the threats of today and tomorrow, it is important that we identify the critical uncertainties in our environment, reframe our thinking and develop a flexible strategic vision for the future.

The *Marine Operations Strategy* provides an innovative framework for an effective and efficient response to a variety of emergencies and threats in the Harbor. We thank all who participated in this important initiative.

Salvatore J. Cassano  
*Fire Commissioner*

Edward S. Kilduff  
*Chief of Department*



---

## TABLE OF CONTENTS

---

<b>I. Marine Operations: Mission and Vision.....</b>	<b>1</b>
<b>Marine Operations' Tiered Response</b>	<b>3</b>
<b>II. Firefighting Capabilities for the Harbor .....</b>	<b>5</b>
<b>Firefighting Capability, Capacity and Delivery</b>	<b>5</b>
<b>Critical Infrastructure and Key Resources</b>	<b>6</b>
<b>Maintaining Bridge Structural Integrity</b>	<b>7</b>
<b>Water Evacuation</b>	<b>7</b>
<b>Water Supply for Land-Based Firefighting Operations</b>	<b>8</b>
<b>III. Water Rescues and Medical Emergencies .....</b>	<b>9</b>
<b>Medical Triage, Treatment and Transport</b>	<b>9</b>
<b>Water Rescue Operations</b>	<b>10</b>
<b>Coastal Flooding and Hurricane Response</b>	<b>10</b>
<b>IV. CBRN and Hazardous Material Capabilities.....</b>	<b>11</b>
<b>Responding to CBRN and Hazardous Material Incidents</b>	<b>11</b>
<b>Command and Control Platforms</b>	<b>12</b>
<b>Safety Monitoring</b>	<b>12</b>
<b>Dispersing Vapor Clouds</b>	<b>12</b>
<b>V. Life Safety Prevention and Protection Initiatives.....</b>	<b>13</b>
<b>Risk Assessment and Risk Reduction</b>	<b>13</b>
<b>Expanding Harbor Detection</b>	<b>13</b>
<b>Pre-Planned Events</b>	<b>14</b>
<b>VI. Conclusion.....</b>	<b>15</b>
<b>VII. Appendices .....</b>	<b>16</b>
<b>Appendix A: FDNY Marine Operations Vessels</b>	<b>16</b>
<b>Appendix B: Acknowledgments and References</b>	<b>17</b>



---

## I. MARINE OPERATIONS: MISSION AND VISION

---



*Three Forty Three, the FDNY's newly commissioned boat.*

---

*“FDNY is committed to ensuring that the public has access to the equivalent lifesaving and firefighting capabilities on water as they do on land.”* Fire Commissioner Salvatore J. Cassano

The New York City Fire Department (FDNY) developed a *Marine Operations Strategy* to meet the growing challenges and vulnerabilities in the Port of New York and New Jersey. Marine Operations provides multi-faceted response for firefighting, water rescue, medical evacuation and treatment, hazardous material mitigation and decontamination and state-of-the-art command and control equipment for complex maritime events.

This *Strategy* presents a new vision on how the Department's modern fireboats, arranged into a highly flexible *Tiered Response System* (layered resources), will provide unique lifesaving capabilities for incidents on or near the water--a truly 21<sup>st</sup> century marine firefighting concept. The *Strategy*, which is

aligned with the Department of Homeland Security's (DHS) strategic objectives, clearly illustrates the important role that fireboats play in protecting the Harbor--from routine emergencies, to large-scale crises--not just today, but into the future.

The Harbor is critical to the economic success and livelihood of many in this region. As the third largest port in the United States, the Harbor supports \$166 billion in annual trade and takes delivery of a large portion of the petroleum used on the eastern seaboard.

The Harbor is also an important conduit for 20 million people living in the region. New York City has more than 60 bridges and tunnels and 20 million commuters travel on the Staten Island Ferry each year.

---

The Harbor is constantly active with commerce, tourism and transportation. Every day, container ships carrying a variety of goods arrive at marine terminals to be loaded and unloaded. Also, massive oil tankers deliver their product to petroleum barges, which then make the final transfer to nearby oil refineries.

Daily commuters use water ferries serving many routes to avoid bumper-to-bumper vehicle traffic in tunnels and on bridges. Tourists arrive and depart by the hundreds, even thousands, at cruise ship terminals in Manhattan and Brooklyn. And New York City's residents and visitors enjoy the Harbor's 600 miles of shoreline seven days a week.

On a daily basis, this complex, choreographed and interdependent series of activities operates with amazing efficiency. However, accidents, natural disasters and terrorism are constant threats. An inferno could engulf ships and piers; a ship carrying fuel oil could catch fire and sink in a shipping channel, halting all commercial traffic; a large gasoline or chemical tanker-truck fire could compromise the structural integrity of a bridge; a coastal flood could trap scores of people; or terrorists could use improvised incendiary or explosive devices on ferries that could place thousands of people in extreme danger.

**FDNY All-Hazards Life Safety Mission**

To save lives, reduce risks and mitigate dangerous hazards.

To address these threats, minimize risks, respond to incidents and restore waterways to normal, the Harbor has a network of public and private partners that work together. As a member of this security network, FDNY Marine Operations provides critical and irreplaceable resources for the Harbor.

The core mission of the FDNY is to ensure *life safety*. Actions related to life safety supersede other objectives during an incident. Life safety operations refer to strategic and tactical measures implemented in response to imminent hazards or threats to life. FDNY

Marine Operations understands its role at the nexus of port protection and operates within the Department's life safety mission on the water and coastline.

**FDNY Marine Operations' Mission**

To protect lives and property within the Port of New York and New Jersey and surrounding regions by responding to fires, water rescues, hazardous material incidents, medical emergencies and maritime disasters. In collaboration with port security partners, Marine Operations advances public safety through incident prevention, harbor protection and safety education. The robust and timely response of FDNY's Marine Operations protects the Port of New York and New Jersey and strengthens homeland security efforts.

The mission of Marine Operations to protect life and property applies to all types of incidents and extends from hazard prevention and mitigation to recovery. Fire and emergency medical services long have been recognized as the lead agencies for life safety mitigation activities, which the *National Response Plan* (NRP) describes as those "designed to reduce or eliminate risks to persons or property or to lessen the actual or potential effects or consequences of an incident." With emergency medical training as Certified First Responders with Defibrillator (CFR-D), Marine Operations' Firefighters can access and treat patients expeditiously and effectively within a maritime setting.

Recognizing the roles it performs in port security, FDNY Marine Operations requires response resources that can quickly increase or decrease scale to a variety of dangerous incidents. Accordingly, FDNY has invested in maritime assets that are *fast, strong and agile*.

FDNY's fleet of fireboats is a combination of fast and light fireboats for rapid water rescue and large and powerful boats to manage large-scale events or disasters. This permits Marine Operations to develop a flexible response strategy for both fires and emergencies.

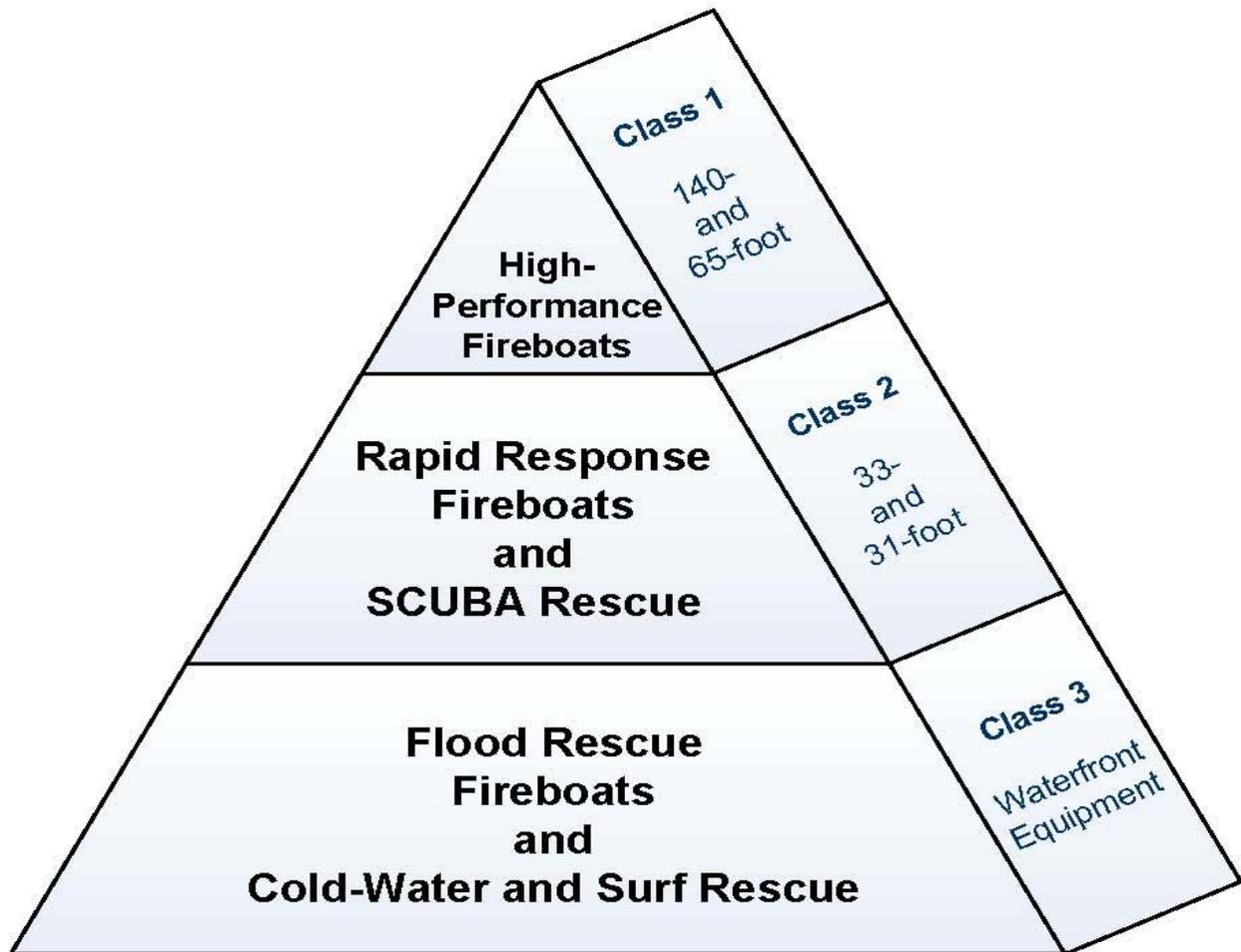
---

## Marine Operations' Tiered Response

To ensure the optimal availability and distribution of response resources, FDNY established a Marine Operations' *Tiered Response System*. Tiered response is a system of layered resources, with each layer containing incrementally higher levels of special response capabilities. This system enables the Department to rapidly deploy the appropriately scaled mix of specialty units in a manner that is responsive to an incident's escalation or recession, while also maintaining adequate capabilities to manage additional incidents and

coverage throughout the entire Harbor. To protect life and property, the *Marine Operations Strategy* employs a tiered response to get the right asset to the scene quickly.

By training Marine Operations personnel in a variety of response capabilities at incremental proficiency levels and strategically placing fireboats, the *Tiered Response System* maximizes FDNY's capabilities for response in a manner that is highly effective, economically efficient and sustainable over time.



**Marine Operations' Tiered Response System**

### *Class 1–High-Performance Fireboats*

The top tier features the Department’s high-performance fireboats, which have specialized equipment for water and ship rescue, firefighting, medical treatment, hazardous material detection, mitigation and technical decontamination. This class of large, high-performance fireboats has the capacity to manage and control difficult, water-borne disasters. The 140-foot fireboats provide the only chemical, biological, radiological and nuclear (CBRN) command and control platform in the Harbor and the largest everyday response platforms for the port. FDNY intends to make this command and control platform available to the United States Coast Guard, Port Authority of New York and New Jersey, law enforcement, health, other fire departments, environmental agencies and those who share, as partners, responsibility for the Harbor.



Class 1--The new, 140-foot, *Three Forty Three* fireboat.

### *Class 2–Rapid Response Fireboats*

The rapid response tier features a 33-foot fireboat and 31-foot medical boats. Year round, FDNY has at least 11 boats available in the water and, during the summer season, a total of 14 boats are operational. Combined with the larger, high-performance fireboats, these boats get underway first to make rapid rescues (up to 20 people per boat), even in shallow water, or to extinguish small fires with a flow capacity comparable to an engine company. For example, when a large recreation boat docked in

Hoboken, New Jersey, caught fire, Marine Operations used a rapid response fireboat, whose smaller size allowed it to navigate better within the marina and stopped the fire from spreading to the pier or other boats.



Class 2–Rapid Response boat.

### *Class 3–MARC Flood Boats*

Marine Operations’ tiered response at the operational level is composed of more than 3000 land-based Firefighters who receive special training in marine firefighting. This allows these land-based Firefighters to be deployed with the fireboats for shipboard firefighting or operate one of FDNY’s 25 Marine Auxiliary Rescue Craft (MARC), used primarily for flood rescues during coastal storms or hurricanes. Firefighting units located near the waterway are equipped and trained for cold-water surface and surf rescues.



Class 3–MARC boat.

---

## II. FIREFIGHTING CAPABILITIES FOR THE HARBOR

---



Brooklyn Box 10-10-0036, Greenpoint Terminal Market, May 2, 2006.

*The following fires caused the greatest loss of life in New York City history:*

- *June 15, 1904—Fire onboard the passenger ship General Slocum in the East River—1021 died.*
- *September 11, 2001—World Trade Center attacks—2750 were killed.*

### **Firefighting Capability, Capacity and Delivery**

As on land, fires on the water pose a significant risk to life and property. However, on water, there are additional risks to both victims and responders. Without adequate resources, boat and ship fires often spread rapidly, jeopardizing lives, vessels or other structures. Additionally, 30 billion gallons of oil are exchanged in the Harbor each year. The potential for ignition or spill could create massive fires and mega-environmental disasters.

Fires--especially large-scale ones--on commercial vessels at critical locations could halt shipping operations within the Harbor for days. A halt to shipping into the Harbor is estimated at \$450 million in lost commerce per day. Also at risk are the thousands of domestic and foreign vessels that visit the Harbor annually.

In 2009, the Harbor averted disaster when FDNY, led by Marine Operations, responded to the *CSL Atlas*, a 700-foot coal ship, which had 12,800 tons of coal burning on it. Using Marine Operations' firefighting

resources, the partners successfully mitigated the situation, protected the ship and maintained normal Harbor operations. In 2003, a gasoline barge exploded at Port Mobil on Staten Island. Fireboats operated for days to control the incident.



Staten Island Box 3-3-4197, Port Mobil, February 21, 2003.

To ensure safety and minimize property damage, FDNY Marine Operations responds to all fires in New York City east to Long Island, west to New Jersey and up the Hudson River. As a regional asset, FDNY uses its tiered response approach to ensure a **fast, strong and agile** response.

Rapid response fireboats can travel at more than 50 mph and pump 1000 gallons of water a minute, which is equivalent to a single land-based pumper. These rapid response fireboats can extinguish small fires or contain and prevent fires from spreading.

However, for large fires, the high-performance fireboats are needed. The 140-foot class of high-performance fireboats can pump up to 50,000 gallons of water per minute, which is equivalent to that of 50 land-based fire engines. Using the total capacity of all its fireboats, FDNY has the ability to pump an impressive 150,000 gallons per minute.

During firefighting operations, FDNY's high-performance fireboats also can maintain a ship's ballast by using the reduced weight of foam concentrate and/or Purple K dry chemical

extinguishing agent, in lieu of water, to quickly extinguish petroleum-based fires. This reduces the risk of subsequent ship instability caused by an excess application of water.

### Critical Infrastructure and Key Resources

FDNY Marine Operations' firefighting capabilities not only are important for vessels in the Harbor, but are an integral component of FDNY's overall strategy in protecting critical infrastructure. The Harbor has 150 key assets of national significance, including structures of economic (cargo ports and bridges), energy (electrical power plants, gas and petroleum fuel depots) and political or iconic importance, including the United Nations and the Statue of Liberty. As indicated in the *2009 National Infrastructure Protection Plan (NIPP)*, an incident involving critical infrastructure could be extremely disruptive and have a cascading impact on the community and country.

Marine Operations' tiered approach allows resources to be efficiently deployed to support operations and minimize damage to critical infrastructure on the Harbor-facing sides where land-based equipment cannot reach. For example, the high-performance fireboats can provide water for major fires at the Statue of Liberty and are powerful enough to reach any location on Liberty Island. Marine Operations allows FDNY to offer an expanded and more comprehensive response to critical infrastructure protection on or near the water.



Staten Island Box 3-3-4197, Port Mobil, February 21, 2003.

---

## Maintaining Bridge Structural Integrity

Bridges are vital to New York City's prosperity because they allow people and goods to move within and into the City. For example, more than 100 million vehicles use the George Washington Bridge annually. An accident or fire could threaten the structural integrity of the bridge steel (similar to what happened to the World Trade Center towers on September 11, 2001). Yet, structural steel can retain its strength if it is cooled with copious amounts of water.

FDNY land-based firefighting equipment may not be able to reach some of the most critical bridge supports. However, high-performance boats can pump cooling water onto these supports with their powerful water cannons, which can reach a horizontal distance of more than 700 feet, high enough to project a stream of water to the deck of the Verrazano Bridge. In 2009, fireboats extinguished a fire and cooled structural steel on the Throgs Neck Bridge. And, in September 2010, the *Kevin C. Kane* extinguished a fire, which was out of reach of land-based units, on the Metro-North Bridge in the Harlem River.



Metro-North Bridge fire, September 2010.

Furthermore, securing the structural integrity of a bridge during a fire also ensures that critical transportation arteries remain accessible. For example, 90 percent of all ship traffic into the Harbor goes under the Verrazano Bridge. If the goods-carrying ships could not

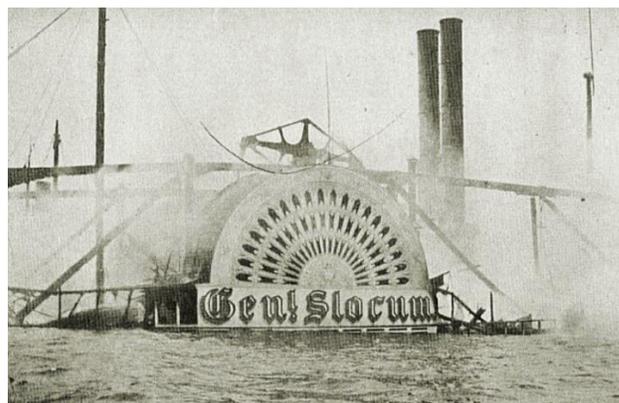
pass underneath because it was structurally unsound or collapsed, the economic impact would be enormous for each day the shipping channel remained closed.

## Water Evacuation

FDNY boats are critical to saving lives. While some other Harbor partners have the ability to evacuate a small number of people from disabled ships, only the FDNY is trained and equipped to perform evacuation when the rescue ship is exposed to hazardous situations, such as fires or chemical conditions during the rescue.

New York and New Jersey Harbor is filled each day with ferries, sightseeing boats, water taxis and recreational boats. FDNY's fireboats can prevent people from becoming trapped on burning ships without an escape. Today, the Staten Island Ferry carries 4000 people during peak hours. If a fire broke out from a bomb, disabling the ferry, 4000 people would have to be rescued.

In 1904, when FDNY assets were limited, a massive boat fire on the passenger ship *General Slocum* erupted and killed 1021 people in the East River. This was the largest one-day loss of life in New York City history until September 11, 2001.



The *General Slocum*.

To avoid another tragic event, FDNY has expanded its capacity so its fireboats will be able to evacuate 500 people per trip and extinguish large volumes of fire. Of these, 300 people can be evacuated using hydraulics, a

special feature of the high-performance fireboats that allows their height to be adjusted to align with a vessel in distress (similar to kneeling buses). The agility and capacity of these fireboats facilitate safer disembarking, especially for the injured or individuals with special needs.

### **Water Supply for Land-Based Firefighting Operations**

Today, FDNY’s land-based units rely on a system of fire hydrants for water to quench raging fires. If the hydrant system was compromised and could not provide water, land-based firefighting would be severely limited. Without water, fires would continue to spread, eventually reaching a point of conflagration in which the fire cannot be contained until it has run out of material to burn. This has occurred multiple times throughout history, including the Great New York City Fire of 1835, the Chicago Fire of 1871 and the San Francisco Fire after the 1906 earthquake.

While it may seem unlikely that fire hydrants would dry up, it is still a real possibility to have a major water main disruption. The 9/11 attacks rendered hydrants inoperable on several surrounding blocks in lower Manhattan. FDNY Marine Operations’



fireboats were the only water source available for the first four days to fight the fires at the World Trade Center. Without the water from the fireboats, multiple fires could have spread beyond the 16 acres of destruction.

If a significant event renders the land-based fire hydrants inoperable, FDNY’s high-performance fireboats can provide access to water through large-diameter hose for firefighting anywhere in Manhattan. These boats can provide enough water volume, using relay pumpers, to provide water across Manhattan’s widest point at 14<sup>th</sup> Street.

### **Commissioning Orders—FDNY Fireboat *Three Forty Three***

“We hereby appoint you, the Captain of Marine Company One,  
as the Commander of Fireboat *Three Forty Three*.

Furthermore, we direct you to place her in service as soon as possible,  
so that she may serve and protect all those residents and visitors to New York City.

May you keep our coastlines and waterways safe.”

By Orders of:  
Salvatore J. Cassano, Fire Commissioner  
Edward S. Kilduff, Chief of Department  
1830 hours, May 26, 2010

---

### III. WATER RESCUES AND MEDICAL EMERGENCIES

---



Manhattan Box 868, across from West 45<sup>th</sup> Street, January 15, 2009.

*Using Marine Operations' tiered response, fireboats rescued 20 people from the wings of US Airways Flight 1549 in the Hudson River and towed the sinking plane out of commercial shipping lanes.*

January 15, 2009

#### **Medical Triage, Treatment and Transport**

Marine Operations serves a key role in deploying FDNY's medical response capabilities in the Harbor by providing medical triage, treatment and transport. Boat passengers and crew personnel experience the same medical emergencies that occur on land and, thus, require comparable medical attention. Marine Operations provides the primary response to such medical emergencies.

FDNY Marine Operations relies heavily on its *fast, strong and agile* capabilities in addressing most medical emergencies in the Harbor. Each FDNY rapid response fireboat is

staffed with certified first responders with defibrillators. These boats can quickly transport personnel to provide oxygen and other basic emergency medical care.

Additionally, FDNY is in the process of procuring a number of rapid response medical boats that will be the only certified water ambulances in the Harbor. These boats can be staffed with EMTs and Paramedics when required to respond to routine or catastrophic events. FDNY's rapid response boats also can transport land-based EMS personnel to an incident when necessary.

---

To speed up medical transfer to land-based ambulances, FDNY Marine Operations is acquiring four-wheel-drive gators with trailers, which can drive on beaches and non-paved terrain to increase the number of patient water-to-land transfer points.



FDNY flatbed truck with gator and boat trailer.

For larger-scale medical emergencies (mass casualties) requiring significant medical triage, treatment and transport capabilities, FDNY Marine Operations can leverage its high-performance fireboats' platforms to gather, treat and transport people. Each of the two 140-foot high-performance fireboats can transport 150 non-ambulatory patients or up to 500 people who can self-evacuate.

### **Water Rescue Operations**

FDNY Marine Operations' resources are vital to expanding the Harbor's overall water rescue capacity. While multiple partners have vessels capable of responding to a person-in-the-water emergency, no single partner has the capacity to provide full coverage. Thus, water rescue is a multi-agency task. Every year, about 500 emergency rescue calls occur in the Harbor. Approximately 50 percent of FDNY Marine Operations' calls involve people in the water and the total number of calls is on the rise.

FDNY Marine Operations has the capability to conduct water rescues (requiring cold-water or dry suits), transport FDNY SCUBA divers or provide vessel towing in life-threatening incidents. Both rapid response and high-performance fireboats carry cold-water suits, allowing Firefighters to safely enter the

water to reach victims. FDNY divers can be transported and enter the water from any FDNY fireboat and the high-performance fireboats are equipped with special diving platforms for rescue operations.

Each 140-foot fireboat carries a 17-foot rapid response boat that can be quickly launched. Marine Operations' search capabilities are enhanced by thermal imaging cameras and searchlights. Water rescues could involve a single person in the water or hundreds requiring assistance. The tiered response to all incidents of varying sizes promotes flexibility.

### **Coastal Flooding and Hurricane Response**

With 600 miles of coastline surrounding the Harbor, the threat of flooding during a hurricane or other storm is significant. This threat is particularly relevant in flood-prone areas, such as Coney Island, the Rockaways, Battery Park City and the FDR Drive. In such a crisis, FDNY land-based resources would be unable to rely on engines, ladders or ambulances to reach individuals stranded in the flood waters. This potential challenge was highlighted in 2005 by Hurricane Katrina in New Orleans where first responders found it difficult to reach people on flooded streets.

To address this problem, FDNY relies on each progression of the Marine Operations' tiered response. FDNY is able to leverage the basic response tier by employing their 25 MARC flood rescue boats. MARCs are the easiest vessels to pilot and, therefore, require the least amount of specialized training. Firefighters in flood-prone areas, trained by Marine Operations, can use these boats to provide basic emergency and rescue services to people stranded in flooded areas.

Additionally, Marine Operations can activate more technical and specialized tiers as necessary. For example, rapid-response and high-performance fireboats can fight fires in flooded areas or supply water to land-based units when fire hydrants are inoperable or inaccessible.

---

## IV. CBRN AND HAZARDOUS MATERIAL CAPABILITIES

---



FDNY's *Three Forty Three* fireboat, which features the Harbor's inter-agency command and control platform. Photo courtesy of Bill Tompkins

*“The ability to command and respond to the dynamic threat environment is critical to protecting the Port of New York and New Jersey, which remains a viable and significant terrorist target.”*

General (Ret.) John P. Abizaid

### **Responding to CBRN and Hazardous Material Incidents**

In addition to life safety issues, CBRN and hazardous materials (haz-mat) contamination can cripple New York City's transportation and economic systems and, if contamination is not contained, cause a cascading failure. Despite advances in security and deterrence, it is essential that FDNY and its partners are focused not only on prevention, but also on *resilience* after an incident.

Responding to haz-mat incidents requires specialized training, equipment and protective gear to safely enter contaminated areas or hot zones. FDNY Marine Operations, along with specialized land-based FDNY Haz-Mat Operations units, offer unique capabilities to Harbor partners. FDNY's high-performance fireboats have crew and patient cabins with full

military-grade CBRN filtration systems to allow the boats to safely enter and operate in hot zones. This filtration system gives FDNY a distinct advantage to enter areas where other partners are not sufficiently equipped to safely and effectively operate.

Each Class 1 vessel carries chemical protective gear, allowing Firefighters to make rescues in the contaminated areas and then transport victims, while performing gross or technical decontamination on FDNY's vessels. Additionally, FDNY Haz-Mat crews can mitigate hazards on the ships. In 2009, FDNY was part of the integrated response to an explosion on the chemical tanker *Sichem Defiance*. FDNY ensured the safety of all responders as it monitored the fire risk while

---

chemicals were removed from the damaged vessel during the 20-day incident.

### Command and Control Platforms

In a larger incident, the command structure will require a unified command involving many individuals from different partner organizations.



High-performance, 64-foot fireboat.

Depending on the incident, it may be vitally important that an element of command presence be housed safely on a boat, such as during incidents when the damaged vessel is pulled downstream by strong currents. Its military-grade air filtration system, which filters chemical, biological and radiological particles, provides the only safe environment capable of holding a floating, 40-person unified Command Post during a CBRN event.

Without these resources, there would be less command and operational collaboration and a danger of agencies independently operating on their own vessels. The command center offers *Blue-Force* tracking (a GPS-based system) to track Fire Department, law enforcement and Coast Guard vessels in the Harbor. It also has communications channels from multiple agencies to receive and broadcast voice, video and data feeds to ensure that decision-makers have access to the best situational awareness available for commanding at a major maritime incident.

### Safety Monitoring

FDNY Marine Operations plays a vital role in monitoring and standby planning during recovery operations to protect workers and the public from undue risk or injury. FDNY Marine Operations minimizes this risk by calling on the expertise of FDNY Haz-Mat Operations. Since every shipboard incident has the potential for a confined-space component (due to the composition and configuration of ship interiors), Firefighters assigned to respond to incidents occurring within the City's waterways are trained to safely operate under the unique conditions they will face once shipboard.

### Dispersing Vapor Clouds

While the initial explosions of a chemical accident or attack can be destructive, the subsequent vapor cloud poses an even greater danger, which could move toward New York City's eight million inhabitants and millions of visitors. FDNY controls the only boats in the Harbor capable of pumping 50,000 gallons of water per minute to dissipate the vapor cloud. Without this vital capability, the Harbor partners could rely only on the wind and weather conditions to dissipate the cloud.



Fireboat uses water streams to disperse vapor cloud.

In the case of an oil spill or leak, fireboats can play a significant role in assisting the Coast Guard in managing the incidents and averting an environmental disaster. FDNY also can provide a command and control platform for multi-agency incident management.

---

## V. LIFE SAFETY PREVENTION AND PROTECTION INITIATIVES

---



---

### Risk Assessment and Risk Reduction

As an active Harbor partner, FDNY is integral not only in responding to incidents, but also in helping to reduce the likelihood that an incident will occur. Two important tools in risk reduction are conducting risk-assessment inspections and designing risk-mitigation plans for critical infrastructure in or around the Harbor, including:

- Bridges and tunnels
- Docks and piers
- National and local landmarks
- Energy storage sites or refineries
- Transportation systems

As experts in life safety and fire-risk reduction, FDNY collaborates with Harbor partners under the NIPP to “build a safer, more secure and more resilient America by preventing, deterring, neutralizing or mitigating the effects of deliberate efforts by terrorists to destroy, incapacitate or exploit elements of our nation’s critical infrastructure and key resources.”

The risk assessments carried out by FDNY Marine Operations identify threats, vulnerabilities and consequences related to life safety and fires. In working with structural designers, FDNY provides guidance on the design of new structures and improvement of existing structures.

For example, Marine Operations collaborated on the redesign of the Manhattan Bridge’s standpipe system to allow water to be fed from an engine or fireboat. With more than 150,000 vehicles crossing the bridge each day, plus around-the-clock subway train movement on the bridge, such an improvement can protect the lives of New Yorkers and tourists on the bridge in case of a major fire.

### Expanding Harbor Detection

As a partner in *The Fleet of 1000 Ships*, FDNY Marine Operations expands the Coast Guard’s and law enforcement’s abilities to detect, identify and respond to potential security threats on the waterways. The fireboats are equipped to provide radiological monitoring, while conducting routine patrols or participating in choke-point operations with law enforcement; the data can be collected and analyzed centrally.

By deterring dangerous behaviors--such as speeding and recklessness--Marine Operations also enhances safety due to its increased uniformed presence.



Rapid Response boat.

FDNY's diverse fleet of vessels allows for a tiered approach to prevention and response. Through routine patrols and by responding to calls, FDNY actively monitors major threats and safety concerns in the Harbor year-round. Marine Operations also scales up resources during peak months to ensure patrolling coverage matches Harbor traffic. Given the increasing proliferation and complexity of terrorist threats, the FDNY is well-positioned to help detect and deter threats through its tiered response and assets.

## Pre-Planned Events

With numerous large-scale, high-profile, special events in the Harbor and on the waterfront each year, FDNY Marine Operations protects citizens and visitors by minimizing accident risk and terrorist threats or vulnerabilities. More than 450 marine-based special events are held each year, including Macy's Fourth of July Fireworks Spectacular, which attracts more than two million spectators as 40,000 fireworks shells are launched into the air.

The FDNY also helps ensure life safety at other large-scale annual events, including Fleet Week and the New York City Marathon. Moreover, Marine Operations also assists with life safety plans related to the United Nations General Assembly. Specifically, the fleet's new vessels could safely evacuate key world leaders in its CBRN-protected cabin, if required.

FDNY's involvement in planning these events mandates a clear plan of action in case of accidents or threats.



Fireboat deploying multiple streams.

---

## VI. CONCLUSION

---



Staten Island Box 3-3-4197, Port Mobil, February 21, 2003.

*“The public can depend on FDNY Marine Operations to work with its network of Harbor partners to protect the Port of New York and New Jersey and its waterways.”*

FDNY Commissioner Salvatore J. Cassano

FDNY Marine Operations is committed to remaining an active partner on the water and providing the broader New York community with critical life safety and firefighting resources. The public relies on the ferries for transportation, beaches for relaxation and commerce from shipping for economic prosperity. It is important that residents and visitors know that they can depend on the FDNY on land, as well as by sea.

FDNY is dedicated to delivering its unique capabilities as it protects America’s critical infrastructure and secures the homeland. The Marine Operations’ strategy allows FDNY to respond quickly and appropriately to incidents ranging from people drowning in the water to burning oil tankers. Since 9/11, with

funding from the City of New York, as well as Federal dollars from the Port Security and Urban Areas Security Initiative grant programs, the FDNY has invested in the appropriate boats, tools and personnel needed to address the ever-changing national security threats and ensure Harbor-wide resilience.

The FDNY’s preparedness goals will continue to be realized by adapting to changes in the threat environment, reinforcing core competencies, maintaining a steady state of operational readiness, reducing the risks to the City and working in concert with our Harbor partners as the Department continues its role as a lead innovator at the local level in the greater homeland security network.

## VII. APPENDICES

### APPENDIX A: FDNY Marine Operations Vessels

<b>TIERED CLASS I VESSELS--HIGH-PERFORMANCE FIREBOATS</b>	
	<p><b>High-Performance 140-foot Fireboats</b></p> <ul style="list-style-type: none"> <li>• World’s largest and most technically advanced fireboat</li> <li>• Command and Control Center</li> <li>• 50,000-gpm pumping capacity, 25,000-gpm underway</li> <li>• Military air filter-protected super-structure, crew areas</li> <li>• Gross technical decontamination facilities</li> <li>• Medical triage and treatment facilities</li> <li>• Thermal imaging</li> <li>• Speed of more than 20 mph</li> <li>• 50-foot crane/tower-ladder boom</li> <li>• Fore peak tank for kneeling</li> <li>• Dive platform and 17-foot fast boat launch</li> <li>• Foam</li> </ul>
	<p><b>High-Performance 65-foot Fireboat</b></p> <ul style="list-style-type: none"> <li>• 50-mph, triple 1000-hp jets</li> <li>• Pumps 6000 gpm</li> <li>• Foam and Purple K</li> <li>• Protected super-structure</li> <li>• Thermal imaging</li> </ul>
<b>TIERED CLASS II VESSELS--RAPID RESPONSE FIRE AND MEDICAL RESCUE BOATS</b>	
	<p><b>Rapid Response 33-foot Fireboats</b></p> <ul style="list-style-type: none"> <li>• More than 45 mph</li> <li>• Triple outboards</li> <li>• 1000 gpm</li> <li>• Foam</li> <li>• Thermal imaging</li> <li>• Dive capable, shallow draft</li> </ul>
	<p><b>Rapid Response 31-foot Medical Boats</b></p> <ul style="list-style-type: none"> <li>• Twin outboards</li> <li>• Patient treatment bench, pass-through cabin</li> <li>• Drop bow, shallow draft</li> </ul>
<b>TIERED CLASS III VESSELS—MARC FLOOD RESCUE BOATS</b>	
	<p><b>MARC Flood Rescue Boats</b></p> <ul style="list-style-type: none"> <li>• Flat-bottom boats can maneuver in shallow water, including flooded streets and near the shoreline</li> </ul>

---

## APPENDIX B: Acknowledgments and References

---

### Acknowledgments

**The FDNY thanks the following contributors for their time, dedication and insight:**

Assistant Chief Joseph W. Pfeifer, Chief of Counterterrorism and Emergency Preparedness  
Deputy Assistant Chief William Seelig, Chief of Special Operations Command  
Battalion Chief James Dalton, Chief of Marine Operations  
Battalion Chief Michael Buckheit, Marine Battalion



#### **FDNY Editors**

Captain Sean S. Newman, Center for Terrorism and Disaster Preparedness  
Janet Kimmerly, Editor, *WNYF*  
Jenny Holland, Office of the Fire Commissioner



#### **From Harvard Business School**

Ophelia Roman  
Jacob Cusak  
Scott DeVos  
James Eastham  
Jonathan Grzyb, II  
Jeffrey Katzin  
Eric Lampe  
Matthew McKnight  
Forbes McPherson

### References

The Marine Operations Strategy format and content closely adhere to the planning guidelines described in the following documents: *National Response Plan*; *National Incident Management System (NIMS)*; *National Preparedness Goal*; *National Planning Scenarios*; *Universal Task List*; *Target Capabilities List*; *National Infrastructure Protection Plan*; *State and Urban Area Homeland Security Strategy: Guidance on Aligning Strategies with the National Preparedness Goal*; *Homeland Security Grant Program*; *National Response Framework*; and *New York City Office of Emergency Management's Citywide Incident Management System (CIMS)*.