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Hurricane Katrina: A Deadly Warning Mandating Improvement to the National Response to Disasters

Aileen M. Marty*

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HURRICANE KATRINA: A DEADLY WARNING MANDATING IMPROVEMENT TO THE NATIONAL RESPONSE TO DISASTERS

AILEEN M. MARTY, M.D., FACP⁺⁺

Dr. Aileen Marty is an internationally recognized expert in emergency preparedness, infectious disease, pathology, and the science, medicine, and policy of chemical, biological, and radiation counterterrorism. She is a frequent lecturer on disaster preparedness throughout the world. Dr. Marty is currently on Special Assignment with the Battelle Office of Homeland Security serving as Liaison and Relationship Manager for Office of Health Affairs of the Department of Homeland Security. She also serves as an Interagency Coordinator for the Department of Health and Human Services, United States Department of Agriculture, National Laboratories of the Department of Energy, and the Department of Defense. She teaches "Scientific, Domestic, and International Policy Challenges of Weapons of Mass Destruction and Terror" at the National Defense University. The editors of the Law Review solicited Dr. Marty's contribution to this symposium on disasters, in part because of her expertise in the subject, but also because we wanted to highlight the need for a multi-disciplinary approach to disaster preparedness in the hopes of stimulating further collaboration among the professions in this vital area. In this article, Dr. Marty, a medical doctor, puts into context the Federal Response to catastrophes and disasters, explores some of the lessons learned from Hurricane Katrina focusing primarily on the health issues, and then explains some of the remaining policy challenges that continue to face the nation regarding disasters. – Law Review Eds.

* Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of Battelle Memorial Institute, the Department of Homeland Security, or the Department of Health and Human Services.

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I. INTRODUCTION

The federal government's role in disaster management has evolved from simply providing tax relief to that of an active participant in prevention, response, and recovery.¹ Experience with massive catastrophes that cause

1. See *infra* Table 1.

multiple casualties² in the United States is limited; only ten large disasters are recorded in which there were over 1000 fatalities.³ Prior to the 2006 Hurricane Season, experts agreed that there would be more category four and five hurricanes.⁴ In addition, the risk from large-scale deliberate disasters is increasing; particularly as acquiring nuclear weapons is considered a potent political, military, and social tool.⁵ Since the 9/11 attacks, the federal government has recognized the urgent need for an improved, integrated National Plan for Preparedness, Response, and Recovery. The response to the 2005 hurricanes demonstrated the need for even more changes. This article first examines the changes initiated by 9/11. The article then reveals the mandated improvements, such as further integration between federal, state/tribal, and local government and the private sector capabilities that were made obvious by the lessons learned from Hurricanes Katrina and Rita, focusing particularly on some of the health care issues that arose. Finally, the article raises some very significant issues that continue to require multi-disciplinary and creative solutions and that must be addressed in disaster preparedness.

In February 2003, the White House produced Homeland Security Presidential Directive-5 (HSPD-5) on the Management of Domestic Incidents,⁶

2. The term “casualty” is often ill-defined. In some texts, the term casualty means death, whereas in others it implies a patient with a treatable injury or illness. See BLACK’S LAW DICTIONARY 231 (8th ed. 2004). In this article, the term “casualty” is used to encompass both those with potentially treatable conditions and the dead. The absolute number of patients needed to define an event as producing “mass casualties” is less important than the functional impact to the existing support system. An incident that overwhelms the resources of a given system at a specific point in time is considered a mass casualty event. High impact events may or may not cause large numbers of directly impacted persons, but may nonetheless cause a large impact on the support system, because of the numbers of persons who fear that they may have been impacted. Thus, if one considers the “psychological casualties” and the fact that the effects of major natural catastrophes or of a terrorist event can be far-reaching, then even events with limited numbers of directly impacted persons can be “mass casualties” events.

3. See *infra* Table 2.

4. National Weather Service, NOAA, Climate Prediction Center: Atlantic Hurricane Outlook – Background Information, http://www.cpc.ncep.noaa.gov/products/outlooks/background_information.shtml#NOAADEF (last visited June 21, 2007).

5. George P. Shultz et al., *A World Free of Nuclear Weapons*, WALL ST. J., Jan. 4, 2007, at A15; see *U.N. Security Council Votes to Impose Tougher Iran Sanctions*, WALL ST. J., Mar. 25, 2007.

6. Homeland Security Presidential Directive/HSPD-5—Management of Domestic Incidents, 1 PUB. PAPERS 229 (Feb. 28, 2003) [hereinafter HSPD-5].

and in December 2003, the White House issued Homeland Security Presidential Directive-8 (HSPD-8) on National Preparedness.⁷

HSPD-5 called for a transition from a Federal Response Plan (FRP) to a National Response Plan (NRP)⁸ coupled with a National Incident Management System (NIMS).⁹ The hope was that the NIMS would provide a consistent nationwide approach for federal, state, tribal, and local governments to work together effectively and efficiently to prepare, respond, and recover from domestic incidents, regardless of cause, size, or complexity. The backbone of the NIMS is the Incident Command System (ICS),¹⁰ expanded so that NIMS would provide for interoperability and compatibility among federal, state, tribal, and local capabilities. The NIMS included a core set of concepts, principles, terminology, and technologies covering the incident command system, multi-agency coordination systems, unified command, training, identification and management of resources, qualifications and certification, as well as the collection, tracking, and reporting of incident information and incident resources.

HSPD-8 had the goal of establishing policies to strengthen the preparedness of the United States to prevent and respond to emergencies under a national, domestic, all-hazards preparedness goal. The NRP, modeled on the FRP,¹¹ incorporated the Robert T. Stafford Disaster Assistance and Emergency Relief Act,¹² and presented an all-hazards approach. The NRP, using the NIMS, was designed to provide the structure and mechanisms for national level policy and operational direction for federal support to state and local incident managers and for exercising direct federal authorities and re-

7. Homeland Security Presidential Directive/HSPD-8—National Preparedness, 2 PUB. PAPERS 1822 (Dec. 17, 2003) [hereinafter HSPD-8]. For a complete list of Presidential Directives, see <http://www.fas.org/irp/offdocs/direct.htm>.

8. U.S. DEP'T OF HOMELAND SEC., NATIONAL RESPONSE PLAN (2004), available at <http://www.dhs.gov/xlibrary/assets/NRPbaseplan.pdf> [hereinafter NATIONAL RESPONSE PLAN].

9. U.S. DEP'T OF HOMELAND SEC., NATIONAL INCIDENT MANAGEMENT SYSTEM (2004), available at http://www.fema.gov/pdf/emergency/nims/nims_doc_full.pdf.

10. The ICS was developed in the early 1970s to deal with differences among agencies and unspecified incident objectives in certain disasters. Occupational Safety & Health Admin., U.S. Dep't of Labor, Incident Command System: What is an Incident Command System? http://www.osha.gov/SLTC/etools/ics/what_is_ics.html (last visited June 21, 2007). ICS is "a standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries." *Id.*

11. U.S. DEP'T OF HOMELAND SEC., FEDERAL RESPONSE PLAN: BASIC PLAN (2003), available at <http://www.au.af.mil/au/awc/awcgate/frp/frpbasic.pdf>.

12. Robert T. Stafford Disaster Assistance and Emergency Relief Act of 1988, Pub. L. No. 100-707, 102 Stat. 4689 ((codified as amended at 42 U.S.C. § 5121 (2000 & Supp.)).

sponsibilities, as appropriate.¹³ The NRP attempted to capture protocols for operating under different threats or threat levels and it incorporated, as much as possible, the existing federal emergency and incident management plans, along with rigorous requirements for continuous improvements from testing, exercising, and experience. The hope was that the NRP would provide a consistent approach to reporting incidents, providing assessments, and making recommendations to the President, the Secretary of Homeland Security, and the Homeland Security Council. HSPD–8 also called for a National Preparedness Goal that established measurable priorities, targets, and a common approach to developing needed capabilities.¹⁴ This National Preparedness Goal uses a Capabilities-Based Planning approach to determine how prepared we are, how prepared we should be, and how to prioritize our efforts to close the gaps. It required the development of a target capabilities list that identified the capabilities of federal, state, local, and tribal entities.

Hurricane Katrina revealed many gaps and issues with the National Preparedness Goal and its target capabilities list, as well as issues with the NRP and the NIMS. The lessons learned have led to major revisions in all of these documents¹⁵ and to the development of an NRP/NIMS review process.¹⁶

13. See *infra* Figure 1.

14. U.S. Dep't of Homeland Sec., Fact Sheet: Strengthening National Preparedness: Capabilities-Based Planning, http://www.ojp.usdoj.gov/odp/docs/CBP_041305.pdf (last visited June 21, 2007); see also HSPD–8, *supra* note 7.

15. See generally U.S. DEP'T OF HOMELAND SEC., NOTICE OF CHANGE TO THE NATIONAL RESPONSE PLAN (2006), available at http://www.dhs.gov/xlibrary/assets/NRP_Notice_of_Change_5-22-06.pdf [hereinafter NOTICE OF CHANGE TO THE NATIONAL RESPONSE PLAN]; FEMA, NIMS BASIC: ONGOING MANAGEMENT AND MAINTENANCE, (Mar. 23, 2006), http://www.fema.gov/pdf/nims/NIMS_basic_ongoing_management_and_maintenance.pdf; Memorandum from Al Fluman, Acting Dir., NIMS Integration Ctr., FEMA, DHS to the NIMS Stakeholders (Mar. 26, 2007), available at <http://www.dhs.gov/xlibrary/assets/nims-upgrade-revision-v2-032707.pdf>; U.S. Dep't of Homeland Sec., National Response Plan and National Incident Management System Review and Revision Process, Stakeholder Meeting, National Incident Management System (NIMS) Key Revision Issues – Background (Oct. 25, 2006), <http://www.dhs.gov/xlibrary/assets/nrp-nims-upgrade-bullets-102406.pdf> [hereinafter NIMS Key Revision Issues – Background]; U.S. Dep't of Homeland Sec., National Response Plan and National Incident Management System Review and Revision Process, Stakeholders Meeting, NIMS Upgrade Summary (Oct. 25, 2006), <http://www.dhs.gov/xlibrary/assets/nrp-nims-upgrade-paper-102406.pdf> [hereinafter NIMS Upgrade Summary]; U.S. DEP'T OF HOMELAND SEC., HURRICANE KATRINA IMPACT ON THE NATIONAL PREPAREDNESS GOAL AND TARGET CAPABILITIES LIST, <http://www.ojp.usdoj.gov/odp/docs/KatrinaspactontheGoalandTCL.pdf> (last visited June 21, 2007).

16. U.S. Dep't of Homeland Sec., The NRP/NIMS Review Process Coordination Structure, <http://www.dhs.gov/xlibrary/assets/nrp-nims-coord-structure.pdf> (last visited June 21, 2007).

II. HURRICANE KATRINA

Hurricane Katrina collided with South Florida, picked up strength, and slammed into the Gulf Coast ravaging Mississippi, Louisiana, and Alabama in late August 2005.¹⁷

On August 29, 2005, at approximately 6:10 a.m. CDT (7:10 a.m. EST), Hurricane Katrina's eye made landfall at Buras, on the Louisiana coast, between Grand Isle and the mouth of the Mississippi River. An hour and a half *before* the storm made landfall, the levees near the CSX railroad and Industrial canal were breached and the flooding of residential areas in greater New Orleans began. The storm surge overtopped the levees on the east bank of the river, "crossed" the river, overtopped the levees on the west bank, and sent additional water into neighborhoods in Plaquemines Parish. The center of Hurricane Katrina moved ashore into southeast Louisiana just east of Grand Isle. Catastrophic flooding manifested in New Orleans from massive overtopping of levees in east Orleans and St. Bernard Parish, overtopping and breaking of the Industrial Canal levees, and breaks in the 17th Street and London Avenue Canal flood walls. Though the flooding was first reported locally at 8:21 a.m. CDT (9:21 a.m. EST) on Monday, the Homeland Security Operations Center (HSOC) merely reported a "levee issue" at 9:50 a.m. CDT (10:50 a.m. EST) on Monday. Sadly, by Monday morning the disaster zone encompassed an area of 93,000 square miles, and thirteen states were in

17. SELECT BIPARTISAN COMM. TO INVESTIGATE THE PREPARATION FOR AND RESPONSE TO HURRICANE KATRINA, A FAILURE OF INITIATIVE 1-27 (2006), *available at* http://katrina.house.gov/full_katrina_report.htm [hereinafter A FAILURE OF INITIATIVE]; FRANCES F. TOWNSEND, THE FEDERAL RESPONSE TO HURRICANE KATRINA: LESSONS LEARNED 1 (2006), <http://www.whitehouse.gov/reports/katrina-lessons-learned.pdf>; COMM. ON HOMELAND SEC. & GOV'T AFFAIRS, HURRICANE KATRINA: A NATION STILL UNPREPARED, S. REP. NO. 109-322 (2006), *available at* http://hsgac.senate.gov/_files/Katrina/FullReport.pdf; *Hurricane Katrina: GAO's Preliminary Observations Regarding Preparedness, Response, and Recovery: Hearing Before the S. Homeland Sec. & Gov't Affairs Comm.*, 109th Cong. 2 (2006) (statement of David M. Walker, Comptroller General of the United States), <http://www.gao.gov/new.items/d06442t.pdf> [hereinafter Walker Statement]; U.S. DEP'T OF HOMELAND SECURITY, OFFICE OF INSPECTOR GEN., OFFICE OF INSPECTIONS AND SPECIAL REVIEWS, A PERFORMANCE REVIEW OF FEMA'S DISASTER MANAGEMENT ACTIVITIES IN RESPONSE TO HURRICANE KATRINA 1 (Mar. 31, 2006), http://www.dhs.gov/xoig/assets/mgmttrpts/OIG_06-32_Mar06.pdf [hereinafter FEMA PERFORMANCE REVIEW]; U.S. GOV'T ACCOUNTABILITY OFFICE, CATASTROPHIC DISASTERS: ENHANCED LEADERSHIP, CAPABILITIES, AND ACCOUNTABILITY CONTROLS WILL IMPROVE THE EFFECTIVENESS OF THE NATION'S PREPAREDNESS, RESPONSE, AND RECOVERY SYSTEM, GAO-06-618 (Sept. 6, 2006), *available at* <http://www.gao.gov/new.items/d06618.pdf> [hereinafter CATASTROPHIC DISASTERS]; U.S. DEP'T OF HOMELAND SEC., NATIONWIDE PLAN REVIEW PHASE 2 REPORT (2006), *available at* https://www.dhs.gov/xlibrary/assets/Prep_NationwidePlanReview.pdf; *see infra* Table 4.

a “state of emergency.” The storm had caused repeated surges of water many reaching twenty-seven feet above normal in the Biloxi Mississippi area, and damaged 169 miles of levees in Louisiana. It was not until Tuesday, August 30, at 6:00 a.m. EST that the HSOC finally provided a confirmed report of a breach. Inexplicably, Secretary of Homeland Security Michael Chertoff held off declaring Hurricane Katrina an “Incident of National Significance”¹⁸ until Tuesday evening, August 30, at 7:30 p.m. EST.¹⁹

The impact from these events were felt not only by the thousands of people caught in the path of the storms, but also by the entire nation as we struggled to provide shelter, food, medical resources, and law enforcement to those in and from the affected communities, and to deal with the economic consequences of the damaged infrastructure caused by these storms. The hurricanes, coupled with the subsequent flooding, caused the same sort of devastation to many local health care facilities, research centers, waste facilities, chemical facilities, and cemeteries, as it did to other types of buildings in the region, compounding the medical threats to the community. It damaged jails and law offices, compounding the security and law enforcement issues as well.

Countless foreign nations, from the poorest to the wealthiest, offered cash and in-kind donations, including foreign military donations to the United States. In-kind donations included food, clothing, medical supplies, and equipment. FEMA and other government agencies, however, did not have plans, policies, or procedures to ensure the proper acceptance and distribution of either cash or in-kind assistance donated by foreign countries and militaries. FEMA and other agencies established ad hoc procedures, but no agency tracked and confirmed that the assistance arrived at their destinations.

18. NATIONAL RESPONSE PLAN, *supra* note 8, at 4. The response to the hurricanes of 2005 was based on the NRP of December 2004. In the NRP of December 2004, an “Incident of National Significance” was defined as being based on criteria established in paragraph 4 of HSPD-5, and was considered an actual or potential high-impact event that required a “coordinated and effective response by an appropriate combination of federal, state, local, tribal, nongovernmental, and/or private-sector entities in order to save lives, minimize damage, and provided the basis for long-term community recovery and mitigation activities.” *Id.* at 3. Paragraph 4 of HSPD-5 states:

The Secretary shall coordinate the Federal Government's resources utilized in response to or recovery from terrorist attacks, major disasters, or other emergencies if and when any one of the following four conditions applies: (1) a Federal department or agency acting under its own authority has requested the assistance of the Secretary; (2) the resources of State and local authorities are overwhelmed *and* Federal assistance has been requested by the appropriate State and local authorities; (3) more than one Federal department or agency has become substantially involved in responding to the incident; or (4) the Secretary has been directed to assume responsibility for managing the domestic incident by the President.

HSPD-5, *supra* note 6, at 230.

19. See *supra* note 17 and accompanying text.

Lack of procedures, inadequate data about the donations, and poor coordination resulted in the United States government agreeing to receive food and medical items that could not be used in the United States and led to storage costs of about \$80,000.²⁰

III. KEY FACTORS THAT LED TO FAILURES

(1) Long-term warnings went unheeded and government officials neglected their duties to prepare for a forewarned catastrophe.²¹

(2) Government officials took insufficient actions or made poor decisions in the days immediately before and after landfall.²²

(3) Some important definitions and triggers in the NRP were not clearly defined.

(4) The Catastrophic Incident Annex could not be activated without the declaration of an Incident of National Significance or the specific request of the affected state.

(4) There were inconsistencies between the NRP and NIMS.

(5) There was ignorance concerning the NRP, NIMS, and the lessons learned from the Hurricane Pam exercise by key persons at all levels of response.

(6) Funding was cut to the Hurricane Pam exercise before it was completed, thus while problems were identified, key planning decisions for managing the problems were not yet made (plans for medical care for victims were not finalized, communication issues were not addressed, and key transportation decisions were left "to be determined").

(7) The systems which officials relied on to support their response efforts failed.

(8) Government officials at all levels failed to provide effective leadership and were confused regarding their relative responsibilities.²³

(9) There were problems with communication and situational awareness.

(10) Our plan failed to recognize that local police, fire, and medical personnel might be incapacitated.

20. U.S. GOV'T ACCOUNTABILITY OFFICE, HURRICANE KATRINA: COMPREHENSIVE POLICIES AND PROCEDURES ARE NEEDED TO ENSURE APPROPRIATE USE OF AND ACCOUNTABILITY FOR INTERNATIONAL ASSISTANCE, GAO-06-460, at 1 (Apr. 6, 2006), available at <http://www.gao.gov/new.items/d06460.pdf>.

21. S. REP. 109-322.

22. *Id.*

23. See *supra* note 17; see also Ben Depoorter, *Horizontal Political Externalities: The Supply and Demand of Disaster Management*, 56 DUKE L.J. 101 (2006).

(11) There was a need but no plan in effect that utilized a modern, flexible, transparent logistic system between federal, state, local, and industry agencies.

(12) Confusion arose regarding the roles of the Principle Federal Official and the Federal Coordinating Officer.

(13) We were unprepared to manage and accept the unprecedented tide of foreign assistance on this scale.²⁴

(14) Issues arose between the roles of the Military and the National Guard, and their deployment was delayed.

(15) There was confusion between the roles of the HSOC, Interagency Incident Management Group (IIMG), and other operation centers and delays in activating the IIMG.

IV. ADJUSTMENTS TO NRP, NIMS, AND THE NATIONAL PREPAREDNESS GOAL AND ITS TARGET CAPABILITIES

A. *Adjustments to National Response Plan*

The NRP applies to all incidents requiring a coordinated federal response and is an all-hazards plan built on the template of the NIMS, which provides the structure and mechanism for national-level policy and operational direction for managing a domestic incident. Its flexibility is intended to enable effective interaction among various federal, state, local, tribal, private-sector, and other nongovernmental entities. The specific changes to the NRP following Hurricanes Katrina and Rita are:

- (1) The NRP is always in effect.²⁵
- (2) When incidents impact the entire nation, multiple states, or localities, multiple Joint Field Offices (JFO)²⁶ may be established regionally.
- (3) The Secretary will consider the four criteria set forth in HSPD-5 when making the determination to declare an Incident of National Signifi-

24. See generally U.S. Dep't of State, Freedom of Information Act – Document Collection: Hurricane Katrina—Relief Assistance, <http://foia.state.gov/SearchColls/CollsSearch.asp> (select “Hurricane Katrina”; click “Search”) (last visited June 21, 2007).

25. In the December 2004 NRP, which was not always in effect, the NRP could be partially or fully implemented in the context of a threat, anticipation of a significant event, or in response to a significant event. Selective implementation through the activation of one or more of the system's components was supposed to allow for maximum flexibility in meeting the unique operational and information-sharing requirements of the situation at hand and enabling effective interaction between various federal and non-federal entities.

26. A JFO is a temporary federal facility established locally to serve as a central point for federal, state, local, and tribal executives who have responsibility for incident oversight, direction, and/or assistance to effectively coordinate protection, prevention, preparedness, response, and recovery actions.

cance, but he is no longer bound to them; he is not limited to those thresholds, and he may base his decision on other applicable factors.

(4) The declaration of an Incident of National Significance is no longer critical to the decision to implement certain elements of the NRP.

(5) Catastrophic Incident Annex: While the basic premise still applies that incidents are generally handled at the lowest jurisdictional level possible, the revised NRP says the CI Annex is primarily designed to address no-notice or short-notice catastrophic incidents where the need for federal assistance is obvious and immediate. This allows the federal government to act in support of projected needs *in anticipation of requests* from state and local authorities.

(6) Department of Defense (DoD) provides Defense Support of Civil Authorities (DSCA) in response to requests for assistance during domestic incidents. The supported DoD combatant commander may use a Joint Task Force (JTF) to command federal Title X military activities in support of the incident. Command and Control of the JTF is collocated with the Principal Federal Official (PFO)²⁷ at the JFO to ensure coordination and unity of efforts.

(7) The Secretary of Homeland Security is now permitted to combine the roles of the PFO and that of the Federal Coordinating Officer (FCO)²⁸ in a single individual for any disaster that is not an incident resulting from terrorism.

(8) To ensure coordination of effort, whenever possible, from operational entities such as DoD JTF; headquarters will collocate at the Joint Field Office.

(9) To better coordinate the NIMS with the NRP elements of Emergency Support Functions (ESF), they now organizationally fall within the Operations, Planning, and Logistics and Finance/Administration sections of the Joint Field Office, and other sections as required.

(10) The Domestic Readiness Group, which serves as a permanent standing interagency planning/operations staff housed within the National Operations Center, was created.

(11) The HSOC was replaced with the National Operations Center.

27. The PFO is the federal official designated by the Secretary of Homeland Security to act as his or her local representative to oversee, coordinate, and execute the Secretary's incident management responsibilities under HSPD-5 for Incidents of National Significance.

28. The FCO is someone appointed to manage federal resource support activities related to Stafford Act disasters and emergencies. The FCO is responsible for coordinating timely delivery of federal disaster assistance resources and programs to the affected state and local governments, individual victims, and the private sector.

(12) The Interagency Incident Management Group was replaced with an incident advisory group and adjudication body for the Secretary of Homeland Security.

B. *Adjustments to National Incident Management System*

The NIMS provides a structural framework for incident management at all jurisdictional levels regardless of the cause, size, or complexity of an event. The basic components of NIMS are now Preparedness, Communications and Information Management, Resource Management, and the Command and Management component—headed by the Incident Commander.²⁹ These four NIMS components work together as a system to provide the national framework for incident management. Each organization—e.g., fire, police, emergency medical services, hospitals, etc.—needs some type of an Incident Management System (IMS) with an Incident Command System (ICS). The Command and Management oversees four sections—Operations, Planning, Logistics, and Finance.³⁰ When more than one entity works together, a “joint command” is used. The Command is responsible for overall operations and liaisons with other agencies. The Operations Section houses the “doers”; the Planning Section looks ahead and addresses the “what if” scenarios; the Logistics Section gets “stuff” to keep operations going; and the Finance Section tracks and authorizes expenses and personnel. The ICS provides a flexible infrastructure that can expand and contract as time evolves, depending on the size and complexity of the event. All personnel need to have clearly defined roles and responsibilities, based on previously described functions rather than on specific individuals.

As of March 26, 2007, the NIMS working group has produced a draft NIMS Upgrade V2.³¹ The working group continues to study, obtain, and review comments and revise NIMS accordingly to include: improving the guidance to clarify roles and responsibilities within the NIMS framework; the incorporation of concept preparedness into NIMS; and making NIMS easier for stakeholders to use. The revised NIMS will provide clearer identification of the relationships between the NIMS, HSPD-8, the NRP, and other federal response efforts.³² In addition, the revised NIMS will emphasize

29. Memorandum from Al Fluman, *supra* note 15.

30. *See* Figure 2.

31. U.S. Dep’t of Homeland Sec., NRP & NIMS Review—NIMS Working Group, http://www.dhs.gov/xprepresp/programs/gc_1168637749890.shtm (last visited June 21, 2007).

32. *Id.*

NIMS training for emergency management, response personnel, disaster workers, private sector, and nongovernmental agencies.

C. *Adjustments to National Preparedness Goal and Its Target Capabilities*

The impact of the 2005 hurricanes required changes to our National Preparedness Goal (NPG).³³ A new national priority was added: “*Strengthen Emergency operations planning and citizen protection capabilities.*” This new priority is now a capability-specific priority to the NPG. Emergency planning is now a “National Security Priority.”

The NPG is now more strongly viewed as one with an “All-Hazard” approach and less of a counter-terrorism approach. The specific capabilities in environmental health, fatality management, citizen protection (evacuation or in-place protection), public safety and security response, on-site incident management and emergency operations center management (such that government officials are better prepared to handle their role in managing a major event), and urban search and rescue (to emphasize search of evacuated areas in addition to structural collapse extrication) have been modified or rewritten. There are also plans to rewrite or modify mass care, short-term recovery, critical resource logistics and distribution, citizen preparedness and participation, and water rescue.

V. PUBLIC HEALTH ASPECTS

A. *Lessons Learned from Katrina Regarding Public Health in a Catastrophe*

(1) Shelter in place: Hospitals had to support thousands of extra people—evacuees, families of staff and patients, policemen, firefighters, National Guardsmen, and United States Marshals. Extra beds, toiletries, and food needed to be found and distributed at the same time that patient care was being provided.

- (2) Loss of access to drugs and vaccines.
- (3) Separating acute treatment needs from pre-existing conditions.
- (4) Impact on Hospital staff: Many lost their homes, some lost medical practices by loss of patients.
- (5) Need to improvise and disregard certain rules during event.
- (6) Reorienting medical specialists toward providing primary care.

33. See generally U.S. DEPT. OF HOMELAND SEC., NATIONAL PREPAREDNESS GOAL (2005), available at <http://www.iaem.com/documents/FinalDraftNPG.pdf>.

- (7) Location of generators—loss of power on health care (e.g. dialysis equipment, ventilators, etc.).
- (8) Coordination between FEMA & DHHS.
- (9) Evacuating/accepting patients: Transportation issues.
 - (a) Need for better planning and coordination of transportation of patients to/from hospitals, because following Katrina the nearest centers got most patients and were overwhelmed.
 - (b) Need for better plans for the evacuation of handicapped/elderly.
- (10) Heat, hygiene, and waste disposal.
- (11) Immunizing workers who clean up debris.
- (12) Complications caused by mold, allergies, petrochemicals, and infectious agents.
- (13) Security forces need to coordinate with health experts as per the ICS.
- (14) Hospitals in New Orleans failed to anticipate communication failures, and such failures lasted nearly twenty-one hours.
- (15) The transfer of the National Disaster Medical System (NDMS) to the Department of Homeland Security in 2003 had undermined NDMS effectiveness. When Hurricane Katrina struck the Gulf Coast, NDMS was unprepared to properly respond,³⁴ also there was confusion between HHS and DHS about deploying NDMS personnel and assets.

B. Public Health Aspects of Multi-Disciplinary Coordination and Communications

Disasters require non-traditional partnerships, and the partners must be notified and must participate in coordination of the event. These include: 1) local law enforcement and potentially the Federal Bureau of Investigation (FBI); 2) public health—populations of patients rather than simply individuals are involved; 3) the EMS agency; 4) city/county/state or tribal/federal administration; 5) the Laboratory Response Network; 6) the media; 7) mortuary affairs; and 8) faith-based leaders. Clear procedures must be in place to maintain the “chain of evidence” and proper authorities must be notified, such as public health and the FBI, when collecting samples. A 24/7 reporting system must be implemented so notifications can be readily made at all hours during the emergency. Potential damage to physical communications infrastructure necessitates appropriate redundancy planning and must con-

34. U.S. HOUSE OF REP. COMM. ON GOV'T REFORM, *THE DECLINE OF THE NATIONAL DISASTER MEDICAL SYSTEM* 1–2 (2005), <http://oversight.house.gov/Documents/20051209095733-01279.pdf>.

sider alternate forms of communications and notification systems. In past disasters, communications networks have been crippled significantly by massive simultaneous utilization by the affected population. The numbers of persons attempting to access various telecommunication systems simultaneously affects the communication networks in such a way that no calls can get through, even though the system remains physically intact.

C. *Surge Capacity and Alternate Sites of Care*

A strategy to improve system capacity—surge capacity—is critical to optimize preparation and management of mass casualties. Even with an optimal IMS, if the health care system lacks the capacity to provide patient care to large numbers of casualties, people will die. Our current health care system has virtually no excess capacity. This is very cost-efficient under ordinary circumstances, but problematic following any type of disaster or public health emergency that produces large numbers of casualties. Even a small increase in the number of patients stresses the current health care system. Compounding the problem is the issue that hospital disaster plans cannot count on a staff level that equals or exceeds their normal staffing. Some staff members will go home—or not come in—so they can take care of their own families, while others may be isolated because of road conditions or other physical problems. Additionally, loss of power, phones, and cellphones can make it difficult or impossible to respond. Hospitals need plans that are capable of functioning at scaled levels, based on the scope of the emergency and the availability of the staff. An expert has proposed a model for improving surge capacity for hospitals that contains of three components: “Staff,” “Stuff,” and “Structure,” with “Structure” consisting of both the management infrastructure as well as the physical buildings required to provide patient care.³⁵ Using this model; personnel, supplies, equipment, physical space, and a management infrastructure, consistent with the needs of the event, would be identified and provided.

Traditionally, hospitals have been thought of as the major or the only places for medical care; but, hospital resources can easily be exceeded or the hospital could become non-functional because of flooding, power-issues, or

35. Donna Barbisch, *Regional Responses to Terrorism and Other Medical Disasters: Developing Sustainable Surge Capacity*, in COMMUNITY PREPAREDNESS AND RESPONSE TO TERRORISM: THE TERRORIST THREAT AND COMMUNITY RESPONSE 78–80 (James A. Johnson et al. eds., 2005); Donna Barbisch, *Surge Capacity: Seamless Emergency Medical Logistics Expansion System: From Concept to Operational Capability* 22, 25–27, 30–31 (Apr. 20, 2004) (presented at the 2004 Nat’l Disaster Med. Sys. Conf.), available at <http://www.ndms.chepinc.org/presentations/2004/142.pdf>.

contamination. One strategy for dealing with mass casualties is to use alternate sites of care, referred to as “surge hospitals,” such as veterinary hospitals, shuttered retail stores, athletic arenas, airport hangers, and other facilities.³⁶ Another strategy is to “surge” within existing hospitals by, for example, adding additional beds, opening unused wards, and adding personnel. The capability to emergently expand patient care capacity is required by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards. Thus, all hospital facilities must either designate appropriate alternate sites of care or have an internal surge capacity.³⁷ The Medical Disaster Response concept is one example of such an approach.³⁸ The local administrative jurisdiction (EMS or public health) should also be involved in community and regional planning for alternate care sites.

Expanded hospitals and surge hospitals require additional staff. The recruitment of properly licensed and credentialed health care volunteers presents significant challenges for public and private health entities. The existing methods for the deployment of voluntary health personnel in emergencies are limited by issues with recruitment of qualified volunteers, effective use of volunteers during emergencies, and verification of the identity and qualifications of the volunteers by those seeking their assistance.³⁹ To adequately staff this expanded capacity, decision-makers should consider innovative concepts to provide emergency credentialing of personnel. One technique is to temporarily grant privileges to providers by honoring the credentialing process of neighboring institutions. Another technique is to employ the concept of a National Medical License for Disasters (NMLD). There would be strict criteria for obtaining and maintaining the license, including passing the United States Medical Licensing Exam (USMLE) and yearly Continuing Medical Education (CME) credits, as well as yearly assessment of the individual’s role and responsibility in an incident. Such a license would not be active until a disaster or catastrophe is declared. When it is the

36. JOINT COMM. ON ACCREDITATION OF HEALTHCARE ORGS., SURGE HOSPITALS: PROVIDING SAFE CARE IN EMERGENCIES iv, 2 (2006), http://www.jointcommission.org/NR/rdonlyres/802E9DA4-AE80-4584-A205-48989C5BD684/0/surge_hospital.pdf [hereinafter SURGE HOSPITALS].

37. See JOINT COMM. ON ACCREDITATION OF HEALTHCARE ORGS., STANDING TOGETHER: AN EMERGENCY PLANNING GUIDE FOR AMERICA’S COMMUNITIES 35 (2005), http://www.jointcommission.org/NR/rdonlyres/FE29E7D3-22AA-4DEB-94B2-5E8D507F92D1/0/planning_guide.pdf; SURGE HOSPITALS, *supra* note 36, at 10.

38. See Carl H. Schultz et al., *A Medical Disaster Response to Reduce Immediate Mortality After an Earthquake*, 334 NEW ENG. J. MED. 438, 439–40, 443 (1996).

39. James G. Hodge, Jr. et al., *The Legal Framework for Meeting Surge Capacity Through the Use of Volunteer Health Professionals During Public Health Emergencies and Other Disasters*, 22 J. CONTEMP. HEALTH L. & POL’Y 5, 21–22 (2005).

activated practitioner, it is automatically “federalized” and thus, the practitioner is insured as a federal practitioner. It replaces a registration system and is more cost effective for the federal government and for the regions in need of health care providers. It could allow for qualified foreign personnel to assist in a domestic emergency if the foreign physicians can pass our tests and maintain their national medical license for disaster.

D. *Health Risk Communications During Disasters*

Health care providers and the public may lack a basic understanding of the true risks associated with certain types of disasters. This lack of knowledge can reduce the effectiveness of mitigation measures which would otherwise limit morbidity and mortality.

Clear and concise messages—ideally prepared in advance of an event—delivered by a credible technical spokesperson can positively influence outcomes. One of the challenges is that the scientific knowledge necessary to support appropriate prevention and treatment recommendations may initially be absent.

Public information is readily available at several locations, particularly government websites such as:

<http://www.ready.gov>

<http://www.bt.cdc.gov/planning/>

<http://www.fema.gov/hazard/index.shtm>

<http://www.nhc.noaa.gov/HAW2/english/intro.shtml>

<http://www.cdc.gov/niosh/docs/2002-139/default.html#toc>

<http://earthquake.usgs.gov/learning/preparedness.php>

These sites may be invaluable for the continued dissemination of information before and after a natural disaster or a deliberate attack. Additionally, by providing information about when and where to seek treatment, how to recognize symptoms of particular diseases, techniques for sheltering, and methods of mitigation, we can potentially decrease the “surge” burden to emergency response systems.

E. *Delicate Legal Issues Regarding Public Health During Catastrophes*

Certain laws and regulations can be problematic in the face of mass casualties. For example, in situations where there is exposure to a contagious agent, quarantine of exposed individuals and isolation of ill persons may be necessary. Quarantine authority varies by jurisdiction and has not been invoked for many years in the United States. It may become necessary to involuntarily isolate exposed victims until lack of contagion can be as-

sured. This will likely require close collaboration between hospital security, local law enforcement, and public health authorities. Thus, “[t]he balance between civil liberties and the protection of public health remains a challenge.”⁴⁰

Complications can arise with application of the Consolidated Omnibus Budget Reconciliation Act/Emergency Medical Treatment and Active Labor Act (COBRA/EMTALA),⁴¹ which limits transfer of patients to specific pre-defined circumstances and requires facilities with the capability and capacity for a higher level of care to accept patients in transfer, and the Health Insurance Portability and Accountability Act (HIPAA)⁴² privacy regulations. There is an emergency exception in the HIPAA regulations,⁴³ but case law is lacking to determine whether this would be sufficient to allow appropriate medical information to be transmitted in a mass casualty situation.

F. Triage

In the setting of mass casualties, the goal of triage shifts from doing the best for an individual to “doing the most good for the most patients.” There are several systems available to manage a large influx of casualties. The most common system used in the United States for initial triage is START (Simple Triage and Rapid Treatment).⁴⁴ Of note, patients who are contaminated or those who are exposed to contagious agents must be triaged in a manner that minimizes the possibility of transmitting the hazardous agent to others.⁴⁵

G. Securing Healthcare Facilities

During catastrophes a security plan must be in place that limits access to the hospital or appropriate ward(s) so only patients, authorized personnel

40. Kristi L. Koenig, Christopher A. Kahn & Carl H. Schultz, *Medical Strategies to Handle Mass Casualties from the Use of Biological Weapons*, U.C. POSTPRINTS 16 (2006), <http://repositories.cdlib.org/postprints/2100/> (click on “Download the Article”) (last visited June 21, 2007).

41. 42 U.S.C. § 1395dd (2000 & Supp.); *see also* Special Responsibilities of Medicare Hospitals in Emergency Cases, 42 CFR § 489.24 (2003).

42. Health Insurance Portability & Accountability Act of 1996, Pub. L. No. 104–191, 110 Stat. 1936 (codified in scattered sections of the U.S.C.); *see also* HIPAA, <http://www.hipaa.org/> (last visited Apr. 14, 2007).

43. *See id.*

44. *See generally* LOS ANGELES FIRE DEP’T, SIMPLE TRIAGE AND RAPID TREATMENT (START) (Aug. 12, 2005), <http://www.cert-la.com/triage/start.pdf>.

45. David C. Cone & Kristi L. Koenig, *Mass Casualty Triage in the Chemical, Biological, Radiological, or Nuclear Environment*, 12 EUR. J. EMERG. MED. 287, 287 (2005).

and, if appropriate, patient visitors may enter. Logistical interventions, such as shutting down the ventilation systems, may be needed to prevent rapid spread if there is a contagious agent involved. "Reducing a building's vulnerability to an airborne chemical, biological, or radiological attack requires a comprehensive [plan]. Decisions concerning which protective measures to implement should be based on the threat profile and a security assessment of the building and its occupants. [P]hysical security is the first layer of defense."⁴⁶ A building security assessment should be done to determine the necessity of additional measures. Codes must be developed such that new building systems adopt design features that are capable of incorporating the currently rapidly evolving technology which offers a greater level of protection.

H. *Personal Protective Equipment for Health Care Providers*

Standard precautions should be used for all patient encounters. In addition, if patients are exposed to agents that are spread person-to-person, appropriate respiratory personal protective equipment (PPE) may be needed to decrease the risk from exposure to respiratory droplets. There is some controversy regarding what types of masks would be protective if an agent is unknown. For agents transmitted by respiratory droplets, an N-95 mask would theoretically be adequate. In other situations, a HEPA filter mask might be more appropriate. This issue is currently unresolved.

I. *Stockpiling*

Strategic planning for mass casualties requires appropriate stockpiling of necessary medications, supplies, and equipment; especially since most hospitals have a "just-in-time" strategy for providing pharmaceuticals and equipment to their patients on a daily basis and lack the ability to rapidly expand resources to meet the needs of a large influx of casualties. Threat vulnerability analysis helps determine what should be in the stockpile by providing data regarding events that pose the greatest threat for a given place. Portable disposable ventilators and training staff in their use are advised. In addition, another sad lesson learned from Katrina is the need for additional persons, such as family members, to receive training on an ad-hoc basis on bag-valve-mask techniques to keep their relatives alive. If an event unfolds quickly, such as an earthquake, storage of stockpiles must be close by. Medications that arrive after six to twelve hours may have little impact.

46. CDC, NIOSH, GUIDANCE FOR PROTECTING BUILDING ENVIRONMENTS FROM AIRBORNE, CHEMICAL, BIOLOGICAL, OR RADIOLOGICAL ATTACKS 22 (May 2002).

If, however, it takes several days for a disaster to fully develop, then there may be time to request additional medications and other equipment from a remote location. In general, a combination of local, regional, statewide, and federal caches is ideal. Careful administration will prevent multiple entities from being dependent on the same supplier. In between disasters, medications and other perishable items from the stockpile should be rotated into local or regional usage to minimize losses from expiration. One problem that arose during the medical management of victims of Katrina was the jurisdiction of the Strategic National Stockpile (SNS). Supplies from the SNS belong to the Federal Government until they are dispatched for use at which time ownership is transferred to the state. In at least one site, the SNS was delivered but not used, because all of the medical staff present at the scene were from a federal group and they were not permitted to use the supplies that were very much needed by the victims of the hurricane because of jurisdictional issues.⁴⁷ This issue is still unresolved.

J. *Psychological Aspects of Public Health Aspects of Catastrophes*

A key component of any response is the psychological care for victims, involved emergency personnel, affected communities, and the country at large. Close integration with health risk communicators may help to mitigate some of the psychological trauma that is likely to follow an attack.⁴⁸ Contrary to popular mythology, very few people, if any, panic during disasters.⁴⁹ Nonetheless fear will cause an increase in persons presenting for care and the incremental effects of increased call volume, hazardous materials team responses, and concerned patients with unexplained medical symptoms visiting the emergency departments which can prove to be highly detrimental to public health and emergency response services.⁵⁰

47. E-mail from Raymond E. Swienton M.D., FACEP, Associate Professor of Emergency Medicine, Co-Director EMS, Disaster Medicine & Homeland Security Section, Division of Emergency Medicine, Southwestern Medical Center to author (May 22, 2006 11:00:10 PST) (on file with author).

48. See Simon Wessely et al., *Psychological Implications of Chemical and Biological Weapons*, BRITISH MED. J. (INT. ED.), Oct. 20, 2001, at 878, available at <http://www.bmj.com/cgi/content/full/323/7318/878?ck=nck>.

49. Bill Durodié & Simon Wessely, *Resilience or Panic? The Public and Terrorist Attack*, THE LANCET, Dec. 14, 2002, at 1901, available at <http://www.sciencedirect.com> (search Title "Resilience or Panic? The Public and Terrorist Attack").

50. See G. James Rubin et al., *Psychological and Behavioural Reactions to the Bombings in London on 7 July 2005: Cross Sectional Survey of a Representative Sample of Londoners*, BRITISH MED. J. (INT. ED.), Aug. 26, 2005, at 1, available at <http://bmj.com/cgi/content/full/7517/606#BIBL>.

K. *Health Care Providers Impacted by the Catastrophe*

A particular aspect of physical and psychological trauma is the impact of a catastrophe on the people participating in response and recovery activities. Whether particular response persons are injured or concerned about the effects on themselves and their families, the net effect is the same: loss of personnel. This decrease in personnel can affect the efficiency and success of the overall response effort—as was evident in the response to Hurricane Katrina.⁵¹ Providing information and solutions to people prior to and during the event helps—as does providing any needed personal protective equipment and post exposure medications or vaccines. Helping staff take care of their families and dependents is an essential effort to help secure the services of those persons who may otherwise need to care for their families. Stress debriefing and other psychological care services may help, but the efficacy of certain techniques is unclear and may actually be detrimental.

L. *Mortuary Affairs*

Planning at local and regional levels must take into consideration safe locations for the storage of possibly contagious or contaminated remains. Disaster Mortuary Operational Response Teams (DMORT),⁵² should be contacted, but local officials should prepare in case the DMORT is not immediately available to assist. The needs of criminal investigations and public health concerns, as well as the availability of mortuary services during a surge of mortality, may conflict with families' wishes for rapid disposition of remains and religious concerns regarding timing and method of disposition. Confusion arose during Hurricane Katrina because the flood damaged some local cemeteries and uprooted trees which exposed some human remains.⁵³ Inclusion of local religious leaders into ongoing planning/exercise events involving mortuary affairs may help mitigate some concerns. Religion-neutral, compassionately devised health risk communications may help alleviate public concern. Such measures will enhance the ability of law enforcement and public health agencies to carry out their duties while maintaining appropriate respect and dignity for the deceased.

51. See A FAILURE OF INITIATIVE, *supra* note 17.

52. Disaster Mortuary Operational Response Team, DMORT Mass Fatality Assistance, <http://www.dmort.org/> (last visited June 21, 2007).

53. National Park Service – Task Force Responds to Hurricane Katrina: Hurricanes 2005 – National Park Service Status Report (Dec. 30, 2005), <http://www.heritagepreservation.org/PROGRAMS/KatrinaNPS.HTM>.

M. *Special Populations*

Specific populations are likely to be at higher risk of morbidity and mortality during disasters. These include geriatric, pediatric, immunocompromised, and pregnant persons, as well as those with limited communications abilities due to physical (deafness, blindness), cognitive (mental illness), or language barriers. As revealed in the response to Hurricane Katrina, persons who are homebound or who are reliant on home health nursing and materials, are also at higher risk, as are persons who are in high-density populations, such as shelters, nursing homes, and prisons. Education and surveillance in these populations is critical as are plans for early transportation or sheltering in place, quarantine/isolation, and treatment as needed.

VI. PUBLIC HEALTH AND MEDICAL SUPPORT CHANGES STIMULATED BY THE 2005 HURRICANES AND SUBSEQUENT THREAT ASSESSMENTS

On December 19, 2006, the President signed into law the Pandemic and All-Hazards Preparedness Act.⁵⁴ This law has:

(1) Transferred the National Disaster Medical System back from DHS to the Department of Health and Human Services (HHS);

(2) Created the office of Assistant Secretary for Preparedness and Response within the HHS to consolidate the responsibilities for federal public health and medical emergency preparedness and response activities;

(3) Required the Secretary of HHS to appoint an official to ensure that the Strategic National Stockpile (SNS) addresses the needs of at-risk populations, oversee development of curriculum for training programs on medical management of at-risk individuals, and disseminate best practices for outreach to and care for at-risk individuals before, during, and following public health emergencies;

(4) Beginning in 2009, HHS is required to prepare and submit the National Health Security Strategy for coordinated public health preparedness and response to Congress every four years. The strategy will evaluate and measure progress in federal, state, local, and tribal preparedness.

(5) Provided for cooperative agreements (i.e., grants) to state and selected local public health entities to improve health security, however, states or a consortium of states must agree to supplement this with non-federal funds. It also authorized grants to universities, laboratories, and hospitals for

54. Pub. L. No. 109-417, 120 Stat. 2831 (2004) (codified at various sections of 42 U.S.C.).

tuition loans for persons willing to serve two years in local, state, or tribal health departments.

(6) Required the development of a nationwide, near real-time electronic public health situational awareness capability.

(7) Strengthened federal support and structure for the Medical Reserve Corps (MRC) program.

(8) Established the Biomedical Advanced Research and Development Authority (BARDA) and a Biodefense Medical Countermeasure Development Fund to allow BARDA to fund the development of products between NIH-funded basic research and end-stage procurement by the BioShield program.

(9) Established the National Biodefense Science Board.

(10) Set up limited anti-trust exemptions to help pharmaceutical companies collaborate with each other and with the government in the development of medical countermeasures and made other reforms to the Project BioShield Act of 2004⁵⁵ to facilitate drug development.

Unresolved issues include:

(1) Issues with medical licensing and malpractice risk for volunteer health workers from out of the affected region.

(2) Better coordination of logistics and transparencies to coordinate logistic activities between private and public entities.

(3) Improving interoperable communication systems, detection systems, and warning systems.

(4) Improving education, exercising, and training for private citizens.

(5) Preparing healthcare facilities and response agencies to triage for a large numbers of patients and assuring that they have ready access to current diagnostic and treatment information, while protecting the responding personnel from further harm is critical and complicated. This problem is compounded because 90% of the United States health care system is in private hands and these private entities struggle with the issue of unfunded mandates.

VII. CONCLUSION

The management of disasters requires a carefully orchestrated multidisciplinary plan for federal, state, tribal, local, and private entities and requires an interdisciplinary understanding of the threats and issues. Thus, a

55. Pub. L. No. 108-276, 118 Stat. 835 (codified as amended in scattered sections of 42 U.S.C.).

crucial necessity for preparation, mitigation, response to, and recovery from catastrophic events is the existence of pre-existing relationships between medical, public health, policy, and law enforcement agencies at all levels of government coupled with a coordinated national response plan operating under a national incident management system. Public and private entities at all levels have to drill, drill, and re-drill, while learning from those drills and improve plans, and drilling them again so that we don't wait for another catastrophe to reveal weakness. Careful attention to education and training efforts and to health risk communications planning can help mitigate physical and psychological casualties, minimize attrition among response personnel, and decrease damage to infrastructure. The Federal Government in coordination with local, state, and private entities has made many efforts to improve our response since the hurricanes of 2005 and has set in motion a mechanism for continuous revision and improvement. We must be ever vigilant, however, to ensure that this momentum is not halted or derailed and that the ideas are tested and retested so that we will never again face the catastrophic human, economic, and social toll extracted by disasters with the magnitude of the hurricanes of 2005.

Table 1: Evolution of Federal and National Response to Disasters and Catastrophes⁵⁶

1803: Congressional Act of 1803: Provided assistance by waiving duties & tariffs for merchants following fires in Portsmouth, New Hampshire.
1900: Congress chartered American Red Cross as a charitable organization to provide disaster relief. This charter was dissolved for financial difficulties and a new charter was created in 1905.
1932: Hoover's Reconstruction Finance Corporation (RFC): Lent money to banks and institutions to stimulate economic activity & dispense federal dollars after a disaster.
1934: Bureau of Public Roads given authority to finance reconstruction of highways and roads after a disaster.
1944: Flood Control Act: Gave U.S. Army Corps of Engineers authority over flood control and irrigation projects.
1950: Civil Defense Act: First comprehensive legislation on federal disaster relief.
1952: President Truman's Executive Order 10427: Established federal disaster assistance is a supplement.
1965: Establish HUD: Led to the establishment of the Federal Disaster Assistance Administration.
1968: National Flood Insurance Act.
1973: President Nixon's Report: New approach to Federal Disaster, assistance is a supplement.

56. See FEMA, FEMA History, <http://www.fema.gov/about/history.shtm> (last visited June 21, 2007); THOMAS E. DRABEK, EMERGENCY MANAGEMENT: STRATEGIES FOR MAINTAINING ORGANIZATIONAL INTEGRITY (Springer-Verlag 1990); The National Archives, Records of the Federal Emergency Management Agency (FEMA), available at <http://www.archives.gov/research/guide-fed-records/groups/311.html> (last visited June 21, 2007); TOWNSEND, *supra* note 17, at 11–19; National Emergency Management Association (NEMA): Emergency Management, <http://em.nemaweb.org/?17> (last visited June 21, 2007); EMERGENCY MANAGEMENT: PRINCIPLES AND PRACTICE FOR LOCAL GOVERNMENT (Thomas E. Drabek & Gerard J. Hoetmer eds., Municipal Mgmt. 1991); The National Archives, Records of the Reconstruction Finance Corporation (RFC), available at <http://www.archives.gov/research/guide-fed-records/groups/234.html> (last visited June 21, 2007); Civil Defense and Emergency Management Organizational History: United States 1917–2001 (2003), <http://www.richmond.edu/~wgreen/Ecdflow.pdf>; KEVIN R. KOSAR, THE CONGRESSIONAL CHARTER OF THE AMERICAN NATIONAL RED CROSS: OVERVIEW, HISTORY, AND ANALYSIS (Mar. 15, 2006), available at <http://www.fas.org/spp/crs/misc/RL33314.pdf>; All-Hazard Authorities of the Federal Emergency Management Agency, http://www.fema.gov/pdf/fhm/frm_acts.pdf; The American Presidency Project, Jimmy Carter: Executive Order 12148—Federal Emergency Management, July 20, 1979, available at <http://www.presidency.ucsb.edu/ws/index.php?pid=32625>.

1974: Disaster Relief Act: Established process of presidential disaster declarations.
1979: President Carter's Executive Order 12148: Created FEMA to coordinate all disaster relief efforts at the federal level. FEMA absorbed HUD's: Federal Insurance Administration, National Fire Prevention and Control Administration, National Weather Service Community Preparedness Program, Federal Preparedness Agency of the General Services Administration, Federal Disaster Assistance Administration. Also, FEMA charged to oversee the nation's Civil Defense (previously done by DoD's Defense Civil Preparedness Agency).
1988: Stafford Disaster Relief and Emergency Assistance Act.
1993: President Clinton elevated FEMA to a cabinet level position.
2000: Disaster Mitigation Act (Stafford Act with revisions). ⁵⁷
2002: Homeland Security Act: Incorporated FEMA into DHS (stood up March 2003). ⁵⁸
2005: Hurricane Katrina and Rita.
2006: Notice of Change to the National Response Plan: Reorganized incident management, created the Domestic Readiness Group, established the National Operations center, changed and broadened the scope of the Catastrophic Incident annex, and clarified the meaning of an "Incident of National Significance". ⁵⁹
2006: Department of Homeland Security Appropriations Act, 2006. ⁶⁰
2007: Department of Homeland Security Appropriations Act, 2007: Reorganizing DHS and the role of FEMA within DHS. ⁶¹

Table 2: Major U.S. Disasters (Deaths >1000)⁶²

Year	Event	Deaths
1865	Steamship explosion	1547
1875	Forest fire (Wisconsin)	1182

57. Pub. L. No. 106-390 (2000).

58. Homeland Security Act of 2002, Pub. L. No. 107-296, 116 Stat. 2135 available at <http://www.whitehouse.gov/deptofhomeland/bill/hsl-bill.pdf>; see also The White House, Analysis for the Homeland Security Act of 2002, <http://www.whitehouse.gov/deptofhomeland/analysis/hsl-bill-analysis.pdf> (last visited June 21, 2007).

59. NOTICE OF CHANGE TO NATIONAL RESPONSE PLAN, *supra* note 15, at 9; NIMS Key Revision Issues – Background, *supra* note 15.

60. Department of Homeland Security Appropriations Act of 2006, Pub. L. No. 109-90, 119 Stat. 2064.

61. Department of Homeland Security Appropriations Act of 2007, Pub. L. No. 109-295, 120 Stat. 1355.

62. Table modified from Craig Goolsby et al., *Disaster Planning*, EMEDICINE.COM (May 25, 2006), at tbl. 1, <http://www.emedicine.com/EMERG/topic718.htm> (last visited June 21, 2007).

1889	Flood (Pennsylvania)	>2000
1900	Hurricane (Texas)	8000
1904	Steamship fire	1021
1906	San Francisco earthquake	>3000
1928	Hurricane (Florida)	2000
1941	Pearl Harbor attack	2403
2001	September 11 attack	2819
2005	Hurricane (Gulf Coast)	1527

Figure 1: Organization of the NRP

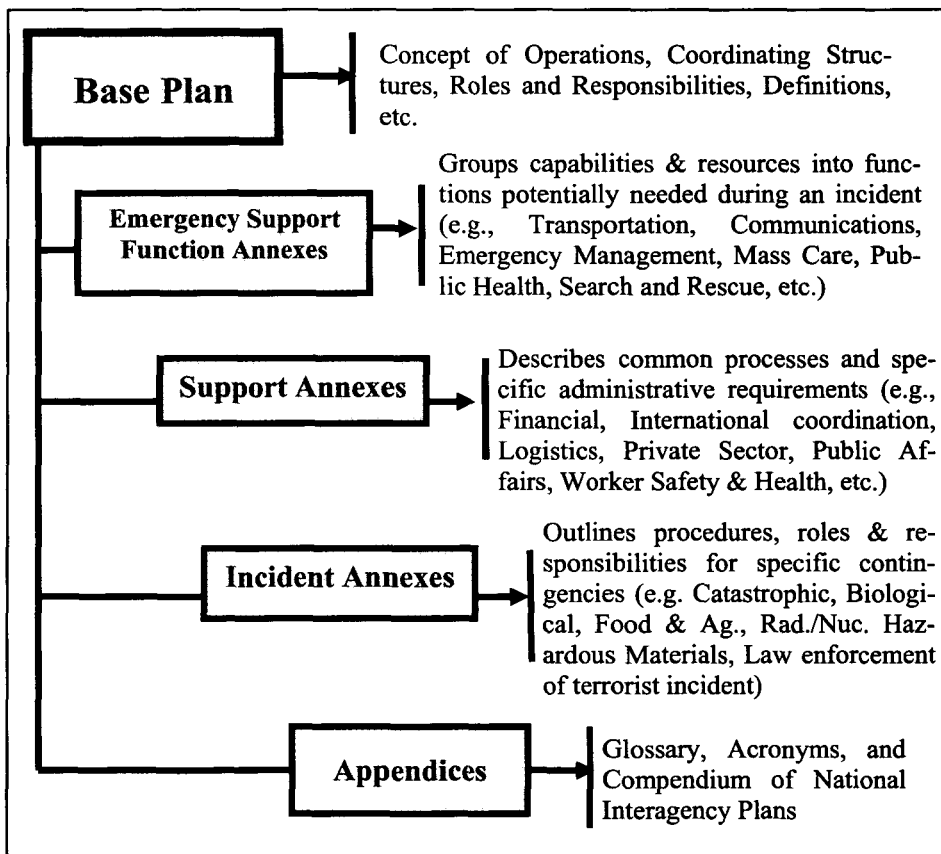


Table 3: Emergency Support Functions in the NRP⁶³

#	Function	Primary Department or Agency
ESF 1	Transportation	DOT
ESF 2	Communication	DHS (IAIP/NCS)
ESF 3	Public Works & Engineering	DoD (USACE), DHS (FEMA)
ESF 4	Firefighting	USDA (Forest Service)
ESF 5	Emergency Management	DHS (FEMA)
ESF 6	Mass Care, Housing, Human Services	DHS (FEMA), American Red Cross
ESF 7	Resources Support	GSA
ESF 8	Public Health & Medical Support	HHS
ESF 9	Urban Search & Rescue	DHS (FEMA)
ESF 10	Oil & Hazardous Material Response	EPA, DHS (Coast Guard)
ESF 11	Agriculture & Natural Resources	USDA, DOI
ESF 12	Energy	DOE
ESF 13	Public Safety & Security	DOJ
ESF 14	Long Term Community Recovery & Mitigation	USDA, DOC, DHS, HUD, Treasury, SBA
ESF 15	External Affairs	DHS (FEMA)

63. This table is a modified version of the December 2004 NRP modified to include the revisions specified in the Notice of Change to the National Response Plan dated May 25, 2006 version 5.0.

Figure 2: Post-Hurricane Katrina Integration of ICS with ESF's

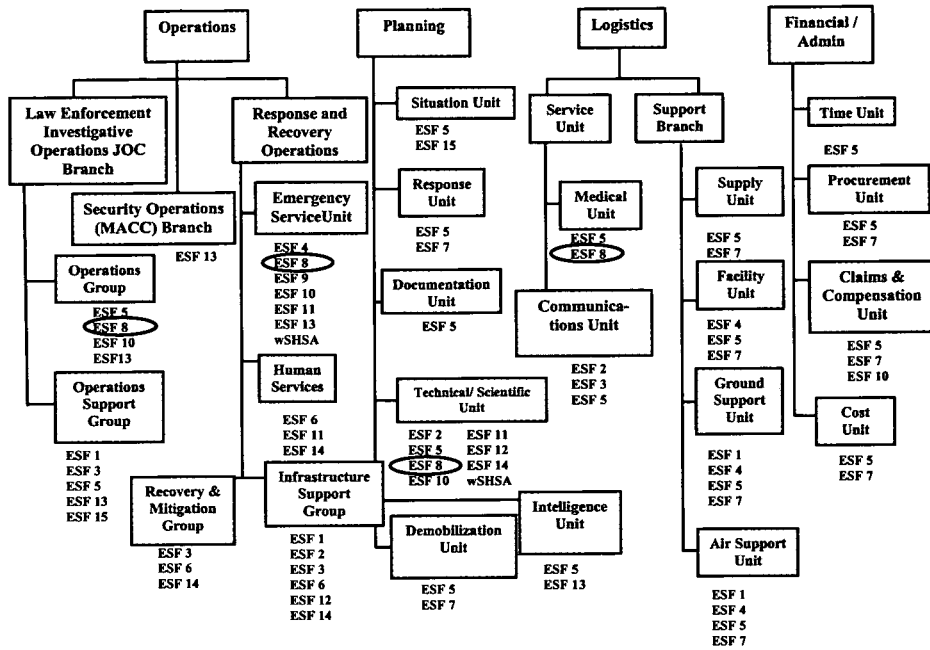


Table 4: Hurricane Katrina Key Events and Response⁶⁴

Time ⁶⁵	Event	Federal	State & Local
Thursday, August 25, 2005			
12:00 p.m.		FEMA conducts first video teleconference to help synchronize federal, state, and local responders and, as a means of defining and coordinating assistance and support needs, these calls were held each day at noon from August 25 until well after land-fall.	
3:30 p.m.*	Tropical Storm Katrina becomes Hurricane Katrina (Category 1)	FEMA delivers 100 truckloads of ice, 35 truckloads of food, and 70 trucks of water to staging areas in Georgia, and over 400 truckloads of ice, over 500 truckloads of water, and nearly 200 truckloads of food at logistics centers in Alabama, Louisiana, Georgia, Texas, and South Carolina.	
6:30 p.m.	Hurricane Katrina slams into South Florida at the Dade-Broward County line.	FEMA places Rapid Needs Assessment and Emergency Response Teams – Advance Elements (ERT-As) on alert.	

64. See generally *supra* note 17 and accompanying text.

65. To emphasize the view from Washington, D.C., the time used here is Eastern Standard Time (Louisiana is on Central Time). The time also reflects the view of the Homeland Security Operations Center.

Friday, August 26, 2005			
1:00 a.m.	Eye passes over Miami, Florida.		
5:00 a.m.	Katrina clears from South Florida.		
11:30 a.m. ✱	Katrina becomes a Category 2 hurricane and is predicted to make second landfall near Florida Panhandle as Category 3.		
1:00 p.m.*			Louisiana Governor Kathleen Blanco declares a State of Emergency and activates the National Guard.
4:30 p.m.			Mississippi Governor Haley Barbour declares a State of Emergency and activates the National Guard.
5:00 p.m.		National Hurricane Center (NHC) changes prediction of second landfall from the Florida Panhandle to eastern Louisiana and Mississippi.	
Saturday, August 27, 2005			
5:00 a.m.		NHC issues forecast stating that Katrina is a Category 3 hurricane and predicts a direct	

		hit on New Orleans, Louisiana.	
7:00 a.m.		FEMA NRCC activated at Level 1 (24 hour operation); FEMA NRCC ESFs 2, 6, 8, 9, 10, 11, 12, 13, 14, 15, and EMC activated.	
8:30 a.m.		National Weather Service (NWS) informs Louisiana state and local officials that “probable path is right smack through metropolitan New Orleans.”	Louisiana and Mississippi Emergency Operations Center activated, Governors of Louisiana and Mississippi declare State of Emergency.
10:00 a.m.		FEMA ERT-As activated, pre-staged at FEMA RRCC Region IV in Atlanta, Georgia and deployed to Alabama and Mississippi.	
12:00 p.m.		FEMA Region IV at Level 1; all ESFs + Military Liaison Activated, Coast Guard Activated.	Governor Blanco requests declaration of Federal State of Emergency under Stafford Act.
2:00 p.m.			Press Conference: New Orleans Mayor Ray Nagin and Governor Blanco announce issuance of Voluntary Evacuation Order & Superdome will open at 8 a.m CDT on Sunday as “Special Needs Shelter”.

5:00 p.m.			Contra Flow activated on Mississippi and Louisiana Interstate Highway.
7:44 – 8:00 p.m.		Emergency Declaration FEMA-3212-#M-LA for Louisiana; FCO- Lokey; NWS advises New Orleans levees could be overtopped.	
Sunday, August 28, 2005			
9:00 a.m.			Superdome opens as a Special Needs Shelter (8:00 a.m. CDT).
10:30 a.m.			Mayor Nagin orders a mandatory evacuation of Orleans Parish.
11:00 – 11:15 a.m.		Emergency Declaration FEMA-3212-#M-LA for Mississippi; FCO- William Lokey.	Governor of Alabama declares State of Emergency; Superdome opened as “refuge of last resort” for general population.
5:00 p.m.		FEMA has pre-positioned ice, trailers, and MRE’s in 16 regional centers.	Contra Flow deactivated on Mississippi and Louisiana Interstate Highway.
6:30 p.m.		Emergency Declaration FEMA-3212-#M-LA for Alabama; FCO- Ron Sharman.	
Monday, August 29, 2005			
7:10 a.m.	Katrina makes landfall in southeastern Lou-		

	isiana as a strong Category 3 hurricane.		
9:21 a.m.			First report of Levee breaches; Superdome begins to leak.
10:50 a.m.		HSOC reports "possible" levee "issue".	
2:00 p.m.	Communications used by first responders fail.	Search and rescue efforts by U.S. Coast Guard begin.	Search and rescue efforts by New Orleans Police and Fire Departments, Louisiana National Guard, and Louisiana Department of Wildlife and Fisheries.
9:00 p.m.		FEMA Director Brown promises Governor Blanco 500 buses.	
11:30 p.m.		FEMA search and rescue teams arrive and begin operations.	
Tuesday, August 30, 2005			
6:00 a.m.		HSOC issues report of levee breaches at Industrial Canal, 17th street, and Lake Ponchartrain.	
11:30 a.m.		Acting Deputy Secretary of Defense orders NORTHCOM to move all needed assets to Gulf Coast, gives blanket authority for military assistance.	Mayor Nagin opens New Orleans Convention Center as refuge for general population.
7:30 p.m.		Secretary Chertoff declares Katrina an "Incident of National Significance" and designates Mike Brown as PFO.	Governor Blanco directs Department of Social Services to find a shelter by 6 a.m. Wednesday for at

			least 25,000 people.
Wednesday, August 31, 2005			
12:30 a.m.		Midnight order by FEMA assigns DOT to send buses to New Orleans.	
Morning		Secretary Mike Leavitt (HHS) declares a public health emergency for Louisiana, Mississippi, Alabama, and Florida.	Governor Blanco issues an Executive Order (No. KBB 2005-31) to commandeer school buses; Calls Governor Perry of Texas to request use of Astrodome to house New Orleans evacuees.