

# **Preparing for Response to a Nuclear Weapon of Mass Destruction, Are We Ready?**

**A Monograph  
by  
LTC Vance P. Visser  
United States Army**



**School of Advanced Military Studies  
United States Army Command and General Staff College  
Fort Leavenworth, Kansas**

**AY 05-06**

REPORT DOCUMENTATION PAGE			Form Approved OMS No. 0704-0188		
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE (DD-MM-YYYY) 25-05-2006		2. REPORT TYPE MONOGRAPH		3. DATES COVERED (From - To) SEPT 2005-MAR 2006	
4. TITLE AND SUBTITLE Preparing for Response to a Nuclear Weapon of Mass Destruction, Are We Ready?			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) LTC Vance P. Visser			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School of Advanced Military Studies 250 Gibbon Ave Ft. Leavenworth, KS 66027			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Command and General Staff College 1 Reynolds Ave Ft. Leavenworth, KS 66027			10. SPONSOR/MONITOR'S ACRONYM(S) CGSC, SAMS		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT In the wake of the untimely execution of an ill-coordinated response at all levels to the Hurricane Katrina devastation and destruction that rocked the Gulf Coast, it is important to examine how the United States government is organized and resourced to confront future catastrophic disasters. Hurricane Katrina, an anticipated natural disaster, clearly demonstrates the enormous complexity associated with the extensive coordination required to synchronize the efforts of local, State, and Federal governmental agencies faced with a significant crisis. In the event the crisis is an unexpected terrorist attack employing a nuclear or radiological weapon of mass destruction, the complexity of synchronizing the response effort increases exponentially. Although extremist groups and terrorists have a wide variety of potential agents and delivery means to choose from for a chemical, biological, radiological or nuclear (CBRN) attack, this study focuses specifically on response capability to a radiological or nuclear WMD attack against the United States.					
15. SUBJECT TERMS Response to Nuclear Weapons of Mass Destruction (WMD), Terrorist Use of WMD, Improvised Nuclear Device, Radiological Dispersal Device, Governmental Interagency Disaster Response					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)	(U)	53	19b. TELEPHONE NUMBER (Include area code) (913) 758-3300

# SCHOOL OF ADVANCED MILITARY STUDIES

## MONOGRAPH APPROVAL

LTC Vance P. Visser

Title of Monograph: Preparing for Response to a Nuclear Weapon of Mass Destruction, Are We Ready?

Approved by:

\_\_\_\_\_  
Peter J. Schifferle, Ph.D.

Director,  
Advanced Operational Arts  
Studies Fellowship

\_\_\_\_\_  
Kevin C.M. Benson, COL, AR

Director,  
School of Advanced  
Military Studies

\_\_\_\_\_  
Robert F. Baumann, Ph.D.

Director,  
Graduate Degree  
Programs

## Abstract

PREPARING FOR RESPONSE TO A NUCLEAR WEAPON OF MASS DESTRUCTION, ARE WE READY? by LTC Vance P. Visser, United States Army, 60 pages.

In the wake of the untimely execution of an ill-coordinated response at all levels to the Hurricane Katrina devastation and destruction that rocked the Gulf Coast, it is important to examine how the United States government is organized and resourced to confront future catastrophic disasters. Hurricane Katrina, an anticipated natural disaster, clearly demonstrates the enormous complexity associated with the extensive coordination required to synchronize the efforts of local, State, and Federal governmental agencies faced with a significant crisis. In the event the crisis is an unexpected terrorist attack employing a nuclear or radiological weapon of mass destruction, the complexity of synchronizing the response effort increases exponentially.

Since the September 11, 2001 terrorist's attacks, the threat that a terrorist group might detonate a dirty bomb or radiological dispersal device or improvised nuclear device in a major United States metropolitan area has received increased attention. If a radiological or improvised nuclear device attack is considered to be an imminent threat to our populace, the federal government should give increased priority to consequence management preparedness efforts and make a concerted, sustained effort to engage the public in response planning.

The National Strategy to Combat Weapons of Mass Destruction acknowledges that nuclear, biological and chemical weapons of mass destruction (WMD) in the possession of hostile states and terrorists represent one of the greatest security challenges facing the United States. Although extremist groups and terrorists have a wide variety of potential agents and delivery means to choose from for a chemical, biological, radiological or nuclear (CBRN) attack, this study focuses specifically on response capability to a radiological or nuclear WMD attack against the United States.

This paper determined we must adequately prepare to overcome the complex command, control and management challenges associated with synchronizing the requisite expertise provided by numerous diverse groups of government, emergency response, law enforcement, military, medical, disaster relief, public health, mental health, and public affairs personnel. It also proposes recommendations to ensure we are prepared to provide immediate, organized, and well-synchronized response to terrorist attack employing nuclear weapons of mass destruction.

The full range of counterproliferation, nonproliferation, and consequence management measures must be brought to bear against the WMD terrorist threat. Together the recommendations presented in this work may enhance our level of consequence management preparedness for dealing with the terrorist employment of nuclear WMD. Since counterproliferation and nonproliferation efforts are increasingly less effective, we must convincingly demonstrate that we are ready to respond to an improvised nuclear device or radiological dispersion device attack and that such an attack will not achieve the adversarial objective of terror. Therefore, we must prepare now; we have no other alternative.

# TABLE OF CONTENTS

Introduction .....	1
Los Angeles Riots .....	3
Hurricane Andrew and Hurricane Katrina Response .....	9
Threat of Terrorist use of Nuclear Weapons of Mass Destruction.....	15
Combating Use of Weapons of Mass Destruction in the United States Homeland.....	19
Nuclear and Radiological Incident Response.....	28
Are We Ready .....	33
Recommendations for a Way Ahead.....	40
Bibliography .....	46

## Introduction

In the wake of the untimely execution of an ill-coordinated response at all levels to the Hurricane Katrina devastation and destruction that rocked the Gulf Coast, it is important to examine how the United States government is organized and resourced to confront future catastrophic disasters. Hurricane Katrina, an anticipated natural disaster, clearly demonstrates the enormous complexity associated with the extensive coordination required to synchronize the efforts of local, State, and Federal governmental agencies faced with a significant crisis. The enormous complexity of requisite coordination exponentially increases in the event when the crisis is actually an unanticipated terrorist attack employing a nuclear or radiological weapon of mass destruction.

The National Strategy to Combat Weapons of Mass Destruction, (Homeland Security Presidential Directive – 4), acknowledges that nuclear, biological and chemical weapons of mass destruction (WMD) in the possession of hostile states and terrorists represent one of the greatest security challenges facing the United States.<sup>1</sup> Although extremist groups and terrorists have a wide variety of potential agents and delivery means to choose from for a chemical, biological, radiological or nuclear (CBRN) attack, this study will focus specifically on response capability to a radiological or nuclear WMD attack against the United States.

Since the September 11, 2001 terrorist's attacks, the threat that a terrorist group might detonate a dirty bomb or radiological dispersal device in a major United States metropolitan area has received increased attention. If a radiological dispersal attack is considered an imminent threat to our populace, the federal government should give increased priority to preparedness efforts and make a concerted, sustained effort to engage the public in response planning.

A detailed examination of disaster response preparedness and organization at all levels of our government provides a broad understanding of what procedures have been established to

---

<sup>1</sup> Bush, George W. "Homeland Security Presidential Directive – 4, (Unclassified) National Strategy to Combat Weapons of Mass Destruction". Office of the Press Secretary, 11 December 2002.

address response to a radiological or nuclear WMD attack against the United States. Specifically, we will closely examine civil-military cooperation and the Department of Defense role in such a response effort. In order to determine the utility of preparatory efforts to date, a fundamental grasp of the effects of nuclear weapons, dirty bombs and radiological dispersal devices is understood. However, a brief discussion of background and science is necessary to articulate why appropriate precautionary measures must be taken to mitigate and remediate the immediate as well as the residual impacts of such devices. In order to understand the scope and magnitude of the myriad of challenges associated with the consequences of a nuclear incident, one can conduct a historical analysis of Hiroshima, Nagasaki, and Chernobyl. Years after each of these nuclear incidents, the world is still involved in monitoring and remediation efforts to overcome the long term effects of radiation.

A review of governmental actions taken and lessons learned from overall responses to incidents such as Los Angeles riots, Hurricane Andrew and Hurricane Katrina will highlight some systemic failures, as well as successful governmental response to disastrous circumstances. In retrospect, critical insight gained from history demonstrates two distinct functional categories of response: crisis management and consequence management. This paper seeks to determine if preparations are adequate enough to overcome the complex command, control and management challenges associated with synchronizing the requisite expertise provided by numerous diverse groups of government, emergency response, law enforcement, military, medical, disaster relief, public health, mental health, and public affairs personnel.

Finally, this paper will propose a vision for a way ahead to ensure we are prepared to provide immediate, organized, and well-synchronized response to terrorist attack employing a nuclear weapon of mass destruction. The recommendations for future preparations must integrate the Strategy for Homeland Defense and Civil Support, published by the Department of Defense in June 2005 and the recently published National Military Strategy for Combating Weapons of Mass Destruction. Transformational impacts on military force structure may influence the

preparedness, equipping and command and control relationships of Department of Defense assets designed, trained and resourced to support such contingencies as addressed in this monograph. The United States must prepare now in order to be ready to confront and overcome the challenges that the Nation will encounter when we suffer a terrorist attack that employs a nuclear device.

The response debacle that followed riots after the Rodney King verdict in Los Angeles sparked a deliberate, concerted effort to improve the effectiveness and interoperability of local, state and federal governmental agencies and departments. A desperate lack of previous experience integrating state, local and federal capabilities on such a large scale greatly hampered the government's ability to rapidly and effectively thwart and contain the Los Angeles riots. Therefore, it is appropriate to commence with a terse review of the lessons learned from the chaotic interagency response to the riots.

## **Los Angeles Riots**

In the spring of 1992, troops were called in to control the rioting streets of South Central Los Angeles. The law enforcement reaction to the violence was painfully slow in coming.<sup>2</sup> The Mutual Aid<sup>3</sup> system bringing in law enforcement from neighboring communities was not immediately implemented. In fact, as late as midnight, Los Angeles law enforcement officials were discussing the Mardi Gras atmosphere while violence and the fires consuming buildings were spreading all over the city.<sup>4</sup> Clearly, the law enforcement's intelligence network had broken down. The following day the California Highway Patrol and the National Guard were deployed to support the overwhelmed local law enforcement capabilities.<sup>5</sup>

Once order was reestablished and the streets quieted down, it was difficult to acquire permission to begin the withdrawal of soldiers deployed throughout the city. The reluctance to

---

<sup>2</sup> Desch, Michael C., ed. Soldiers In Cities: Military Operations On Urban Terrain (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2001), 91.

<sup>3</sup> In emergency services, mutual aid is a formal agreement to lend assistance across jurisdictional boundaries when required, either by an emergency that exceeds local resources or a disaster.

<sup>4</sup> Desch, Soldiers In Cities: Military Operations On Urban Terrain, 92.

<sup>5</sup> *Ibid*, 93.

endorse the soldiers' withdrawal was largely due to the fact that the people of Los Angeles warmly welcomed the soldiers and greatly appreciated the positive impact the soldiers made upon the streets of Los Angeles. The atmosphere of entire neighborhoods transformed as the crime rates decreased to levels considerably below normal, pre-riot levels. Elderly people in the city felt safe walking to the store in their neighborhood and it was safe for the children to play in the streets.

The riots were responsible for 53 confirmed fatalities. In addition, 2,302 people sustained injuries which required emergency medical care. There were 5,383 fires attributed to the riots, causing hundreds of millions of dollars in damage.<sup>6</sup> The lessons learned captured from the Los Angeles riots provided many keen insights for consideration in preparing for future contingencies. Some essential lessons highlighted shortcomings in communications, training, equipment, logistics, medical, legal, rules of engagement, deployment strategies, public affairs, planning and execution, discipline, information operations and stress management.<sup>7</sup>

Although a complete analysis of the lessons learned during the Los Angeles riots is well beyond scope of this paper, it is necessary to cite and address a few specific areas of interest. For example, personnel quickly learned that military radios are not compatible with law enforcement communications equipment. The military radios did not work too well in an urban areas and this hampered communications, command and control. In many areas, small units employed cell phones to communicate between elements.<sup>8</sup>

The riots affected an area covering literally hundreds of square miles of metropolitan Los Angeles.<sup>9</sup> The vast expanse of urban terrain made it difficult to establish command and control measures. Elements of military operational units arrive on scene, look for readily identifiable

---

<sup>6</sup> Desch, Soldiers In Cities: Military Operations On Urban Terrain, 95.

<sup>7</sup> Ibid, 97.

<sup>8</sup> Ibid, 96.

<sup>9</sup> Glenn, Russell W., ed. "The City's Many Faces" in Proceedings of the Rand Arroyo-MCWL-J8 UWG Urban Operations Conference, April 13-14, 1999 (Santa Monica, CA: Rand, 2000), 85.

terrain features and allocate areas of responsibility. In military terms graphic control measures, such as unit boundaries can be neatly and conveniently drawn along freeways because they are so recognizable.<sup>10</sup> Unfortunately, the Los Angeles Police Commands are not divided by highways according to boundaries pristinely drawn on the map. The military operators failed to ensure their efforts were made to conform to the specific tactics, techniques and procedures of the multiple police and law enforcement agencies they were supporting. This critical oversight impeded command and control and made it very difficult for leaders to acquire a common operational picture for their respective areas of responsibility.

On April 29, 1992 at 1520 hours, just ten minutes after the Rodney King verdict was announced, crowds began to gather on Normandie Avenue and in just less than one hour the looting commenced.<sup>11</sup> By 2200 hours, the Governor asked for assistance from the California National Guard. The National Guard had soldiers ready by 1330 hours the following day, April 30, 1992. The incident emergency operations center was established by 1500 hours that afternoon, at the Sheriff's emergency operations center and the Office of Emergency Services, the military and the various law enforcement agencies all dispatched representatives to that facility. The United States Army and the United States Marine Corps deployed Federal Soldiers and Marines to assist in the riot control efforts. In a normal scenario of this type, it is expected that military will be the last in and the first out. In the Los Angeles riot, this was partially reversed and the military was actually the last to depart. Law enforcement personnel and fireman from other areas went home while our troops remained on the streets of Los Angeles for three more weeks.<sup>12</sup>

After military forces became federalized in support of the Los Angeles situation a standard command and control structure existed. The chain of command went from a civilian

---

<sup>10</sup> Glenn, "The City's Many Faces" in Proceedings of the Rand Arroyo-MCWL-J8 UWG Urban Operations Conference, April 13-14, 1999, 85.

<sup>11</sup> Ibid, 88.

<sup>12</sup> Ibid, 107.

agency, the Los Angeles Sheriff's Office (LASO), through the military Joint Task Force Los Angeles (JTF-LA) in coordination with the President's representative, the Senior Civilian Representative of the Attorney General (SCRAG). The Army Forces (ARFOR) and Marine Forces (MARFOR) were subordinate to the Joint Task Force Los Angeles (JTF-LA). Upon federalization, the mission process became encumbered by lawyers reviewing all mission requests to ensure that they were legal prior to their execution. Prior to federalization, state active duty forces accepted 100% of the requested missions they received; while after federalization, federal active duty forces only accepted 10% of the requested missions they received.<sup>13</sup> This sudden great disparity in mission support was blamed on posse comitatus, although posse comitatus had been waived specifically for this instance. In retrospect, it appears that bureaucratic buck-passing, indecisiveness and lack of a clearly defined command and control structure all contributed to an overall decrease in accepted and accomplished missions by federalized active duty forces.

Public Affairs efforts and media interactions were poorly managed. Authorities failed to recognize and appreciate the fact that the public was being provided immediate reporting and video coverage of the riots. The news media repeatedly informed the public that soldiers were being deployed without ammunition which was simply not true.<sup>14</sup> Such reporting may have encouraged gang members to attack military patrols. Two people were actually shot by soldiers.<sup>15</sup>

Key governmental leaders were reluctant to aggressively engage the media to keep the public informed of the facts in a timely manner. In the absence of legitimate factual information, the media was left to themselves to generate and then broadcast their own versions of the

---

<sup>13</sup> Glenn, "The City's Many Faces" in Proceedings of the Rand Arroyo-MCWL-J8 UWG Urban Operations Conference, April 13-14, 1999, 112-113.

<sup>14</sup> Desch, Soldiers In Cities: Military Operations On Urban Terrain, 99.

<sup>15</sup> The two incidents in which civilians were shot by soldiers resulted in the death of one gang member and serious wounds to the other perpetrator involved. Both criminals tried to execute vehicular assaults and were subsequently shot by the soldiers they tried to run over.

situation and their deduced status of the governmental response to the crisis. Summarily, this made Information Operations a constant leadership challenge.

The California National Guard was extraordinarily successful in combating the Los Angeles riots. Many of the senior leaders involved attribute that success to the superior performance of noncommissioned officers and their composed leadership throughout the conduct of numerous decentralized missions executed during the domestic support operations. When mobilized for the 1992 Los Angeles riots, the urban setting and decentralized employment of our soldiers in small elements forced young sergeants and corporals to take charge and accomplish the mission. Their collective efforts clearly demonstrated the merit and utility of the employment of military personnel in response to emergent crisis.<sup>16</sup>

A brief analysis of the governmental response to the chaos and violence of the 1992 Los Angeles Riots provides an excellent example of the complexity of managing an appropriate response and cooperative effort at the local, state and federal levels of government. While short in duration, the resultant damage was considerable. Large portions of Los Angeles were left without any local grocery stores or other markets. Chaos and disorder had challenged the authorities in a head to head confrontation. The good news is that ultimately, in this crisis, the combined efforts of the local, state and federal government were successful in restoring law and order.

Careful review of the critical response shortcomings manifested in the Los Angeles Riots, forced first responder personnel at all levels of government to develop and implement standardized methods for addressing response to such large scale civil unrest and violence. Local, state and federal governmental leaders, as well as the Department of Defense leadership were forced to resolve the planning, coordination, and mission execution problems experienced

---

<sup>16</sup> Desch, Soldiers In Cities: Military Operations On Urban Terrain, 102.

during the response operations. Their review has helped to mitigate some of the confusion regarding the division of critical roles and responsibilities in addressing crisis action response.

In addition, it became clearly evident that incompatible communications systems hampered the ability of the military forces, police and other emergency response personnel from maintaining open lines of communications. The operations centers at all levels were also unable to consistently interface to maintain situational awareness.

Finally, the impact of constant media scrutiny and in-stride reporting of events televised nationwide introduced a new challenge. The challenge of keeping the public accurately apprised of the situation through proactive official updates became clear. Emergency operations centers were now required to deal directly with the media outlets to meet the demands of the public's curiosity. This challenge increased in complexity with the news networks' simultaneous broadcasting of live video and sound bites from their subject matter experts providing real time assessments of the news in the making.

The Los Angeles Riots identified two major vulnerabilities. First, the management effort demonstrated a lack of preparation by various governmental organizations to effectively coordinate and execute a large scale multi-jurisdictional crisis response. The second vulnerability involves the challenge of keeping the populace accurately informed so that the public opinion of the government's ability to adequately respond to a crisis and to meet the security needs of the people remains favorable. In essence, we must seize the perception management initiative. The critical lessons learned from the interagency governmental process employed in Los Angeles have helped to shape the framework for future response(s) to domestic crisis and disaster in the United States of America.

## Hurricane Andrew and Hurricane Katrina Response

As many local, state and federal governmental leaders were engaged in deliberate analysis of the lessons learned during the riots in Los Angeles, in August of 1992, our Nation was confronted with another crisis, Hurricane Andrew. At the time, Hurricane Andrew was one of the most destructive hurricanes to ever strike to United States. Hurricane Andrew was only the third Category 5 hurricane to hit the United States, the previous two were Hurricane Camille of 1969 and the Labor Day Hurricane of 1935.<sup>17</sup> In financial terms, Andrew's total estimated property damage is the second only to the damage brought by Hurricane Katrina of 2005.

Hurricane Andrew claimed a total of 65 lives; 26 deaths were directly attributed to the storm while the remaining 39 deaths indirectly related to the storm.<sup>18</sup> Most of the 39 deaths indirectly attributed to Hurricane Andrew were the result of accidents which occurred in some phase of recovery operations. Good hurricane preparation and well exercised evacuation plans contributed to the minimal loss of life. Although, the impacts of Hurricane Andrew varied from community to community, generally vulnerability depended upon two factors; how well insured the storm's victims were and the demonstrated strength of a community's leadership in times of peril.<sup>19</sup> Areas with weak leadership suffered more than those with strong leadership.

The impact of strong leadership in times of crisis is made practically evident in efforts such as the management of displaced people. In southeastern Florida, Hurricane Andrew forced the temporary evacuation of in excess of 180,000 people. Local and state officials were challenged with the sheer magnitude of logistics required to sustain the evacuees immediately after the storm and into the post-hurricane recovery operations. Florida's leaders turned to federal assistance and the American Red Cross. In addition to the American Red Cross, the National Guard provided recovery assistance. Other Department of Defense assistance found its

---

<sup>17</sup> Wikipedia, "Hurricane Andrew", [http://en.wikipedia.org/wiki/Hurricane\\_Andrew](http://en.wikipedia.org/wiki/Hurricane_Andrew), (1992, last updated 19 March 2006).

<sup>18</sup> Ortega, Luke, "Hurricane Andrew", <http://www.csulb.edu/~lortega2>, (1993).

<sup>19</sup> Ortega, Luke, "Hurricane Andrew", <http://www.csulb.edu/~lortega2>, (1993).

way to support the response effort providing communications architecture, water, food and shelter and limited medical capabilities.<sup>20</sup>

The American Red Cross dispatched over 12,000 volunteers to the disaster area and contributed about \$81.5 million in aid, safe haven for 85,000 evacuees, served over 4.7 million meals and snacks, financially assisted over 60,000 families in need of fundamental survival items and distributed over 42,000 comfort kits.<sup>21</sup> In addition to the valiant efforts of the American Red Cross, there were numerous other nongovernmental relief agencies supporting the recovery efforts of Florida. Initially, response of federal aid to storm victims was slow and it took televised criticism by Dade County Emergency Management Director, Kate Hale to catalyze the delivery of mobile kitchens and tents promised by the federal agencies.<sup>22</sup>

In retrospect, Hurricane Andrew provided local, state and federal governmental and various nongovernmental officials an opportunity to observe firsthand the difficulties associated with providing a prompt and cohesive response to an unforeseen emergent catastrophe. In the aftermath of Hurricane Katrina, thirteen years later, it would prove difficult to ascertain how well our Nation may have applied the vast collection of lessons learned from a poorly coordinated response effort to Hurricane Andrew. Hurricane Katrina exposed a distinct failure of imagination and preparedness with respect to our Homeland Security coordination, planning and execution.<sup>23</sup>

Hurricane Katrina was in every respect the storm of the century. The storm has killed at least 1,599 people and as of March 3, 2006, more than 2,000 people remain unaccounted for.<sup>24</sup>

Hurricane Katrina's total estimated property damage exceeded \$75 billion making it the most

---

<sup>20</sup> Wikipedia, "Hurricane Andrew", [http://en.wikipedia.org/wiki/Hurricane Andrew](http://en.wikipedia.org/wiki/Hurricane_Andrew), (1992, last updated 19 March 2006).

<sup>21</sup> Ortega, Luke, "Hurricane Andrew", <http://www.csulb.edu/~lortega2>, (1993).

<sup>22</sup> Wikipedia, "Hurricane Andrew", [http://en.wikipedia.org/wiki/Hurricane Andrew](http://en.wikipedia.org/wiki/Hurricane_Andrew), (1992, last updated 19 March 2006).

<sup>23</sup> Verton, Dan. "Let's Stick to the Facts; They are Horrible Enough". Homeland Defense Journal Vol.3, Issue 9, (September 2005), 2.

<sup>24</sup> Wikipedia, "Hurricane Katrina", [http://en.wikipedia.org/wiki/Hurricane Katrina](http://en.wikipedia.org/wiki/Hurricane_Katrina), (2005, last updated 23 March 2006).

destructive and costliest of documented United States Atlantic hurricanes.<sup>25</sup> A brief examination of the problematic efforts or perhaps more appropriately, lack of effort by local, state and federal agencies and officials readily highlights some areas of concern for the Department of Homeland Security. The scale of devastation brought about by Hurricane Katrina caught folks by surprise despite the fact that President Bush declared a state of emergency 48 hours before the hurricane hit the coastline.<sup>26</sup>

In accordance with federal law, President Bush directed Secretary Michael Chertoff of the Department of Homeland Security to coordinate the Federal response. Secretary Chertoff designated Michael Brown, head of Federal Emergency Management Agency (FEMA), as the primary federal official to coordinate all federal response and military forces in the region. The United States Northern Command established Joint Task Force Katrina and placed Lieutenant General Russell Honore in command. Former Federal Emergency Management Agency Director Michael Brown endured the brunt of his department's failure to act sooner in response to Hurricane Katrina and he was replaced by Coast Guard Vice Admiral Thad W. Allen who became the Chief of Hurricane Relief Operations.<sup>27</sup>

Based on their abysmal performance, the Federal Emergency Management Agency, now part of the Department of Homeland Security, seems to have lost their focus on emergency management and preparedness. Both the state of Louisiana and the City of New Orleans' emergency management plans or execution never quite measured up to the severity of resultant disaster. Although first responders did what they could, they were quickly overwhelmed. Most importantly, there was an obvious lack of leadership and no chain of command in place to contend with the management of operations underway to address the emergent conditions

---

<sup>25</sup> Wikipedia, "Hurricane Andrew", [http://en.wikipedia.org/wiki/Hurricane Andrew](http://en.wikipedia.org/wiki/Hurricane_Andrew), (1992, last updated 19 March 2006).

<sup>26</sup> Philpott, Don. "Hurricane Katrina – A Homeland Security Reality Check". Homeland Defense Journal Vol.3, Issue 9, (September 2005), 22.

<sup>27</sup> Wikipedia, "Hurricane Katrina", [http://en.wikipedia.org/wiki/Hurricane Katrina](http://en.wikipedia.org/wiki/Hurricane_Katrina), (2005, last updated 23 March 2006).

resulting from Hurricane Katrina and the eventual breaching of the levees. The National Guard and other Department of Defense assets were slow to respond to the crisis but once both the Department of Homeland Security and Federal Emergency Management Agency proved incapable of adequate response, the military stepped in providing badly needed command and control, transportation, vital communications and transportation capabilities, emergency medical care and critical logistical resources.<sup>28</sup> Once again, when confronted with adversity our governmental interagency efforts appeared paralyzed by the fog and friction associated with a calamitous tragedy.

Analysis of Hurricane Katrina response provides keen insight about our overall capability and readiness posture for dealing with such contingencies. Emergency planning must examine and prepare for the absolute worst case scenarios.<sup>29</sup> The Department of Homeland Security, the Federal Emergency Management Agency, as well as, every city, county and state should reevaluate their respective emergency planning following the Hurricane Katrina experience. There must be a mechanism in place to rapidly establish unity of command and control to eliminate bureaucratic delays that impede responsiveness at every level of government. A total review of response strategies and roles is justified to correct the inadequate response to Hurricane Katrina described by President Bush as “not acceptable.”<sup>30</sup>

Fast response is necessary in order to meet the immediate demands for initial emergency support and for maintenance of law and order. In an effort to expedite the process, President Bush has sought to federalize hurricane relief efforts, seeking to remove governors from the decision-making process in such catastrophic scenarios that might require an immediate federal

---

<sup>28</sup> Philpott, Don. “Hurricane Katrina – A Homeland Security Reality Check”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 24.

<sup>29</sup> Philpott, Don. “Hurricane Katrina – A Homeland Security Reality Check”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 25.

<sup>30</sup> Ibid, 25.

response “to provide stability.”<sup>31</sup> First responders and emergency management personnel need compatible communications equipment that will sustain reliable communications connectivity regardless of the circumstances. In addition to radios, we need nationwide standards and protocols based on satellite-based systems, wireless information architecture or cellular technologies.<sup>32</sup> Finally, a deliberate assessment of existing equipment capabilities, future forecasted requirements and shortfalls must be developed and utilized as the basis of a strategy to appropriately resource emergency response teams at all levels for contingency operations.

The heroic efforts in response to the Los Angeles Riots, Hurricane Andrew and Hurricane Katrina have proven what is possible when there is a concerted effort by local, state and national assets. The lessons we glean from such tragic circumstances have to be captured, shared, learned from and integrated in the development and refinement of emergency response plans and procedures. The routine demands of local, state and federal governments seldom include a legitimate focus on long-range crisis planning and prevention. Communities around the country must overhaul four fundamental areas of concern to adequately prepare for quality crisis management; budgets, planning, response and communications.<sup>33</sup> Greater cooperation at all levels will create synergy and closer liaisons between city, county, state and federal agencies and ultimately, lead to a faster response, ensuring that the right people and the right equipment arrive when and where they are needed.<sup>34</sup>

The collective performance of governmental agencies in response to Hurricane Katrina has drawn much criticism and prompted open dialog regarding our ability to confront potential terrorist use of weapons of mass destruction. Perhaps one positive outcome of the Hurricane

---

<sup>31</sup> Sammons, Bill. “Bush Seeks to Federalize Emergencies”. Washington Times. (September 27, 2005), 1.

<sup>32</sup> Philpott, Don. “Hurricane Katrina – A Homeland Security Reality Check”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 26.

<sup>33</sup> Mathis, Donald B. “Hurricane Katrina: Lessons Not Learned”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 30.

<sup>34</sup> Philpott, Don. “Hurricane Katrina – A Homeland Security Reality Check”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 25.

Katrina tragedy will be a thorough reassessment of how the Nation will plan for and react to catastrophes of this scope and magnitude in the future. In his September 2005 Editorial Note, Dan Verton, Vice President and Executive Editor of the Homeland Defense Journal, reminded us frankly, “we simply can’t afford this level of inaction and leadership failure in the future, especially when that future might be marked by a terrorist attack involving nuclear, biological or chemical weapons.”<sup>35</sup>

---

<sup>35</sup> Verton, Dan. “Let’s Stick to the Facts; They are Horrible Enough”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 2.

## **Threat of Terrorist use of Nuclear Weapons of Mass Destruction**

Even a cursory review of observed governmental efforts, capabilities and performance in response to emergencies such as the Los Angeles Riots, Hurricane Andrew and Hurricane Katrina compels one to question our ability to respond to a WMD attack against our homeland. One outcome of the Hurricane Katrina disaster is a renewed public and political interest in Homeland Security. Last fall, following Hurricane Katrina, former House Speaker Newt Gingrich opined that the demonstrated governmental response to Katrina “put into question all of the Homeland Security and Northern Command (NORTHCOM) planning for the last four years, because if we can’t respond faster than this to an event we saw coming across the Gulf for days, then why do we think we’re prepared to respond to a nuclear or biological attack?”<sup>36</sup> Hurricane Katrina, an anticipated natural disaster, clearly demonstrated the enormous complexity associated with the extensive coordination required to synchronize the efforts of local, State, and Federal governmental agencies faced with a significant crisis. The complexity of necessary coordination exponentially increases in the crisis is an unanticipated terrorist attack employing some type of nuclear WMD.

The National Strategy to Combat Weapons of Mass Destruction acknowledges that nuclear, biological and chemical WMD in the possession of hostile states and terrorists represent one of the greatest security challenges facing the United States. Although extremist groups and terrorists have a wide variety of potential agents and delivery means to choose from for a chemical, biological, radiological or nuclear (CBRN) attack, this study will focus specifically on the threat of a radiological or nuclear WMD attack against the United States.

Terrorists have four methods available by which they can exploit military or civilian nuclear assets to accomplish their destructive ends: The theft or purchase of an intact nuclear weapon; the theft or purchase of fissile material used in a crude nuclear weapon or improvised

---

<sup>36</sup> Philpott, Don. “Hurricane Katrina – A Homeland Security Reality Check”. Homeland Defense Journal Vol.3, Issue 9, (September 2005), 24.

nuclear device, attacks against or sabotage of nuclear facilities; and unauthorized acquisition of radioactive materials used to manufacture a radiological dispersion device (dirty bomb) or a radiation emission device.<sup>37</sup> The first two types of incidents would involve nuclear explosions which could result in a great extent of death and destruction.

Consequences from a terrorist-detonated nuclear device would reverberate well beyond tens or hundreds of thousands of casualties and the massive property and financial damage. Surviving Americans would live in fear of future nuclear strikes and such fear could reduce public confidence in the government. Destruction or sabotage of a nuclear facility would cause proportionately less damage; however, the widespread radioactive contamination could lead to substantial loss of economic activity, property damage, and long-term health effects.<sup>38</sup> Use of a radiological dispersal device or a dirty bomb could result in hundreds of immediate casualties, lost economic activity, property damage and long-term health effects. Additionally, the influence of panic and toll of large scale evacuation must also be considered.

Nuclear terrorism experts agree that the nuclear terror acts with the most devastating consequences are the least likely while nuclear terror acts with the least damaging consequences are the most likely because they are the easiest to carry out.<sup>39</sup> A dirty bomb or radiological dispersal device would require significantly less technical skills and financial resources than the other forms of nuclear terrorism. A radiological dispersal device may be delivered as a conventional bomb packed with radioactive material. The versatility and relative ease of delivery of a radiological dispersal device makes it a viable option for groups with limited financial

---

<sup>37</sup> Ferguson, Charles D.; Potter, William C.; Sands, Amy; Spector, Leonard S. and Wehling, Fred L., The Four Faces of Nuclear Terrorism, (New York: Routledge, 2005), 3.

<sup>38</sup> Ibid, 4.

<sup>39</sup> Ferguson, Charles D.; Potter, William C.; Sands, Amy; Spector, Leonard S. and Wehling, Fred L., The Four Faces of Nuclear Terrorism, (New York: Routledge, 2005), 5.

resources and technical know-how.<sup>40</sup> Therefore, we will characterize the dirty bomb threat in a greater detail.

The desired characteristics of a dirty bomb can be achieved by use of conventional explosives or other means to disperse radioactive materials, dispersal of radioactive material resulting by attack on a fixed nuclear facility, dispersal of radioactive material resulting by an attack on in transit radioactive material or detonation of a malfunctioning or damaged nuclear weapon.<sup>41</sup> Radiological dispersal incidents are divided into two broad categories. The first category involves incidents that are small and highly localized sources of radiation. The second category involves incidents that result in the dispersal of large amounts of radioactive material over large areas.

Dirty bomb incidents involving a single or a few, small low-level radioactive source(s) may be used to cause fear and disrupt social order. Such radioactive material could be packaged and delivered in very small and quite ordinary containers. Minute quantities of radiation could be spread quite easily. Dispersal of such low levels of radioactive material would pose a limited exposure hazard. The impact of such an attack would be primarily psychosocial and produce little, if any, long-term radiation exposure induced health effects.<sup>42</sup>

The most dangerous dirty bomb scenario is the incident that results in the dispersal of radioactive materials over a large area by a device that utilize explosives combined with large amounts of radioactive material. If the large area is inhabited, the populace wounded by the blast will likely be contaminated with radioactive material. Since the intent of such devices is to affect

---

<sup>40</sup> Ibid, 36.

<sup>41</sup> O'Brian, Cindy L., Management of Terrorist Events Involving Radioactive Material, (Bethesda, MD: National Council on Radiation Protection and Measurements, 2001), 13.

<sup>42</sup> O'Brian, Cindy L., Management of Terrorist Events Involving Radioactive Material, (Bethesda, MD: National Council on Radiation Protection and Measurements, 2001), 14.

an extended geographic region or portion of the population, greater amounts of radioactive materials are expected to be employed in the weapon.<sup>43</sup>

The most likely dirty bomb design would involve solid radioactive material with a low enough radiation that construction, transportation and employment of the radiological dispersal device might occur without injury to the terrorists themselves or detection by authorities. Safe handling and concealment of large amounts of penetrating radiation is difficult to accomplish without detection. In order to protect the individuals involved in the design, production and employment of radiological dispersal devices, careful consideration must be given to the use of shielding materials to mitigate exposure to radiation. Although solid radioactive materials are most likely to be used for dirty bombs, the radioactive material could also be contained in radioactive solution or gas.<sup>44</sup>

Radioactive particulate matter, liquids or gases would serve as sources of both internal and external exposure. In the immediate blast area, exposure rates could be high enough to result in lethal doses within a matter of hours. The lethal dose is the dose of radiation expected to cause death within 30 days to 50% of those exposed without medical treatment, generally accepted to be range from 400 to 500 rem received over a short period of time.<sup>45</sup> As the distance increases away from the blast area, there is a decrease in internal and external exposure risks and other potential hazards. In contrast to a Cold War nuclear scenario involving a massive exchange of high-yield nuclear weapons, terrorist use of a dirty bomb would most likely involve a low-yield device. While any nuclear device would prove catastrophic, our local, state and federal government must be prepared to mitigate the consequences of a dirty bomb attack.

The Federation of American Scientists (FAS) presented their assessment of the threat of a radiological attack by terrorist groups against the United States, in testimony before the Senate

---

<sup>43</sup> Ibid, 15.

<sup>44</sup> Ibid, 15.

<sup>45</sup> Irvine, Richard L., ed. Chemical, Biological, Radiological Incident Handbook, (Langley, VA: CIA, 1998), [http://www.au.af.mil/au/awc/awcgate/cbr\\_hdbk/cbr\\_hdbk.htm](http://www.au.af.mil/au/awc/awcgate/cbr_hdbk/cbr_hdbk.htm), 16.

Foreign Relations Committee on March 6, 2002 and their analysis outlined three principle conclusions.<sup>46</sup> First, radiological attacks constitute a credible threat and the radioactive materials that could be used for such attacks are stored in thousands of facilities around the United States. Second, radiological attacks would only result in some immediate fatalities, but the attacks would contaminate large areas with radiation levels that exceed Environmental Protection Agency (EPA) health and toxic material guidelines. Third, radioactive materials that could be easily lost or stolen from United States research institutions and commercial sites could readily contaminate populated areas at a level that would require prompt evacuation and terrorize large communities even if radiation casualties are low.

The events of September 11, 2001 demonstrated our vulnerability to violent, surprise attacks and forced a significant review of United States Homeland Security requirements. It is clearly evident that the United States must be ready to contend with catastrophic threat scenarios to include the potential use of a nuclear weapon of mass destruction such as a radiological dispersal device or dirty bomb. In the event that we are unable to deter terrorist use of such a nuclear device, we have a responsibility to maintain an immediate incident response and consequence management capability to provide for the defense and security of our citizens.

## **Combating Use of Weapons of Mass Destruction in the United States Homeland**

Throughout our storied history, the United States has experienced, endured and overcome a wide variety of disasters, both man-made and natural. Each progressive challenge has shaped policy and forced local, state and national governmental organizations to maintain specific capabilities to respond to such disaster scenarios. The Los Angeles riots, Hurricane Andrew and Hurricane Katrina all provide insights into the challenges associated with of encountered disaster response. Since the attacks of September 11, an increased priority was placed on disaster

---

<sup>46</sup> Kelly, Henry. Testimony to Senate Foreign Relations Committee, March 6, 2002. "Dirty Bombs: Response to a Threat", Journal of the Federation of American Scientists, vol 55, n 2.

planning and preparedness. In an effort to promote the effective development and implementation of all homeland security policies, Homeland Security Presidential Directive-1, dated October 29, 2001, established the Homeland Security Council to ensure coordination between executive departments and agencies.<sup>47</sup>

The *National Strategy to Combat Weapons of Mass Destruction* (Homeland Security Presidential Directive – 4), published on 11 December 2002, formally proclaimed the United States intent not to permit the world’s most dangerous regimes and governments to threaten us with the world’s most destructive weapons, specifically; weapons of mass destruction.<sup>48</sup> Our *National Strategy to Combat Weapons of Mass Destruction* has three principal pillars: counterproliferation to combat weapons of mass destruction, strengthened nonproliferation to combat weapons of mass destruction proliferation, and consequence management to respond to weapons of mass destruction use. Four critical enabling functions which serve to integrate the three pillars of the *National Strategy to Combat Weapons of Mass Destruction* include: improved intelligence collection and analysis, research and development, strengthened international cooperation and targeted strategies against proliferants. The strategy addresses the complex nature and the daunting challenge we confront in meeting the requirements to prevent, deter, defend against and respond to today’s WMD threats.

The most comprehensive guidance addressing the management of domestic incidents is contained in “Homeland Security Presidential Directive – 5, Subject: Management of Domestic Incidents,” dated February 28, 2003. Homeland Security Presidential Directive – 5 enhances the ability of the United States to manage domestic incidents by establishing a single, comprehensive

---

<sup>47</sup> Bush, George W. “Homeland Security Presidential Directive – 1, Subject: Organization and Operation of the Homeland Security Council”. Office of the Press Secretary, October 30, 2001.

<sup>48</sup> Bush, George W. “Homeland Security Presidential Directive – 4, National Strategy to Combat Weapons of Mass Destruction”. Office of the Press Secretary, December 11, 2002.

national incident management system.<sup>49</sup> The objective of this directive is to ensure all levels of government across the Nation have the capability to work efficiently and effectively together, using a standardized, national approach to domestic incident management. In such efforts to contend with domestic incidents, the United States Government will treat crisis management and consequence management as a single integrated function, rather than two separate functions.

The Secretary of Homeland Security is the principal Federal official for domestic incident management. In accordance with the Homeland Security Act of 2002, The Secretary is responsible for coordinating Federal operations within the United States to prepare for, respond to and recover from terrorist attacks, major disasters and other emergencies. The Secretary coordinates the Federal Government's resources utilized in response to a terrorist attack when any one of the following conditions applies: (1) a Federal department or agency acting on its own has requested assistance of the Secretary; (2) the resources of local and state government are overwhelmed and Federal assistance has been requested by appropriate local and state authorities; (3) more than one Federal agency or department has become substantially involved in response to the incident; or (4) the Secretary has been directed to assume responsibility by the President.<sup>50</sup> The Federal Government recognizes the roles and responsibilities of State and local authorities in the process of domestic incident management. Initial responsibility for managing domestic incidents rests with State and local authorities. The Secretary will coordinate with State and local authorities to ensure compatibility of State, local and Federal plans.

The Attorney General has the lead responsibility for criminal investigations of terrorist acts or terrorist threats made inside the United States. The Attorney General, through the Federal Bureau of Investigation, will coordinate law enforcement activities necessary to identify, apprehend and bring perpetrators to justice. The Secretary of Defense shall provide military

---

<sup>49</sup> Bush, George W. "Homeland Security Presidential Directive – 5, Management of Domestic Incidents". Office of the Press Secretary, February 28, 2003.

<sup>50</sup> Bush, George W. "Homeland Security Presidential Directive – 5, Management of Domestic Incidents". Office of the Press Secretary, February 28, 2003.

support to civil authorities for domestic incidents as directed by the Commander in Chief or when consistent with military readiness and appropriate under the law.<sup>51</sup> The Secretary of Defense will retain command of military forces providing civil support.

The most critical mandate directed in Homeland Security Presidential Directive – 5 is the requirement for the Secretary of Homeland Security to develop and administer a National Response Plan (NRP). The National Response Plan shall be unclassified. In the event operational aspects of the plan require classification, those portions shall be included in classified annexes to the National Response Plan. The National Response Plan, using the National Incident Management System (NIMS), provides the structure and mechanisms for national policy and operational direction for Federal support to State and local incident managers. The National Response Plan will include protocols for operating under different threats or threat levels, incorporate existing Federal emergency and incident management plans and any additional plans or annexes, including public affairs and intergovernmental communications.<sup>52</sup>

The Homeland Security Advisory System standardizes Federal Threat Conditions for use as a means to disseminate information regarding the risk of terrorist acts to the Nation.<sup>53</sup> Homeland Security Presidential Directive – 3 established five threat conditions, each defined by a description and a corresponding color. From lowest to highest, the levels and their respective corresponding colors are: Low = Green; Guarded = Blue; Elevated = Yellow; High = Orange; and Severe = Red. The higher the threat condition, the greater the risk of a terrorist attack. The Attorney General determines and assigns Threat Conditions.<sup>54</sup>

---

<sup>51</sup> Bush, George W. “Homeland Security Presidential Directive – 5, Management of Domestic Incidents”. Office of the Press Secretary, February 28, 2003.

<sup>52</sup> Bush, George W. “Homeland Security Presidential Directive – 5, Management of Domestic Incidents”. Office of the Press Secretary, February 28, 2003.

<sup>53</sup> Bush, George W. “Homeland Security Presidential Directive – 3, Homeland Security Advisory System”. Office of the Press Secretary, March 12, 2002.

<sup>54</sup> Bush, George W. “Homeland Security Presidential Directive – 3, Homeland Security Advisory System”. Office of the Press Secretary, March 12, 2002.

The National Response Plan will outline standards for reporting incidents, providing assessments and making recommendations to the President, Secretary of Homeland Security, and the Homeland Security Council. Finally, the National Response Plan must also include requirements for continuous improvements to testing, exercising, experience with incidents, and new information and technologies. All Federal departments and agencies will use the National Incident Management System to guide their domestic incident management and emergency prevention, preparedness, response, recovery and consequence management mitigation activities.<sup>55</sup>

Additional preparedness guidance mandating the way Federal departments and agencies will prepare for incident response, including prevention activities during the initial stages of a terrorism incident was provided in Homeland Security Presidential Directive – 8. Homeland Security Presidential Directive – 8, a companion to Security Presidential Directive – 5, identifies steps to enable improved coordination in response to incidents and establishes policies to enhance the preparedness of the United States to prevent and respond to domestic terrorist attacks by outlining specific actions to strengthen the preparedness capabilities of the Federal, State and local authorities.<sup>56</sup> Specifically, this document directs the development of a National domestic all-hazards preparedness goal including standards for preparedness assessments and strategies and a system for assessing the Nation’s overall readiness to respond to events, especially those involving acts of terrorism.

The National Response Plan and the National Incident Management System partner together to provide a comprehensive national approach to incident management, applicable at all jurisdiction levels and across all functional departments and agencies. Not only will the National Incident Management System improve the effectiveness of emergency first responders, it will

---

<sup>55</sup> Bush, George W. “Homeland Security Presidential Directive – 5, Management of Domestic Incidents”. Office of the Press Secretary, February 28, 2003.

<sup>56</sup> Bush, George W. “Homeland Security Presidential Directive – 8, National Preparedness”. Office of the Press Secretary, December 17, 2003.

also improve coordination and cooperation between public and private resources involved in incident response. The National Incident Management System is made up of six components which provide the framework in preparation for, prevention of, response to, and recover from domestic incidents.<sup>57</sup>

Command and management, the standard incident command structure component, is based upon three organizational systems: Incident Command System, Multi-Agency Coordination Systems and Public Information Systems. The Incident Command System is a modular management system formed to integrate personnel, equipment, facilities, communications and procedures that operate within a common organizational incident command structure to achieve and maintain incident control. The Multi-Agency Coordination Systems encompass all coordination elements or emergency operations centers that coordinate information and resources supporting a specific incident. Public Information Management Systems handle the media and public inquiries, emergency public information and warning emphasizing information regarding public health, safety and protection.

The basic Incident Control System structure must expand in order to become capable of managing responses to complex incidents which involve multiple agencies. A terrorist CBRNE event is one type of event that can quickly escalate to one which requires a multi-disciplinary, multi-jurisdictional response requiring an integrated command and control structure. The two variations employed during such an expansion of the Incident Control System are the Unified Command System and Area Command. The Unified Command System is an important tool for managing multi-agency domestic incidents. It provides guidelines that enable agencies from different legal, geographical and functional responsibilities to coordinate, plan and interact more efficiently. The eight first responder disciplines required by the Department of Homeland

---

<sup>57</sup> Director, Texas Engineering Extension Service (TEEX), Weapons of Mass Destruction: Incident Management / Unified Command, (College Station, Texas: Texas A&M University, 2005), PM 1-7.

Security's Office of Domestic Preparedness disciplines that need to apply the principles of unified command include; law enforcement, fire services, emergency medical services, public health, hazardous materials, search and rescue, emergency management, and public works.<sup>58</sup>

Under unified command, all incidents are managed under single leadership with the collaborative efforts of the numerous agencies and jurisdictions involved. A unified command response structure includes a common organizational structure, a single incident command post, a unified planning process, and unified resource management. Unified command operates with an understanding that all agencies or departments in the unified command are equal. Leadership for the operation is delegated according to the incident and the agency best suited to the required response. In some jurisdictions, laws, emergency operations plans, policies or procedures may identify a particular agency or department to be in command based on the incident, while others may elect to designate a lead agency.<sup>59</sup>

Area Command is established to oversee the management of incidents that are not site specific, geographically dispersed, or evolve over long periods of time. Area command is activated only if necessary, depending on the complexity of an incident and span of control considerations. In the event a determination is made to activate Area Command, the area command is responsible for establishing overall incident priorities, allocating critical resources based upon incident priorities, ensuring each incident is properly managed, ensuring incident management objectives are met, identifying critical resource needs and reporting shortfalls and ensuring short-term emergency recovery is coordinated to assist in the transition to full recovery operations.<sup>60</sup>

---

<sup>58</sup> Director, Texas Engineering Extension Service (TEEX), Weapons of Mass Destruction: Incident Management / Unified Command, (College Station, Texas: Texas A&M University, 2005), PM 2-5.

<sup>59</sup> Ibid, PM 2-9.

<sup>60</sup> Director, Texas Engineering Extension Service (TEEX), Weapons of Mass Destruction: Incident Management / Unified Command, (College Station, Texas: Texas A&M University, 2005), PM 2-11.

The field location where the primary tactical-level, on-scene incident command functions are performed is the Incident Command Post. The Incident Command Post is the place where command post decisions are made regarding tactical operations. The responsibilities of the Incident Command Post are performing command and control functions at the scene, developing the Incident Action Plan, requesting resources from the Emergency Operations Center as required, and coordinating multi-agency incidents under a unified command structure.<sup>61</sup> It may be necessary to activate an Emergency Operations Center for incidents requiring coordination assistance that exceeds the scope of capabilities of the incident commander and the Incident Command Post staff.

The Emergency Operations Center represents the physical location where the coordination of information and resources to support incident management activities normally occur. The size, manning, and equipping of an Emergency Operations Center varies widely with the scope of the incident and the anticipated incident management workload. Regardless of the configuration, each Emergency Operations Center should provide five basic functions to create a coordinated and effective response.<sup>62</sup> The Emergency Operations Center facilitates both direction and control, maintains situational assessment, coordinates, and establishes priorities. The Emergency Operations Center becomes the central location from which any level of government can synchronize inter-agency coordination and executive decision making for managing response and recovery.

The coordination that occurs in the Emergency Operations Center is the foundation for a successful resolution to any contingency. Communications must be vertical and horizontal among response personnel and agencies. Critical redundant communication assets must be available and compatible. Typical communication equipment required in an Emergency

---

<sup>61</sup> Ibid, PM 2-13.

<sup>62</sup> Ibid, PM 2-15.

Operations Center includes radios, telephones, fax machines, computers with internet access which enable both secure and unsecure communications.

In the event that incidents cross jurisdictional or disciplinary boundaries or involve complex incident management scenarios, a multi-agency coordination entity is used to facilitate incident management and policy coordination. A multi-agency coordination system encompasses all of the command and management functions necessary to provide strategic coordination during domestic incidents. Following incidents, typically, the multi-agency coordination system is responsible for ensuring that improvements in plans, procedures, communications, staffing, and other capabilities necessary for improved incident management are identified and implemented.<sup>63</sup>

Our *National Strategy to Combat Weapons of Mass Destruction* has three principal pillars: counterproliferation to combat weapons of mass destruction, strengthened nonproliferation to combat weapons of mass destruction proliferation, and consequence management to respond to weapons of mass destruction use. The possession and increased likelihood of use of WMD by hostile states and terrorists are realities in the contemporary security environment and make it critical that the United States military and civilian agencies are prepared to defend against possible nuclear WMD employment scenarios.<sup>64</sup> Although the United States, our friends and allies, and the broader international community undertake every effort to prevent states and terrorists from acquiring and manufacturing nuclear materials and expertise associated with WMD, Iran just recently announced that they have enriched uranium and have they too, are now capable members of nuclear club.

Therefore, one may conclude that the since first two pillars of the *National Strategy to Combat Weapons of Mass Destruction* are not working so well, it is necessary to ensure the

---

<sup>63</sup> Director, Texas Engineering Extension Service (TEEX), Weapons of Mass Destruction: Incident Management / Unified Command, (College Station, Texas: Texas A&M University, 2005), PM 2-19.

<sup>64</sup> Bush, George W. "Homeland Security Presidential Directive – 4, National Strategy to Combat Weapons of Mass Destruction". Office of the Press Secretary, December 11, 2002.

success of the third pillar, consequence management to respond to weapons of mass destruction use. The previous section outlines the present complex bureaucracy associated with the planning and execution of the consequence management pillar. If this pillar of the national strategy should also falter, it will further exacerbate the two previously addressed major vulnerabilities. Our consequence management effort must not ever demonstrate a lack of preparation by various governmental organizations to effectively coordinate and execute a large scale multi-jurisdictional crisis response. The public must completely trust in the government's ability to adequately respond to a crisis and to meet the security needs of the people. Consequence management efforts must be responsive in order to demonstrate our preparedness to respond to domestic crisis or disaster, not only to Americans, but also to terrorists and any potential adversarial threat to our homeland security.

## **Nuclear and Radiological Incident Response**

The Nuclear/Radiological Incident Annex to the National Response Plan provides an organized and integrated capability for a timely, coordinated response by Federal agencies to Incidents of National Significance or terrorists incidents involving nuclear or radioactive material. The Annex also provides for a timely, coordinated response by Federal agencies to accidents or incidents involving radioactive material which are considered to be below the threshold of an Incident of National Significance.<sup>65</sup> The Nuclear/Radiological Incident Annex describes how the six identified Coordinating Agencies and the seventeen identified Cooperating Agencies support the Department of Homeland Security's overall response to a nuclear or radiological incident. All Federal nuclear/radiological assistance capabilities outlined in the Nuclear/Radiological Incident Annex are available to support the Federal response to a terrorist threat, whether or not the threat actually develops into an actual incident.<sup>66</sup>

---

<sup>65</sup> Ridge, Tom, National Response Plan, (Washington, DC; December 2004), 375.

<sup>66</sup> Ibid, 378.

During response to an Incident of National Significance, coordinating agencies and cooperating agencies provide technical expertise, specialized equipment, and personnel in support of the Department of Homeland Security. The coordinating agency is that Federal Agency which owns, has custody of, authorizes, regulates or is responsible for the radiological facility or activity involved in the incident. For radiological terrorism incidents, the coordinating agency provides technical support to Department of Homeland Security, which has the overall responsibility for domestic incident management, and to the Federal Bureau of Investigation, which has the lead responsibility for criminal investigations of terrorist acts or threats. The Federal Bureau of Investigation coordinates the activities of other members of the law enforcement community to detect, prevent, preempt, investigate, and disrupt terrorist radiological dispersion device or improvised nuclear device attacks against the United States.

For radiological terrorism attacks involving materials or facilities owned or operated by the Department of Defense (DOD) or the Department of Energy (DOE), DOD or DOE is the coordinating agency, as appropriate. The Nuclear Regulatory Commission (NRC) is the coordinating agency for a radiological terrorism incident involving materials or facilities licensed by the NRC or Agreement States. For all other radiological terrorist incidents, DOE is the coordinating agency. At a mutually agreed upon time and after consultation with appropriate governmental agencies, the lead coordinating agency role transitions from the DOE to the Environmental Protection Agency for remediation and environmental restoration.<sup>67</sup>

The Department of Defense, recognizing its important role in combating WMD, recently published The National Military Strategy to Combat Weapons of Mass Destruction (NMS-CWMD) which outlines strategic guidance for supporting other departments and agencies as directed, at home and abroad. The NMS-CWMD presents the Department of Defense's approach in fulfilling its role in implementing the President's vision for protecting the United States from

---

<sup>67</sup> Ridge, Tom, National Response Plan, (Washington, DC; December 2004), 382.

the existing and growing WMD threat. The NMS-CWMD uses an ends, ways and means approach to planning, executing, and resourcing that emphasizes those combating WMD missions in which the military plays a prominent role.<sup>68</sup>

Six guiding principles underpin The National Military Strategy to Combat Weapons of Mass Destruction and these guiding principles should serve as the cornerstone for the development of all combating WMD concepts of operations and plans. The principles include developing an active and layered defense in depth, establishing integrated command and control, implementing global force management, utilizing capabilities-based planning, utilizing an effects based approach, and assuring our allies and coalition partners.<sup>69</sup>

The strategic military framework to combat WMD consists of ends (the military strategic goal and associated endstate), ways (military strategic objectives), and means (combatant commands, Military Departments and combat support agencies). These ends, ways and means are applied across the three pillars of The National Military Strategy to Combat Weapons of Mass Destruction: nonproliferation, counterproliferation, and consequence management. Our military strategic goal is to ensure that the United States, its Armed Forces, allies, partners, and interests are neither coerced nor attacked by WMD.<sup>70</sup> The military strategic objectives describe how the United States Armed Forces will accomplish the military strategic goal.

The purpose of the first strategic objective, defeat and deter WMD use and subsequent use, is to counter an adversarial capabilities and willingness to employ WMD. The purpose of the second strategic objective, defend, respond and recover from WMD use, is to respond to an adversarial employment of WMD on the battlefield or against United States strategic interests. The purpose of the third strategic objective, prevent, dissuade or deny WMD proliferation or possession, is to keep WMD out of the hands of adversaries or potential adversaries, while

---

<sup>68</sup> Pace, Peter. National Military Strategy to Combat Weapons of Mass Destruction (MNS-CWMD), (Washington, D.C., 13 Feb 2006), 9.

<sup>69</sup> Ibid, 13.

<sup>70</sup> Ibid, 16.

increasing our capability and support for combating WMD activities. The purpose of the final strategic objective, reduce, destroy, or reverse WMD possession, is to destroy or secure WMD when there is an agreement to do so. The aforementioned military strategic objectives are achieved through eight combating WMD missions: offensive operations, elimination, interdiction, active defense, passive defense, consequence management, security cooperation and partner activities and threat reduction cooperation.<sup>71</sup>

The combatant commands, Military Departments, and combat support agencies are the means to accomplish the military strategic objectives. The Commander, United States Strategic Command (CDRUSSTRATCOM) is the lead combatant commander for integrating and synchronizing Department of Defense efforts in combating WMD. Additionally, Commander, United States Northern Command (CDRUSNORTHCOM) and Commander, United States Pacific Command (CDRUSPACOM) have unique responsibilities for supporting domestic WMD consequence management activities. Combating WMD is a mission set that will fully challenge the Department of Defense and require effective cooperation among United States agencies, allies and partners. The demands across the full spectrum of combating WMD must also be synchronized with the objectives of the Global War on Terrorism, as identified in the National Military Strategic Plan for the War on Terrorism.

The National Military Strategy to Combat Weapons of Mass Destruction codifies how the Department of Defense will fulfill its role as prescribed in the Strategy for Homeland Defense and Civil Support, dated June 2005. The Strategy for Homeland Defense and Civil Support divides the Department of Defense's activities into three categories: lead, support and enable. The Department of Defense leads military missions to deter, prevent, and defeat attacks on the

---

<sup>71</sup> Pace, Peter. National Military Strategy to Combat Weapons of Mass Destruction (MNS-CWMD), (Washington, D.C., 13 Feb 2006), 28.

United States, its people, and its defense critical infrastructure.<sup>72</sup> As directed by the National Command Authority or the Secretary of Defense, the Armed Forces provide Department of Defense support of civil authorities in order to prevent terrorist incidents or manage the consequences of an attack or a disaster.<sup>73</sup> The Department of Defense enables other Departments and Agencies through efforts to share capabilities and expertise in an effort to improve the Nation's overall collective capabilities for homeland defense.

The United States Government has worked diligently to plan, organize and equip itself to adequately protect the United States from a nuclear WMD attack. The numerous governmental departments and agencies involved in emergency response and consequence management are cooperating in exercises and endeavors that will standardize protocols for response. Although significant progress has been made to synchronize the efforts of the large number departments and agencies involved, it may be necessary to consider restructuring portions of the federal government to meet the specific challenges associated with dealing with catastrophic incidents like WMD attack.

The Strategy for Homeland Defense and Civil Support required adjustments to Department of Defense force structure, resource allocation and future research and development. The Department of Defense effort continues to focus on developing capabilities for achieving maximum awareness of threats, developing capabilities for deterring, intercepting, and defeating threats at a safe distance, developing capabilities for achieving mission assurance, developing capabilities for chemical, biological, radiological, nuclear or high-explosive (CBRNE) consequence management, and improving United States and International capabilities for Homeland Defense and Homeland Security.

---

<sup>72</sup> England, Gordon. Strategy for Homeland Defense and Civil Support (Washington, D.C., June 2005), 14.

<sup>73</sup> Ibid, 14.

## Are We Ready

A great deal of attention and effort has been focused on developing capabilities to address the significant challenges presented by the prospect of a radiological dispersal device or improvised nuclear device attack against the United States or her strategic interests. A brief examination of the bureaucracy involved in the preparation and response process clearly demonstrates the complexity associated with National Preparedness for a nuclear WMD incident. The Department of Homeland Security Office for Policy, Initiatives and Analysis recently presented fifteen all-hazards National Planning Scenarios to serve as the foundation for the development of homeland security tasks, target capabilities, and standards and measures of performance against which capabilities and tasks will ultimately be measured.<sup>74</sup> Ultimately, the scenario-derived capabilities and standards will serve as a basis for assessing national preparedness and assist in development of national exercises and training programs.

The Homeland Security Council and the Department of Homeland Security formed an interagency Scenario Working Group to develop a minimum number of scenarios required to evaluate prevention, protection, response and recovery capabilities. The Scenario Working Group refined fifteen all-hazards planning scenarios. Twelve scenarios represent terrorist attacks and three represent natural disasters. The fact that two of the National Planning Scenarios represent nuclear device attack scenarios clearly communicates the recognition of a perceived mounting threat in this area of vulnerability.

The summary of Scenario 1 (Nuclear Detonation – Improvised Nuclear Device (IND)) clearly highlights a number of areas of concern.<sup>75</sup> In Scenario 1, a universal adversary acquires small amounts of enriched Uranium-235 and equipment for constructing a gun-type nuclear

---

<sup>74</sup> Director, Office for Policy, Initiatives and Analysis. National Planning Scenarios Briefing, (Washington, D.C., April 11, 2006), Slide 2.

<sup>75</sup> Director, Office for Policy, Initiatives and Analysis. National Planning Scenarios Briefing, (Washington, D.C., April 11, 2006), Slide 7.

device through black market arms dealers from the former Soviet Union. The universal adversary operatives then transport the nuclear material and weapons parts to a facility in a failed state where they are met by a Pakistani nuclear weapons engineer. The weapons engineer helps develop, assemble and test a gun-type improvised nuclear device.

The universal adversary operatives travel to the United States through Mexico and smuggle the nuclear engineer into the United States with illegal immigrants. The universal adversary operatives exploit legitimate business contacts to ship the device components to the United States through Mexico. The Highly Enriched Uranium is shipped to Mexico and later smuggled into the United States. The nuclear engineer assembles the device in a safe house while other operatives acquire a delivery van and disguise it as a local service vehicle. Two suicide bombers drive the device to the center of the targeted metropolitan area and position the vehicle borne device in the attack position. The improvised nuclear device is then detonated using a manually-activated detonator in the middle of the day at the height of lunch hour.

The estimated consequences of the 10 kiloTon (kT) payload of the improvised nuclear device are catastrophic. Such a device might result in between 99,000 – 229,370 deaths and hundreds of thousands of other injuries. The economic cost estimates of such an attack might easily exceed hundreds of billions of dollars and it would take years to fully recover from the prolonged effects of radiation.

The summary of Scenario 11 (Radiological Attack – Radiological Dispersion Device (RDD)), similarly highlights additional areas of concern.<sup>76</sup> In Scenario 11, universal adversary operatives purchase approximately 6,900 curies of Cesium-137 on the Russian black market. Simultaneously, a cell of operatives in the United States begins acquiring a large amount of prilled ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>) in relatively small increments. An operative manufactures a test bomb that will serve as a dissemination device. The improvised explosive device consists of

---

<sup>76</sup> Director, Office for Policy, Initiatives and Analysis. National Planning Scenarios Briefing, (Washington, D.C., April 11, 2006), Slide 17.

a timer, detonator cord, and Pentaerythritol Tetranitrate (PETN) high explosive (HE) primer. The test is successful.

Universal adversary operative tactical teams travel to the United States on separate flights using counterfeit passports. The operative tactical teams stay at a remote farmhouse with some members of the operational cell. Additional universal adversary operatives shield and ship the Cesium-137 to a port and deliver it to the operational cell. The lead shielding prevents detection by deployed, strategically positioned radiation-detecting pagers.

The tactical teams assemble three radiological dispersal devices and load them into three rental trucks disguised as belonging to a local delivery company. The first radiological dispersal device detonates in a major urban area at mid-morning. The second and third radiological dispersal devices explode in two other cities within two hours.

The estimated consequences of the payload of the Cesium-137 and ammonium nitrate radiological dispersal device are not nearly as catastrophic as the destructive force described in Scenario 1. Such a radiological dispersal device might only result in about 180 deaths and 280 other injuries. The economic cost estimates of such an attack might still exceed billions of dollars and it would take months to years to fully recover from the prolonged effects of radiation. The most significant impact of an attack by multiple radiological dispersal devices may well be the second and third order effects manifested in terms of psychological trauma, personal anxiety and a resultant lack of trust in the government's ability to provide for the health and safety of its citizenry.

After extensive analysis, both Scenarios 1 and 11 were matched with a Global Salafist Jihad threat based on the six threat categories derived from universal adversary threat models.<sup>77</sup> The universal adversary threat models were generated during the conduct of the National

---

<sup>77</sup> Director, Office for Policy, Initiatives and Analysis. National Planning Scenarios Briefing, (Washington, D.C., April 11, 2006), Slide 27.

Planning Scenario development. The threat models were then verified by law enforcement and intelligence communities.

Each of the two radiological scenarios fit with Salafist ideology and their willingness to commit mass casualty acts against Western targets. The capability to execute Scenario 1 is enhanced by a global support network, contacts with sympathetic Pakistani elements, previous research regarding weapons of mass destruction technology and a permissive failed state. The capability to execute Scenario 11 is enhanced by the availability of vast amounts of non-fissile radioactive material, high yield bomb-making expertise, Russian and Pakistani networks, and a wide-reaching logistical network. The two threat scenarios detailed above review critical vulnerabilities terrorists can exploit. The scenarios detail the danger we face with terrorists that intend to employ a nuclear or radiological device against the United States.

Thomas L. Friedman in his book, The World is Flat, suggests that the only reason Osama Bin Laden did not use a nuclear device on 9/11 is that Bin Laden did not have the capability to do so. He further argues that the only strategy we have is to limit the terrorist's most extreme capabilities through a more serious global effort to stanch nuclear proliferation by limiting the supply. Friedman proposes two ways to limit the supply. First, to buy up all the fissile material that is already out there, especially in the former Soviet Union, and second, to prevent more states from going nuclear.<sup>78</sup>

The United States government has worked diligently to overcome many of the vulnerabilities exploited by the two Threat Planning Scenarios which address the threat of terrorism use of radiological dispersal devices or improvised nuclear devices. The first crucial step was the recognition of the preeminence of nuclear terrorism as the leading national security

---

<sup>78</sup> Friedman, Thomas L. The World is Flat, A Brief History of the Twenty-first Century. (Farrar, Straus and Giroux: New York, 2005), 436.

challenge facing the United States and its allies and friends.<sup>79</sup> Specific actions have already been taken to secure nuclear weapons, nuclear facilities, and high-risk radioactive sources. The United States continues to work to reduce the probability of nuclear terrorism strikes and to prepare mitigation and consequence management strategies to deal with the most probable or likely nuclear terror acts.

In recognition of a dramatic shift in the threat environment, numerous initiatives have been implemented to alleviate terrorist threats. The prosecution of the Global War on Terrorism has disrupted terrorist organizations, severed their lines of communication and logistics support, eliminated safe havens and training bases, and interfered with the international financial network that funds terrorist organizations. The United States is improving port security by installing new radiation sensors around certain cities considered to be lucrative or likely terrorist targets. Security of commercial air travel has significantly increased to reduce the risk that a commercial aircraft could transport dangerous people or cargo into the country. Efforts have been made to improve border security and detection methods utilized to impede illicit trafficking of radioactive and nuclear weapons materials.

The adoption of United Nations Resolution 1540, requires all United Nations States to adopt measures to control their nuclear weapons, to adopt effective export controls on WMD material, and to criminalize actions to develop WMD by non-state actors. The Department of Energy's 2004 Global Threat Reduction Initiative to police up stocks of United States and Soviet – origin highly enriched uranium stored at vulnerable research centers worldwide is an attempt at reducing a source of radioactive material needed to develop nuclear devices. The benefits derived from the cumulative affect of these initiatives all contribute to a reduction of the overall danger of nuclear terrorism.

---

<sup>79</sup> Ferguson, Charles D.; Potter, William C.; Sands, Amy; Spector, Leonard S. and Wehling, Fred L, The Four Faces of Nuclear Terrorism, (New York: Routledge, 2005), 324.

Assuming that terrorism involving radioactive material is inevitable, it is crucial for the United States to intensify its efforts to control and secure radioactive material. Steady progress must continue in protecting nuclear facilities against attack or sabotage. In the event the United States is attacked by a nuclear device, emergency response must be rapid and effective, mitigating the consequences of a potential nuclear terrorist attack. First responders must know how to operate in a radioactively contaminated environment. Decontamination and remediation protocols must be standardized, resourced at tactical levels and integrated in response plans. Consequence management activities must be appropriately designed, evaluated, codified, trained and rehearsed at all levels to enable an effective and efficient response and recovery. The public must be convinced that the Nation is prepared to contend with the consequences of a radiological catastrophe. The public's reaction can be one of the best defenses or the greatest weakness in responding to radiological terrorism.<sup>80</sup>

The question of whether the United States is ready to respond to the terrorist detonation of a nuclear device is a difficult question to answer definitively. A review of the impact of the two nuclear weapons employed in World War II in 1945 and the Chernobyl accident in 1986 provide insight into the complexity of responding to a nuclear incident. The atomic bomb dropped on Hiroshima, "Little Boy", delivered a payload of approximately 12kT and the atomic bomb dropped on Nagasaki, "Fat Man", delivered a payload of approximately 20kT.<sup>81</sup> Although the exact figure will never be known, the estimated number of people killed by the two bombs probably exceeds 250,000. The physical destruction of the two cities was considerable and the residual effects of radiation continued to hamper the health and environment for years after the attacks.

---

<sup>80</sup> Ferguson, Charles D.; Potter, William C.; Sands, Amy; Spector, Leonard S. and Wehling, Fred L., The Four Faces of Nuclear Terrorism, (New York: Routledge, 2005), 308.

<sup>81</sup> Holdstock, Douglas and Barnaby, Frank, ed. Hiroshima and Nagasaki Retrospect and Prospect, (Frank Cass & Co, Ltd: London, 1995), 1.

A report published following a recent United Nations assessment of the twenty year impact of the Chernobyl Nuclear Accident quantified the impact of the incident.<sup>82</sup> Over 200,000 square kilometers of Europe were contaminated by radionucleotides. Open surfaces, such as roads, lawns and roofs were heavily contaminated. Weathering reduced surface contamination but led to secondary contamination of sewage and sludge systems. The total number of deaths attributable to Chernobyl or expected in the future is estimated to be about 4,000 people. Hundreds of farms in Great Britain are still monitored for radioactive contamination.<sup>83</sup>

Herculean strides have dramatically improved our Nation's readiness and enhanced our preparedness for responding to a nuclear WMD. Over the years, emergency responders at all levels, various governmental departments and agencies have partnered together for integrated training and exercises. Monumental Presidential directives have mandated federal policy decisions to establish unity of command and clearly delineate responsibilities. Millions of dollars have been expended to field standardized off the shelf technologies to fill critical operational shortfalls that previously existed.

Large scale disaster response exercises and simulation models are utilized to help synchronize inter-agency response and consequence management efforts. Taking the colossal casualty rates from historical nuclear attacks and incidents into account, it is difficult to adequately assess our ability to meet the demands that will be placed on our emergency medical evacuation and treatment personnel and facilities. The demolished buildings and raging fires will quickly overwhelm the capacity of firefighting units in most metropolitan areas. The impact that electromagnetic pulse will have on our communications architecture is unknown and if the blast disables our telephone and internet connectivity, the degree of complexity associated with an incident response increase exponentially.

---

<sup>82</sup> Bureau of International Information Programs, U.S. Department of State, "UN Releases Report on Scale of Chernobyl Nuclear Accident", (<http://www.globalsecurity.org>: 6 Sep 2005), 1.

<sup>83</sup> Bellona Foundation, "Chernobyl Accident still Haunts UK", (<http://www.bellona.no>: 5 Mar 2003), 1.

The multitude of contributing and cooperating departments and agencies involved in the response and consequence management missions described in this work, rarely have the opportunity to work together on incidents or disasters of such horrific scale and magnitude. The exercises are scheduled well in advance and usually are relatively short in duration. The exercises terminate well before the capabilities are overwhelmed and the strains of prolonged operation take their toll on personnel or resources. A terrorist strike will be unanticipated and require an unscheduled response by all those involved. Recent experience with Hurricane Katrina serves as a constant reminder that much preparatory work at all levels remains to be done.

After deliberate analysis and reflection, it becomes apparent that our Nation will only know for certain if we are ready to respond to a terrorist use of a nuclear weapon of mass destruction once, we are, in fact, attacked. Our immediate response and ability to accomplish the requisite consequence management activities will demonstrate our level of preparedness and overall readiness posture. The irony of the situation is the Nation must remain vigilant in their efforts to prepare for such an incident, knowing full well, they will not know if they are ready until the first terrorist strike.

## **Recommendations for a Way Ahead**

Combating the threat of catastrophic destruction and loss of life posed by terrorists possessing nuclear or radiological weapons is paramount. The strategic focus falls into two major categories. First, the United States must work to immediately reduce the probability of nuclear terror acts. Second, the United States must work to mitigate the consequences of nuclear terror acts that are most probable. The National Threat Scenarios, briefed on April 11, 2006 outlined two probable nuclear terrorist incident scenarios we must prepare for. The improvised nuclear device is described in Scenario 1 and the radiological dispersal device is described in Scenario 11.

To reduce the probability of nuclear terrorism with improvised nuclear devices, the United States must revise efforts to protect fissile materials by securing, consolidating, and

eliminating highly enriched uranium. It is critical that the United States continue to pursue regional stability in South and Central Asia, a region where Islamic terrorist groups are volatile and openly desire to gain access to weapons of mass destruction. Countries such as Pakistan and Iran pose special problems with regard to security of nuclear weapons and nuclear weapons materials and technologies. Both Pakistan and Iran governments are susceptible to fundamental Islamic extremist attacks. The need to secure Russia's nuclear weapons and highly enriched uranium remains a priority.

The following measures will increase the United States preparedness for mitigating the consequences of the nuclear terror acts. Federal, state and local governments, departments and agencies must plan and train together routinely. All personnel must be trained to operate in a radioactive environment. Medical facilities must be prepared to treat casualties contaminated by radioactive material, as well as, radiation illness. In addition to training, emergency first responders must all be resourced with compatible equipment, especially communications equipment.

The most dangerous impact from most radiological attacks will be the contamination of property, destroying property values and disrupting employment patterns.<sup>84</sup> Decontamination technologies and protocols must be developed and standardized. Rapid decontamination will be a critical step in reclamation of radioactive areas. Once decontamination standards are established, equipment must be acquired and distributed to first responder personnel.

The creation of the Domestic Nuclear Detection Office in the Department of Homeland Security will assist with detection capabilities.<sup>85</sup> Homeland Security Presidential Directive – 14, Domestic Nuclear Detection, dated April 15, 2005 established the Domestic Nuclear Detection

---

<sup>84</sup> Ferguson, Charles D.; Potter, William C.; Sands, Amy; Spector, Leonard S. and Wehling, Fred L., The Four Faces of Nuclear Terrorism, (New York: Routledge, 2005), 331.

<sup>85</sup> Oxford, Vayl, "Detecting Nuclear Weapons and Radiological Materials: How Effective is Available Technology?", (Testimony Before the House Homeland Security Committee Subcommittee on Prevention of Nuclear and Biological Attack, Subcommittee on Emergency Preparedness, Science and Technology, June 21, 2005), 1.

Office and charged the new office with developing global nuclear detection architecture, and acquiring and supporting the deployment of the domestic nuclear detection system. The purpose of the domestic nuclear detection system is to detect and report attempts to import or transport a nuclear device, or fissile or radiological material. Increased detection capability is necessary to disrupt shipping and transport of radiological material by road, rail, sea and air.

The security of United States nuclear power plants remains a concern. Clearly, security must be enhanced at nuclear facilities that maintain large quantities of radioactive materials to prevent theft, attack or sabotage. Reactor control rooms, spent fuel pools, and vital nuclear safety systems are vulnerable to attack from the air or stand-off weapons. Research reactors, often located in urban areas and limited security, are vulnerable targets for attack.

We must deliberately wage an information campaign to educate the public. It is imperative that this campaign leads citizens to understand our capabilities and preparations for addressing the threat of radiological attacks by terrorists. The public must be confident in the government's ability to immediately respond and ultimately recover from an improvised nuclear device or a radiological dispersal device.

Transformation of Federal agencies and the military must continue. The intelligence community must adjust to the changing nature of the homeland security intelligence requirements. The intelligence community must: provide a capable and agile intelligence architecture; collect, analyze, and understand potential threats; detect, identify, and track emerging threats in all operational domains; and share situational awareness within Department of Defense and with domestic and foreign partners.<sup>86</sup> Further, the Department of Defense must: deter adversaries from attacking the United States homeland; and intercept and defeat national security threats in the maritime and air approaches and within United States territory.<sup>87</sup>

---

<sup>86</sup> England, Gordon. Strategy for Homeland Defense and Civil Support (Washington, D.C., June 2005), 20-23.

<sup>87</sup> Ibid, 24.

Improving the Department of Defense's capabilities for mitigating, if necessary, operating in a contaminated environment will require progress in detecting and identifying threats (sense), providing early warning (shape), protecting forces and installations (shield), and ensuring the ability to operate in a contaminated environment (sustain).<sup>88</sup> The Department of Defense must maintain the capability to provide consequence management assistance for domestic chemical, biological, radiological, nuclear and high yield explosive mass casualty attacks. The Department of Defense's capabilities include special agent detection, identification, and dispersion modeling systems, casualty extraction and mass decontamination.<sup>89</sup>

Command and control of military assets supporting consequence management can be orchestrated at the operational level by the 20<sup>th</sup> Support (Chemical) Group at Aberdeen Proving Grounds, Maryland. The 20<sup>th</sup> Support Group can provide a vital command and control link between Department of Defense assets and capabilities that play a vital role in consequence management. As force structure transformation continues to meet the emerging security demands of the future, new units are being developed and activated. For example, command and control of units supporting consequence management operations at the tactical level, can be provided by the 48<sup>th</sup> Chemical Brigade once it is activated at Fort Hood, Texas next year.

Nuclear weapons offer terrorists the ultimate means of causing mass destruction. To thwart their malicious intentions, we must reduce access to radioactive materials, improve radiation detection systems and expand their use, and prepare to provide effective disaster response. The United States maintaining a coordinated and sustained effort to reduce the risks of nuclear terrorism is an essential element in the Global War on Terror.

Several critical enabling functions serve to integrate the three pillars of the *National Strategy to Combat Weapons of Mass Destruction*. Each of these enabling functions (improved

---

<sup>88</sup> England, Gordon. *Strategy for Homeland Defense and Civil Support* (Washington, D.C., June 2005), 27.

<sup>89</sup> *Ibid*, 31.

intelligence collection and analysis, research and development, strengthened international cooperation, and targeted strategies against proliferation) must contribute in the overall effort to combat WMD. Unity of command is vital to the successful implementation and synchronization of the lines of operation supporting the strategy. The best way to bring all of the elements of national power to bear is to charge one single governmental entity with the mission of combating WMD.

That entity requires robust intelligence architecture capable of analyzing reports and information to provide running assessments of the WMD threat. This architecture could then provide routine, timely intelligence updates across the multi-jurisdictional layers of bureaucracy which exists in our present governmental structure. An accurate and complete understanding of the WMD threat is crucial to developing effective counter- and nonproliferation policies and capabilities.<sup>90</sup>

The Goldwater-Nichols Department of Reorganization Act of 1986 addressed a huge problem that plagued the armed forces; specifically, the inability of the military services to work effectively together as a joint team in conducting military operations.<sup>91</sup> Goldwater-Nichols served as a forcing function to bring a joint interoperability to the services and it may be time to have some similar forcing function to spark the cooperation and interoperability of other governmental agencies and departments.

The primary goal of Beyond Goldwater-Nichols, an initiative used to explore the next era of defense reform by the Center for Strategic International Studies, is to develop an integrated set of practical and actionable recommended reforms for organizing both the United States military

---

<sup>90</sup> Bush, George W. "Homeland Security Presidential Directive – 4, National Strategy to Combat Weapons of Mass Destruction". Office of the Press Secretary, December 11, 2002.

<sup>91</sup> Center for Strategic International Studies, "Beyond Goldwater-Nichols U.S. Government & Defense Reform for a new Strategic Era", (<http://www.csis.org/isp/bgn>), 2005.

and national security apparatus to meet 21<sup>st</sup> century challenges.<sup>92</sup> In order to better facilitate cooperation and interoperability of other governmental agencies and departments, dramatic reform is necessary to streamline governmental execution of its consequence management responsibilities. Reorganization may eliminate unnecessary bureaucracy and enable successful and expeditious response to disaster and or attack.

The full range of counterproliferation, nonproliferation, and consequence management measures must be brought to bear against the WMD terrorist threat. Together the recommendations presented in this work may enhance our level of consequence management preparedness for dealing with the terrorist employment of nuclear WMD. Since counterproliferation and nonproliferation efforts are increasingly less effective, we must convincingly demonstrate that we are ready to respond to an improvised nuclear device or radiological dispersion device attack and that such an attack will not achieve the adversarial objective of terror. Therefore, we must prepare now; we have no other alternative.

---

<sup>92</sup> Center for Strategic International Studies, “Beyond Goldwater-Nichols U.S. Government & Defense Reform for a new Strategic Era”, (<http://www.csis.org/isp/bgn>), 2005.

## Bibliography

### Books

- Allison, Graham T., Cote, Owen R., Jr., Falkenrath, Richard A., and Miller, Steven E. *Avoiding Nuclear Anarchy Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material*. Cambridge, Massachusetts: Harvard University, 1996.
- Bailey, Kathleen C., *Doomsday Weapons in the Hands of Many*. Urbana and Chicago: University of Illinois Press, 1991.
- Borawski, John, ed. *Avoiding War in the Nuclear Age Confidence-Building Measures for Crisis Stability*. Boulder, Colorado: Westview Press, 1986.
- Cochran, Andrew and Leslie. *One Point Safe*. New York: Anchor Press, 1997.
- Desch, Michael C., ed. *Soldiers in Cities: Military Operations on Urban Terrain*, Carlisle, PA: Strategic Studies Institute, October 2001. Director, Texas Engineering Extension Service (TEEX), *Weapons of Mass Destruction: Incident Management / Unified Command*. College Station, Texas: Texas A&M University, 2005.
- Ferguson, Charles D. and Potter, William C. *The Four Faces of Nuclear Terrorism*. New York: Routledge, 2005.
- Friedman, Thomas L. *The World is Flat, A Brief History of the Twenty-first Century*, (Farrar, Straus and Giroux: New York, 2005).
- Glasstone, Samuel and Dolan, Philip J., ed. *The Effects of Nuclear Weapons*. 3<sup>rd</sup> ed. United States Department of Defense and United States Department of Energy, 1977.
- Glenn, Russell W., ed. *The City's Many Faces*, Proceedings of the Rand Arroyo-MCWL- J8 UWG Urban Operations Conference, April 13-14, 1999. Arlington VA: Rand, 2000.
- Holdstock, Douglas and Barnaby, Frank, ed. *Hiroshima and Nagasaki Retrospect and Prospect*. London: Frank Cass, 1995.
- Hubbach, Susan M., *Writing Research Papers Across the Curriculum, Fourth Edition*, Orlando, Florida: Harcourt Brace College Publishers, 1996.
- Irvine, Richard L., ed. *Chemical, Biological, Radiological Incident Handbook*, (Langley, VA: CIA, 1998), National Council on Radiation Protection and Measurements (NCRP), Report No. 138: Management of Terrorist Events Involving Radioactive Material. Bethesda, Maryland, 2001.
- O'Brian, Cindy L., *Management of Terrorist Events Involving Radioactive Material*, Bethesda, MD: National Council on Radiation Protection and Measurements, 2001, 13.
- Sagan, Scott D. and Walz, Kenneth N. *The Spread of Nuclear Weapons: A Debate Renewed*. New York: W.W. Norton, 2002.
- Turabian, Kate L. *A Manual for Writers of Term Papers, Theses, and Dissertations*. 6<sup>th</sup> ed. Chicago: University of Chicago Press, 1996.

## **National Guidance**

- National Planning Scenarios, Department of Homeland Security Briefing: Washington, D.C.: April 2005.
- The National Defense Strategy of the United States of America, Washington, D.C.: GPO, March, 2005.
- The National Incident Management System, Washington, D.C.: GPO, 4 March 2004.
- The National Military Strategy of the United States of America, Washington, D.C.: GPO, 2004.
- The National Military Strategic Plan for the War on Terrorism, Washington, D.C.: GPO, 1 February 2006.
- The National Military Strategy to Combat Weapons of Mass Destruction, Washington, D.C.: GPO, 13 February 2006.
- The National Response Plan. Washington, D.C., GPO: 2004.
- The National Security Strategy of the United States of America, Washington, D.C.: GPO, September 2002.
- The National Strategy to Combat Weapons of Mass Destruction, Washington, D.C.:GPO, December 2002.
- Strategy for Homeland Defense and Civil Support, Washington, D.C.: GPO, June 2005.

## **Presidential Directives**

- Homeland Security Presidential Directive - 1 SUBJECT: Organization and Operation of Homeland Security, October 29, 2001.
- Homeland Security Presidential Directive - 2 SUBJECT: Combating Terrorism Through Immigration Policies, October 29, 2001.
- Homeland Security Presidential Directive - 3 SUBJECT: Homeland Security Advisory System, March 12, 2002.
- Homeland Security Presidential Directive - 4 SUBJECT: (Unclassified) National Strategy to Combat Weapons of Mass Destruction, December 2002.
- Homeland Security Presidential Directive - 5 SUBJECT: Management of Domestic Incidents, February 28, 2003.
- Homeland Security Presidential Directive - 6 SUBJECT: Integration and Use of Screening Information, September 16, 2003.
- Homeland Security Presidential Directive - 7 SUBJECT: Critical Infrastructure Identification, Prioritization, and Protection, December 17, 2003.
- Homeland Security Presidential Directive - 8 SUBJECT: National Preparedness, December 17, 2003.

Homeland Security Presidential Directive -9 SUBJECT: Defense of United States Agriculture and Food, February 3, 2004.

Homeland Security Presidential Directive - 10 SUBJECT: Biodefense for the 21<sup>st</sup> Century, April 28, 2004.

Homeland Security Presidential Directive - 11 SUBJECT: Comprehensive Terrorist-Related Screening Procedures, August 27, 2004.

Homeland Security Presidential Directive – 12 SUBJECT: Policy for Identification Standard for Federal Employees and Contractors, August 27, 2004.

## **Articles, Periodicals and Testimony**

Aloise, Gene. “Combating Nuclear Smuggling”. Testimony Before the Subcommittee on the Prevention of Nuclear and Biological Attack and on Emergency Preparedness, Science, Technology, Committee on Homeland Security, House of Representatives. Washington, D.C.: GAO, June 21, 2005.

Bunn, Matthew and Wier, Anthony. “The Seven Myths of Nuclear Terrorism”, *Current History*, April 2005, pp. 153-161.

Eraker, Elizabeth. “Cleanup After a Radiological Attack US Prepares Guidance”, *The Nonproliferation Review / Fall-Winter 2004*, pp. 167-185.

Glaser, Alexander and von Hippel, Frank N. “Thwarting Nuclear Terrorism”, *Scientific American*, February 2006, pp. 56-63.

Kelly, Henry. “Dirty Bombs: Response to a Threat”, Published Testimony before the Senate Foreign Relations Committee, March 6, 2002.

Marghella, Pete. “Planning in Organizations”, *Homeland Defense Journal*, vol.3, Issue 9, September 2005, pp. 13-14.

Mathis, Donald B. “Hurricane Katrina: Lessons Not Learned”, *Homeland Defense Journal*, vol.3, Issue 9, September 2005, pp. 30-33.

Oxford, Vayl. “Detecting Nuclear Weapons and Radiological Materials: How Effective Is Available Technology?”. Opening Statement of Acting Director, Nuclear Detection Office, Department of Homeland Security before House Homeland Security Committee, June 21, 2005.

Philpot, Don. “Hurricane Katrina – A Homeland Security Reality Check”, *Homeland Defense Journal*, vol.3, Issue 9, September 2005, pp. 22-26.

Sammons, Bill. “Bush Seeks to Federalize Emergencies”. *Washington Times*.(September 27, 2005), 1. Verton, Dan. “Let’s Stick to the Facts: They are Horrible Enough”, *Homeland Defense Journal*, vol.3, Issue 9, September 2005, 2.

Ward, Judi A. “Homeland Defense: Are We There Yet?”, *The Counterproliferation Papers Future Warfare Series No. 11*, Maxwell Air Force Base, Alabama: Air University, 2001.

## Web Sites

- <http://www.belona.no/en/energy/nuclear/28808.html>, “Chernobyl Accident still Haunts UK”, 5 March 2003.
- <http://www.cia.gov> “Chemical / Biological / Radiological Incident Handbook” October 1998.
- <http://www.csis.org/isp/bgn>, Center for Strategic International Studies, “Beyond Goldwater-Nichols U.S. Government & Defense Reform for a new Strategic Era”, 2005.
- <http://www.csulb.edu/~lortega2>, Ortega, Luke, “Hurricane Andrew (1993).
- <http://www.fas.org> “Dirty Bombs: Response to a Threat”. FAS Public Interest Report, 2002.
- <http://www.fas.org> “Nuclear Weapons Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.fas.org> “Other Nuclear Weapons Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.fas.org> “Nuclear Weapons EMP Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.fas.org> “Nuclear Weapon Blast Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.fas.org> “Nuclear Weapon Thermal Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.fas.org> “Nuclear Weapon Radiation Effects”. Federation of American Scientists, Special Weapons Primer, Weapons of Mass Destruction, October 21, 1998.
- <http://www.globalsecurity.org> “U.N. Releases Report on Scale of Chernobyl Nuclear Accident”. September 6, 2005.
- <http://www.infoukes.com> Gregorovich, Andrew. “Chornobyl Nuclear Catastrophe Ten Years After April 26, 1986”. Reprinted from Ukrainian Review No. 94, Spring 1996.
- <http://www.infoukes.com> European Liaison Group. “The Chornobyl Nuclear Disaster”. 1986.
- <http://www.terrorismanswers.org> “Terrorist CBRN: Materials and Effects (U)”, Central Intelligence Agency, May 2003.
- <http://www.terrorismanswers.org> “Dirty Bombs”. Terrorism Questions and Answers, Council on Foreign Relations, 2003.
- <http://www.terrorismanswers.org> “Loose Nukes”. Terrorism Questions and Answers, Council on Foreign Relations, 2004.
- <http://www.terrorismanswers.org> “Making a Bomb”. Terrorism Questions and Answers, Council on Foreign Relations, 2004.
- <http://www.terrorismanswers.org> “Responding to Radiation Attacks”. Terrorism Questions and Answers, Council on Foreign Relations, 2004.
- [http://www.wikipedia.org/wiki/Hurricane\\_Andrew](http://www.wikipedia.org/wiki/Hurricane_Andrew), “Hurricane Andrew”, 2005.
- [http://www.wikipedia.org/wiki/Hurricane\\_Katrina](http://www.wikipedia.org/wiki/Hurricane_Katrina), “Hurricane Katrina”, 2006.