

**THE MILITARY ROLE IN COUNTERING  
TERRORIST USE OF WEAPONS  
OF MASS DESTRUCTION**

by

Lansing E. Dickinson, Lt Col, USAF

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Air University

Maxwell Air Force Base, Alabama

# **The Military Role in Countering Terrorist Use of Weapons of Mass Destruction**

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## **Disclaimer**

The views expressed in this publication are those of the author and do not reflect the official policy or position of the Department of Defense, the U.S. Government, or the USAF Counterproliferation Center.

## **The Author**

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## **Acknowledgments**

The end of the Cold War created a new-world order and presented new challenges for future leaders. One of the challenges is countering the ever growing terrorist threat. Accompanying this threat is a proliferation of weapons of mass destruction. These weapons are now available to individuals, as well as groups and nations, and pose a serious threat to global stability and security. The bombing of two U.S. embassies in August 1998 with the loss of over 300 lives highlighted the problem. The military is an easy target for these “irrational actors” and needs to prepare for the future.

Air War College gave me the opportunity to examine the military role in countering this terrorist threat. Classes throughout the year focused on future conflict and the asymmetric means others would use to counter U.S. military superiority. This paper would not be possible without the help of the Air War College Counterproliferation team. Special thanks to my research advisor, Dr. Barry Schneider, for his patience, insight and critiques. He was instrumental in helping me produce a quality product. Additional thanks to Dr. Schneider, Colonel Bob Sutton, and Colonel Jim Davis for their expert instruction in counterproliferation and chemical and biological warfare.

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## **Abstract**

Terrorist use of weapons of mass destruction threatens Americans and our armed forces every day. To many nations and groups, their only means to counter the United States is with nuclear, biological, or chemical weapons. The terrorist use of weapons of mass destruction is no longer a question of “if” they will be used, but “when” they will be used. This paper examines the U.S. military capability to counter terrorist use of weapons of mass destruction. It describes the terrorist threat to U.S. forces and reasons why terrorists would use these types of weapons. Our current national policy, strategy and doctrine highlight the problem, but show a need to improve interagency coordination and cooperation in the fight against terrorism. On the military level, combating the threat is an integral part of our strategy but needs increased emphasis at the planning level. Capabilities do exist to deter or counter the threat, protect our forces, and sustain and operate after an NBC attack. But countering a terrorist threat presents unique challenges to future leaders and requires improvements in intelligence, equipment, training and education.

The key to defeating the terrorist threat is timely and accurate intelligence collection, analysis and dissemination for detecting, characterizing, and countering the threat. Improvements in individual and collective protection are necessary to sustain operations. As important, the military needs to emphasize realistic joint and combined training and must add chemical and biological scenarios to future war games. Finally, the U.S. must be prepared to find and destroy terrorist weapons before they can be used against us.

## The Military Role in Countering Terrorist Use of Weapons of Mass Destruction

Lansing E. Dickinson

### I. Introduction

*A paradox of the new strategic environment is that American military superiority actually increases the threat of nuclear, biological, and chemical attack against us by creating incentives for adversaries to challenge us asymmetrically.*<sup>1</sup>

— William S. Cohen

The end of the Cold War created a new world order or as some have described a new world “disorder.” The United States remains the world’s only superpower with unique responsibilities to ensure global security. In his *National Security Strategy for a New Century*, President Clinton states “Weapons of mass destruction pose the greatest potential threat to global stability and security. Proliferation of advanced weapons and technologies threatens to provide rogue states, terrorists and international crime organizations the means to inflict terrible damage on the United States, its allies and U.S. citizens and troops abroad.”<sup>2</sup>

To many nations and groups, their only means to counter the United States are with weapons of mass destruction (WMD). Secretary of Defense Cohen feels these weapons may “be used in an attempt to counter U.S. dominance on the battlefield, neutralize vastly superior U.S. conventional forces and power projection capabilities, or deter U.S. involvement in a conflict.”<sup>3</sup> This threatens our armed forces in the United States and overseas and poses a threat we will face on every deployment and exercise—a threat we are not prepared to counter. This threat is not from a regional force, rogue state, or specific terrorist group. As Secretary Cohen says “A lone madman or nest of fanatics with a bottle of chemicals, a batch of plague-inducing bacteria, or a crude nuclear bomb can threaten or kill tens of thousands of people in a single act of malevolence.”<sup>4</sup>

This study will look at the U.S. military capability to counter the terrorist use of weapons of mass destruction. The first section will examine the terrorist threat to U.S. forces and show motives and reasons terrorists would use such weapons. It will describe the weapons and delivery means available and look at past incidents of use or threat of use. The second section will

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review current U.S. policy and strategy to counter terrorist uses of WMD. This includes joint doctrine, strategy, and procedures for guidance on military preparation and response. The third section will examine the current military capability to respond to WMD. Are we prepared to deter, defend, and respond effectively in a nuclear, biological, and chemical (NBC) environment? The final section will detail current shortfalls, planned improvements for the future, and recommendations to improve overall military capability.

The terrorist threat is real. Some say it is only a question of time before terrorists use weapons of mass destruction against our military forces. Secretary Cohen in the *Report of the Quadrennial Defense Review* concluded “the threat or use of chemical and biological (CB) weapons is a likely condition of future warfare, including in the early stages of war to disrupt U.S. operations and logistics . . . This requires that the U.S. military continue to improve its capabilities to locate and destroy such CB weapons, preferably before they can be used, and defend against and manage the consequences of CB weapons if they are used.”<sup>5</sup>

## II. What Terrorist Threat?

*Imagine a group of religious zealots led by a charismatic, half-blind yoga instructor with an international following of nearly 50,000 members and over \$1 billion in assets. Imagine that this group recruits scientists from around the world, including a number of converts among the scientific and professional communities in Russia and Japan. This group also has as converts members of the Japanese and possibly the Russian national police forces, military, and intelligence services.*

*Believing in Armageddon, they decide to hasten it along by developing a panoply of weapons of mass destruction right under the noses of their government and completely unnoticed by U.S. and other Western intelligence services. They purchase sophisticated dual-use technology in the United States to develop their lethal weapons. They send their members worldwide to develop and acquire weaponry—looking for the Ebola virus in Zaire, mining for uranium in Australia, seeking protein databases for biological weapons and laser instruments in the United States, and obtaining helicopters and other weapon systems from the former Soviet Union...*

*On at least three occasions, they launch unsuccessful biological attacks. However, they succeed in a sarin gas attack on an unsuspecting, sleeping, suburban community, killing seven and injuring five hundred. Ultimately, the cult is only stopped by authorities after another sarin gas attack on a major subway system during morning rush hour goes awry. A mistake in crafting their chemical potion and the premature destruction of their normal delivery system reduces the potential fatalities from tens of thousands to twelve dead and five thousand injured.<sup>6</sup>*

— John F. Sopko

The scenario described by John Sopko, former senior advisor to Senator Sam Nunn on terrorism and proliferation issues, is not fictitious. It describes the Japanese terrorist group Aum Shinrikyo. It shows the potential threat posed to the United States military by nonstate actors and terrorist groups.

Counterproliferation experts now agree, the terrorist use of weapons of mass destruction is no longer a question of “if,” but a question of “when?” It is only a matter of time before another terrorist group uses a weapon of mass destruction. The threat is real, the technology available, agents relatively inexpensive, with attacks that are difficult to prevent. Terrorist expert Walter Laqueur says the prospects for terrorism “are improving as its destructive potential increases. This has to do with the rise of groups and individuals that practice or might take up terrorism with the weapons available to them.”<sup>7</sup> The weapons include nuclear, chemical, and biological agents. Terrorist groups have attempted using all three in the past, with nuclear the most difficult to obtain and deliver. Chemical and biological agents are easier to produce, yet more difficult to disperse. According to Kyle Olson of the Chemical and Biological Arms Control Institute, Aum Shinrikyo conceived their Sarin attack on Friday and carried it out on the following Monday.<sup>8</sup> Laqueur states, “now, mail-order catalogs tempt militants with readily available, far cheaper, unconventional as well as conventional weapons—the poor man’s nuclear bomb.”<sup>9</sup> Did Aum Shinrikyo break a taboo by using WMD?

### **Why Weapons of Mass Destruction?**

Why would terrorists want to use weapons of mass destruction? Laqueur says, “the past few decades have witnessed the birth of dozens of aggressive movements espousing varieties of nationalism, religious fundamentalism, fascism, and apocalyptic millenionism.”<sup>10</sup> These groups look for ways to spread their cause, gain media attention, and make a statement. Analyst Elliott Hurwitz states “If terrorists were to use chemical/biological weapons in a mass casualty attack, there is no doubt that it would be an event of singular visibility and importance. The particular group would receive enormous publicity, and the event would be perceived as not just another assassination, kidnapping, bombing, or hijacking.”<sup>11</sup>

Biological warfare (BW) researcher W. Seth Carus lists four reasons terrorist groups might use biological warfare: a desire to influence the political-military calculations of potential adversaries; the dual-use, off-the-shelf availability; the extreme difficulty of program detection; and the relative inexpense of developing weapons.<sup>12</sup> The Department of Defense Report *Proliferation: Threat and Response* states, “The increased availability of these technologies, coupled with the relative ease of producing

chemical or biological weapons may become more attractive to terrorist groups intent on causing panic or inflicting a large number of casualties.”<sup>13</sup>

Most experts agree terrorist groups are more likely to use chemical or biological weapons versus a nuclear weapon. This is due to the ease of acquisition, inexpense, and easier methods of delivery. Bruce Hoffman, Director of the Centre for the Study of Terrorism and Political Violence, says, “previously, terrorism was not just a matter of having the will and motivation to act, but of having the capability to do so—the requisite training, access to weaponry, and operational knowledge . . . Today, however, the means and methods of terrorism can be easily obtained at bookstores, from mail-order publishers, on CD-ROM, or even over the Internet. Relying on such commercially published or readily accessible . . . manuals and operational guides . . . the ‘amateur’ terrorist can be just as deadly and destructive as his more professional counterpart.”<sup>14</sup>

In an Advanced Concept Research Report, B.J. Berkowitz summarizes, “the chief advantages of CB weapons are the unrestricted availability of the necessary information, the relatively small resources needed, and the ability to test the product. There are no meaningful controls on the availability of chemicals, and what little control exists over pathogenic cultures can be overcome in a variety of ways. Perhaps most important is the fact that the chemical and biological materials can be produced under the cover of an apparently legitimate commercial venture such as a small research company, fine chemical manufacturer, or bio-medical laboratory.”<sup>15</sup>

Other scholars point out weapons of mass destruction limit selective targeting and pose a risk to the user. When assessing the terrorist threat, national security analyst Anthony Fainberg says, “Most of them will almost certainly continue to avoid the use of such weapons for a variety of reasons: the old-fashioned methods were suitable for the goals of most; there may be a reluctance to experiment with new and dangerous methods; the nature of the acts might alienate the terrorists from their base of support; the use of such weapons might bring down the wrath of governments and, indeed, most of the world upon the terrorists heads.”<sup>16</sup> Would this be enough to persuade groups not to use them?

Laqueur contends religious fanatical elements are the most likely to use WMD. These extremist groups consider the religious cause justification for taking lives. He concludes, “proliferation of the weapons of mass destruction does not mean that most terrorist groups are likely to use them in the foreseeable future, but some almost certainly will, in spite of all the reasons militating against it.”<sup>17</sup> Jonathan Tucker from the Center for Non-

proliferation Studies of the Monterey Institute of International Studies says “a CB terrorist attack is a “low probability, high consequence event” that warrants careful government planning and preparation.”<sup>18</sup>

## Types of Weapons

As mentioned earlier, weapons of mass destruction include nuclear, chemical and biological weapons. Although the use of a nuclear weapon by a terrorist is less likely than a CB attack, the possibility still exists. *Proliferation: Threat and Response* states, “Reported incidents of nuclear-related smuggling from the former Soviet Union increased dramatically during the early 1990’s but have declined since 1994. News reports about smuggling, however, generally overstate the potential impact of the particular theft. For example, most incidents have not involved weapons-usable materials, but rather radioactive isotopes, natural or low enriched uranium . . . It is important to emphasize, however, that all known highly enriched uranium and plutonium stolen to date is still insufficient to make a single nuclear weapon and that reports of thefts of weapon-grade material have declined in the last three years.”<sup>19</sup> This does not preclude a group from using radioactive material in conjunction with a high yield explosion to contaminate an area or as a psychological tool against an adversary. However, obtaining the material still remains difficult. Defense correspondent Sandra Meadows reviewing a Congressional Office of Technology Assessment (OTA) report stated, “the difficulty of obtaining nuclear weapons materials—plutonium or highly enriched uranium—today remains the single obstacle . . . in pursuing nuclear weapons.”<sup>20</sup>

A higher probability exists for terrorist use of chemical and biological weapons. Laqueur says, “most terrorist groups do not have the financial and technical resources to acquire nuclear weapons but could gather materials to make radiological dispersion devices and some biological and chemical agents.”<sup>21</sup> He goes on to say nuclear weapons are hard to manufacture and deliver; chemical agents are easier to produce, but difficult to store and disperse; and biological agents are easy to procure, but storage and dispersal are difficult. In his view, terrorists are more likely to use chemical weapons over biological and nuclear weapons.

The Congressional OTA report highlighted the ease of producing chemical weapons. It stated, “The technology used to produce chemical weapons, conversely, is much harder to identify as weapons-related than that for nuclear materials production technology . . . Many production techniques

for chemical weapons, for example, can be found in the open literature and can be assimilated from standard chemical engineering principles. Certain chemical agents such as mustard gas are very simple to produce . . . Multipurpose chemical plants capable of manufacturing organo-phosphorus pesticides or flame retardants could be converted in a matter of weeks or months to the production of nerve agents.”<sup>22</sup>

Chemicals fall in several categories including choking, blood, blister, and nerve agents. Choking agents cause the lungs to fill with fluid; blood agents prevent blood cells from utilizing oxygen; blister agents cause eye, lung and skin damage; and nerve agents paralyze the respiratory muscles. G-series nerve agents such as Tabun, Sarin, and Soman can lead quickly to death, while the even more toxic and persistent V-series creates long-term contamination of people, equipment, and territory.<sup>23</sup> Chemical agents are classified as lethal or nonlethal, rapid acting or slow acting, persistent or non-persistent. Sulfur mustard is an ideal agent for terrorists to use against the military since it is persistent and forces personnel to don protective gear—seriously degrading performance. The agent of choice for a terrorist group may be a non-persistent nerve agent such as Tabun, Sarin and Soman—all which act rapidly and cause immediate casualties.<sup>24</sup>

Chemical warfare agents are readily available and simple to produce. Procedures are based on old technology (used prior to World War I) and within reach of any terrorist group. A CIA threat assessment says, “newer agents, particularly the nerve agents, are more difficult to produce; however, the technology for these agents is widely available in the public domain. In many ways, production of chemical warfare agents is like that of legitimate commercial compounds . . . The greatest similarities occur between pesticide and nerve agent production units because these compounds are so closely related.”<sup>25</sup> There are many ways to disseminate chemical agents, including conventional munitions such as bombs, missiles, artillery shells, and mortar rounds. It is also possible to disseminate them in aerosol form from a crop duster or mobile generator.

Biological agents are of great concern because all the equipment needed for production is dual-use and available on the open market. You can produce biological agents from naturally occurring pathogens such as bacteria and viruses, which are often self-replicating. Death may be inflicted by biological agents for a variety of reasons including cessation of breathing, collapse of body tissues, cell tissue trauma, and pulmonary failure.<sup>26</sup> The OTA report states, “Biological warfare agents are easier to produce than either nuclear materials or chemical warfare agents because they require a

much smaller and cheaper industrial infrastructure and because the necessary technology and know how is widely available.”<sup>27</sup>

Robert Kupperman and David Smith state in a Georgetown University Center for Strategic and International Studies report that terrorists could produce many biological agents in sufficient quantities for their use. They consider anthrax, botulinum toxin, and the plant toxin, ricin, as typical biological agents. Anthrax grows aerobically, a product of fermentation, much the same as brewing beer. Preparing it for dissemination as spores requires some expertise, but the terrorist can practice disseminating species that are not pathogenic to humans. Botulinum toxin is a bacteria found virtually everywhere. Improperly handling food can cause botulinum toxin poisoning. The toxin, when crystallized, is extremely lethal and is easy to produce and dispense. Another easy procedure is extracting ricin from the castor bean which produces a deadly toxin. When inhaled, this toxin causes death in hours. Extracting the protein toxin is a well-documented, easy two-step procedure.<sup>28</sup>

Brigadier General John Doesburg, the former Director of the Joint Program Office for Biological Defense, says, “Anyone who makes home-brewed beer can make anthrax. Anthrax is a deadly toxin that, depending on the quantities used, can disable and kill thousands of people within hours or days . . . Another agent that could be in the enemy’s arsenal is staphylococcus enterotoxin B (SEB)—an incapacitant that, if it goes into the lungs, causes a fever of 106 degrees within an hour to three hours. The force will go into immediate malaise, but the agent will not kill them. If they ingest it, they will have severe diarrhea and vomiting.”<sup>29</sup>

The most effective means of delivering toxic agents is through aerosol clouds. Kupperman and Smith state, “aerosol dispersal technology is easy to obtain from open literature and commercial sources, and equipment to aerosolize biological agents is available as virtually off-the-shelf systems produced for legitimate industrial, medical, and agricultural applications. With access to a standard machine shop, it would not be difficult to fabricate aerosol generators and integrate components to produce reliable systems for dispersing microorganisms or toxins.”<sup>30</sup> Others suggest dispersing agents with crop dusters or through building air ventilation systems. The OTA study sums up the biological threat by stating “Standard biological agents for covert sabotage or attacks against broad-area targets would be relatively easy to produce and disseminate using commercially available equipment, such as agricultural sprayers.”<sup>31</sup>

## Past Use

The use of weapons of mass destruction is on the rise. Kupperman and Smith claim there were over 200 attacks worldwide by terrorists sympathetic to Saddam Hussein during and following the Gulf War. Most of the acts were minor, but they contend the threat is higher now given it takes only months to plan, coordinate, and execute a terrorist attack. They contend, “it is during the lulls (*of world activity*) that terrorism achieves center stage—precisely the effect the terrorists are after.”<sup>32</sup> The *Senate Hearings on Global Proliferation of Weapons of Mass Destruction* highlighted the increasing trend in use of WMD:

- December 1995: A man with alleged ties to survivalist groups, is charged with attempting to smuggle 130 grams of ricin into the United States intending to use it as a weapon.
- October 1995: Jordanian officials seize sophisticated missile guidance systems from dismantled Soviet ICBMs on their way to Iraq.
- Summer 1995: Iraqi defectors reveal the extent of Iraq’s massive chemical and biological program, including anthrax, botulinum, sarin, and VX.
- May 1995: A white supremacist member of the Aryan Nations organization is arrested in Ohio after ordering freeze-dried bubonic plague bacteria for “research purposes.”
- March 1995: The Japanese Doomsday cult, Aum Shinrikyo, releases deadly sarin nerve gas into the Tokyo subway system at the height of the morning rush hour, killing twelve and hospitalizing five thousand.
- March 1995: Two members of a militia-style group called the Minnesota Patriots Council are convicted of planning to use ricin to assassinate IRS agents and other federal employees.
- December 1994: Prague police seize 2.72 kilograms of weapons grade highly enriched uranium from a Czech policeman and a Czech, Russian, and Byelorussian with ties to the nuclear industry.
- August 1994: German authorities seize 363 grams of Pu-239 from a Lufthansa flight arriving in Munich from Moscow. The material

had come from a nuclear facility in Obninsk and the defendants claimed they could supply 11 kilograms of plutonium.

- May 1994: The sentencing judge in the World Trade Center case announces the defendants had placed sodium cyanide in their explosives package with the intent of creating a poisonous cyanide gas.<sup>33</sup>

This shows a definite trend by a variety of groups intending to use or experiment with WMD. Add to this the Chechen rebels in November 1995 who placed radiological material in a Moscow park. Shamir Basayev, the Chechan leader, led members of the press to the site. Although the material was contained in a protective canister, it did serve to embarrass the Russian government and demonstrated the potential for using radioactive material for contamination purposes.<sup>34</sup>

There are many other examples and the trend continues. The terrorist use of weapons of mass destruction is a national security nightmare. What if other terrorist acts had included WMD? Correspondent Barbara Starr suggests if chemical or biological weapons were used in the Khobar Towers bombing in Saudi Arabia, the results would have been staggering. The bombing killed 19 servicemen, but, “if just over 1 litre of anthrax had been released, around 1,500 military personnel would have died within three days, and thousands more civilians could have been killed.”<sup>35</sup> The 1997 Counterproliferation Program Review Committee Report states, “the military threat from chemical and biological warfare is greater today than it has ever been—particularly in regions where religious, ethnic, and/or economic strife are feeding the roots of conflict...Not only must U.S. forces be prepared for these threats, they must be prepared now.”<sup>36</sup>

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*Japanese authorities determined that Aum had produced the chemical nerve agents sarin and VX. Further probing after the March 1995 attack indicates that this was not the first or last use of chemical or biological agents by the cult. In all, the cult appears to have conducted at least 2 biological attacks with anthrax and botulinum toxin and 5 chemical attacks with sarin and cyanide, including the Tokyo subway attack. These attacks met with varying success.*

*The Aum was able to legitimately obtain all of the components it needed to build its sizable chemical and biological infrastructures. However, terrorists and violent sub-national groups need not acquire the massive infrastructure of the Aum. Only small quantities of precursors, available on the open market, are needed to manufacture deadly chemical and biological weapons for terrorist acts.*<sup>37</sup>

— John F. Sopko

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The terrorist use of WMD is a real threat. Major General Robert Orton, former Commandant of the U.S. Army Chemical School said, “even if such weapons are not actually used, the threat of use, by itself, will produce militarily significant results.”<sup>38</sup> In an Air War College briefing, Dr. William Patrick, former head of product development at the Fort Detrick Biological Warfare Laboratory, stated the future biological threat is not from a nation-to-nation exchange, but from an educated terrorist entering the country on diplomatic immunity carrying pre-manufactured biological weapons. He feels homegrown terrorists can produce the BW agents readily enough, but lack the expertise to “weaponize” such agents. On the other hand, state sponsors could provide terrorist groups the means for mass destruction.<sup>39</sup> In 1995, Senator Richard Lugar made a worse prediction stating, “Americans have every reason to expect a nuclear, biological, or chemical attack before the decade is over.”<sup>40</sup> Is the military prepared for this terrorist threat?

Correspondent Meadows claims, “military planners are concerned that an enemy will seize victory not through force-on-force, but, instead, by the threat of disseminating deadly biological and chemical agents on the battlefield.”<sup>41</sup> Former Secretary of the Army Togo West said when it comes to CB weapons, “there are still people out there in other countries building them and planning on how they can use them against the United States . . . We are going to face these issues in regular warfare, because enemies know that chemicals can be stealthy, silent killers which could easily dissolve the U.S. conventional military advantage—not to mention shatter troop morale and willingness to fight.”<sup>42</sup> Are the United States and the armed forces ready for this challenge?

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### III. Policy, Doctrine, and Strategy

*Weapons of mass destruction pose the greatest potential threat to global stability and security.*<sup>43</sup>

— President Clinton

Countering terrorist use of weapons of mass destruction presents new challenges to political and military leaders. President Clinton in a Letter to Congress continued his national emergency against WMD by stating, “the proliferation of weapons of mass destruction continues to pose an unusual and extraordinary threat to the national security, foreign policy, and economy of the United States.”<sup>44</sup> Congress recognized the threat and enacted the *Defense Against Weapons of Mass Destruction Act of 1996 (Title XIV)*. This legislation acknowledged the threat, but stated conventional counter-proliferation efforts do little to prevent or deter development of WMD by terrorist groups.<sup>45</sup> Does our national and military policy focus on the future terrorist threat?

This section will look at current policy and strategy dealing with weapons of mass destruction. The first section will explore national and Department of Defense (DoD) policy and strategy for countering the terrorist threat. This will be followed by a review of joint doctrine, strategy and procedures for specific guidance on military preparation for this asymmetric warfare.

#### National Policy and Strategy

In *A National Security Strategy for a New Century*, President Clinton highlights the WMD threat. He states, “we will work to prevent the spread of nuclear, biological, and chemical weapons and the materials for producing them . . . We will continue to ensure that we have effective means for countering and responding to the threats we cannot deter or otherwise prevent from arising . . . The United States must act to deter or prevent such attacks and, if attacks occur despite those efforts, must be prepared to limit the damage they cause and respond decisively against the perpetrators.”<sup>46</sup> The terrorist threat of WMD presents the military and other government agencies a new challenge. Secretary of Defense Cohen in the Quadrennial Defense Review (QDR), “highlighted the danger to our nation and forces of ‘asymmetric threats,’ ranging from nuclear, biological, and chemical weapons to attacks via information warfare and terrorism.”<sup>47</sup> The QDR provided an excellent summary of the challenges facing by the United States:

- We will continue to confront a variety of regional dangers.
- The proliferation of advanced weapons and technologies will continue.
- Of particular concern is the spread of nuclear, biological, and chemical weapons.
- U.S. interests will continue to be challenged by a variety of transnational dangers.
- Increasingly capable and violent terrorists will continue to directly threaten the lives of American citizens and try to undermine U.S. policies and alliances.
- U.S. dominance in the conventional military arena may encourage adversaries to use such asymmetric means to attack our forces and interests overseas and Americans at home.
- Strategically, an aggressor may seek to avoid direct military confrontation with the United States, using instead means such as terrorism, NBC threats, information warfare, or environmental sabotage to achieve its goals.
- Dealing with such asymmetric challenges must be an important element of U.S. defense strategy, from fielding new capabilities to adapting how U.S. forces will operate in future contingencies.<sup>48</sup>

Countering terrorist use of weapons of mass destruction is not only a Department of Defense responsibility, but involves the Department of State, Department of Transportation, FBI, CIA, and Federal Emergency Management Agency (FEMA) to name a few agencies. Depending on where the terrorist attack occurs determines which agency has the lead. This makes countering the problem more difficult. National Security Strategy, “requires that the DoD develop the capability to prevent, disrupt, and defeat terrorist operations before they can carry out a threat to use NBC weapons, as well as the capability to respond overwhelmingly if an actual NBC terrorist attack should occur.”<sup>49</sup> Prevention, disruption, and defeat require working with the other agencies on nonproliferation and counterproliferation efforts. At the same time, the military must be prepared to operate in an NBC environment. Unfortunately, the military is not focused on the terrorist threat.

A Department of Defense sponsored *Assessment of the Impact of Chemical and Biological Weapons on Joint Operations in 2010* states, “The focus of chemical and biological defense has been, and continues to be,

largely on massive battlefield use of chemical and biological weapons. Our military judgment is that this is no longer the most likely threat. . . . While U.S. forces must still be prepared to fight on a CB battlefield, they must also be able to counter and cope with limited, localized CB attacks including attacks by asymmetrical means on key units, facilities, and equipment at both U.S. and foreign sites.”<sup>50</sup> What is DoD doing to counter this challenge?

In his 1998 *Annual Report to the President and the Congress*, Secretary of Defense Cohen reiterates the chemical and biological threat to future warfare. He says “U.S. forces continue to improve their capabilities to locate and destroy such weapons, including hard and/or deeply buried facilities, preferably before such weapons can be used, and to defend against and manage the consequences of chemical and biological warfare (CBW) if they are used. But capability enhancements alone are not enough. Equally important is continuing to adapt U.S. doctrine, operational concepts, training, and exercises to take full account of the threat posed by CBW as well as other likely asymmetric threats . . . The Department also needs to better understand the requirements associated with deterring, defeating, and defending against adversaries willing to use CBW and other asymmetric means.”<sup>51</sup>

### **Joint Doctrine, Strategy and Procedures**

The Joint Staff develops military doctrine and operational procedures. *Joint Doctrine for Nuclear, Biological, and Chemical Defense*, Joint Pub 3-11, contains doctrine for NBC Defense. It stresses the need to counter NBC operations with defense and deterrence. U.S. forces must be able to survive and operate in an NBC environment and to defend against this threat requires command, control, communications, computers and intelligence (C<sup>4</sup>I), logistical support, medical support, and education and training. Although not directly addressing WMD use by terrorists, Joint Pub 3-11 does point out “the potential for their use can range from blackmail or acts of terrorism during peace to escalation during conflict or war.”<sup>52</sup> The strategy of defense and deterrence is based on, “providing direction, intelligence, and employment of U.S. forces in countering enemy NBC war making capabilities.”<sup>53</sup> Will defense and deterrence work against a terrorist threat?

Deterrence is the first line of defense, but poses a special challenge when countering a terrorist threat. Deterrence works when a foe believes you are willing to use the means to retaliate with unacceptable damage after absorbing an attack. Deterrence is based on working with rational actors.

Many individuals debate the “rational actor” issue when discussing terrorist deterrence. Joseph and Reichart say, “regional states motivated by messianic antiwestern zealots or by regime survival may well act differently, perhaps being more willing to risk annihilation for outcomes the United States would not consider ‘rational’.”<sup>54</sup> Because of this, policy makers must rethink how they approach deterrence. Brad Roberts suggests our current policy might drive adversaries to counter our military might. He says, “Among potential adversaries, the fear of an overarmed and aggressive United States may well have accelerated the search for ‘asymmetric strategies’. Such strategies seek to pit the strengths of the weak against the vulnerabilities of the strong; they threaten to inflict huge casualties on U.S. power projection forces and/or the U.S. populace through unconventional attack with unconventional weapons.”<sup>55</sup> Due to this the military needs to bolster other counter-proliferation options.

Special Operations Forces (SOF) play a key role in counterproliferation and combating terrorism. According to the Secretary of Defense *Annual Report to the President and Congress*, they provide DoD:

- A ground force option short of a major theater war scenario to seize, recover, disable, render ineffective, or destroy weapons of mass destruction and associated technology. Additionally, SOF skills may be used in support of diplomatic, arms control, and export control efforts.
- Offensive (counterterrorism) and defensive (antiterrorism) capabilities and programs to detect, deter, and respond to all forms of terrorism.<sup>56</sup>

Special Operations Forces are specifically trained for counterterrorism missions. They have the most advanced equipment, receive diverse training, and exercise regularly to maintain proficiency. They are trained to prevent, deter, and respond to terrorism across the threat spectrum. Specifically for counterproliferation actions, Joint Pub 3-05, *Doctrine for Joint Special Operations* states, “The major objectives of DoD counterproliferation policy are to prevent the acquisition of WMD and missile capabilities, (i.e., preventive defense); roll back proliferation where it has occurred; deter the use of WMD and their delivery systems; and adapt U.S. military forces and planning to operate against the threats posed by WMD and their delivery systems.”<sup>57</sup>

What about forces other than Special Operations that may come into contact with terrorist activity. Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War (MOOTW)* addresses combating terrorism. The pub states, “Although the threat of nuclear conflict has diminished, proliferation of weapons of mass destruction and conventional advanced technology weaponry is continuing. Threats directed against the United States, allies, or other friendly nations—ranging from terrorism to WMD—require the maintenance of a full array of response capabilities.”<sup>58</sup> The publication goes on to describe the military role in arms control, anti-terrorism, and counterterrorism. Many consider arms control a diplomatic mission, but, “U.S. military personnel may be involved in verifying an arms control treaty; seizing WMD (nuclear, biological, and chemical or conventional); escorting authorized deliveries of weapons and other material (such as enriched uranium) to preclude loss or unauthorized use of these assets; or dismantling, destroying, or disposing of weapons and hazardous materials. All of these actions help reduce threats to regional security.”<sup>59</sup>

All three Joint Pubs stress the importance of planning, intelligence, logistics, medical support, education, and training for successful counterproliferation operations. For planning, a key consideration is interagency coordination and cooperation. Joint Pub 3-11 states, “Combatant commanders should establish close coordination relationships with U.S. departments and agencies.”<sup>60</sup> This is especially critical against terrorist activity as the Department of State and country team will be vital players in the decision process. The Department of State is the lead agency for incidents taking place outside the United States unless it involves an aircraft, where the Department of Transportation takes the lead. Coordination may also be required with nongovernmental and private voluntary organizations. Command, control, communication and computers are part of the planning process and integral for timely decisions in a terrorist environment. Additionally, intelligence and information gathering and analysis and sharing up and down the chain of command and between agencies is invaluable to terrorist and counterproliferation operations. “Commanders at all levels must ensure that all sources of intelligence (signals intelligence, imagery intelligence, human intelligence (HUMINT), measurement and signature intelligence, open source intelligence, technical intelligence, and counterintelligence) are considered and fully involved in the determination of the enemy’s intentions, capabilities, and vulnerabilities.”<sup>61</sup>

Doctrine also requires the ability to survive and sustain operations in an NBC environment. Joint Pub 3-11 states, “To counter these effects, NBC defense . . . adheres to the three principles: avoidance, protection, and decontamination.

- Avoidance. Passive and active measures used in avoiding NBC attack are keys to NBC defense.
- Protection. This principle consists of hardening of positions, protecting personnel, assuming mission-oriented protective posture (MOPP), physical defense measures, and reacting to attack.
- Decontamination. Decontamination stops the erosion of combat power and reduces the possibility of additional casualties from inadvertent exposure or failure of protection.”<sup>62</sup>

Joint doctrine stresses logistical and medical support to ensure readiness. Logistical support provides the sustainability and stocks for NBC readiness. Sustainability includes anticipation, integration, continuity, improvisation, and responsiveness for future operations.<sup>63</sup> Each of these areas is critical when countering a terrorist threat. The logistician must plan for the unknown, yet have the supplies available to react in a timely manner. In the same light, medical supporters must be prepared for pre-attack, attack, and post-attack. This includes defensive measures to protect individuals and equipment, and the right forces to manage casualties after an attack. Pre-attack preparation includes immunizations, physical protection, and training. During an attack, responders must provide timely detection, treatment, protection, and decontamination. The post-attack situation requires monitoring and detection, contamination control, decontamination, and preparation for additional adversary attacks.

The problem with a terrorist attack is ensuring the forces are always prepared. Training and education are critical to this process. This requires adding NBC and counter terrorist awareness into all training, exercises, and war games. The importance of education and training is highlighted in each joint pub. Joint Pub 3-11 sums it up by stating, “The objectives of this training are to develop and evaluate the readiness of U.S. and multinational military forces and mission-essential civilians to operate in an NBC environment and to ensure proficiency with defensive NBC equipment, materials, and procedures.”<sup>64</sup>

Responding to the WMD threat on December 7, 1993, then Secretary of Defense Les Aspin announced the Defense Counterproliferation Initiative, “to develop the necessary capabilities to deal with the emerging military threat posed by weapons of mass destruction.”<sup>65</sup> This initiative set the Department of Defense in motion to deal with this threat and highlighted future military capabilities and needs. According to Senator Pete Domenici of New Mexico, future capabilities include military intelligence; command, control, and communications; passive defenses; active defenses; and counterforce technologies.<sup>66</sup> These counterproliferation efforts become more difficult when countering terrorist use, but as Senator Domenici states, “The only way this emerging threat can be contained is by clear and forceful U.S. policy that will lead the international community in a concerted effort to prevent, deter, and, if necessary, respond to acquisition, threats, and prospective use of WMD.”<sup>67</sup>



#### IV. Current Capabilities

*The Gulf War experience exposed weaknesses in the U.S. forces' preparedness to defend against chemical or biological agent attacks and the risks associated with reliance on post-mobilization activities to overcome deficiencies in chemical and biological readiness. Post-conflict studies confirmed that U.S. forces were not fully prepared to defend against Iraqi use of chemical or biological weapons and could have suffered significant casualties had they been used.*<sup>68</sup>

— GAO Report to Congress

In his National Military Strategy, General Shalikashvili stated that, "U.S. forces must have a counterproliferation capability balanced among the requirements to prevent the spread of WMD through engagement activities; detect an adversary's possession and intention to use WMD; destroy WMD before they can be used; deter or counter WMD; protect the force from the effects of WMD through training, detection, equipment, and immunization; and restore areas affected by the employment of WMD through containment, neutralization, and decontamination."<sup>69</sup>

Countering the terrorist threat presents military leaders with a new challenge. Traditional nonproliferation options of dissuasion, denial, disarmament, and diplomatic pressure are not always available. The threat may not be known until it is used, putting leaders in a reactive versus proactive mode. Robert Joseph and John Reichart from the National Defense University Center for Counterproliferation Research say, "prevention of proliferation through such traditional measures as diplomacy, export controls, and security assurances is an essential element in responding to the NBC and missile threat. However, given the growing availability of dual-use technology and alternative suppliers, a determined proliferator of even modest resources is likely to succeed, especially with biological warfare (BW) and chemical warfare (CW) programs."<sup>70</sup> Countering the terrorist threat requires knowing their supplier, their motives, and their target. This requires the military to take a more active role in deterring, preventing, defending against and countering a terrorist attack.

## **Deterrence**

As mentioned in the previous section, deterrence can be difficult when working against a terrorist threat. Richard Betts, Columbia University professor, says, “The main problem for deterrence, however, is that it still relies on the corpus of theory that undergirded Cold War policy, dominated by reliance on the threat of second-strike retaliation. But retaliation requires knowledge of who has launched an attack and the address at which they reside. Those requirements are not a problem when the threat comes from a government, but they are if the enemy is anonymous. Today some groups may wish to punish the United States without taking credit for the action.”<sup>71</sup> The problem is the no-notice terrorist attack. An anonymous strike leaves a terrorist group with little fear of retaliation. Additionally, what deters one terrorist or regime will not necessarily deter another. Identifying the group and a timely response is critical to deterrence.

For deterrence to work, the United States must be prepared to use force against terrorists. Robert Joseph states, “For deterrence to succeed, the United States must have—and be prepared to have—the capability and will to prevail in an NBC environment and retaliate against an enemy, holding at risk assets of value that can be attacked and destroyed if an enemy undertakes the action which was to have been deterred . . . To be credible, deterrence must demonstrate consistency of purpose as well as determination over the long haul.”<sup>72</sup> A clear signal was sent on August 20, 1998 when U.S. forces attacked the terrorist camp and facilities of Osama bin Laden in Afghanistan and Sudan. This timely attack showed U.S. resolve and added credibility to our national policy of making no concessions to terrorists and bringing pressure to bear on state sponsors of terrorism.<sup>73</sup>

## **Prevention**

The key to prevention is a strong intelligence network. A Congressional Research Service Report to Congress states, “every step to stem the spread of nuclear, biological, and chemical weapon systems starts with sound intelligence. The quest for indisputable clues requires painstaking reconnaissance/surveillance activities, patience, and luck.”<sup>74</sup> Sound intelligence is even more important when combating terrorist use of NBC. Terrorists could be getting their material or weapons from rogue states or developing their own technology. Looking for trends in chemical and biological programs is difficult. The congressional report goes on to say,

“CW and BW development processes offer few clues that help observers determine when weapon proliferation is taking place. Both employ dual-use materials that can be used equally well for harmless and harmful purposes. Neither need large, distinctive facilities to create militarily useful agents. Field testing often is avoidable and would be difficult to detect if conducted at night or camouflaged as conventional activity, such as crop dusting. Chemical and biological munitions are externally indistinguishable from conventional bombs or artillery shells.”<sup>75</sup> Terrorists will not be producing or stockpiling large amounts of weapons, so these indicators will also not be readily noticeable. Military personnel will need to rely more on surveillance and reconnaissance and continue to improve human intelligence efforts.

For the terrorist threat, more emphasis needs to be placed on HUMINT. A study on *Joint Operations in 2010* commented, “an increasing emphasis on the HUMINT side of intelligence collection and a more widespread consciousness of chemical and biological indicators is important to improve our ability to analyze threats.”<sup>76</sup> The report recommended specific targeting of low level chemical and biological threats and intent to use; increasing the number of analysts; increasing the awareness of non-CB specialists; and precision location of mobile missiles.<sup>77</sup>

## Defense

Military units must continue to improve active and passive defenses. With the unanticipated terrorist threat, forces must be prepared to survive and operate in a contaminated environment. “Passive defense involves military capabilities that protect against nuclear, chemical and biological weapon effects. Programs involve contamination avoidance (reconnaissance, detection, and warning), force protection (individual and collective protection and medical support) and decontamination.”<sup>78</sup>

Contamination avoidance relies on timely detection and warning. In *Medical Aspects of Chemical and Biological Warfare*, the U.S. Army Surgeon General points out, “Detection of an attack, with subsequent warning of affected forces downwind, can allow adoption of an effective protective posture and continuation of military operations with minimal degradation of operations.”<sup>79</sup> Detection devices are divided into two groups: point and standoff. “Point detectors sample the immediate area to determine the presence of chemical agents . . . In addition to monitoring the atmosphere, the point detectors provide monitoring after an attack, identify the contaminated area, monitor collective protection areas, monitor

effectiveness of decontamination, and identify chemical contamination during reconnaissance efforts.”<sup>80</sup> Currently, we rely on detection paper for point detection to identify chemical agents. This paper is attached to personnel and equipment to sample the atmosphere and kits are available to sample soil or water. The Army also has a hand-held chemical agent monitor (CAM) to detect contamination of personnel, equipment, and surfaces. Although these systems are critical for forces on the ground, mobile point detection provides additional and earlier threat recognition.

The U.S. Army *Medical Management of Biological Casualties Handbook* highlights the importance of timely detection. “Once an agent has been dispersed, detection of the biological aerosol prior to its arrival over target, in time for personnel to don protective equipment, is the best way to minimize or prevent casualties. However, interim systems of detecting biological agents are just now being fielded in limited numbers.”<sup>81</sup>

Three systems are currently in use for chemical and biological mobile point detection. “The M21 Remote Sensing Chemical Agent Alarm (RSCAAL) is an automatic scanning, passive infrared sensor. The M21 detects nerve and blister agent clouds based on changes in the background infrared spectra caused by the presence of the agent vapor.”<sup>82</sup> Efforts are underway to develop improved sensors to detect biological and chemical agents. Two mobile systems complement the RSCAAL. “The Biological Integrated Detection System (BIDS) is vehicle mounted and concentrates aerosol particles from environmental air, then subjects the particle sample to both generic and antibody-based detection schemes for selected agents.”<sup>83</sup> It can detect and identify between 5 and 25 agent-containing particles per litre of air in 15 to 30 minutes.<sup>84</sup>

Additionally, the Army has acquired the German FOX Nuclear, Biological, Chemical Reconnaissance System (NBCRS). “The FOX is instrumented to detect chemical contamination in its immediate vicinity with a variety of probes, and at a distance via a standoff detector (M21).”<sup>85</sup> Point detection is critical to identify agents after an attack, but to protect forces, minimize casualties, and manage BW/CW effects we need to identify agents at a distance with standoff detection. Work is beginning in this area and will be discussed in the next section.

Individual and collective protection allows military forces to survive and operate in a CB environment. Timely detection and warning is critical to allow forces, “to adopt an adequate posture, since the effects of agents can sometimes occur in less than a minute.”<sup>86</sup> Our current individual protection equipment is adequate for initial protection. *Medical Aspects of Chemical*

*and Biological Warfare* states, “total individual protection requires an integrated approach with the primary mechanism being respiratory protection which, when combined with an overgarment, gloves, and boots all properly fitted and used correctly, can provide excellent protection against chemical agents of all known types.”<sup>87</sup> The same equipment will also provide protection against a biological agent attack. Problems arise in sustaining operations after an attack. The current ensemble is cumbersome, warm, and reduces mobility. “A soldier wearing the chemical protective boots and gloves . . . will soon realize that mobility is compromised by the boots and that tactile ability is degraded by the gloves.”<sup>88</sup>

Collective protection is important for command and control, medical treatment, and individual relief from the contaminated environment. “Collective protection serves a vital role in the medical area since treatment of casualties must continue even in a contaminated environment . . . In addition, it allows individuals to rest and eat, and provides temporary relief from the individual protection equipment thus allowing continuing military operations in the contaminated environment.”<sup>89</sup> Current shelters include the U.S. Army Chemically Protected Deployable Medical System, the Air Force Chemically Hardened Air Transportable Hospital, the Chemical and Biological Protected Shelter, and the Simplified Collective Protection Equipment for command, control, and communications.<sup>90</sup> Improvements in personal protective equipment and shelters are necessary to reduce the weight, heat stress and logistics burden of the current equipment.

Decontamination is another area of concern for post-attack survival and sustainability of operations. “To effectively perform complete personnel and equipment decontamination operations, decontamination units use truck-mounted tanks, pumps, and water heater units; and trailer-mounted pumps and water heater units. In these processes, reducing the exposure time of the individual or piece of equipment to the chemical contaminant is of the highest priority.”<sup>91</sup> Decontamination is a time consuming process and we currently lack the capability to decontaminate large areas or equipment. “Additionally, when both crews and equipment are contaminated, combined complete personnel and equipment decontamination operations are scheduled as the situation and mission permit, bearing in mind the lengthy time required for such an operation.”<sup>92</sup>

Our decontamination policy is centered on major theater warfare. “Current decontamination efforts focus on maximizing combat power in a fast-moving, heavy force-on-force scenario involving massive battlefield employment of CB weapons. Decontamination policy is based on the

concepts of ‘fighting dirty’ and ‘fighting through’ the contamination.”<sup>93</sup> More effort needs to be focused on decontamination of noncombatants, facilities and high technology equipment. Additionally, increased emphasis must be placed on decontamination training and awareness.

Overall, passive defense efforts are receiving increased attention. “The combatant commanders’ No. 1 priority for enhancing their counter-proliferation capabilities is improved equipment to detect and characterize chemical and biological weapons threats, particularly at long range . . . Detection and characterization are passive defenses and relevant because they provide additional early warning for units at risk of attack . . . The regional commanders have identified other requirements to improve passive defenses . . . A key ingredient to dissuading proliferants from acquiring or using these weapons is to eliminate their value. Passive defenses that allow sustained combat and logistical operations are among the best ways to accomplish this.”<sup>94</sup>

“Active defense involves programs that detect, track, identify, intercept and destroy, and neutralize nuclear, chemical and biological warheads . . .”<sup>95</sup> Improvements in this area concentrate on missile defense. Although a terrorist could have access to missiles, most experts do not expect terrorists to employ their weapons with this technology. Improvements in this area are still progressing to help detect, track, identify, intercept, and destroy warheads. This capability does provide an important psychological advantage for friendly forces.

Counterforce involves destroying an enemy’s weapon prior to him using it. Once sources identify WMD production or storage areas, government and military leaders must counter the threat. We cannot afford to wait for a terrorist to use a weapon of mass destruction if we have the intelligence available to identify the group. Senator Domenici states, “unless military responses are undertaken in unequivocal self-defense or are sanctioned by the UN Security Council, they will be seen by some to constitute challenges to national sovereignty and raise questions of international law.”<sup>96</sup> Waiting for UN consensus or international approval may prove to be too late to counter the threat. This will be the most difficult issue leaders will face in the counterproliferation decision process.

The *Joint Operations in 2010 Report* highlights the limited ability we have in countering chemical and biological threats. It states, “The United States Special Operations Command is currently one of the few elements in the U.S. Government possessing the capability to locate, identify, recover, neutralize and transport CB weapons. Both the USMC Chemical/Biological

Incident Response Force and the Army's Tech Escort Unit also have the capability to execute these tasks in a more limited fashion."<sup>97</sup> All would need timely, reliable, and precise intelligence. A problem these teams would face once in country is how to dispose of the captured munitions. If the weapons are to be destroyed, collateral damage and contamination must be considered.

Aircraft and cruise missiles attacks are other counterforce options. The same damage and contamination issues must be analyzed. A congressional report says, "Aircraft and/or cruise missile attacks on biological and chemical warfare plants almost certainly would create undesirable collateral damage and casualties among civilian populations . . . Results could be counterproductive in political, moral, and perhaps economic terms."<sup>98</sup>

The key to successful defense is training, education and awareness. We currently train for battlefield operations, but are not trained for the no-notice terrorist response. Major General Orton, former Commandant of the U.S. Army Chemical School, says, "NBC defense training and the introduction of NBC conditions during exercises is crucial for establishing a versatile force capable of power-projection operations . . . Personnel must be adequately trained, properly equipped, and psychologically prepared for the effects of nuclear and chemical weapons."<sup>99</sup>

## Response

One area in which the U.S. military is making progress is response and consequence management after an attack. Timeliness in identifying chemical, biological, or nuclear contamination is critical for casualty recovery and decontamination efforts. Major Joseph Osterman, a U.S. Marine Corps Infantry Officer, in a *U.S. Naval Proceedings* article highlighted the Department of Defense role in responding to a terrorist CB attack. He said, "unique technical capabilities are required to identify the chemical or biological agent employed, conduct limited decontamination, and complete site appraisal. Much of the response strategy will depend on a timely identification. The unit must be able to conduct on-site detection and identification and to collect, package, and transport samples to predetermined laboratory facilities for off-site analysis, if required."<sup>100</sup>

Medical response plays a critical role in defeating or mitigating the terrorist threat. This response is important prior to and after an attack. The *Medical Management of Biological Casualties Handbook* states:

*The medical response to the threat or use of biological weapons may be different depending on whether medical measures are employed prior to exposure, or whether exposure has already occurred and/or symptoms are present. If provided before exposure, active immunization or prophylaxis with antibiotics may prevent illness in those exposed. Active immunizations may be effective against several potential biological warfare agents, and is probably the best modality for future protection of U.S. military forces against a wide variety of biological threats. After exposure, active or passive immunization as well as pre-treatment with therapeutic antibiotics or antiviral drugs may ameliorate disease symptoms. After onset of illness, only diagnosis of the disease and general or specific treatment are left to medical care providers. The good news is that excellent vaccines and antitoxins exist for several of the most likely biological warfare agents, and more are under development.*<sup>101</sup>

Medical response for a chemical attack takes a similar approach. Medical units must train for pre-attack, attack and post-attack measures. Pre-attack measures include training on characteristics of chemical agents; defensive planning; self-aid and buddy care training; casualty decontamination; activation of collective protection; and detection/monitoring training. Attack measures include detection and monitoring; guidance to commanders; first aid treatment; treatment and evacuation; and individual and collective protection. Post-attack consists of monitoring and reporting; control of contamination; damage assessment and control; monitoring for effects; medical treatment; decontamination; and preparation for future attacks.<sup>102</sup>

Part of the response effort is research and development to identify biological and chemical threats. The U.S. Army Medical Research and Materiel Command and Army Medical Research Institute of Infectious Disease, “develop strategies, products, information, procedures, and training for medical defense against agents of biological origin and naturally occurring infectious diseases of military importance that require special containment.”<sup>103</sup> Capabilities include identifying and evaluating threat capability in agents and delivery methods, producing vaccines, technical guidance on personnel protection and decontamination, and training for medical response. The Naval Medical Research Institute also provides

research and technology for agent classification and immunizations related to military requirements and operational needs.<sup>104</sup>

The Counterproliferation Program Review Committee focused on the terrorist threat. They directed DoD in conjunction with other agencies to look at, “supporting, training, and equipping DoD teams to detect, neutralize, and render safe NBC weapons and devices in permissive and nonpermissive environments both in the U.S. and overseas. DoD teams include the Army’s Technical Escort Units (TEU) and 52nd Ordnance Group, the Navy’s Defense Technical Response Group (DTRG), Navy Explosive Ordnance Disposal (EOD) units, and SOF units.”<sup>105</sup> The TEU, part of the Army’s Chemical and Biological Defense Command, “is a specialized army unit with missions of escorting the movement of chemical or biological material and finding, rendering safe and disposing of chemical or biological munitions.”<sup>106</sup>

The Marines developed a short-notice Chemical/Biological Incident Response Force (CBIRF). General Charles Krulak, Commandant, USMC, formed the unit after the Aum Shinriyko attack on the Tokyo subway. He was looking to fill what he “perceived as a national security void—the U.S.’s inability to deal swiftly with an incident of chemical or biological terrorism.”<sup>107</sup> The team worked with the FBI and local authorities during the Atlanta Olympics and is, “able to deal with nerve gas agents like Sarin and blister agents like mustard gas, as well as some 25 biological and toxin threats like anthrax and typhoid.”<sup>108</sup> The unit is designed to come in after an attack. “This self-contained, self-sufficient response unit is integrated into the consequence management plans of the Commander-in-Chief (CINC) U.S. Atlantic Command and is trained to deploy domestically or overseas in support of the CINCs or the Department of State . . . The CBIRF will have enhanced capabilities for detecting and identifying specific CW/BW agents, assessing downwind hazards, conducting advanced lifesaving support, and decontaminating patients to facilitate medical treatment.”<sup>109</sup> DoD is exploring the formation of a “911-BIO” consequence management team involving CBIRF and TEU “to enhance military capabilities to respond effectively to the terrorist/ paramilitary use of BW.”<sup>110</sup>

According to our National Security Strategy, “The WMD threat to our forces is receiving the special attention it deserves. We are enhancing the preparedness of our Armed Forces to effectively conduct sustained operations despite the presence, threat or use of WMD. Such preparedness requires the capability to deter, detect, protect against and respond to the use of WMD when necessary. The Administration has significantly increased

funding to enhance biological and chemical defense capabilities and has begun the vaccination of military personnel against the anthrax bacteria, the most feared biological weapon threat today.”<sup>111</sup>

Yet despite these efforts, most units are still in a reactive mode and trained to respond after the fact. John Roos in describing the TEU and the Department of Energy’s Nuclear Emergency Search Team (NEST) says they, “are organized and equipped only to detect, contain, limit the damage from, and clean up after an attack has occurred. Neither organization routinely trains with, or is even linked to, a standing force or other response team that includes the highly specialized medical, security, and other personnel and material assets that would be in immediate demand at the scene of a terrorist attack involving WMD.”<sup>112</sup> Where should the military go from here?

## V. Shortfalls, Improvements, and Recommendations

*Soldiers are fearful of the effects from weapons of mass destruction and prolonged operations in protective equipment produces numerous psychological effects on soldiers.*<sup>113</sup>

— Major General Robert Orton

The military is making progress in counterproliferation, but most efforts are focused on a major theater conflict. The Counterproliferation Review Committee evaluated a terrorist surprise attack on U.S. forces. “In the surprise attack, terrorists targeted an air base supporting U.S. military activities in a foreign country with a sufficient quantity of CW and BW agents to provide a lethal dose to base personnel while minimizing the risk of exposure to the surrounding population . . . It was estimated that U.S. SOF troops at current readiness levels could simultaneously neutralize several of the BW dispensers and/or bands of terrorists with high confidence, provided their locations were known or could be found quickly.”<sup>114</sup> The critical factor is having timely intelligence to prepare for the threat. The other key factor is having troops, other than SOF, trained to counter the threat. The military needs to improve in these areas and identify other operational shortfalls.

### Shortfalls

The 1994 Deutch Report and 1995 Counterproliferation Program Review highlighted the following areas as current shortfalls in operational capabilities:

- Real time detection and characterization of BW/CW agents
- Passive defense capabilities for sustained operations
- Underground structures detection and hard target defeat
- Prompt mobile target kill
- Capability to locate and disarm terrorist NBC areas
- Detection and interception of low flying/stealthy cruise missiles
- Rapid production of protective BW vaccines<sup>115</sup>

A critical element is real time detection and characterization of chemical and biological agents. According to Dr. H. Lee Buchanan, Deputy Director of the Defense Advanced Research Projects Agency, “especially vital are

biological weapon sensors that provide not only dependable advanced warning of specific exposure but also accurate ‘all clear’ assessments after the application of countermeasures . . . For the most part, detectors are effective only for specific agents (e.g., individual strains). Knowing this, an adversary can exploit that specificity by modifying pathogens or toxins genetically, so they will not be recognized.”<sup>116</sup> We currently have limited mobile point detection capability with the FOX, BIDS and remote sensors. The Army medical management handbook states, “Until reliable detectors are available in sufficient numbers, usually the first indication of a biological attack in unprotected soldiers will be the ill soldier.”<sup>117</sup> We also need standoff detection capability to be able to avoid contaminated areas after an attack. Brad Roberts in a briefing at the U.S. Air Force Air War College said “At present, the best warning available from detectors is delayed notification of attack, essential for triggering medical treatments but inadequate for triggering preventive masking.”<sup>118</sup>

Additionally, we need units able to conduct timely detection and identification to limit further contamination and to prevent the spread of contamination to adjacent areas. As pointed out in the previous section, the TEU, CBIRF, and NEST teams are able to detect, contain, limit the damage from, and clean up after an attack, but do not train or deploy with forces on a regular basis. John Roos says this is not a shortcoming for these units, but a void in the larger national response picture.<sup>119</sup>

A similar problem exists for the timeliness in producing vaccines. Vaccines are only effective for a specific strain, making immunizations very selective. Dr. Buchanan says, “it takes months—even years—to develop and test a vaccine, even after the antigen has been isolated. After immunization it takes weeks for the body to build up an effective concentration of antibody. In biological warfare, therefore, the offense usually has a great advantage. This places an unrealistic burden on the depth and reliability of intelligence and advanced reconnaissance.”<sup>120</sup> The Army handbook stresses the impact of lethal biological agents. It states, “Diseases produced by the offensive use of biological agents against U.S. forces could be lethal and/or disabling. From a military standpoint, incapacitation of a high percentage of friendly forces may be as operationally significant as effects caused by more lethal agents.”<sup>121</sup> Although vaccines exist for many agents and testing is promising, of the 14 diseases listed in the Army handbook, 6 have no vaccines and only 3 are licensed, as depicted in the table on the following page.<sup>122</sup>

Brad Roberts says, “rapid innovation in the tech base promises more numerous vaccines, lower costs, shorter lead times, improved effectiveness, and the possibility of protecting against more than one agent with a single or series of inoculations.”<sup>123</sup> We need to continue efforts in vaccine research and development.

### Biological Agent Vaccines

Disease	Vaccine	Comments
Anthrax	Yes	Licensed.
Brucellosis	No	
Cholera	Yes	Vaccine not recommended for routine protection in endemic areas. (50% efficacy, short term)
Glanders	No	No large therapeutic human trials have been conducted owing to the rarity of naturally occurring disease.
Plague	Yes	FDA Licensed. Not protective against aerosol challenge in animal studies.
Tularemia	Yes	
Q Fever	Yes	Currently testing vaccine to determine the necessity of skin testing prior to use.
Smallpox	Yes	Licensed. Pre and post exposure vaccine required if greater than 3 years since last vaccine.
VEE	Yes	Multiple vaccines required.
VHF	No	
Botulism	Yes	
SEB	No	
Ricin	No	
Mycotoxins	No	

**Source:** *Medical Management of Biological Casualties Handbook*. Fort Detrick, Maryland: U.S. Army Medical Research Institute of Infectious Disease, July 1998, p. 112.

DoD also needs to improve individual and collective protection gear. The ability to survive and operate depends on the protective equipment. Currently, the equipment is bulky, uncomfortable, and short in supply. Being able to use the equipment and having faith in it is essential to sustaining operations after an attack. *Medical Aspects of Chemical and Biological Warfare* says successful defense depends on “personal protective equipment,

consisting of a properly fitted mask and overgarment with gloves and boots as required. This equipment is the most critical component of chemical defense equipment, the first line of defense.”<sup>124</sup>

We have a similar problem with decontamination equipment. Joseph and Reichart say the, “United States does not have an adequate capability to decontaminate people, equipment, or areas exposed to BW agents.”<sup>125</sup> According to Dr. Barry Schneider, Director of the USAF Counterproliferation Center, “We need a breakthrough in techniques for solving the large area decontamination problem (such as, ports/airfields). Solvents may not work unless they are so caustic that they are also harmful to health and equipment.”<sup>126</sup>

Another major shortfall exists in training and education. A GAO report highlighted inadequacies in individual and unit training. The report cited the “inability to handle CW and BW casualties, improper wear of masks, and the inability to operate detection equipment.”<sup>127</sup> With our current emphasis on military operations other than war, and the increase in small-scale contingency operations, the probability of a terrorist attack rises. Increased emphasis must be placed on training, WMD scenarios in future joint and combined exercises, and war games focused on asymmetric warfare.

## **Improvements**

With these shortfalls, there are improvements on the horizon. The QDR highlights the need for DoD to “improve intelligence collection, distribution, and information-sharing with allies, and strengthen our capability to protect citizens and military personnel from chemical or biological attacks with special emphasis on high threat regions.”<sup>128</sup> Are we making progress in this area? Kupperman and Smith suggest preparedness begins with “technological innovations designed to detect and identify pathogens and toxins; active defenses (counter-clouds of disinfectants and high-power ultraviolet lasers); pharmacological defenses (vaccines, toxoids, monoclonal antibodies, and antibiotics); disinfectant aerosols built into air-conditioning systems of large buildings; and effective decontaminates following an attack.”<sup>129</sup> According to the Army Surgeon General, success depends on an integrated system of chemical and biological equipment including real-time detection and warning; personal protective equipment; collective protection; decontamination; and medical treatment.<sup>130</sup>

TEU members are working with Los Alamos scientists on improved detection and characterization equipment. These include instruments, “that

can identify the composition of any chemical munition or device without opening it (thanks to a noninvasive, acoustic resonance spectroscopy technique) to Transportable Emergency Response Monitoring Modules (TERMM) designed for unobtrusive, prolonged sampling and state-of-the-art analysis of chemical and biological agents . . . and a helicopter-mounted Light Detection and Ranging system for tracing chemical contamination, and the work about to begin on fluorescence techniques aimed at quickly identifying various biological agents.”<sup>131</sup>

Other DoD improvements in detection and characterization include, “standoff detection systems that use laser systems and can provide advance warning from 30 to 50 km distance and point detectors that will be placed on attended air vehicles, with warning sent back by radio or forward-emplaced point detectors with radio links to a headquarters or a central warning network.”<sup>132</sup> For standoff detection, the Army is pursuing the long-range biological standoff detection system (LR-BSDS). This system, “is not a detector of biological agents. It only discriminates man-made particulate clouds from natural clouds. This provides forces an indication that something is happening out there. Unlike natural clouds, biological clouds tend to expand, disperse, and reproduce.”<sup>133</sup> This system would be mounted on a Blackhawk helicopter and could monitor and track clouds out to 30 kilometers. There are currently three operational LR-BSDS systems.<sup>134</sup> The Army is also pursuing the “Short-Range Biological Standoff Detection System (SRBSDS). It will employ an ultraviolet and laser-induced fluorescence to detect biological aerosol clouds at distances up to 5 kilometers. The information will be used to provide early warning, enhance contamination avoidance efforts, and cue other detection efforts.”<sup>135</sup>

The other services are also improving identification systems. “A naval detection system called IBAD, for integrated biological agent detector, acts as a local alarm for blue water point detection. There are currently 25 systems fielded on various ships.”<sup>136</sup> Another Navy system, the Specific Emitter Identification System, “would improve DoD’s ability to identify and track ships at sea suspected of transporting nuclear, chemical, and biological weapons, delivery systems, and related materials.”<sup>137</sup>

The DoD Joint Biological Defense Program Office is working with industry and commercial technologies for long-term point detection capability. “JBPDS (joint biological point detection system) will provide a common detection suite for most threat agents in 10 to 15 minutes. It will be activated in 2001. Officials estimate that 1,400 units are needed for all the services. . . . The Defense Department is currently evaluating industry

proposals for a joint chemical agent detector (JCAD) system capable of automatically detecting, identifying, and quantifying chemical agents inside aircraft and ships, providing hand-held monitoring capabilities, and protecting troops with a pocket-sized detection and alarm . . . JCAD must be able to detect 10 agents in the presence of 183 ‘battlefield interferences’ such as smoke, diesel exhaust, or vapor, without giving a false response.”<sup>138</sup> Testing is also underway using Unmanned Aerial Vehicles for threat detection.

The President in a *Message to Congress* highlighted DoD passive defense improvements permitting forces to survive and operate in an NBC contaminated environment. These include “new protective masks, advanced chemical and biological protective garments, stand-off optical chemical detectors, and first-ever capabilities for point biological agent detection and stand-off aerosol/particulate detection.”<sup>139</sup> Other recommendations include improving protective equipment to reduce the weight and heat stress to improve military readiness. The Joint Service Lightweight Integrated Suit (JSLIST) program will be fielded this year and provides the future chemical-biological protective equipment for all the services. The JSLIST is a lightweight garment with improved protective handwear and overboots. It is less bulky and has state-of-the-art material to reduce heat stress.<sup>140</sup> Lightweight shelters are also being developed for collective protection. New developments center on, “improved adsorbents and impregnants as replacements for activated charcoal; methods to better determine filter lifetime; and new systems, such as pressure and temperature-swing adsorption, which may provide significant improvements for collective protection in ships, aircraft, and armored vehicles.”<sup>141</sup>

Finally, decontamination technology supports advances in sorbents, coatings catalysis and physical removal. “There is a need for an effective and environmentally safe reactive decontaminant that does not harm equipment and personnel. Bacterial enzymes, catalytic-type compounds, and other stable decontaminants (e.g., quaternary ammonium complexes) are under consideration. Sorbent compounds and nonaqueous decontaminants are also being investigated for use on electronic components and other sensitive equipment.”<sup>142</sup>

The U.S. Army Medical Research and Material Command, “continues to develop a number of new generation vaccines against agents such as botulinum toxins, *Yersinia Pestis*, Venezuelan Equine Encephalitis virus and other biological threat agents, as well as novel approaches to preventing and treating chemical agent exposure . . . In addition, preventive medicine and

subject matter experts provide crucial training for first responders and other medical personnel on the medical management of chemical and biological casualties, advise on medical plans and operations, evaluate threat capability for specific chemical and biological agents in various scenarios and regularly train with interagency rapid response teams.”<sup>143</sup>

For counterforce, the United States needs the ability to intercept and destroy NBC weapons prior to them being used against our forces. When destroying weapons, care must be taken to protect friendly forces, limit collateral damage, and limit collateral contamination. Improvements in this area include, “counterforce sensor technology projects such as tactical unattended ground sensors and airborne forward-looking infrared radar for target surveillance, characterization, battle damage assessment and collateral effects monitoring, a weapon-borne sensor to enhance underground target bomb damage assessment, and improved missile launch detection using overhead assets . . . and weapons enhancements such as a precision-guided penetrating munition to defeat underground targets.”<sup>144</sup>

Future research and development technology efforts specifically designed for anti-terrorist activity include, “chemical/biological agent perimeter monitoring sensors; a vented suppressive shield to contain biological and chemical weapons effects; a Quick Mask for responsive protection against chemical and biological agents; a joint U.S.-Canadian explosive ordnance disposal suit for biological and chemical threats; a non-intrusive chemical agent detection system; and, a special chemical and biological agent sample extraction and rapid identification system.”<sup>145</sup>

## **Recommendations**

It is only a matter of time before U.S. military forces will encounter terrorist use of WMD. The *Quadrennial Defense Review* says we must prepare for a range of asymmetric challenges, “chief among these are threats of NBC weapons use, terrorism, and information warfare.”<sup>146</sup> To counter the terrorist WMD threat will take improvements in intelligence, equipment, and training. If these fail, the U.S. must be prepared to destroy the threat.

The key to defeating terrorism is to know when and where they will strike. This is easier said than done, but it is our first line of defense. During testimony to the Senate Armed Services Committee, Former Defense Secretary William Perry stated, “We must increase our ‘active defenses’ by getting better at gathering intelligence so that we can pre-empt or disrupt terrorist operations before they can come to fruition . . . Therefore we must

intensify our intelligence targeting of international terrorists . . . The goal is to discover their identities, their sources of funds, their materiel flow and their plans in order to pre-empt them before they attack.”<sup>147</sup>

A crucial part of intelligence is keeping abreast of the threat. With the dual-use nature of chemical and biological weapons, experts in these fields reside in the civilian sector. Dr. Buchanan feels it is impossible to restrict the flow of biotechnology information, so he recommends using the expertise of the technological community for formulation of policy and strategy and employing their knowledge base to help improve our defense capabilities.<sup>148</sup>

Due to the unique nature of the terrorist threat, more emphasis needs to be placed on increasing HUMINT collection. The *Joint Operations in 2010 Study* says we must, “ensure HUMINT critical collection priorities include specific targeting of low level chemical and biological threats and intent to use; increase HUMINT resources related to this area; and review any restrictive control policies which currently inhibit full utilization of existing DoD HUMINT capabilities.”<sup>149</sup>

The *National Security Strategy* sums up the intelligence challenge by stating, “We must continue to attract and retain enough highly qualified people to provide human intelligence collection, translation and analysis in those many emerging areas where there simply is no technological substitute, and we must forge strong links to the private enterprises and public institutions whose expertise is especially critical.”<sup>150</sup>

The second area for improvement is better equipment for protection and decontamination. As already stated, we need individual protective equipment that is lightweight and usable in all environments. We must ensure we have enough equipment for all individuals and make certain we train and exercise with the equipment. This includes equipment for U.S. military and allies, contractors, indigenous port and air base workers and, if possible, all dependents in the area of responsibility.

We also need to develop decontamination equipment for large areas and equipment. The *2010 Study* states, “equipment must be developed and procured which can rapidly and effectively decontaminate large areas such as ports and airfields (at least tactical and airlift ramps) and essential equipment.”<sup>151</sup> Further research and development is recommended for decontamination requirements, “for afloat prepositioned equipment; for sensitive equipment such as communications equipment and avionics; and for resumption of full operations at contaminated ports and airfields.”<sup>152</sup>

The third area requiring concentration is training. The QDR states DoD “must *institutionalize* counterproliferation as an organizing principle in

every facet of military activity, from logistics to maneuver and strike warfare, and *internationalize* those same efforts to encourage our allies and potential coalition partners to train, equip, and prepare their forces to operate with us under NBC conditions.”<sup>153</sup> Training begins at basic training for personal protection, but more emphasis needs to be added on sustaining operations in a contaminated area. This includes adding annexes to war plans to, “integrate the use of NBC reconnaissance and decontamination assets into the overall plan. The emphasis must be on training to reduce the effects of the use of weapons of mass destruction.”<sup>154</sup>

Robert Joseph points out the lack of tactical training and procedures for NBC operations. He states, “we also lack TTP (tactics, techniques, and procedures) needed to overcome key vulnerabilities identified by operators and planners. These vulnerabilities include protection of facilities such as ports and prepositioning depots, large groups of personnel, and essential equipment and supplies; decontamination capabilities for large areas and sensitive material such as airfields and aircraft; and handling contaminated casualties and cargoes.”<sup>155</sup> Improvements are needed in training at every level, to include field training, exercises, and war games.

Finally, the United States must be prepared to destroy terrorist WMD prior to their use against our allies or us. Brad Roberts says, “the United States needs to be able to destroy BW production and storage facilities without also risking widespread contamination . . . and should also have the means to disrupt and destroy BW facilities without recourse to the open use of military power.”<sup>156</sup> If intelligence sources can determine a terrorist is stockpiling WMD or is being supplied WMD from a rogue state, policy makers need a timely process in place to make the decision to pre-empt or not pre-empt. The lives of our military forces depend on this timely process.



## VI. Conclusions

*The terrorist is a criminal, not a soldier. He strikes indiscriminately at the target of his choosing, with any means, at any time. All targets are legitimate in his eyes. He seeks to inflict as much damage as possible to horrify and shock the local population and global audience and to embarrass the leaders of a country.*<sup>157</sup>

— General J.H. Binford Peay

Terrorists will use weapons of mass destruction in the future. Robert Joseph says, “NBC capabilities are seen as weapons of the weak against the strong, as the only arms that can overcome the conventional superiority of the West. They are not weapons of last resort, but rather weapons of choice to be threatened or used early in a conflict for political and psychological as well as military purposes.”<sup>158</sup> The military must be prepared for attack by terrorists at times and places of their choosing, not ours. According to Senator Domenici, “The only way this emerging threat can be contained is by a clear and forceful U.S. policy that will lead the international community in a concerted effort to prevent, deter, and if necessary, respond to acquisition, threats, and prospective use of WMD.”<sup>159</sup>

Our U.S. foreign policy and military doctrine and strategy highlight the terrorist threat. The President in his *National Security Strategy* says, “We must continue to deter and be prepared to counter the use or threatened use of WMD, reduce the threat posed by existing arsenals of such weaponry and halt the smuggling of nuclear materials. We must identify the technical information, technologies and materials that cannot be allowed to fall into the hands of those seeking to develop and produce WMD. And we must stop the proliferation of non-safeguarded dual-use technologies that place these destructive capabilities in the hands of parties hostile to the U.S. and global security interests.”<sup>160</sup> The Secretary of Defense reiterates the problem in *Proliferation: Threat and Response*, where he states, “The proliferation of nuclear, biological, or chemical weapons and their delivery means is not a hypothetical threat . . . the NBC proliferation threat has become transnational and now has the potential to come from terrorist organizations . . . DoD has unique responsibilities for the military responses needed if prevention fails: active defense, passive defense, counterforce, and response to paramilitary/covert threats.”<sup>161</sup>

There is a terrorist threat and it is only a matter of time before terrorism will be directed at military forces deploying, employing and redeploying for conventional battlefield operations and for military operations other than war. Our current national policy, strategy and doctrine highlight the problem, but there is a need for more interagency coordination and cooperation. National leaders must design a decision process to consider preemptive strikes if terrorists are known to have weapons of mass destruction and intend to use them to attack American citizens. Combating the terrorist WMD threat is an integral part of our military strategy, but needs increased emphasis at the planning level. This includes emphasis in intelligence, equipment, training and education.

The key to defeating the terrorist threat is timely and accurate intelligence. This is necessary for detection, characterization, and countering the threat. Improvements are being made in these areas, but emphasis needs to be placed on human intelligence, intelligence sharing between agencies and allies, and continued improvements in detection equipment. We will also need congressional and military support to fund improvements for the future.

The second area for concern is individual and collective protection equipment. Military forces have been using the same bulky protective equipment for over 20 years. The equipment is hard to operate in and has been shown in studies to degrade mission effectiveness. Initial efforts are underway for lightweight equipment and quick-donning masks. Additionally, improvements in decontamination are needed to ensure the ability to sustain operations after an attack. Current shortfalls exist in decontaminating large areas and sensitive equipment. This is exactly what the terrorist will target at a staging port or airfield.

Most important, the military needs to emphasize training for NBC threats. We need to switch from limited MOPP level training in protective gear at different levels of threat to realistic joint and combined exercises. Exercises must force units to wear their protective equipment, find their limitations, and experience the difficulties in sustaining operations in a contaminated environment. We also need to add chemical and biological scenarios to war gaming exercises during all levels of professional training.

Irrational actors will not hesitate to use WMD against U.S. citizens and soldiers. The military needs to be ready to respond to the challenge. Current efforts focus on responding after an attack. In the future, we need to prevent attacks from happening and be able to survive and operate during and after an attack. Improvements will require a combined interagency approach,

pooling all available military and civilian resources. Political and military leaders need to highlight the terrorist WMD threat in future policy, planning, training, and exercises.

Concluding his testimony on the Khobar Towers bombing to the Senate Armed Services Committee, General Peay concluded, “Even with additional physical security upgrades, however, we must recognize that we will remain vulnerable to terrorist attacks. No amount of money or physical security upgrade alone can stop a determined terrorist. We must recognize that while terrorism has been a threat to our country for many years, it is evolving and growing more sophisticated.”<sup>162</sup>



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## **USAF Counterproliferation Center**

The USAF Counterproliferation Center was established in 1998 to provide education and research to the present and future leaders of the USAF, to assist them in their activities to counter the threats posed by adversaries equipped with weapons of mass destruction.

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