Preparing for the Chemical, Biological, Radiological and Nuclear (CBRN) Threat within the Contemporary Operating Environment (COE)

A Monograph
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14. ABSTRACT

This monograph investigates the Chemical, Biological, Radiological and Nuclear (CBRN) threat the US will face on the battlefield and in the homeland in what is now called the Contemporary Operating Environment (COE). The monograph begins by examining the CBRN evolution and its impact to include recent conflicts. The monograph focuses on three areas. First, has the CBRN threat been adequately identified within the COE? This threat includes the possible agents and employment scenarios used against US Forces. Second, is the current force design within the US Army and US Army Chemical Corps properly structured to deal with the threat? Finally, based on the first two issues, what are the appropriate solutions? The monograph frames the US Army's current and future capabilities to operate in a CBRN environment. Army doctrine states US forces must operate in a CBRN environment with minimum degradation. The monograph provides a comparison of US Army capability against the COE CBRN threat construct. This comparison identifies the critical gap that currently exists between requirements and capabilities. Finally, the examination concludes that the US Army is not adequately postured to meet the CBRN COE threat. The monograph recommends the establishment of a multi-purpose CBRN organization at the Corps and Division level and a realignment of CBRN personnel and organizations.

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Abstract

PREPARING FOR THE CBRN THREAT WITHIN THE COE by MAJ Cedrick A. Farrior, USA, 51 pages.

This monograph investigates the Chemical, Biological, Radiological and Nuclear (CBRN) threat the US will face on the battlefield and in the homeland in what is now called the Contemporary Operating Environment (COE). The monograph begins by examining the CBRN evolution and its impact to include recent conflicts.

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CHAPTER ONE

INTRODUCTION

DOD also has not taken sufficient action to provide reasonable assurance that its weapon systems and equipment can survive and operate in a biological and chemical environment.[1]

General Accounting Office Report, May 2000

The threat of weapons of mass destruction (WMD) has been one of the biggest challenges to face a military during combat operations.[2] The impact of these weapons can have both a physical and psychological effect that can alter the outcome of a conflict. The 2001 anthrax attacks brought to the forefront the consequences of the WMD threat and have spurred a determination to prepare to deal with

[1] General Accounting Office Report to House Armed Services Committee, Weapons of Mass Destruction: DOD's Actions Should be More Integrated and Focused. Washington, DC: Government Printing Office, May 2000.

[2] Weapons of Mass Destruction (WMD). Weapons that are capable of a high order of destruction and/or of being used in such a manner as to destroy large numbers of people. Can be nuclear, chemical, biological, and radiological weapons, but excludes the means of transporting or propelling the weapon where such means of transporting or propelling the weapon where such means is a separable and divisible part of the weapon. This arms control term generally refers to the nuclear, biological, and chemical warfare threat posed by adversarial nations or non-state actors, or their offensive programs developed to asymmetrically counter US or coalition ally strengths. The Germans first introduced gas weapons during WWI. Phosgene gas was dispersed through artillery delivery systems intending to break the stalemate of trench warfare. DOD Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms* (Washington, D. C., May 02).

them on the battlefield.[3] The United States Army has identified a new contemporary operating environment (COE) assessing the likely threats and scenarios that US forces will face up to 2020. This COE provides the basis for development of doctrine, training, threat assessment, and preparation for operating within the new environment. The COE concept is predicated on the fact that the US has no peer competitors and combat against conventional forces is less likely and that rogue nations and non-state actors will be more of a threat to US forces.[4] The COE construct is a radical change in threat concept from the Soviet doctrine that drove US forces during the Cold War era.

Under the Soviet doctrine, threat forces normally combined chemical strikes as a part of their conventional operations. Nuclear and Biological weapons were available but seldom used; their availability was mostly intended as a deterrence option. The COE proposes that current and future US adversaries will use chemical, biological, radiological and nuclear (CBRN) weapons in a non-conventional setting.[5] The CBRN threat includes the traditional weapons of chemical, biological and

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[3] Beginning in October 2001, anthrax-laced letters arrived at offices of US Sens. Tom Daschle, D-South Dakota, and Patrick Leahy, D-Vermont, and to TV network news offices in New York. Five people, including two postal employees in Washington, died of inhalation anthrax. CNN (on-line); available from http://www.cnn.com/2003/LAW/08/26/hatfill.lawsuit/index.html; internet; accessed 25 November 2003.

[4] The Contemporary Operating Environment (COE) has emerged as a full spectrum environment that the US Army must be able to operate in. This spectrum runs the gamut from major conflict to support and stability operations. Although US military forces enjoy advantages in many aspects of armed conflict, the US will be challenged by adversaries that possess or seek capabilities and design novel concepts to overcome those advantages. The United States cannot predict with a high degree of confidence the identity of the countries or the actors that may threaten its interests and security. But it is possible to identify the trends that will provide adversaries with capabilities and opportunities to do harm to the US Donald H. Rumsfield, *"DoD Report to the President and Congress"*2002 (on-line);available from http://www.defenselink.mil/execsec/adr2002/pdf_files/chap1.pdf.

[5] Chemical, Biological, Radiological, Nuclear, High Yield Explosives (CBRNE) is the umbrella that outlines the weapons of mass destruction. For the purpose of this monograph it will not focus on high yield explosives thus the CBRN term.

nuclear options but also the possible use of toxic compounds and toxic materials as an agent against friendly forces.

The future vision for CBRN defense preparation is outlined in both Army and Joint Doctrine in *Chemical Vision* and *Joint Vision 2020,* respectively. The US Army Chemical School, as the lead agency within the Armed Services for CBRN concepts and doctrine, is responsible for developing doctrine to prepare and deal with a CBRN threat.[6] Consequence Management and Force Protection are basic tenets in CBRN defense. Consequence Management has evolved into the Chemical Corps lexicon as a result of the focus on Homeland Security and Defense. The requirements that are outlined in Presidential Directive (PDD) 39 in 1995 requires the US Armed Forces to provide support in the event of an attack against US interests by the use of WMDs.[7]

The US Army has organizations that are designed to support the forces against CBRN threats. These organizations are chemical and biological units, whose missions include NBC Reconnaissance, Decontamination, and Smoke operations and are often classified as force protection. The majority of these assets are in the Reserve component. The question is whether the current force structure and design and the proposed changes are adequate to meet the ongoing and emerging CBRN requirements in the COE?

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[6] The Chemical Vision was developed in 2001 to outline the future architecture for the US Army Chemical Corps. It provides the construct for the future Chemical Corps force structure, mission and future threat. NBC Future Architecture Vision O&O Execution, March 2001.

[7] Joint Pub 1-02 defines consequence management as "those measures taken to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of a chemical, biological, nuclear and/or high yield explosive situation.

RESEARCH QUESTION AND METHODOLOGY

The monograph focuses on CBRN capabilities as it relates to the new COE. The monograph reviews the previous role CBRN/WMD doctrine and capabilities served in the old Soviet/Krasnovian Doctrine and provides a suitable evaluation against the threat assessment in the new COE.[8] The focus is on identifying any changes in possible employment scenarios and new emerging threats, and assesses whether our current doctrine and organization adequately supports dealing with potential threats.

The monograph focuses on three areas. First, has the CBRN threat been adequately identified within the COE? This threat includes the possible agents and employment scenarios used against US Forces. Second, is the current force design as well as the future organizational changes within the US Army and US Army Chemical Corps properly structured to deal with the threat? Finally, what would be an appropriate organization to address the threat?

Analyzing the current force structure, the monograph assesses the impact and effectiveness of the CBRN organizations that supported OPERATION ENDURING FREEDOM and OPERATION IRAQI FREEDOM. Derived from multiple sources ranging from after-action reports, articles, publications and monographs, these case studies will be the basis for analysis and comparison. Coming on the heels of the 2001 anthrax attacks and the expected Iraqi CBRN threat, both operations created diverse requirements and capabilities for CBRN units. OPERATION NOBLE EAGLE also provided requirements for CBRN support against the possibility of another attack against the US homeland. The actions and feedback from

[8] The Soviet/Krasvovian doctrine was based on the Soviet employment of CBRN weapons in conflict. CBRN weapons were viewed as a significant combat multiplier. During offensive operations weapons could be employed as a part of the artillery-rolling barrage to disrupt Blue Forces C2 structure, isolate reserves and cause confusion among the defenders. They also could be used to shape the battlefield by protecting the flanks.

these operations provide a discernable measure of effectiveness for how well prepared the US Army was when dealing with a known and unknown/suspected CBRN threat.

An assessment of ongoing changes in the current force structure and doctrine dealing with the CBRN threat within the COE construct will facilitate drawing recommendations of a unit's design, organization, equipment and training requirements to more effectively deal with emerging threats. Using broad definitions from Field Manual 3.0, *Operations*, the established criteria for measurement are defined as follows: Responsiveness, Agility, and Versatility.[9]

Responsiveness. Ability to deploy quickly with the right forces at the right place at the right time. Discernible and verifiable measures of effectiveness are: (1) What factors influenced the development of a capability to deal with a short notice requirement to deploy CBRN units to a theater of operations? (2) What assets were deployed in support of OPERATION ENDURING FREEDOM and OPERATION IRAQI FREEDOM? What was their impact? (3) What were the requirements for consequence management support during OPERATION NOBLE EAGLE? What was the impact?

Agility. An agile force package that is responsive and able to conduct all of the required missions. This is based on the following: (1) Must provide operational agility to deploy and employ the assets throughout the full spectrum of operations. (2) The ability to minimize operational friction when conducting multiple and diverse operations in the core CBRN missions (NBC Recon, Decon and Obscuration).

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[9] Headquarters, Department of the Army, *FM 3-0 Operations*, Washington, D.C. 2001.

Versatility. Army forces conduct prompt and sustained full spectrum operations with forces tailored to accomplish the missions. This is based on the following: Command and Control requirements in dealing with multiple mission requirements as well as the current capabilities to deal with both consequence management and force protection requirements.

Chapter 2 examines the CBRN threat both historically and as it is outlined within the COE. It looks at how the threat was portrayed in the Krasnovian/Soviet Doctrine and the steps/procedures that were used to counter the threat. This is followed by a description of the CBRN threat that is provided by the COE and an analysis of the current CBRN organizations with their current capabilities and locations.

Chapter 3 looks at the role CBRN played during OPERATION ENDURING FREEDOM and OPERATION IRAQI FREEDOM. This will focus on the task organizations and the capabilities deployed in support of the operations and the effectiveness of the organizations. Their feedback will identify lessons learned that can be used for future operations.

Chapter 4 looks at the current approach to the changes that are being planned for the future force to counter the CBRN threat. The chapter analyzes the capabilities that are being recommended for the future force, summarizes the analysis conducted throughout the monograph, and includes the recommendation for the establishment of a multi-purpose CBRN organization at the Corps and Division level and a realignment of CBRN personnel and organizations.

CHAPTER 2

The Chemical, Biological, Radiological and Nuclear (CBRN) Threat

"[The] vapor settled to the ground like a swamp mist and drifted toward the French trenches on a brisk wind. Its effect on the French was a violent nausea and faintness, followed by an utter collapse. It is believed that the Germans, who charged in behind the vapor, met no resistance at all, the French at their front being virtually paralyzed."

The use of gas at Langemarck as reported in the New York Tribune, April 27, 1915[10]

On 6 November 2003, 10 post offices in the Washington DC metropolitan area were closed for several days after a sensor indicated a possible presence of anthrax.[11] The resulting tests proved to be negative but the country has now become more sensitive and aware of a possible use of CBRN agents. To gain a better understanding of the CBRN threat we will discuss its evolution and impact on readiness. This discussion focuses on four areas: the role CBRN played in the Cold War, specifically looking at Soviet/Krasnovian doctrine, a review of past and current US CBRN doctrine, the CBRN threat in the COE, and finally, how CBRN units are postured around the world to deal with the threat.

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[10]John S. Sargent, *"Gassed* Gas Warfare," available from internet (on-line) http://www.worldwar1.com /arm006.htm; accessed 13 January 2004.

[11] Anthrax is a gram-positive sporulating bacillus. The spores are resistant to heat, cold, drying, and chemical disinfection Disease is transmitted from infected animals or their products via skin abrasions in more than 90% of cases. This usually fatal disease starts as a vague prodrome with fever, malaise, myalgias and cough. During the next several days, these non-specific symptoms may be rapidly followed by precordial discomfort, cyanosis, stridor, diaphoresis, moist rales, pleural effusion, and death. The initial symptoms mimic any number of influenza-like infections. The disease is difficult to diagnose in the early, treatable stage. Thomas W. McGovern, MD, and George W. Christopher, "BIOLOGICAL WARFARE AND ITS CUTANEOUS MANIFESTATIONS,"available from internet (on-line) http://telemedicine.org/BioWar/biologic.htm; accessed 11 November 2003.

CBRN Weapons

The conventional CBRN spectrum includes three main pillars; biological, chemical and nuclear weapons. CBRN weapons are also known as Weapons of Mass Destruction (WMD) and is the term used in the monograph to focus on the CBRN spectrum. Weapons of Mass Destruction and Effects (WMDE) describe both the CBRN spectrum as well as the use of high yield explosives. A fourth pillar that will be discussed is the possible use of Toxic Industrial Compounds (TICs) or Toxic Industrial Materials (TIMs) in a weaponized form to create a mass casualty situation. TICs and TIMs have occasionally been included as part of chemical or biological warfare but the discussion will focus on their roles separately. CBRN weapons present a dual-purpose threat as they can cause both physical and psychological devastation. The psychological effects from these threats were evident after the 2001 anthrax attacks and later by the coalition forces as they prepared to face the Iraqi Army during DESERT STORM and OPERATION IRAQI FREEDOM.

For a time it was common to refer to chemical and biological weapons in the same context. However, during the 1990s it became apparent that chemical and biological weapons should be viewed individually. The scientific and medical communities understood the difference, but the military did not. The term Chem-Bio was a common term and gave the impression that the threats were similar and linked. Recently, however, a re-examination highlighted that the two are extremely different. Chemical warfare agents are chemical substances designed to kill, seriously injure, or incapacitate humans and animals.

Chemical agents can also deny or hinder the use of areas, facilities, and materials.[12] Chemical agents can be looked at in two categories. First are the traditional agents that include nerve, blister, and blood. (Cyanide is also known by designations as AC & CK which are blood agents). The other category is agents that have a dual-purpose mode such as chlorine, ammonia and strychnine.

Poisonous gas was invented (and very successfully used) as a terror weapon meant to instill confusion and panic among the enemy prior to an offensive. It was a sort of physiological weapon with the non-lethal tearing agents inflicting as much panic as the dreaded mustard gas.[13] World War I saw the introduction of Gas warfare when the Germans used it on the Russians in 1915 on the Eastern Front and later the same year against the Entente in an attempt to break the trench warfare that had stagnated the battlefield. The Germans used gas to cause casualties and confusion in the allies' trenches as they attempted to achieve a breakthrough. The world community saw this use as a violation of the Hague Convention as this new form of warfare had a deadly effect on the battlefield. [14]

In the great carnage of 1916-17 there were approximately 17,700 gas casualties from the Somme, Chemin des Dames, and Passchendaele battles alone. These numbers would grow considerably higher due to the large number of deaths after the war that would be directly attributed to gas exposure. Despite this

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[12] Brian Blodgett, "Germany's Use of Chemical Warfare in World War I (The Great War)," available from http://members.tripod.com/Brian_Blodgett/Chemical.htm#Hague; internet (on-line)accessed 11 November 2003.

[13] John Singer Sargent, "*Gassed* Gas Warfare," available from http://www.worldwar1.com/arm006.htm; internet (on-line)accessed 13 January 2004.

[14] At the end of the 19th century, a number of men foresaw the devastation that chemical agents could cause in a European war. The Hague Convention of 1899 discussed the issue of using chemicals as weapons. The Contracting Powers agreed not to use projectiles whose sole purpose was the diffusion of asphyxiating or deleterious gases. Delegates from all of the attending countries except the United States signed the resolution.

high casualty count for both sides, the use of gas continued to grow. By 1918, one in every four artillery shells fired contained gas of one type or another.[15] For some time after the war it was expected that gas warfare would be a part of the battlefield. Post World War I saw multiple uses of chemical weapons on the battlefield and against civilians but the most significant impact was the use of chemical agents during the Iraq-Iran war of the 1980s.

Prior to the Iran-Iraq War, Iraq developed the ability to produce, store, and use chemical weapons which included H-series blister and G-series nerve agents. Iraq deployed/employed these agents through various offensive munitions, including rockets, artillery shells, aerial bombs, and warheads on the Al Hussein Scud missile variant. During the Iran-Iraq war, Iraqi fighter-bombers dropped tabun-filled 250 kilogram bombs and mustard-filled 500 kilogram bombs on Iranian targets. Other reports indicate that Iraq may have also installed spray tanks on an unknown number of helicopters or dropped 55-gallon drums filled with unknown agents (presumably mustard) from low altitudes.[16]

Based on the Iraqi previous use it was widely expected that chemical weapons would be used against coalition forces during DESERT SHIELD/STORM. Post DESERT STORM investigations by UN inspectors discovered a significant Iraqi WMD capability.

The second CBRN pillar is the Biological threat. Biological warfare (BW) is defined as "the employment of biological agents to produce casualties in man or animals or damage to plants."[17] There

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[15] John Singer Sargent, "*Gassed* Gas Warfare," available from http://www.worldwar1.com/arm006.htm; accessed 13 January 2004.

[16] Iran-Iraq War (1980-1988), Federation of American Scientists, available from http://www.fas.org/man/dod-101/ops/war/iran-iraq.htm; internet (on-line) accessed 11 February 2004.

[17] Ibid.

are multiple examples of attacks using Biological Weapons throughout history as they are extremely effective and relatively cheap. An early BW attack took place in the Black Sea port of Kaffa (now Feodossia, Ukraine) in 1346. Rats and their fleas carried the plague to besieging Tatar soldiers. Seeking revenge, the Tatars catapulted the bodies of victims at the defending Genoese who contracted the disease and abandoned Kaffa. The same cause afflicting the Tatars likely brought the disease to the Genoese.[18]

Prior to any biological weapons treaty the US had weaponized biological agents. The United States started an offensive biological warfare program at Camp Detrick (today Fort Detrick) in Frederick, Maryland in 1943. Ten years later, the defensive program began. By 1969, the US had weaponized the agents causing anthrax, botulism, tularemia, brucellosis, Venezuelan equine encephalitis, and Q fever. These agents are easily procured from the environment, universities, biological supply houses, and clinical specimens.[19] Known biological weapons include: ricin, anthrax, botulism, small pox and certain pathogens. All if used properly can cause massive casualties. In the aftermath of DESERT STORM it was revealed that the Iraqis had weaponized anthrax, botulinum toxin, and aflatoxin.[20] The 2001 anthrax attacks in the United States revealed to the nation its vulnerability to biological attacks and the need to prepare for possible widespread attacks that could produce mass casualties among the civilian populace. Immediately after the attacks, Army and Marine CBRN units were deployed to sensitive areas within the

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[18] Ibid.

[19] Ibid.

[20] Ibid.

country as a part of OPERATION NOBLE EAGLE to provide CBRN support and protection against possible attacks.

Nuclear warfare is the third pillar of the NBC spectrum. The detonation of atomic bombs in 1945 against Japan ushered the world into the nuclear age. The US became the first nuclear super power but was shortly joined by the Soviet Union. Because nuclear fission was discovered in Germany, which remained the home of many brilliant scientists, the United States perceived itself to be in a race to build an atomic bomb during World War II.[21] Immediately following World War II the US saw the Soviet Union as its likely adversary in the next war and the spread of communism as the primary threat to the free world. The Truman Doctrine emerged as the construct for containing communism.[22] The 1950s ushered in an arms race that culminated with the possibility of mutual assured destruction. The US, recognizing it could not match the Soviets in conventional warfare in Europe resorted to nuclear warfare. Western Europe was the most likely place of battle and it evolved into the Fulda Gap scenario where tactical nuclear bombs could be used in the event of a Soviet invasion. The possibility of war with the Soviet Union provided the US with a known threat and likelihood of operating in a nuclear environment,

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[21] Federation of American Scientists, "Weapons of Mass Destruction," available from http://fas.org/nuke/intro/nuke/intro.htm; internet accessed 13 January 2004.

[22] In a meeting between Congressmen and state department officials, Undersecretary of State Dean Acheson articulated what would later become known as the domino theory. He stated that more was at stake than Greece and Turkey, for if those two key states should fall, Communism would likely spread south to Iran and as far east as India. Acheson concluded that not since the days of Rome and Carthage had such a polarization of power existed. The stunned legislators agreed to endorse the program on the condition that President Truman stress the severity of the crisis in an address to Congress and in a radio broadcast to the American people. available from http://www.trumanlibrary.org/teacher/doctrine.htm; internet; accessed 11 November 2003.

which led to the Pentomic Division of the 1950s. [23] UN involvement in Vietnam and Southeast Asia took center stage in the 1960s and pushed the Soviet-NATO conflict into the background. After the Vietnam War, the US once again turned towards the Soviets and prepared to meet this threat.

Nuclear detonation is not the only way to employ radiological material. Another nuclear threat scenario is the possibility of a "dirty bomb." Radiological materials are used to make what is commonly referred to as a "dirty bomb." The threat occurs from the initial explosion and radiological contamination rather than that of the actual bomb detonation. A nuclear bomb requires a significant support system to develop and the material required is rare and easily tracked. The facilities and requirements to construct a nuclear device are tremendous and require the resources that only a state can afford. A "dirty bomb" allows an adversary to avoid the support system but still have the capability to deliver the WMD effects. The following is an excerpt from the "Federation of American Scientist" (FAS) that outlines the concerns with the threat from radiological material.

> Radiological attacks constitute a credible threat. Radioactive materials that could be used for such attacks are stored in thousands of facilities around the US, many of which may not be adequately protected against theft by determined terrorists. Some of this material could be easily dispersed in urban areas by using conventional explosives or by other methods. [24]

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[23] Mr. Roger Houston, in his article, "The US Army's Pentomic Division: A Historical TOE," The Pentomic concept was based on a pentangular division designed to fight on the tactical atomic battlefield of the 1950s. Each battlegroup was a self-contained task force that could fight dispersed on a sustained basis, enhancing its survival in a highly lethal arena. Because casualties in the tactical nuclear environment were expected to be extremely heavy, the five-sided division was designed to remain effective despite severe losses. Mr. Roger Huston, "The US Army's Pentomic Division: A Historical TOE," (April 2001), available from http://orbat.com/site/toe/toe/usa/pentomicdivisions.html; internet; accessed 11 November 2003.

[24] Federation of American Scientists, "*Dirty Bombs: A response to the Threat*," available from http://fas.org/faspir/2002/v55n2/dirtybomb.htm; internet; accessed 13 January 2004.

FAS concludes that there is a viable threat from radioactive material. The results of an incident or accident could leave urban areas paralyzed and cause catastrophic casualties which would overwhelm local resources and require support from federal agencies to include the US Army.

Soviet/Krasnovian Threat

Since the gas filled battlefields of World War I no adversary has used weapons of mass destruction against US military forces. From post World War I through the Vietnam War the international community has engaged in a series of treaties to eliminate gas warfare from the battlefield. During the 1960s, the US, in a good face effort, eliminated the Chemical Warfare Corps from the US military; the responsibilities for NBC defense were absorbed into the Ordinance Branch. Nuclear warfare was also seen as a remote possibility with the prospects of mutual assured destruction. This thought process continued until the 1970s. Immediately after the 1973 Yom Kippur War the US had an opportunity to examine captured Soviet equipment used by the Egyptians. The captured Soviet built tanks contained over-pressurized systems that allowed operations within a chemical environment. The obvious question was, if the Soviets had not expected to use chemical or biological warfare agents why were they building tanks that could operate within those environments? This caused the US military to quickly restart the NBC Defense program to deal with the possibility of fighting on a contaminated battlefield.

Soviet doctrine envisioned employment of chemical and biological weapons with a central role on the battlefield in both offensive and defensive operations. In the offense, the Soviets would employ weapons to protect their flanks, isolate enemy reserves and against frontline troops at the point of penetration to cause confusion and degradation. Chemical weapons would be included in the rolling artillery barrage that preceded the attack. In the defense, the weapons would be employed against attacking units to separate first and second echelon forces, protect dug in infantry troops and to prevent

envelopment against an exposed flank. The Soviets had prepared for operating in a contaminated environment by developing decontamination capabilities that allowed them to operate on the move. Dr. Ken Alibek, a noted former Soviet scientist that defected to the West, commented on several occasions that there was a robust biological program designed for battlefield use against NATO units. [25] North Korea, Iraq, Syria and Libya were potential adversaries that could use the same concepts. These countries, (minus Iraq) are also identified as potential threats within the COE.

[25] NATO is the North Atlantic Treaty Organization that was started in 1947 among the US and its Western allies to counter the growing Soviet/Communist threat that was represented by the Warsaw Pact. The members of NATO were pledged to defend against a possible invasion of Western Europe by the Soviet Bloc.

CBRN Threats within the Contemporary Operating Environment

"*When the spread of chemical and biological and nuclear weapon, a long with ballistic missile technology--when that occurs, even weak states and small groups could attain a catastrophic power to strike great nations*."

President George W. Bush[26]

The Contemporary Operating Environment (COE) is consistently based on the likelihood of a threat from rogue states and non-state actors. The 2001 NBC threat assessment identifies that the concern is based on both the agents and the delivery systems.[27] The proliferation in weapon technology has given terrorists and potential adversaries a greater capability to acquire these agents and employ them against the US and its allies. The threat assessment states that there is an incentive for an adversary to acquire the weapons since it cannot match the US in a conventional manner. The potential adversaries see these weapons as leverage against a potential US invasion. The 1997 Quadrennial Defense Review (QDR) concluded that the threat and/or use of chemical or biological weapons is a likely condition of future warfare and could occur in the very early stages of conflict to disrupt US military operations and deployments of men and supplies into theater.[28] Counter-proliferation of WMD is a major objective of the US. The threats from the proliferation of nuclear, biological and chemical (NBC) weapons and missiles comes from both states and non-state groups, such as terrorists. The President, in a June 2002

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[26] President Bush, June 2002 "West Point Speech," available from http://fas.org/man/eprint/record.pdf ; accessed 13 January 2004.

[27] NBC Annex to Operating Environment; US Army Chemical School, Fort Leonard Wood, MO March 2001.

[28] Quadrennial Defense Review, (Washington D.C.), May 1997.

speech at the US Military Academy, stated that the worst scenario is marrying up of WMD technology to a rogue state or terrorist organization.[29]

Proliferation of WMD is a major concern/driver of the Global War on Terror. The growing availability and sophistication of NBC and missile-related technologies and expertise, also highlight the threat. In addition, NBC weapons are increasingly viewed as asymmetric means to counter America's superior conventional military capabilities.[30] Moreover, the relative ease and inexpensiveness of producing some chemical or biological agents has increased concern that their employment may become more attractive to terrorist groups intending on causing panic or inflicting large numbers of casualties. For example, the reported interest of Usama Bin Laden's network in NBC materials is a key concern in terms of possible future threats to US interests. [31]

The threat that is identified here is significantly different from the Soviet/Krasnovian concept. One of the defining objectives of OPERATION IRAQI FREEDOM was to find and destroy the weapons of mass destruction that could be used by Iraq against its neighbors or the possible proliferation of the weapons to a terrorist for an attack against the US or its allies. One of the concerns of this monograph is that despite the identification that these weapons have been used in different scenarios from the past the proper focus still does not exist to deal with the scenarios of the future. We have not mentally adjusted from our Cold War understanding of NBC employment. Within the likely CBRN threat scenarios that are

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[29] President Bush, June 2002 "West Point Speech," available from http://fas.org/man/eprint/record.pdf ; internet (on-line)accessed 13 January 2004.

[30] NBC Threat 2001unclass text briefing, presented by US Army Chemical School, Fort Leonard Wood, MO.

[31] Ibid.

identified in the COE, the focus is still on chemical as the most likely agent of choice. This is in sharp contrast to the multiple speeches and policy decisions that address the likely CBRN threat that the US will encounter. One of the weapons it does not identify is the use of toxic substances.

Toxic Industrial Compounds and Materials

Toxic industrial compounds (TICs) and Toxic industrial Materials (TIMs) are hazardous materials that can be defined as a dual-purpose material and constitute the fourth CBRN pillar. These compounds are conventional and legal materials that have the potential to be weaponized. Mark Lee has written a monograph entitled, *A Curious Void --Army Doctrine and Toxic Industrial Materials in the Urban Battlespace*, which discusses the possibility of how TICs and TIMs can be used in an urban environment as weapons, illustrating the lethality of these materials compared to chemical weapons.[32] The employment of TICs and TIMs on the battlefield or against a civilian populace can have devastating affects. Their employment provides multiple advantages to the adversary over the use of traditional WMD agents.

The following vignette illustrates the possibilities of TICs and TIMs targeted against a military installation resulting in catastrophic casualties. One possible scenario uses chlorine as a casualty-

[32] Mark Lee, in his monograph, *"A Curious Void --Army Doctrine and Toxic Industrial Materials in the Urban Battlespace,"* explains the implications of TICs and TIMs on the battlefield in an urban environment. He identifies the multiple hazards that prevalent in an urban setting that can be used by an adversary. One of the main arguments is that we do not have the means to identify and detect the agents that can be used. He illustrates the potential casualties that can be caused by TICs and TIMs and the lack of preparation. The use of TICs and TIMs would require the US to provide consequence management support to mitigate the impact of these substances. Lee, Mark *"A Curious Void --Army Doctrine and Toxic Industrial Materials in the Urban Battlespace,"* monograph, School of Advanced Military Studies, Fort Leavenworth, KS 2001.

producing agent. Near any installation, there is a water sanitation site which uses chlorine for filtration purposes. In March 2002, Fort Knox, Kentucky conducted an exercise to test its force protection readiness. The scenario called for a terrorist attack at the water sanitation site that included the release of a chlorine cloud over the installation and local area. The results showed the cloud would have caused catastrophic physical and psychological casualties among the affected area. Chlorine's weight is heavier than that of oxygen, which causes a gas cloud to maintain a lower proximity to the ground and slow the dissipation process resulting in multiple casualties in an urban area. Under scenarios of this type, civilian accidents or incidents, first responders are the first on the scene and handle the initial consequences. Military forces are requested to provide consequence management support to mitigate the impacts of the attack. The Fort Knox exercise was an example of the complexities of dealing with a CBRN incident that affected both the military installation and the surrounding community.

A similar scenario can be seen in a deployment of US forces to an Area of Operations (AO) due to a small-scale contingency or a major theater of war. Any area where US forces could be deployed would most likely possess an industrial complex where TICs and TIMs are prevalent. Even Afghanistan had a minimal industrial complex that existed under the Taliban Regime. The scenario has US forces deploying a brigade size unit on a small-scale contingency operation in support of a Joint Forces Command requirement. The force will not be required to deploy into a hostile theater but will face the possibility of a terrorist threat. The force will have the capability to deploy into theater and immediately proceed to its area of operations. Once the force has departed its air port of de-embarkation (APOD), it will deploy into its prescribed area via roadmarch. Enroute, it passes a train track that has several cargo trains that contain hazardous material. As the force passes the location a terrorist causes a release of the material producing a cloud. The force will not be aware of the release and will be unable to detect the cloud. Because the symptoms from the substance have a delayed affect the unit will not experience symptoms immediately. The symptoms will be unusual and hard to trace to the release point of the train.

This scenario not only provides an adversary an opportunity to strike at a stronger force but also provides the adversary the ability to claim plausible deniability.

The scenarios listed above are areas of concern not adequately analyzed within the COE. The COE needs to be further analyzed to ensure that friendly forces posses the capabilities needed to deal with the consequences from these asymmetric threats. When posturing the force to meet and deal with the CBRN possibility and providing support in the event of an incident it is critical that the forces be structured to meet the threat. Currently that is not the case.

US Doctrine (Pre-COE)

The United States Chemical Corps was organized with the mission of assisting the Army in preparing to fight on a NBC contaminated battlefield. The Chemical Corps mission was to provide force protection within the sphere of NBC warning, reporting, detection and decontamination. The first mission is NBC avoidance consisting of the ability to identify through the Intelligence Preparation of the Battlefield process the likelihood of a NBC attack and provide the information to friendly forces that would reduce their vulnerability to an attack.[33] The NBC Warning and Reporting system was established to provide friendly forces the locations of possible attacks and potentially contaminated areas. Another

[33] IPB is a systematic, continuous process of analyzing the threat and environment in a specific geographic area. It is designed to support staff estimates and military decision making. Applying the IPB process helps the commander selectively apply and maximize his combat power at critical points in time and space on the battlefield by, determining the threat's likely COA and describing the environment your unit is operating within and the effects of the environment of your unit. DA, *F M 24-130, Intelligence Preparation of the Battlefield* (Washington D.C., 8 July 1994), 1-1.

mission is decontamination operations. Decontamination doctrine calls for the operation to be conducted as far forward as possible, which is performed by a chemical company supporting warfighting units. Decontaminating near the Forward Edge of the Battlefield (FEBA) allows the unit to pull out at the earliest possible time, be decontaminated, and be re-employed in the fight. The decontamination mission is critical for force protection and can be used on personnel, equipment, terrain and facilities. Chemical organizations reside in both the active and reserve force, with the majority residing in the reserve force. Within the active force the organizations are aligned to support division and corps operations. The chemical units are either assigned to a division or to an echelon above division (Corps or Army level). Within eight of the ten active divisions there are chemical companies assigned to support them. The 1st Cavalry and 4th Infantry Divisions are supported by the 2d Chemical Battalion, which is assigned to the Army's III Corps. The companies are multi-purpose with the capabilities to provide NBC reconnaissance, decontamination and smoke operations support. The companies that directly support the heavy divisions are equipped with mechanized smoke assets and heavy decontamination equipment, whereas the units supporting the light, airborne and air assault divisions are wheel mounted.

The employment doctrine for these units and their current locations are areas of concern and require further analysis. There is a chemical staff element within the division headquarters that serves in an advisory role to the division command for employment of CBRN assets as well as the NBC warning and reporting structure. In peacetime, the chemical company provides support to the maneuver brigades during training. A typical training scenario has a smoke platoon, NBC recon squad, a decontamination platoon and the chemical company's headquarters providing command and control in support of the maneuver brigade. This allows the chemical company to train on its core mission essential tasks list (METL) as well as develop a working relationship with the warfighting brigade, thus facilitating successful integration of NBC assets on the battlefield. The drawback is that there is only one company, which is required to support two to three maneuver brigades, two to three field artillery battalions and the

aviation brigade. It is unrealistic that a separate company could sufficiently provide support to six to nine brigades. Current NBC doctrine requires that the chemical company be augmented by chemical battalions from the Reserve component. The obvious downside here is that the chemical company and the follow-on chemical battalion has no habitual relationship and would take a tremendous amount of time attempting to establish such a relationship. This assessment is based on the concept of task organization and the go to war training relationships that should be established during peacetime training. This is also tied to the problem of organizational structure.

The chemical companies within the US Army inventory vary in structure and capability. Only the units assigned to the divisions have a multi-purpose capability. Some are single purposed: smoke, decontamination, biological or reconnaissance. Some have a dual-purpose capability: smoke and decontamination. The dual-purpose company can do smoke or decontamination but not both simultaneously. Ad hoc companies have been formed in the past to support and meet the mission requirement. This has resulted in cases where a NBC Recon company would provide its organic recon squad; however, decon and smoke platoons would come from separate organizations. The NBC recon company would serve as the company headquarters over the ad hoc organization. This scenario creates obvious problems in command and control, maintenance and sustainment operations. The organizations have not had the benefit of training together prior to brigade level exercises, and have signficant differences in their organizational maintenance structures. The possibility exists that their first meeting would occur at the National Training Center. The NBC Recon headquarters would have the problem of attempting to provide maintenance support to two systems (decontamination and smoke) that it is not properly structured to support. All too often the company spends the NTC rotation trying to figure itself out and provides minimum capabilities to the rotational unit it is supposed to support. Another problem with the current concept is training. All too often NBC training is given little focus during exercises. Collective training from Platoon Lanes to Command Post Exercises are seen as opportunities to

incorporate realistic threat scenarios but instead NBC conditions on the battlefield are minimized. If the CBRN threat in the COE is to be realistic, then the CBRN conditions need to be re-looked.

Finally, the current location of the active chemical units needs to be analyzed. As stated earlier, each of the Army divisions has multi-purpose companies that are habitually associated with them. III Corps, Eighth Army and XVIII Airborne Corps have Echelon Above Division (EAD) Chemical Battalions assigned to them. The two companies that were assigned to the 4th Infantry Division and the 1st Cavalry Division were reassigned to the 2d Chemical Battalion that is assigned to III Corps. The 4th Infantry Division was restructured with a chemical reconnaissance platoon within the Division Cavalry. This platoon has three squads of NBC Fox vehicles that provide reconnaissance support. The 23rd Chemical Battalion provides support to Eighth Army and US Forces Korea. The battalion consists of two decontamination companies and a headquarters detachment. There is a multi-purpose company that has NBC recon, decon and smoke capability assigned to the 2nd Infantry Division.

An analysis of the Korean threat scenario and support requirements would illustrate obvious flaws in the current structure and positioning of the NBC assets. The 2nd Infantry Division is currently posted forward towards the Demilitarized Zone. A threat assessment of the peninsula shows the likely objectives for CBRN attacks would be against the air port of de-embarkations (APODs) and sea port of de-embarkations (SPODs) on the peninsula. The proximity of CBRN assets in relation to the CBRN vulnerabilities, specifically the APODs/SPODS reveal potential shortfalls. In the event of an attack the flaws are revealed based on the location of the assets and the fact they would have to be requested from an organization located in a potential attack area, through Eighth Army, down to 2nd Infantry Division and if approved, the assets would then be sent south. The assets would have to navigate what is expected to be a calamitous situation with refugee traffic on the roads leading south and other priorities on limited lift assets that would ultimately prove to be very time consuming. This does not meet the criteria of flexibility and responsiveness as defined earlier.

Another concern with geographic locations of NBC assets is in Europe. Currently the highest level NBC organization in Europe is the company level. Under the current construct of augmenting the theater with a chemical battalion or brigade the obvious concerns are the timeliness of deploying an organization to a theatre where it must be integrated into the operation all the while trying to develop a relationship with the supported units and the chemical unit in theater. The concerns of organizational structure, employment and locations will be further developed during the discussion of possible solutions addressing the CBRN threat in the COE.

The major operations that were conducted in Afghanistan and Iraq required support from chemical units. Chapter 3 looks at the lessons learned from these operations focusing on how effective the chemical units were organized and employed.

CHAPTER 3

CBRN Support for OPERATIONS ENDURING FREEDOM, NOBLE EAGLE and IRAQI FREEDOM

"Understand up front, the US Army's priority is to Fight and Win the Nation's wars. Homeland Defense is a secondary effort and will remain as such."

Anonymous[34]

After the September 2001 attacks against the United States, the US has conducted two major military operations in support of the Global War on Terrorism. One operation was against the Taliban Regime in Afghanistan and the other was to topple the Iraqi Regime of Saddam Hussein. This chapter will focus on lessons learned from these operations, specifically on the CBRN support for each operation. There will be an assessment to discern if the support was adequate and responsive using the criteria of responsiveness, versatility and agility that was established in Chapter 1. The assessments are based on After Action Reports from the units that participated in the operations and lessons learned that were developed by the training and doctrine community. The assessment will first look at OPERATION ENDURING FREEDOM (OEF) and then OPERATION IRAQI FREEDOM (OIF). OPERATION NOBLE EAGLE will be looked at as a part of OEF.[35]

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[34] Quote by a unnamed US Army Colonel on 22 October 2000 at the beginning of a Council of Colonels meeting held at the Pentagon to develop the Army's strategic plan for Homeland Defense.

[35] The term Operation NOBLE EAGLE refers to US military operations in homeland defense and civil support to federal, state and local agencies around the country. Operation ENDURING FREEDOM is the name

In October 2001 United States forces launched operations against the Taliban regime in Afghanistan. This was part of the larger Global War on Terrorism (GWOT)[36]. The Taliban Regime had come to power as a result of the chaos that was left in Afghanistan after the Soviet-Afghanistan war of the 1980s. The Soviets had left the country in 1989 and installed a communist government. The government was eventually overthrown in 1994 and by 1996 the Taliban regime had come to power. After the September 11, 2001 attacks on the World Trade Center and the Pentagon it was discovered the actions were sponsored by a terrorist organization in Afghanistan. The threat assessment for the Afghanistan Theater revealed a mostly unconventional adversary. The Taliban Government possessed a small amount of conventional weapons that were remnants from the Soviet Army as well as equipment acquired from countries such as Pakistan. The CBRN capability consisted of a possible toxic threat from the small industrial complex that existed in Afghanistan. There was also the possibility of a chemical/biological threat from the terrorist organizations in country. In response to this concern, CBRN units deployed to

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associated with the war on terrorism outside the United States; available from http://www.goarm y.com/eagle /index.htm; accessed 19 January 2004.

[36] The initial military objectives of Operation Enduring Freedom, as articulated by President George W. Bush in his Sept. 20th Address to a Joint Session of Congress and his Oct. 7th address to country, include the destruction of terrorist training camps and infrastructure within Afghanistan, the capture of al Qaeda leaders, and the cessation of terrorist activities in Afghanistan.

Secretary of Defense Donald Rumsfeld stated in an Oct. 7th DoD News Briefing that US objectives were to make clear to Taliban leaders that the harboring of terrorists is unacceptable, to acquire intelligence on al Qaeda and Taliban resources, to develop relations with groups opposed to the Taliban, to prevent the use of Afghanistan as a safe haven for terrorists, and to destroy the Taliban military allowing opposition forces to succeed in their struggle. Finally, military force would help facilitate the delivering of humanitarian supplies to the Afghan people. Available from internet (on-line) http://www.globalsecurity.org/military/ops/enduring-freedom.htm; accessed 21 February 2004.

provide NBC reconnaissance to the Joint Task Force.[37] CBRN units deployed to Afghanistan and to Kuwait to detect, identify and confirm the presence of CBRN agents. Two Biological Detection Companies (BIDs) were deployed to Afghanistan to support OEF. [38] Their mission was to provide force protection against a possible biological attack. Once in theater, problems immediately surfaced. There was no responsive CBRN command and control structure. The company level was the highest CBRN structure in theater and was frustrated in attempts to establish higher headquarter priorities and conveying the unit's capabilities and limitations to the supported organization. Furthermore, the company's main capability is to identify the presence of a biological agent on the battlefield; but it was reduced to scanning letters for anthrax.

Concurrent with the operation in Afghanistan was the CBRN support operation in Kuwait. The company deployed to Kuwait, a multi-purpose company from Fort Bragg, had the capability to provide NBC reconnaissance, decontamination and smoke support. There was a concern that the Iraqi government would launch an attack against US Forces in Kuwait. Assigned to the Combined Joint Task Force-Kuwait (CJTF-KU) at Camp Doha, Kuwait, the company was to provide force protection against

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[37] Combined Joint Task Force 180 was formed in June 2002 as the forward headquarters in Afghanistan, commanded by a Lieutenant General. This task force gives a single joint command responsible to USCENTCOM and to the Secretary of Defense for all military functions in the country. It establishes full-time senior presence; available from http://www.globalsecurity.org/military/agency/dod/jtf-180.htm; accessed 7 February 2004.

[38] Biological Detection Companies are EAC organizations structured with the Joint Biological Point Detection System (JBPDS) which is the first joint BW agent detection program. It consists of a common biosuite that can be installed on vehicles, ships, and and at fixed sites to provide biological detection and identification to all service personnel. The JBPDS is also portable, and may be used in support of bare-base or semi-fixed sites. The system is fully automated and is Joint Technical Architecture (JTA)-compliant. JBPDS will presumptively identify 10 BW agents simultaneously It will also collect a liquid sample for confirmatory analysis and identification. Planned product improvements will focus on reducing size, weight, and power consumption while increasing system reliability and the number of agents presumptively identified—up to 26 agents simultaneously.

possible CBRN attacks. There was no known imminent threat other than the possibility of an Iraqi threat based on the geographic location of Camp Doha in relation to Iraq. This company was also deployed to support a theater that had no distinct CBRN command and control structure. The CJTF-KU staff had a Chemical First Lieutenant whose job was to conduct a liaison with the company. Within ten days of deployment the company's force protection requirements were diminished based on a further threat assessment that downplayed the likelihood of an attack. Had there been an attack the positioning and integration into the theater defense plan is questionable. In October 2001, the majority of US Army forces were located in the vicinity of Camp Doha, Kuwait. There were units deployed north toward the Iraqi/Kuwaiti border but the majority was in Camp Doha. This concentration made Camp Doha the likely target. Having the chemical unit stationed and operating in the base only made it part of the target and after a strike its effectiveness would have been severely degraded.

Each operation identified shortfalls in responding to CBRN support requirements. The lack of an existing CBRN command and control structure resulted in organizations assigned to missions that they were ill suited for. The lack of a CBRN C2 structure resulted in organizations conducting menial tasks and took away limited high value assets that could have been used more properly in a more productive manner.

There was also a threat from a possible toxic (TIC or TIM) hazard which existed in both Kuwait and Afghanistan. Across the street from Camp Doha is a water treatment facility that would have been a prime target for a toxic release against US forces. The units deployed to Kuwait and Afghanistan did not have the capabilities to detect a toxic hazard.

As stated earlier, concurrent with OEF, OPERATION NOBLE EAGLE was conducted in the US. During this operation several vials of the biological agent anthrax was sent to various people and agencies within the US. The initial concern was that the anthrax attacks were linked to the September 11 attacks. CBRN units deployed to sensitive sites in the US, to include the Pentagon, the White House and

hazardous material sites around the country. The CBRN organizations included Biological Detection Units (BIDs), Technical Escort Units (TEU), multi-purpose CBRN units and WMD-Civil Support Teams (WMD-CST) designed to provide consequence management support in the advent of a WMD incident.[39] NOBLE EAGLE highlighted how disjointed the coordination procedures were for having military organizations requested and providing support to civilian authorities. Organizations were deployed to meet requirements that they were ill-suited for. An example was the deployment of Reserve Chemical units to hazardous facilities containing materials that the units were not able to detect or decontaminate. This operation occurred before the establishments of United States Northern Command (NORTHCOM)

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[39] Technical Escort Unit (TEU) is a battalion structured to conduct no notice deployments to provide chem./bio advice, assessment, sampling, detection, field verification, mitigation, render safe, limited decontamination, packaging, escorting and remediation of chem/bio devices or hazards worldwide in support of crisis or consequence management and chem/bio defense equipment, technical intelligence and doctrine development. The battalion headquarters is located at Aberdeen Proving Ground, Maryland, with subordinate units stationed at Fort Belvoir, Virginia, Pine Bluff Arsenal, Arkansas and Dugway Proving Grounds, Utah. The organization has a TOE and TDA structure. US Army Technical Escort Unit Command Brief, undated.

In a commencement address at the U.S. Naval Academy in May 1998, President Bill Clinton announced that the nation would do more to protect its citizens against the growing threat of chemical and biological terrorism. As part of this effort, he said, the Department of Defense would form 10 teams to support state and local authorities in the event of an incident involving weapons of mass destruction. The WMD Civil Support Teams were established to deploy rapidly to assist a local incident commander in determining the nature and extent of an attack or incident; provide expert technical advice on WMD response operations; and help identify and support the arrival of follow-on state and federal military response assets. They are joint units and, as such, can consist of both Army National Guard and Air National Guard personnel, with some of these units commanded by Air National Guard lieutenant colonels.

They maintain the capability to mitigate the consequences of any WMD/NBC event, whether natural or man-made. They are experts in WMD effects and NBC defense operations. These National Guard teams provide DoD's unique expertise and capabilities to assist state governors in preparing for and responding to chemical, biological, radiological or nuclear (CBRN) incidents as part of a state's emergency response structure. Each team consists of 22 highly skilled, full-time National Guard members who are federally resourced, trained and exercised, and employs federally approved CBRN response doctrine. Currently there are 32 WMD-CST teams. (on-line); available from http://www.globalsecurity.org/military/agency/army/wmd-cst.htm; internet; accessed 3 April 2004.

and the Department of Homeland Security as a cabinet level organization.[40] This response was based on lack of knowledge about the potential threat, lack of a coherent plan and lack of organizations that could properly deal with the threat.

NOBLE EAGLE support required CBRN organizations to be deployed to multiple areas throughout the country. There was an ad hoc identification of the organizations needed. There were seven Chemical companies deployed to protect the Pentagon. The companies established positions around the Pentagon and were augmented with sensors and biological detectors. Joint Task Force-Civil Support (JTF-CS) was the responsible headquarters for organizing military support to civilian authorities.[41] Active and Reserve component CBRN organizations supported NOBLE EAGLE. NOBLE EAGLE highlighted the flaws in the organizational structure of the units. Units that were only designed for smoke operations had no mission. NBC Reconnaissance vehicles could not detect or identify biological or toxic chemical agents. Neither the Department of Defense nor the Department of the Army possessed a uniformed plan for dealing with CBRN attacks waged against military installations. Again, response and planning were based on local reactions and not all were sufficient. Almost three years after the anthrax attacks there is not a unified DoD or Army plan to counter CBRN attacks in the homeland.

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[40] US Northern Command was established 1 October 2002 within the Department of Defense with a geographical Area of Responsibility (AOR) and Title 10, United States (US) Code authorities and responsibilities. Legal Information Institute (LII): *US Code Collection: United States Code, Title 10-Armed Forces, Part I Organization and General Military Powers, Chapter 6, Combatant Commander* (Washington, D.C., n.d.) 161-168, (on-line); available from http://www.law.cornell.edu/uscode/10/; internet; accessed 19 January 2004.

[41] JTF-Civil Support is the Defense Department organization tasked with consequence management in the event of an attack on the United States by an enemy or a terrorist organization using weapons of mass destruction; available from *By Jim Garamone / American Forces Press Service* available from http://www.defendamerica.mil/profiles/feb2002/pr020602a.html; internet accessed 8 February 2004.

OPERATION IRAQI FREEDOM is the next case study. The CBRN support requirements were more robust than OEF. The threat consisted of the possibility of a CBRN use against coalition forces. Based on the use of CBRN weapons by the Iraqi Regime in the past there was the strong likelihood that these agents would be used against attacking coalition forces. Coalition forces After Action Reports, reports from academia and other military sources will provide an assessment on the capabilities of the CBRN organizations deployed for OIF. A CBRN threat assessment revealed the following likely scenarios for the employment of WMD.

First was the possibility of a CBRN attack into Kuwait to disrupt the flow of forces into theater. An attack against either the APODs or SPODs would seriously degrade the coalition forces deployment time table and would cause both physical and psychological destruction. The Iraqis possessed SCUD missiles that could reach Kuwait. The second scenario would be a strike against coalition forces as they postured along the Iraq/Kuwait border preparing to launch the invasion. The forces would be vulnerable to and offer a large target for a missile attack. This would also disrupt the forces and cause the coalition to fight in a degraded manner. The third and most likely scenario would be to employ the agents as a last resort to protect against withdrawing Iraqi troops and isolate attacking coalition forces. This would produce casualties and assist the Iraqis in their withdrawal to Baghdad. During the final days prior to the coalition invasion a "green line" theory emerged which consisted of the Iraqis launching chemical strikes around Baghdad that would be used as a final protective line against coalition forces as they approached the city. This final protective line scenario when examined revealed unlikely and would not support the Iraqis. The city of Baghdad has five million people and multiple approach routes. To apply CBRN agents liberally around the city would have served no purpose.

OIF serves as an excellent case study to assess the CBRN capabilities to provide support under the current CBRN organization construct. Units that participated were active division CBRN units that deployed with their parent organizations and augmented by reserve units and reserve higher headquarters.

The following is a synopsis of the task organization of the force structure that operated during OIF. Central Command is the combatant command that has the Area of Responsibility (AOR) for Central Asia that includes Kuwait and Iraq. The US Army Component Command (ACC) that serves under CENTCOM is Third Army (ARCENT). During OIF ARCENT also served as the Coalition Forces Land Component Command (CFLCC), which is responsible for all land operations of the US Army, US Marines and other coalition land forces. The CBRN requirements fell under the CFLCC. Assigned to the CFLCC to carry the CBRN C2 requirements was a National Guard Chemical Brigade tasked organized (OPCON) to coordinate CBRN efforts. Task Organized within the CFLCC were the US Army V Corps along with the 3d Infantry Division, the 101st Infantry Division, the 82nd Airborne Division and the 4th Infantry Division. Each of the divisions with the exception of the 4th ID had an organic multi-purpose chemical unit.

The AARs from the participating units illustrate a major concern with the status of CBRN training among their organizations when they deployed into theater. The following is an excerpt from the 4th ID on their capabilities to operate in a CBRN environment.

> The 4th Infantry Division (TF IH) fought OIF on a classic non-linear, non-contiguous battlefield, spread over an enormous area. Notions of a "front" or "rear" were nonexistent. Much of the current Chemical Corps doctrine was not suited for this type of battlefield. Our company, battalion and brigade level chemical staffs were for the most part neither trained nor prepared for operations in this environment.[42]

This assessment is consistent with the comments from the 3d Infantry Division. The deployment process revealed multiple shortcomings in the organizations' CBRN training and equipment status. There were multiple issues with the Chemical Detection Equipment (CDE) that units deployed. Organizations

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[42] HEADQUARTERS, 4th INFANTRY DIVISION (MECHANIZED)Task Force Ironhorse (TF IH) Operation Iraqi Freedom (OIF) Phase III/IV NBC AAR; dated 3 AUG 2003.

had not been reporting equipment shortfalls prior to deployment; these resulted in crises during the deployment as well as the preparation for crossing the Line of Departure (LD). The 3ID's AAR recommends that commanders increase involvement in the CDE requisition process but this is a constant theme among army organizations. The AAR also provided examples of units deploying without required equipment that could not be covered from in theater stocks.

A consistent theme among AARs is a shortcoming in training levels. The GAO report of May 2000 stated that there were serious flaws in the training status of military units in operating in a CBRN environment. This was evident during the RSOI and preparation phases of OIF.[43] Again, units commented on the requirements to replenish logistic shortages and address training concerns during the preparation phase. The training and logistical shortcomings were issues that were suppose to have been resolved during pre-deployment from home-station. It was also revealed that there was no plan in place for theater level re-supply of CBRN equipment. This would have been catastrophic had there been a need for the equipment due to a CBRN incident.

One of the components of CBRN defense is the warning and reporting network. This allows for the timely reporting of impending CBRN attacks, contamination and vulnerability analysis. This critical tool facilitates contamination avoidance and mitigates the impact of CBRN attacks. CBRN warning and

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[43] Field Manual 100-17-1 states RSO&I is a crucial phase of an APA operation. It begins on arrival of the first APA ship or the first aircraft of the main body at the designated APOD/SPOD. It ends when adequate equipment and supplies are discharged and issued to awaiting units; C2 communications are established; units have moved to the TAA; and the ARFOR commander reports that all essential elements of the heavy brigade have attained combat readiness. The brigade's simultaneous or subsequent tactical operations and movements to those operations are not considered part of the APA operation.

reporting is conducted through the Joint Warning and Reporting Network (JWARN). This is a digital program that allows the division NBC section to conduct CBRN planning and reporting. A shortfall with JWARN is that it is not tied into the digital architect that the Army currently uses. It is a stand alone system that does not enable the JWARN operator to send graphics and reports to a unit on the move; consequently, the information does not help the warfighter if it cannot be sent to them in a timely manner.

The TIC/TIM toxic threat was evident during OIF. The 4th Infantry Division recognized their inability to handle this threat with great concern.

> Current chemical detectors (to include the Fox vehicle) do not have the capability to detect commonly known TIMs. During the conduct of operations in Iraq, TF IH encountered numerous potentially hazardous munitions and materials. Not having the necessary equipment with the capability to detect and identify industrial hazards could have cost the TF dearly. [44]

The division was unable to develop a solution to this requirement. There still does not exist a capability to detect and identify TICs/TIMs agents. Again, 4ID illustrates the concern the unit had for this threat.

> The TF occupied an enormous battlespace, which often required units to employ hazard area assessment teams at the company and battalion level. Though each company had trained NBC recon and survey teams, many of them were not trained to operate in the environment we encountered. We train and equip these teams to detect NBC hazards on the "open" battlefield rather than a potential industrial hazard in a bunker or warehouse. They were unprepared in their training and ill equipped for this type of environment.[45]

The CBRN C2 doctrine used for OIF was inadequate. V Corps was augmented by a National Guard Chemical Brigade that was responsible for coordinating CBRN requirements. V Corps' AAR stated that the brigade was not useful due to its late arrival. The timeline that the brigade operated under

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[44] Ibid

[45] Ibid.

for its mobilization and deployment did not give it adequate time to be in place prior to coalition forces crossing the Line of Departure (LD). The brigade was late into theater and did not cross LD as originally planned. The factors leading to the brigade's inability to meet LD time can be traced to the brigade not being identified early on as a requirement, coupled with its location in the deployment priority and its time requirements for mobilization and deployment.[46] This lateness is probably more attributable to the organization's timeliness to get to the battlefield and less with its own C2 capabilities.

Joint Doctrine in a CBRN environment is another concern. In terms of decontamination, one of the issues is determining what is considered free of contaminants. Specifically, at what point can a piece of decontaminated equipment, facility or terrain be considered clean. Army doctrine FM 3-11 states "the required decontamination that is required to clean the equipment, facility or terrain can be considered safe to operate in without protective gear." Conversely, Air Force doctrine differs substantially from the Army. Air Force doctrine states that a facility that has been contaminated with an agent can be re-entered in a matter of days.[47] Air Force doctrine takes into account the porous surface and the persistency of the agent. Based on tests conducted at Osan AFB in Korea in 1999 it was determined that the time requirements that the Army was using were incorrect. This basically calls into the question which

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[46] Headquarters, V Corps, NBC AAR, dated 25 Aug 2003

[47] Restoration of Operations (RestOps) is an Advanced Concept Technology Demonstration (ACTD) designed to help fixed military sites, such as air bases, protect against and recover from the consequences of chemical or biological attacks. The five-year ACTD is divided into two phases, a three-year demonstration phase, followed by a two-year transition phase. During the operations at Osan Air Base in Korea the Air Force concluded that it is safe to work in a contaminated environment that was contaminated with a persistent agent mask free hours after a chemical attack. This is in contrast to Army doctrine that states that the persistency of the agent is normally days to weeks and must be done in mask. Defense Threat Reduction Agency, fact sheet, *Restoration of Operations Advanced Concept Technology Demonstration*, available (on-line) http://www.dtra.mil/ news/fact/nw%5 Froactd.html; accessed 7 February 2004.

service's science is correct. The following is an excerpt from a US Army Chemical School Lessons Learned from OIF on how "clean is clean."

> We need multi-service definition of what is considered "clean". Each branch of service has a different definitions/perspectives as to what is "clean". An Army unit who has the responsibility of deconing an Airforce plane may come into issues if the plane is clean to Army standards and not Airforce standards. Which standard do we adhere to? Defense Threat Reduction Agency (DTRA) is currently looking into this issue.[48]

Joint Publication 3-11 "Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments does not identify the decontamination requirements. It states that the Combatant Commander (COCOM) will determine the acceptable contamination levels in a theater. The above statements highlight the need for a joint answer for what is considered "clean."

OEF, NOBLE EAGLE and OIF were recent examples of the need to address CBRN requirements. Each of the operations was filled with situations where the requirements and capabilities were not addressed adequately. There is a lot of speculation as to why CBRN agents were not used against coalition forces but the information from the organizations themselves revealed that had they been used there was doubt as to how prepared US forces would have been to handle them. It is imperative that these lessons learned are adhered to and the concerns addressed.

Chapter 3 assessed the CBRN capability in recent conflicts and identified shortcomings that need addressing. Chapter 4 looks at the ongoing approaches to dealing with the CBRN threat of the future. This chapter will identify a possible solution to dealing with the CBRN threat in the COE.

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[48] US Army Chemical School, *AAR Comments from the Chemical Corps Warfighter Conference, 25-26 October 2003*; Fort Leonard Wood, MO 14 November 2003

CHAPTER 4

PREPARING FOR THE CBRN THREAT

"There is no doubt—we are short infantry, we are short chem-bio units, we are short military police. Truly, we are stressed."

General Keane, Vice Chief of Staff[49]

CBRN weapons are possibly the most serious threats that the US faces in the foreseeable future. This threat was emphasized even more when a Pakistani scientist acknowledged that he had shared nuclear weapon technology with the rogue countries of North Korea, Libya and Iran. The extent of how much information and technology and to which countries and possible terrorist organizations may have gotten this information is unknown.[50]

Chapter 4 looks at the ongoing developments in preparing for the CBRN threat and makes recommendations for force structure improvements as well as improvements in doctrine, organization, and personnel that will assist in dealing with the threat. This does not constitute an analysis and review of the entire US Army Chemical Corps, but a review of specific areas. There are recommended solutions to force structure, doctrine and the need for a CBRN multi-purpose unit.

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[49] Keane, Gen, General Keane's comments in August 2003 on the need for more units to support the ongoing operations., available from http://www.GovExec.com.htm; accessed 19 January 2004.

[50] Washington Post, *"Insider Tells Of Nuclear Deals, Cash Pakistani Scientist Netted $3 Million";* available from http://www.washingtonpost.com/wp-dyn/articles/A59015-2004Feb20.html; internet (online) accessed 21 February 2004.

The US Military is in the process of undergoing a transformation. The intent is to transform from the threat-based capability used during the Cold War to a capabilities-based military. Today's "Current Force (Army) transforms into the "Future Force" where TRADOC Pamphlet 525-3-90 outlines the requirements and capabilities of the Unit of Employment and the Unit of Action.[51] This concept is driven by the ability to see first, understand first and shoot first. This occurs through leveraging technology and new fighting concepts. A future force will have the ability to deploy into theater with a tailor made or modular organization that does not have the traditional logistic requirement but has the capability to develop situational understanding of the environment it is operating. This will minimize and when possible eliminate the RSOI requirement. In regards to CBRN requirements the organization is expected to operate within the environment with no degradation. There are no organic CBRN capabilities within the Unit of Action or Unit of Employment. The CBRN organizations are echelon above corps (EAC) units. The expectation is that the Intelligence, Surveillance and Reconnaissance (ISR) capabilities embedded within the organization will allow it to first identify a threat and then engage the threat before it has the opportunity to attack with CBRN weapons. There is a tendency to assume that ISR capabilities can identify potential launch sites, weapon systems, facilities and threat capabilities to minimize the

[51] The Army's Objective Force (OF) concept employs a functional framework in which Units of Employment (UE) perform tasks assigned to service headquarters above brigade level. The Unit of Action (UA) is the tactical warfighting echelon of the OF and comprises echelons at brigade and below to fight tactical engagements and win battles. The UA is designed to win on the offensive, across the full spectrum of conflict, against any expected adversary as part of a UE or Joint Task Force (JTF). In a low end (small scale contingency (SSC), one or more UAs can operate directly under a JTF. A UA can serve as an Army Forces (ARFOR) component headquarters for the JTF in this low end SSC framework. Headquarters, Department of the Army, TRADOC Pamphlet 525-3-90, *The United States Army Objective Force Operational and Organizational Plan Maneuver Unit of Action*, Washington DC, 23 June 2003.

effectiveness of a CBRN strike.[52] There are flaws with this concept. The first is potential threat from toxic compounds and toxic materials. The vignette in Chapter 2 on the employment of a force into an environment that encountered a TIC in theater shows the vulnerability. The second flaw is revealed in the examination of the Army's current preparedness for a possible contaminated environment during OIF. The gap between current readiness and the requirements for the future force are great. One means of closing the gap is the restructuring of the current CBRN organizations.

CBRN Multi-Purpose Organizations

"At the Operational and Tactical levels, US Forces must be trained and ready to operate in WMD environment with little or no degradation in posture."

Major Combat Operations (MCO) Joint Operations Concept (JOC) [53]

Lack of a viable command and control structure for CBRN assets has been a constant theme throughout this analysis. OEF, NOBLE EAGLE and OIF provided examples of the need to develop a hierarchy to coordinate CBRN defense activities within the Army for both Homeland Defense and Major

[52] TRADOC PAM 525-3-90 states the following for operating in a CBRNE Environment; Maneuver support imperatives provide the UA the means to conduct operations in a CBRN environment through embedded capabilities and augmentation from UE and Joint Forces. The basic maneuver support operational is applied in CBRN operations through the processes of Shape-Sense-Shield-Sustain. UA personnel and leaders are trained and equipped to conduct operations in a CBRN environment.

[53] Department of Defense, US Joint Forces Command, Major Combat Operations Joint Operating Concept, version 0.925a, 14 January 2004.

Combat Operations (MCO). The following is an excerpt from the Operational and Organizational (O&O) Concept for a CBRNE Operational Headquarters.

> The US Army has no single organization to effectively train, integrate, coordinate, deploy, and manage its specialized CBRNE technical assets (In this O&O Concept the CBRNE title includes Explosive Ordnance Disposal (EOD). Corps-level and Army Service Component Commanders (ASCCs) are currently not staffed with sufficient personnel or expertise to manage these assets. As a result, these technical assets are often not used effectively and efficiently to meet operational requirements. A dedicated, stand-alone command and control headquarters for US Army CBRNE technical assets addresses this shortfall.[54]

The O&O also highlights the lessons learned from OIF that revealed the shortcoming due to a flawed C2 structure. The O&O lays out the construct for a brigade level command and control headquarters with the purpose of coordinating all CBRNE activities. The organization is mostly Army but will have joint and interagency participation as well. The organization, assigned to the Joint Forces Command, will be responsible for coordinating CBRNE requirements for both Homeland and war-fighting requirements. The headquarters is a step in the right direction. It addresses an operational level need where currently there is no structure to provide the operational level CBRN C2. The brigade headquarters will be commanded by a Colonel and will coordinate all CBRN activities to include WMD Civil Support Teams, Technical Escort Units and CBRN active and reserve unit requirements. This headquarters does not address the tactical level requirements at either the Homeland Defense or warfighting requirements. This organization has no habitual units and is for coordination efforts only. OIF illustrated the shortfall in trying to integrate a Reserve Chemical Brigade Headquarters with active forces already in theater.

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[54] DRAFT Version 4.1 Operational and Organizational Concept – CBRNE Operational Headquarters, undated.

In order to address one of the current shortfalls in operating against CBRN weapons there is a need to organize a unit that provides the Army and the joint commanders a capability to meet the requirements that have been established in both Joint and Army doctrine. This monograph has illustrated from the major combat operations that occurred during OIF and OEF that the need still exists and has not been addressed yet. Using the criteria of Agility, Responsiveness and Versatility that were established in Chapter 1 as a evaluation tools, the following will illustrate the benefits of establishing multi-purpose CBRN units to enhance the military' capability in a CBRN environment in both major combat operations and homeland security.

Based on the lessons learned and the required capabilities from Joint and Army doctrine there is a requirement for establishing CBRN multi-purpose organizations. Using the criteria as a measure of effectiveness this need will be shown.

Agility: An agile force package that is responsive and able to conduct all of the required missions. Under the current CBRN organization construct units are limited to specific capabilities, severely limiting the Army's ability to meet the threats that exist in the COE. OPERATIONS OIF, OEF and NOBLE EAGLE provided multiple lessons learned illustrating that the current CBRN organizations are ill suited for certain missions that the US will face. This was also evident in the review of the current CBRN organizations in Korea and Germany.

Responsiveness: Ability to deploy quickly with the right forces at the right place at the right time. The brigade headquarters that was tasked to support V Corps for OIF did not make its start time (SP). The organization was forced to integrate on the battlefield and assume a C2 relationship with units that were much further along in the operation flow on the battlefield. An event in the European Theater would likely have similar results.

Versatility: Army forces conduct prompt and sustained full spectrum operations with forces tailored to accomplish the mission. Current CBRN force structure is limited with organizations having

one capability. Those that are dual purpose cannot conduct them simultaneously. If the threat requirement is inaccurate and the wrong organization is deployed to the theater, the organization does not increase the JTF's capability but can hinder it.[55]

One of the solutions to the CBRN C2 requirement is the development of CBRN multi-purpose headquarters and organizations. This will address the shortfall in CBRN C2 requirement and provide a capability that currently does not exist. There should be CBRN Brigades and Battalions aligned with active forces that would coordinate and support the warfighting organizations. A more proficient C2 of CBRN activity is the first capability these organizations would provide. This gap was highlighted during OEF by having company level organizations as the highest level in theater, as they were in Afghanistan and Kuwait, without any higher CBRN C2 structure. In each instance the company commanders were always looking for guidance and priority establishment and were often left in a void. The Chemical staff officers assigned to the JTF headquarters could provide input and recommendations but had no tasking authority which left the organizations in a lurch. Currently there are only company level organizations which are insufficient to meet the requirements.

Within each of the Army's Corps should be an active duty Chemical Brigade responsible for CBRN requirements. Within the Brigades would be multi-purpose battalions aligned with each divisions within the Corps. The Brigade Commander would be both the Commander and the Corps Chemical

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[55]There is a distinction in this analysis between the criteria of versatility and agility. An organization can be versatile but not agile as in the case of the current dual-purpose companies. The companies' ability to conduct two distinct missions (smoke and decontamination) makes it versatile, however, they cannot conduct the missions simultaneously, which illustrates their lack of agility. The same observation can be made of the 2nd Chemical Battalion. The battalion can conduct multiple missions through its subordinates, but it cannot deploy and command and control these operations. Both situations identify where an organization can be versatile but not agile.

Officer. Currently the senior ranking Corps Chemical Officer is a staff officer with no authority to assign missions to the CBRN units. This same set up would also occur at the Division level with the Chemical Battalion Commander. The current chemical battalions are not organized for C2 purposes other than garrison administrative activities such as personnel and training but not maintenance and logistics. These organizations rely on their companies to sustain themselves and to establish some sort of C2 structure with the organizations they are deployed with. During OIF two chemical companies from 2d Chemical Battalion were deployed to support TF IRONHORSE but not the battalion headquarters. This task organization would not have happened in any other battlefield functional area. Doctrinally when two or more companies are deployed the battalion deploys a battalion C2 structure to coordinate the companies' activities. Both sustainment and C2 relationships are ad hoc and confusing. The current structure has the company commander coordinating with the brigade staff and in some cases as high as the JTF staff as was the case during OEF. In both instances, in Kuwait and Afghanistan, the company commanders were forced to coordinate with the JTF staff. The establishment of robust brigade and battalion headquarters that are fully functional to meet the C2 and sustainment requirements of a tactical headquarters would address the shortfall. Figure 1 displays a recommended brigade organization structure.

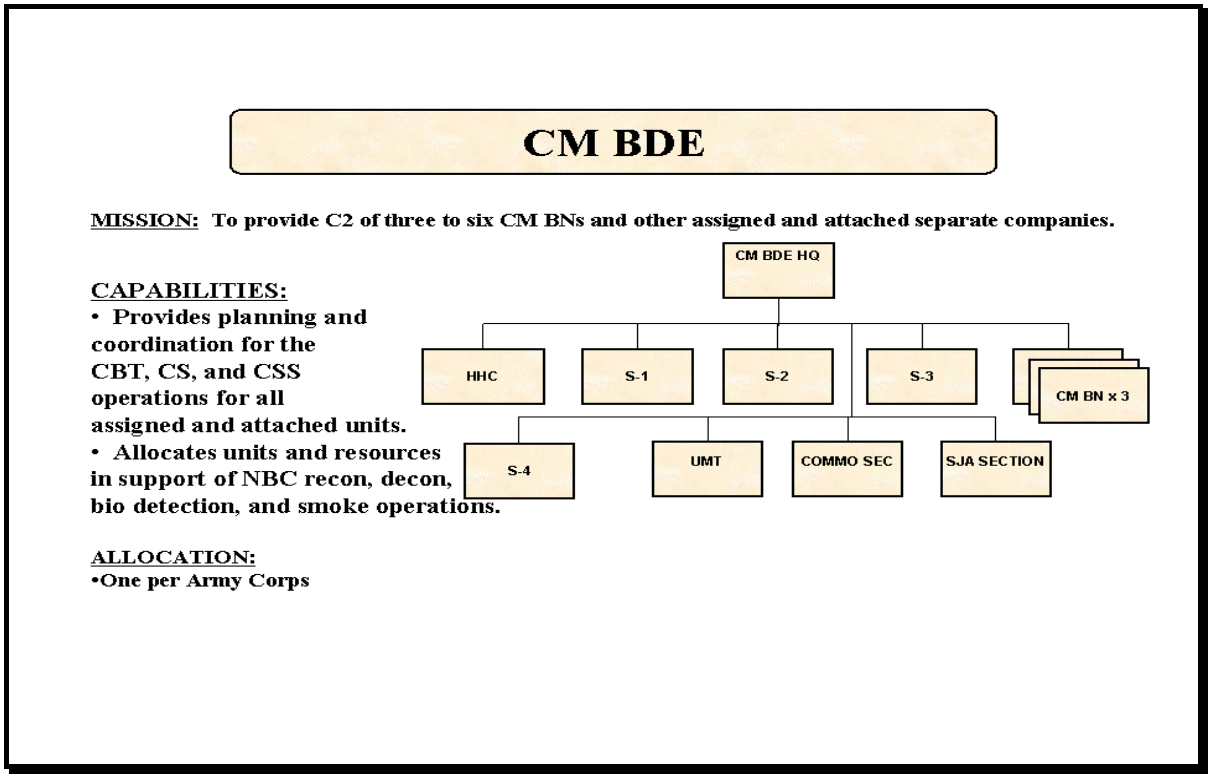

Figure 1: Proposed Chemical Brigade Headquarters. Figure created by author.

The structure and capabilities of the current CBRN battalions is another area to be addressed. Currently there are three active duty Chemical Battalions within the Army. The battalions are not all structured the same. The III Corps 2d Chemical Battalion has three companies. One company is a pure mechanized smoke unit, one is a dual-purpose company with the ability to conduct smoke and decontamination operations but not simultaneously. The third company, previously assigned to the 4th Infantry Division, has the ability to conduct decontamination and NBC reconnaissance operations. The battalion also has a Headquarters Detachment, which consists of the Battalion command and staff sections. The Battalion does not have the capability to conduct robust command and control operations nor logistic support to the companies. Currently the companies are deployed as individual units without the battalion headquarters. The 83rd Chemical Battalion is assigned to the XVIII Airborne Corps. The

battalion consists of a Biological Detection Company (BIDS), a Fox Reconnaissance Company, two smoke/decontamination dual purpose companies and a headquarters detachment. Its headquarters element is able to conduct limited C2 and logistic sustainment operations. Historically the companies are deployed to support mission requirements as pure companies or as Company/Teams. There have been instances where platoons are deployed individually. The 23rd Chemical Battalion, assigned to Eighth US Army in Korea, is the third active duty battalion. This battalion consists of a headquarters detachment and two decontamination companies. The battalion has no smoke or reconnaissance capabilities.

Based on a needs assessment that has been identified consistently in all future vision guidance on the requirements to operate in the COE and the limited capabilities that the current force structure provides, the solution could be found in a multi-purpose battalion. The criteria of responsiveness, agility and versatility as measures of effectiveness (MOE) illustrate the viability of the unit. Had these organizations existed and operated in previous operations (OIF and OEF) the capabilities that these organizations provide would have greatly enhanced the JTF's ability to operate in a CBRN environment. A multi-purpose battalion will provide the Army the capability to close the current shortfall and serve as a combat multiplier to future operations.

The organization structure consists of a battalion headquarters with four subordinate companies. The battalion headquarters will be structured to provide C2, operation and logistic support. The battalion headquarters would have the capability to deploy as a C2 headquarters into any environment and provide the required C2 and logistic support.

Three of the four companies would have the capability to conduct CBRN reconnaissance. They would have the ability to detect and identify chemical, biological, nuclear and toxic hazards. The companies would no longer be single threat identification capable. The fourth company would be a decontamination unit. The battalion's structure gives the Army the flexibility to deploy an organization that does not have the stove pipe structure of the past and provides a robust capability. The battalions are

organized under the chemical brigades that are aligned with the Corps. The brigades and battalions have the ability to deploy into any Combatant Command Area of Operation and support a Joint Task Force Requirement. The multi-purpose battalion would also have the ability to respond to a Homeland Defense requirement.

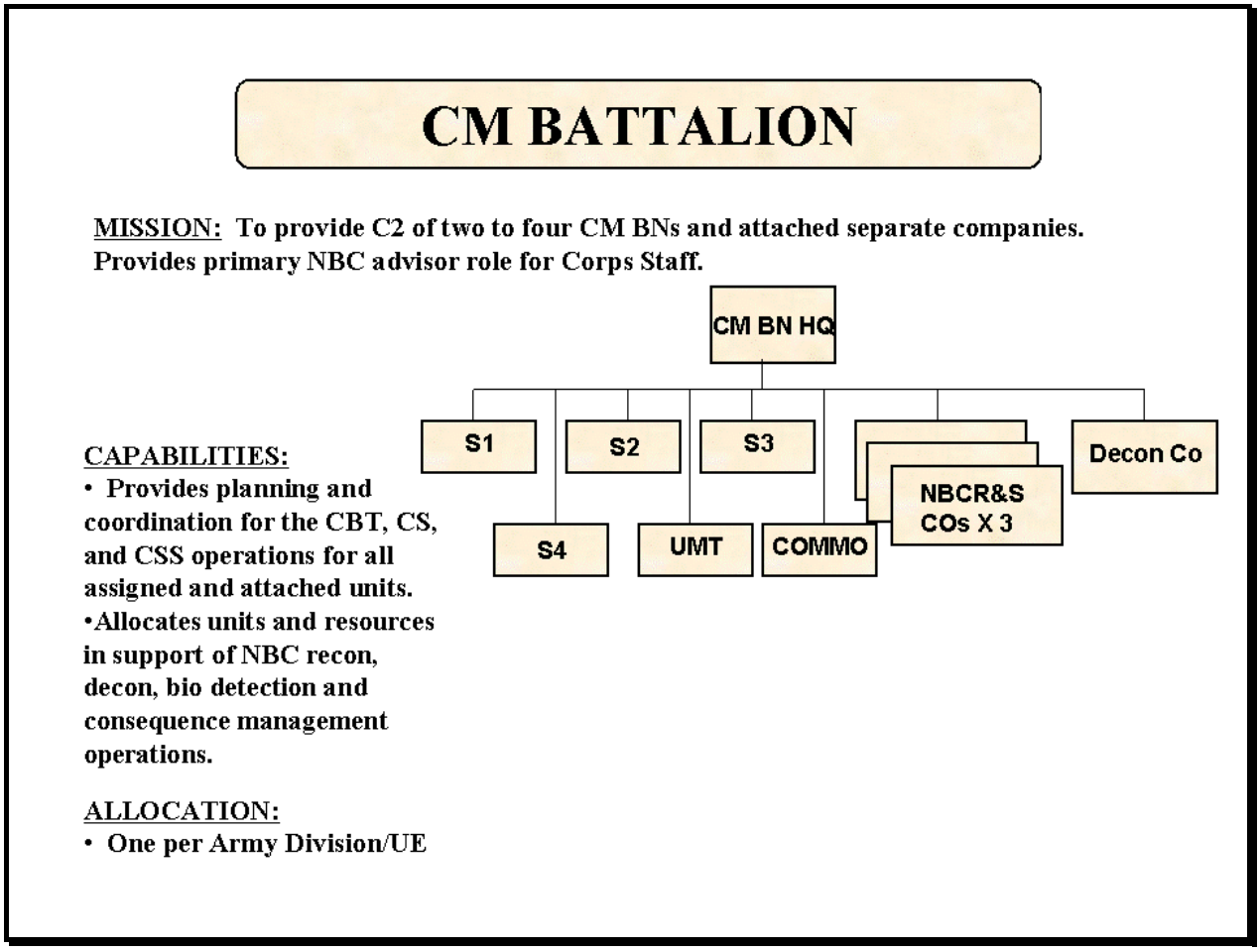

Figure 2: Proposed Chemical Multi-Purpose Chemical Battalion. Figure created by author.

These organizations can operate under the UE and UA concept. Structured with the modularity concept of being able to pull an organization and plug it into a force requirement provides the Army the flexibility to quickly deploy the organizations to meet any existing contingency. Currently there are no organizations that are structured to operate in a homeland defense role. The proposed multi-purpose

organizations would operate in both combat operations and in a home security support requirement. The organization can conduct decontamination and consequence management support in a crisis situation and has the CBRN C2 structure required to operate as part of a UE, JTF or in support to civil authorities.

This is not an attempt to create new organizations by having additional soldier requirements over and above the current force structure. This would require the realignment of the chemical soldiers that are currently assigned in the Army's warfighting units. Currently chemical soldiers with Military Operation Skill (MOS) 54B are assigned down to the company level. The authorization is for a soldier in the rank from Private to Sergeant assigned to each company. The soldiers are trained in chemical operations and act as the NBC advisor for the commander. This is a wasted asset because the soldiers spend as little as 20 percent of their time conducting NBC operations. They are typically the commander's or first sergeant's driver, work in the company' training room and do a myriad of non-NBC related tasks. The authorization is for Sergeant E-5 but typically filled by a Private First Class or Specialist out of Basic Training and the Advanced Individual Training Course. The soldiers are not trained to be a Company NBC NCO but are trained to operate in a Chemical Company as a NBC Defense Specialist. Non-54B soldiers from within the company could fill these positions. Each division operates a two week NBC Defense Course which instructs the soldiers on how to operate a NBC room and the basics of NBC defense. The priority of working in a NBC Room is maintenance operations. This is basic instruction taught in the NBC Defense Course and not in the 54B AIT. Years ago the NBC Defense doctrine called for companies to establish NBC Defense Teams that would operate in a NBC environment. The NBC NCO would train the company teams but the team concept was done away with to ensure that the skills would not be limited to a select number of soldiers. Assigning NBC specialists at the company level creates multiple problems. The soldiers' professional development falls under the purview of the battalion NBC NCO but the soldiers work for and belong to the company. NBC training is not a priority of the company commander. Also once assigned to a company NBC NCO position the soldiers are rarely

allowed to rotate out of the companies into a chemical company. These soldiers spend the duration of their initial enlistment as a specialty soldier and never get the opportunity to develop the skills they were trained for. If and when they get an opportunity to serve in a squad leader position they are ill suited. The current system has it as a roll of the dice. The soldiers assigned to a chemical company have plenty of leadership and developmental opportunities versus those unfortunate enough to have to work in a unit NBC room. The best case scenario would be for the soldiers to spend 12-15 months in a NBC room and then rotate into a chemical company which is rare. The NBC NCOs are often seen as too valuable to their units and their loss too critical.

Eliminating these positions could generate close to a thousand soldiers to man the reorganized chemical battalions. Within the thirty-three maneuver brigades that are in the Army's Active Force there are over four hundred NBC soldiers at the company level. Add in the Engineer, Artillery, Air Defense, and Logistic organizations and the number grows substantially. This does not include the Armored Cavalry Regiments, separate brigades and other organizations that are authorized company level NCOs.

Another area to address is the increased use of technology to operate in the CBRN environment. Joint and Army doctrine consistently state the increase leveraging of technology is a major component for transformation and operating within the COE, with regards to CBRN that involves the increased use of sensors. The NBC 2001 Path Forward states the following on the need for integrated sensor capability.

> The linkage of what the sensor can detect and when it is operational is essential for interactive NBC networking planning and cross platform integration. Fielded NBC protection systems are limited to current capabilities such as the Biological Integrated Detection System (BIDS), Nuclear, Biological, Chemical Reconnaissance System (NBCRS, also FOX), and M8A1 Alarms. Of these systems, only the BIDS and FOX have rudimentary networking capabilities.[56]

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[56] US Army Future NBC Architecture Organization and Operation (O&O), US Army Chemical School, March 2001.

OIF and OEF both identified this shortfall. Technology must be leveraged to provide the ability to identify, detect and warn friendly forces of a potential or real threat. Transformation consistently states the need to take advantage of existing technology and also require technological developments that meet the capabilities requirements of the future force. William King states in his monograph "*Nullifying the Effectiveness of Weapons of Mass Destruction (NBC) through Integrated Land, Air, and Space-Based Sensors and Analysis,*" the need to incorporate satellites and sensors into a system that provides warning, detection and reporting capabilities to the warfighter.[57]

King states that the sensor system would provide global, regional, as well as large area surveillance and early warning of all chemical and biological signatures within a theater of operations.[58] His conclusion is that there is the need to leverage current satellite and sensor technology that can be used on both the battlefield and for homeland defense.

The final area to examine is the role of obscuration or smoke operations. This monograph did not highlight the role of smoke or obscuration operations in the COE and a review of the proposed CBRN multi-purpose battalion would note their absence which was intentional. Currently smoke operations are a major component of the NBC operations which requires use of smoke generators and smoke pots to provide force protection operations for friendly forces. Among the US Army Chemical community there has been some low level debate about the continuous need for smoke operations. The issue is the

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[57] William King IV, "Nullifying the Effectiveness of Weapons of Mass Destruction (NBC) through Integrated Land, Air, and Space-Based Sensors and Analysis." School of Advanced Military Studies, United States Army Command and General Staff College, KS, 20 May 1999.

[58] Ibid.

viability of smoke and/or should it be incorporated into another branch. According to the 3rd Infantry Division OIF AAR smoke operations served no purpose on the battlefield, it was not used, and the division recommended the obscuration mission be dismantled. The same concern is in the role of smoke operations for Homeland Defense. There is no credible scenario where smoke would support friendly forces in a Homeland Defense operation. Currently, smoke can be provided by artillery units and by smoke pots. The soldiers that are currently in the smoke units could be converted to fill the recommended multi-purpose CBRN battalions.

Conclusion

The US Army has fought two major wars in the Middle East against the Iraqis. In each instance there was an expectation that WMD would be used against the US. In both instances they were not, but there was always a cry from the small CBRN community that the forces were not prepared to fight in that environment. Immediately after OIF, multiple AARs were done on how well the Army fought and what lessons were learned. Tucked away in several AARs are issues that could have been catastrophic in nature but receive very little attention. The organizations that participated in OIF consistently identified the shortfalls in the Army's posture at the beginning of the conflict and the concerns that were not addressed prior to crossing the Line of Departure. Doctrine and guidance for the future environment consistently state of the probability of an attack using CBRN.

What is known is that the requirements that are outlined in the Future Force organizations and the capabilities that are being developed to address the CBRN environment identify a significant shortfall. This monograph has served to provide an analysis of the critical areas that should be addressed and provide some recommendations that would close this gap. Joint and Army doctrine consistently establish an expectation of the capabilities that are required to support the Joint Force Commander and the expectation for operating capabilities in any environment, especially a CBRN environment. Currently and in the foreseeable future these expectations are not being met. There exists a culture that looks at NBC as one of annoyance and one to avoid. The OIF AARs emphasized the need for commanders to be more proactive in CBRN readiness issues.

It is imperative that the senior leaders understand the gaps and shortfalls and take action. The doctrine that outlines the requirements and capabilities are words that have a lot of style but currently have very little substance. When counter-proliferation of WMD fails, the next step must be preparedness, which will mitigate and minimize the effectiveness of the weapons.

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