Description of document:	Title of Thesis: Non-Lethal Weapons: Weapons of Mass Disruption 2004. Released by the Office of the Director of National Intelligence (ODNI)
Requested date:	2022
Release date:	20 December 2024
Posted date:	13-January- 2025
Source of document:	FOIA Request Director, Information Management Office ATTN: FOIA/PA Office of the Director of National Intelligence Washington, D.C. 20511 Email: ODNI_FOIA@odni.gov

OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE
WASHINGTON, DC

20 December 2024

Reference: ODNI Cases DF-2022-00310, DF-2022-00311, & DF-2022-00314

This letter provides an interim response to three of your Freedom of Information Act (FOIA) request to the Defense Intelligence Agency (DIA) requesting specific theses written by students at the National Intelligence University. As previously noted by DIA, DIA transferred these cases to the Office of the Director of National Intelligence (ODNI) in 2022.

ODNI is processing these requests under the FOIA, 5 U.S.C. § 552, as amended.

This interim response addresses eight of the theses. ODNI determined that one thesis, *Why the United States Needs a Domestic Intelligence Service and How to Make it Work*, falls under the purview of another government agency. It has been referred to them for review and direct response to you. *Non-Lethal Weapons of Mass Disruption* is provided in response to case DF-2022-00311 and *Hollywood Soldier Intelligence Support for SOFTWAR Operations* is for case DF-2022-00314. The other five these were requested under case DF-2022-00310.

During the review process of the seven documents being released directly to you, we considered the foreseeable harm standard and determined that certain information must be withheld pursuant to the following FOIA exemptions:

- (b)(3), which applies to information exempt from disclosure by statute. Specifically, the National Security Act of 1947, as amended:
  - Section 102A(i)(l), 50 U.S.C. § 3024(i)(1), which protects information pertaining to intelligence sources and methods; and
  - Section 102A(m), as amended, 50 U.S.C. § 3024(m), which protects the names and identifying information of ODNI personnel.
- (b)(6), which applies to information that, if released, would constitute a clearly unwarranted invasion of personal privacy.

Be advised, we continue to process your request. If you are not satisfied with this response, a number of options are available. You may contact me, the FOIA Public Liaison, at ODNI_FOIA_Liaison@odni.gov, or the ODNI Requester Service Center, at ODNI_FOIA@odni.gov or (703)-275-1313. You may also submit an administrative appeal to the Chief FOIA Officer, c/o Chief, Information Management Office, Office of the Director of National Intelligence, Washington, DC 20511 or emailed to ODNI_FOIA@odni.gov. The appeal correspondence should be clearly marked "Freedom of Information Act Appeal of Adverse Determination" and must be postmarked or electronically transmitted within 90 days of the date of this letter.

Lastly, the Office of Government Information Services (OGIS) of the National Archives and Records Administration is available with mediation services and can be reached by mail at 8601 Adelphi Road, Room 2510, College Park, MD 20740-6001; telephone (202) 741-5770; toll-free (877) 684-6448; or email at ogis@nara.gov.

Sincerely,

Erin Morrison
Chief, Information Review and Release Group
Information Management Office

NON-LETHAL WEAPONS:

WEAPONS OF MASS DISRUPTION

by

(b) (6)
PGIP Class 2004

UNCLASSIFIED//~~FOUO~~ Research Paper submitted to the Faculty
of the Joint Military Intelligence College
in fulfillment of thesis requirements

June 2004

ABSTRACT

TITLE OF THESIS: Non-Lethal Weapons: Weapons of Mass Disruption

STUDENT: (b) (6)

CLASS NO. PGIP 2004 **DATE:** June 2004

THESIS COMMITTEE CHAIR: (b) (6)

SECOND COMMITTEE MEMBER: (b) (6)

This research presents a description and analysis of the U.S. military's Joint non-lethal weapons program and capabilities as it exists in 2004. The purpose is to identify the relevance, adaptability, impact, and shortfalls of non-lethal weapons and the current need for improved intelligence support to non-lethal users at the strategic, operational, and tactical level as non-lethal weapons are incorporated into future military operations.

Non-lethal weapons present a unique challenge to the U.S. military and intelligence communities. Non-lethal weapons are represented by a many types of weapons, each uniquely designed to support various non-lethal operations. They are purposely designed to be non-lethal though they can be employed by a lethal system. What non-lethal weapons and their capabilities offer is not a revolutionary way of conducting warfare, but support the revolution in military affairs and military thought. Non-lethal capabilities change the way future wars are fought and how the peace will be maintained for commanders. Where levels of lethality were virtually non-existent ten years ago, commanders can now conduct military operations with a minimal of casualties and collateral damage.

The commander has the ability to conduct war and conduct peacemaking operations simultaneously.

The history of non-lethal weapons began when the first soldier stood guard at a gate, but it has only been since 1997 that the non-lethal weapons program has come to formal existence with the establishment of the Joint Non-Lethal Weapons Program (JNLWP) at Quantico, Virginia. The establishment of this program brought together the non-lethal needs and demands of the armed services into the one organization that focuses on a truly joint level when developing non-lethal weapons. The Military Police Corps acts as the Army's proponent for non-lethal weapons allows and bridges the gap between the ever blurring line of military and law enforcement operations, especially in Stability and Support Operations (SASO).

The use of non-lethal weapons presents a number of challenges to the United States in such areas as international law and treaty conventions, Department of Defense (DoD) policy, budget constraints, doctrinal development and training challenges, institutional and generational rigidity, proliferation of non-lethal weapons and the need to establish an intelligence support system that supports the employment of non-lethal weapons.

This thesis is a unique contribution to the military community as it addresses current and future non-lethal weapons and the role they will play in future operations. In addition, the role of the intelligence community will assist in determining the success or failure of non-lethal weapons. An accurate intelligence picture of the enemy, their capabilities and intentions will allow

commanders the opportunity to use lethal force or non-lethal force as the situation dictates. The commander has greater control over an operation and has a greater influence on the outcome of the battle.

CONTENTS

List of Figures.....iv

Chapter **Page**

1. INTRODUCTION TO NON-LETHAL WEAPONS.....1

   Overview of Non-Lethal Weapons, 2
   Future Conflicts, 4
   Lethal and Non-Lethal Force, 6
   Non-Lethal Support in Conventional Warfare, 7
   Non-Lethal Use in Stability and Support Operations (SASO), 8
   Problems of Non-Lethal Weapons, 8
   The Non-Lethal Weapons Program, 12

2. DEFINITION OF NON-LETHAL WEAPONS AND WEAPON SYSTEMS.....15

   Non-Lethal Weapons Technology, 18
   Requisite Criteria for Employment, 20
   New Developments n Non-Lethal Weapons Technology, 24
   Additional Non-Lethal Weapons Technology, 29
   Non-Lethal Response to the Threat, 30
   Intelligence Challenges in Support of Non-Lethal Weapons, 32

3. NON-LETHAL WEAPON OPERATIONAL USES.....35

   Non-Lethal Intent, 35
   Operational Environment, 36
   Non-Lethal Weapon Risks, 40
   Non-Lethal Weapons Training, 42
   Rules of Engagement, 43
   Specialized Rules of Engagement Definitions, 45
   Threat Resistance Behavior, 50
   Force Response Options, 51
   Chapter Summary, 56

4. THE HISTORY AND DEVELOPMENT OF NON-LETHAL WEAPONS.....58

   Contemporary Non-Lethal Weapons and Proliferation, 63
   International Non-Lethal Proliferation Concerns, 64
   International Agreements, 68

5. NON-LETHAL SCENARIOS.....74

Scenario #1: Humanitarian Mission and the Use of Non-Lethals.....75
Scenario #2: Urban Operations and the Use of Non-Lethals.....77
Scenario #3: Preemptive Strike and the Use of Non-Lethals.....79
Scenario #4: Riot Control and the Use of Non-Lethals.....81
Lethal/Non-Lethal Force in Urban Operations.....84
Peacekeeping.....87
Maritime Interception.....90
Non-Lethal Protection of a Cultural Heritage Site.....91
Protecting a Relief Convoy.....93

6. NON-LETHAL SYNOPSIS.....97

Issues and Concerns, 97
Summary, 103

Bibliography.....114

FIGURES

Figure **Page**

1. Military Spectrum of Operations.....4

2. Addition NLWs.....29-30

CHAPTER ONE

INTRODUCTION TO NON-LETHAL WEAPONS

This research presents a description and analysis of the U.S. military's Joint non-lethal weapons (NLWs) program and capabilities as it exists in 2004. The purpose is to identify the relevance, adaptability, impact and shortfalls of NLWs and the current need for improved intelligence support to non-lethal users at the strategic, operational and tactical level, as NLWs are incorporated into future military operations.

NLWs present a unique challenge to the U.S. military and intelligence communities. NLWs are represented by a many types of weapons, each uniquely designed to support various non-lethal operations. They are purposely designed to be non-lethal though they can be employed by a lethal system. What NLWs and their capabilities offer is not a revolutionary way of conducting warfare, but instead they are an integral part in the revolution in military affairs and military thought. Non-lethal capabilities change the way future wars are fought and how the peace will be maintained for commanders. Where levels of lethality were virtually non-existent ten years ago, commanders can now conduct military operations with a minimal of casualties and collateral damage.

OVERVIEW OF NON-LETHAL WEAPONS

U.S. military involvement in future conflicts, whether alone or in a coalition effort, will be more challenging then previous conflicts. The public and government expect and demand success on the battlefield. The battlefield of the future will entail fighting in complex, urban terrain against an adversary who is willing to hide among civilians and conduct hit-and-run raids on friendly forces. This environment will challenge the best military minds as to how to conduct urban warfare with limited forces while fixing and denying the enemy freedom of action until sufficient friendly forces can engage and defeat them. Compounding this dilemma are environmental issues, instant media, both friendly and hostile forces, enemies with no seemingly organized structure and the ability of friendly forces to immediately act while considering the global consequences of their actions. In order to maintain control of the battlefield and win the hearts and minds of the people, friendly forces will have to incorporate NLWs into their military actions. NLWs will assist the commander and his forces in achieving national goals and military objective by controlling situations and minimizing needless deaths.

Between now and 2020, the military will operate in a geo-strategic environment of considerable instability, driven by significant demographic, geo-political, economic, and technological dynamics. The realities of this environment will force the military to remain engaged in a wide variety of missions as increasing competition for fiscal and other resources leads to conflict between nation states and other groups that involve the United States.

The U.S. military is facing increased media attention, worldwide environmental concerns, and a low national tolerance for long, lethal, and costly campaigns even where vital interests of the nation are clearly defined. Non-lethal capabilities can expand options and tools available to every level of command.

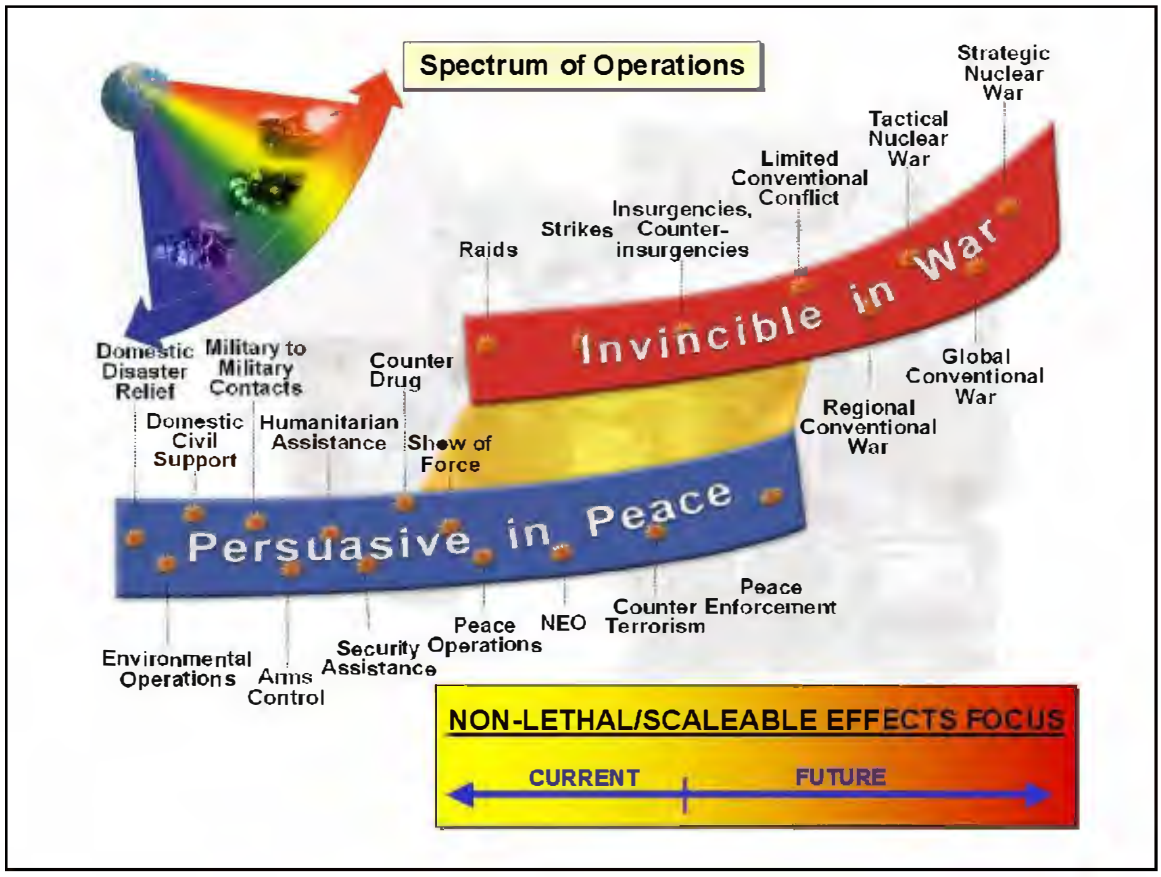
Operations Desert Storm, Enduring Freedom, and Iraqi Freedom provide a glimpse of warfare that relies on precision-guided munitions and "discriminating" technologies. Discriminating capabilities permit the user to attack targets with precision and accuracy while reducing collateral damage and unintentional loss of life. Non-lethal capabilities complement and extend the nation's diplomatic and military options beyond the use of more traditional lethal weapons while supporting the objectives of thwarting aggression and promoting stability.

Non-lethal capabilities afford expanded crisis and contingency response options. They enhance the military's ability to meet requirements of applying force proportional to the threat and while discriminating in the application of force during military operations. They can also reduce the perceived risks of excessive military force, promote international political support, alleviate environmental concerns, and enhance post conflict transitions and termination.[1]

Non-lethal capabilities by themselves are most effective when supported by intelligence in the strategic, operational and tactical environment. The threat or the target must be identified in order to effectively employ non-lethals. The intelligence community must not only identify the target, but it must understand the human dynamics of the situation, including cultural awareness, social norms, ethnic divisions within the country, city or town U.S. forces occupy, whether for short term or long term occupation.

FUTURE CONFLICTS

In the future, most countries will continue to improve and maintain military capabilities in line with regional threats and opportunities. However, potential



Unclassified

Figure 1. Military Spectrum of Operations[2]

adversaries will also modernize their military capabilities in light of the lessons of conflicts from the late 20th century and early 21st century, particularly those involving the U.S. military. They will resort to a wide range of constantly modified, asymmetrically applied conventional and unconventional tactics and capabilities to oppose the U.S. on the battlefield and interdict deployment of U.S. forces. Advances in information and

missile technology (ballistic and well as cruise missiles), and an increasing global economy will fuel continued military change. The U.S. most likely will face future adversaries on a battlefield that includes urban and complex terrain.[3]

Figure 1 illustration provides a graphic representation of the peace and war spectrums that are applicable to lethal and NLWs use. The military spectrum of operations is a gradual shift of civil/political needs to the eventual political/military employment of strategic nuclear war. As civil/political operations move to the right, the need for NLWs comes into use in humanitarian assistance operations. NLWs use becomes more prevalent as peace operations meld into war operations such as raids, strikes and insurgencies/counter-insurgency operations. The optimum situation for NLWs starts with the show of force and peace enforcement to raids and limited conventional conflict. NLWs may lose their effectiveness as military operations move beyond limited conventional conflicts. What NLWs do offer is the ability to operate in limited or constrained peace or military operations without escalating a situation to the next higher level.

While the U.S. must remain optimized for Major Combat Operations (MCO), smaller-scale contingencies will occur much more often, presenting unique challenges. Historically, smaller-scale contingencies have occurred in regions with weak infrastructure, complex terrain, and diverse weather patterns. Threats typically have included mid-to low-end industrial forces, including heavy forces equipped with early generation tanks and some mechanized infantry. The typically persuasive presence of guerilla, paramilitary, and other unconventional forces further complicates operations and broadens concerns about force protection.[4]

The MCO focus, coupled with the increasing likelihood of smaller-scale contingencies, clearly establishes the need for a full spectrum force. This force must be able to execute the full spectrum of operations: minimize non-combatant fatalities, permanent injury, and understand damage to property and environment; maintain force protection, reinforcing deterrence; and expand the range of options available to commanders. All of these imperatives demonstrate a clear need for NLWs, in conjunction with lethal weapons, to achieve a preferred outcome.[5]

LETHAL AND NON-LETHAL FORCE

The commitment of military power to resolve political crises has traditionally involved either the use of deadly force or the implicit or explicit threat of the use of deadly force. Military units are primarily trained, organized, and equipped for these purposes. A force armed only with traditional military weapons normally has only two options for effecting compliance: maintaining a presence (essentially a threat) or actually employing deadly force. These are two extreme options with no middle ground. NLWs provide commanders a more extensive continuum of options. NLWs support the National Military Strategy by providing means for flexible and selective engagement.

NON LETHAL SUPPORT IN CONVENTIONAL WARFARE

The wider range of options provided by non-lethal capabilities augment deadly force but does not replace it. Deadly force must always remain available and viable option to the commander when the situation demands it. The existence of non-lethal capabilities therefore does not represent the potential for "non-lethal warfare" or "non-lethal operations." NLWs may influence a future battlefield operation, but can not carry the battle alone. Non-combatant casualties, including serious injuries and fatalities, will continue to be a regrettable but unavoidable outcome when military power is employed, whether or not NLWs are available. NLWs simply add flexibility to combat operations and enhance force protection by providing an environment in which friendly troops can engage threatening targets with limited risk of noncombatant casualties and collateral damage.[6]

Examples include the experience of the U.S. Marine Corps and the U.S. Army's 10th Mountain Division in Somalia in 1993 under United Nation auspices and in 1995 during United Shield. Both expeditions proved that there was a need for non-lethals in military engagements.[7] Other uses include the 709th Military Police Battalion's employment of non-lethals on 4 April 2000 in Sevce, Kosovo in order to link up with isolated and threatened military police units, and the Russian use of calmatives in a Moscow theater to overwhelm Chechen terrorists threatening to kill 800 hostages.[8]

NON-LETHAL USE IN STABILITY AND SUPPORT OPERATIONS (SASO)

The rapid growth of western military involvement in humanitarian interventions and peace support operations (PSO) over recent years has prompted significant political and military interest in "new tools for new jobs." Attention has focused on specifically on the potential utility of novel equipment and weapon systems in complementing intervention actions in semi- or non-permissive conflict environments.

Moreover, military intervention concepts and doctrine, particularly related to low intensity conflict, have undergone radical change. Non-lethal weapon systems have been viewed with particular attraction in some political and military circles because of their potential to contribute to the attainment of tactical, operational and strategic objectives, but at the same time minimizing casualties and collateral damage and ensuring the protection, cohesion and legitimacy of humanitarian / PSO forces.

PROBLEMS OF NON-LETHAL WEAPONS

The first problem is that there is a risk that "lethal" force carries the potential of undermining the status and impartiality of intervening military forces. This in turn can weaken the influence of, and popular support for, intervening forces among the belligerent parties and, consequently, undermine their "consent".[9]

A prime example of how NLWs can overcome this problem is evident in the 709th Military Police Battalion's use of NLWs on 4 April 2000 in Sevce, Kosovo. The military police apprehended a man from Sevce and was taking him back to the military police

station for questioning and three days confinement for having military contraband which was a treaty violation. As the military police unit tried to leave Sevce, they found themselves quickly surrounded by an angry mob and cut off from any reinforcements. The populace did not want the military police to apprehend the suspect. Military police reinforcements quickly found themselves surrounded and assaulted with rocks, bottles and boards with nails protruding from them. NLWs were employed after the crowd started throwing rocks and injuring soldiers. The crowd quickly dispersed, at which time the military police were finally able to link up with isolated units and extricate themselves from the area and to a safe location. There were no civilian deaths. The 709th Military Police Battalion commander, LTC Brown, was asked by U.S. Army General George Joulwan as to why he employed non-lethals and not lethal force when the situation authorized its use. His response was that he did not want to have a "Boston Massacre 2000" on his hands. The use of non-lethals allowed LTC Brown and his superiors to negotiate with the village leaders from a position of strength versus weakness.[10]

A second problem for western governments and military planners to consider is gathering and maintaining domestic and international support for less-than-vital humanitarian interests and intervention. Included within this problem is accurately identifying the threat in order to employ the appropriate force while minimizing casualties and collateral damage.[11] This is especially difficult when there are no instantaneous solutions to these problems. Furthermore, the government and the populace's expectations of a quick solution may run counter to reality.

Finally, the introduction of NLWs onto the battlefield or in less than threatening situations such as peacekeeping and humanitarian missions could cause an escalation in warfare or cause Allies and Coalition Partners to pull out of the operation. How opposing forces see NLWs is critical. They may see them as a sign of weakness and conduct bold attacks against U.S. forces. Our Allies and Coalition Partners vision of NLWs may run contradictory to our vision in employment and use. They may not want to be associated with non-lethal weapon systems that can switch from non-lethal to lethal and back again. They may require a system that identifies NLWs as unique and expresses intent visually, instead of a "one system fits all" approach.

In conclusion, NLWs have a future due to the blurring of strategic, operational and tactical operations in an ever changing, complex geo-political world. Traditional methods of warfare will exist, but NLWs will reduce the reliance on lethal force in order to prevent the escalation of a conflict as shown in Sevce, Kosovo. NLWs will offer the political and military leadership the flexibility to act without jeopardizing their forces while reducing collateral damage and reducing the opponents will to fight.

There is very little is written by the military or civilian community about the non-lethal system. What is written tends to stay within a small, select group of people who deal with NLWs on a daily basis and tends to address the use of NLWs in a domestic, law enforcement role.

Civilian research and analysis on NLWs is limited, superficial and uneven in quality and quantity due to a lack of access to information on military NLWs. Nick Lewer and Steven Schofield's *Non-Lethal Weapons A Fatal Attraction* was written in 1997. This book mentions technology still in development in the NLWs community,

such as stun weapons and EMP rounds, but computer viruses and lasers designed to blind personnel addressed in the book are not considered part the non-lethal arsenal.

Brian Rappert's 2003 *Non-Lethal Weapons as Legitimizing Forces? Technology, Politics and Management of Conflict* offers the commonly known information on NLWs, but what it really exposes is the use of NLWs by British forces in Northern Ireland, in particular the use of 0-chlorobenzalmalononitrile (CS or tear gas) and rubber bullets and their indiscriminate, devastating effects on passersby's. One picture shows the effect of an Israeli rubber bullet lodged in the eye socket of a Palestinian man. Another picture points out the mural of Julie Livingstone of Northern Ireland, killed by a British soldier using rubber bullets.

"Assessment of Non-Lethal Weapons Science and Technology" is another book, on NLWs and whose recommendations on NLWs are sound. It lacks information useful for all military components because it is narrowly focused on Navy-Marine corps technology and uses.

Finally, the National Research Council in 2003

Many of these authors fail to address the fact that NLWs are used by all the services. For example, every service is interested in the Active Denial System (ADS) and Vehicle Mounted Area Denial System (VMADS) because it has practical application across the military spectrum. Instead, most books and papers focus on one area of the NLWs program, issues that pertain to a particular service, or confuse civilian law enforcement efforts and military non-lethal efforts, all the while ignoring the fact that non-lethal program must be a truly joint effort.

Moreover, most papers, books, or presentations focus on the technology instead what other support networks NLWs need in order to accomplish the mission they were designed to achieve. For example, employing NLWs implies logistical trade-offs. Combatant commanders will always emphasize lethal weapons versus NLWs when going into a potential hostile situation. Once on the ground, precious cargo space must be allocated to carry the proper non-lethal weapon system(s) into the theater. Besides cargo space, NLWs need to be identified in the logistical system so they can be ordered and replaced. Also lacking is information on a standard training system for NLWs. If they are truly the first Joint military weapons system program in existence, Joint classroom and field training should eventually become standardized among the services.[12]

THE NON-LETHAL WEAPONS PROGRAM

The Joint Non-Lethal Weapons Directorate (JNLWD) was created in 1997. Its goal is to enhance and improve the tactical applications of NLWs focusing efforts into developmental and emerging technology. This includes directed energy, lasers, and pulsed energy weapons which will enhance the warfighting capability of soldiers, sailors, airmen and marines in multiple levels of war. The Army, Navy, Air Force, and Marine Corps, as well as the Coast Guard and SOCOM, provide input to JNLWD as to their specific non-lethal needs.

In September 2000, the United States Army Training and Doctrine Command (TRADOC) designated the Military Police Corps as the Army's proponent for NLWs. The Military Police School established the Army's Non-Lethal Center of Excellence

(NLCOE) in November 2002 with a mission to serve as the Army's focal point of contact for non-lethal issues. In addition, the NLCOE develops and advances the Army's non-lethal issues and positions to other Army proponents, the Department of Defense, the JNLWD, material developers and other military services.[13] The NLCOE is also responsible for developing TRADOC Pamphlet 525-3-23.40, *Concept for Military Capabilities in Army Operations*. The pamphlet describes the concept of non-lethal capabilities and how they may delay, disrupt, or degrade threat forces, combat functions and facilities in pursuit of operational and tactical objectives. The NLCOE also focuses on the concepts, material development and acquisition of NLWs for the Army with an emphasis on precision fires, area denial, crowd control, counter-capability and counter-material capabilities while establishing short-, mid-, and long-term Army non-lethal goals.

The Military Police Corps is the optimum branch for development of NLWs for the Army. The Military Police Corps operates in both the tactical and law enforcement operational settings in support of conventional, asymmetrical, peacekeeping, peace-enforcement and humanitarian operations. They are the only branch that is trained to transition from tactical situations to law enforcement and back again to traditional military operations.

The final end state for NLWs and programs is the integration of the program into all the services with a greater understanding of how the program and its weapons can assist civilian and military leadership in meeting national goals. That can only happen if the intelligence community understands NLWs, what they can do, their impact on situation or situations and what could occur if not used in certain situations. The

intelligence community will need to look at its current system to see it how it supports NLWs use and link its intelligence support to future threats and conflicts. The intelligence community must address the issue of integrating new weapons and weapon systems as part of its intelligence preparation of the battlefield to include battle damage assessment. This means that the intelligence community will have to assist the Joint Non-Lethal Weapons Directorate and Joint Forces Command in developing doctrine and information distribution networks that bypass current intelligence channels in order to meet the demands of the user. Perishable intelligence must flow from the top down, with the intermediate levels receiving information after the fact. This also means after NLWs are used, information must flow back to the intelligence community as to the effects of NLWs use.

In summary, this chapter provided the intelligence and organizational challenges NLWs face. It also identified the various literature sources focused on NLWs. Future military operations, conventional, asymmetrical or stability and support operations (SASO) will require that both lethal and NLWs work in conjunction with one another so that operational goals are met. This will force the military to not only accept NLWs, but will require a change in military thought. Future military operations must have the right weapons, at the right time, for the right reasons and right results in order to meet foreign policy objectives and goals.

CHAPTER TWO

DEFINITION OF NON-LETHAL WEAPONS & WEAPON SYSTEMS

This chapter addresses the definition of NLWs, the technology, requisite employment criteria, new developments in technology, non-lethal response to threat, and intelligence support for such weapons.

NLWs are weapons that are explicitly designed and primarily employed so as to temporarily incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment.[14]

Unlike conventional lethal weapons that destroy their targets through blast, penetration, and fragmentation, NLW employ means other than gross physical destruction to prevent the target from functioning. NLWs also have relatively reversible effects on personnel or material and they affect personnel and material differently within their area of influence.

NLWs enhance the capability of U.S. forces to accomplish numerous objectives such as discourage, delay, or prevent hostile actions; limit escalation; allows the commander to take military action in situations where the use of lethal force is either not the preferred option or is not permitted under the established Rules of Engagement (ROEs); allows the better protection of forces; disables equipment, facilities and personnel; engage and control personnel; dislodge enemy forces from positions without causing extensive collateral damage; separates combatants from non-combatants and denies terrain.[15]

The key distinguishing feature between lethal and NLWs is that lethal weapons are designed to cause either precise, directed casualties or area casualties with an emphasis on killing first and wounding second. NLWs are designed to intimidate, discourage, and deny an area or item to people in a direct, pinpoint manner or affect an area by driving people out of or prevent them from occupying the area. NLWs are specifically designed to temporarily incapacitate people with the intent to wound.

The concept of non-lethal has both a concrete meaning and abstract implication. The term non-lethal implies that nothing will cause grievous bodily harm that leads eventually leads to death. Unfortunately, the reality is quite different. There is a chance someone could die from the use of NLWs so it has been suggested that the name be changed to "less than lethal", "disabling effects", "soft kill", or even "pre-lethal". The word non-lethal is not meant to misinform the public, but to inform the public that certain military and law enforcement systems are designed to incapacitate or dissuade individuals from certain actions without causing them bodily harm. NLWs do not include information operations, classic electronic warfare such as radio frequency jamming, or any other military capability not designed *specifically* for the purpose of minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment, even though these capabilities may have non-lethal effects. Space-borne platforms are not a NLW technology.[16]

The intent of distinguishing NLWs from electronic warfare and space-borne platforms is that none of these systems are readily available to the user at a moments notice. It is highly unlikely that a satellite can be made available to assist a soldier. Information does not get to the soldier in enough time for him to act on that information

and people's intent can change faster than the satellite can process the information. Satellites also can not detect intent. Though some people would classify electronic warfare and satellites as NLWs, they are not purely dedicated to being a NLWs system nor are they designed to do so.

NLWs have one, or both, of the following characteristics: they have relatively reversible effects on personnel or material and they affect personnel and material differently. In addition, NLWs are specifically designed to enhance the capability of U.S. forces to accomplish various objectives such as to discourage, delay, or prevent hostile actions.

Finally, NLWs do not have a zero probability of producing fatalities or permanent injuries. When properly employed, non lethal weapons should significantly reduce fatalities or permanent injuries when compared with physically destroying the same target. NLWs are not just "stand alone" weapons for peacekeeping and peace-enforcement missions but can be employed in situations where overwhelming force is being employed or required.[17]

The difference between lethal and non-lethal weaponry is their design and operational use. A lethal weapon is deadly from the time it is fired to the distance the round remains effective based on trajectory and accuracy. In contradistinction, NLWs have zones of effectiveness.

The first zone is defined as when the non-lethal weapon has lethal consequences. This zone, primarily for kinetic, blunt impact weapons, has enough force that its impact upon a target could cause either massive internal and external injuries or even possibly death. The second zone is where the non-lethal weapon is used to its most desired

effectiveness. NLWs use against targets in this zone reduces the probability that the target will receive a fatal blow. Finally, the last zone is when the non-lethal weapon entirely looses its effectiveness. It has reduced energy upon impact, is inaccurate and ineffective in discouraging, denying or delaying a person or persons from acting.

NON-LETHAL WEAPON TECHNOLOGY

The use of non-lethal weaponry is nothing new. Historically, military forces have used NLWs and forces to influence the behavior of people and nations, to defeat adversaries with minimum use of lethal force, and to weaken adversaries. Examples of classic NLWs include: show of force; obstacles; caltrops; noise to create or enhance psychological effects; and, light or fires used to harass soldiers.[18] These weapon systems were not based so much on technological development, but on a need to control, influence, or discourage people and horses. Some of yesterday's NLWs have a place along side current and future technology.

Military units and personnel still conduct patrols or show up to locations to influence people and crowds, obstacles are used to control and canalize people and crowds, while caltrops are used to impede vehicle and personnel movement. Sound is used to warn people of impeding consequences if they do not leave an area or prevents people from entering an area. Light or fires were used to act as a warning, as a show of force, and to generate smoke to obscure a target or effect and area by confusing and drawing people away in a different direction.

NLWs were used in the First Persian Gulf War when Tomahawk cruise missiles sent into Iraq in the first few hours of the war. The missiles were equipped with the warheads filled with thousands of spools of carbon fibers. The spools were dropped over Iraqi power stations and unrolled fine carbon fibers which short-circuited various elements of the outdoor switching and transformer segments of the stations, causing them to shut down. While physical damage caused to power plants was minimal, electrical plants were put out of commission for a short time, affecting the air defenses and facilitating further coalition air operations. With the destruction of power sources and a few key antennas, military commanders in Baghdad were blinded. "Losing primary electrical power sources in the first few days of the war helped reduce Iraq's ability to respond to coalition attacks," the standard method of destroying an electrical facility's generators with high explosives would have put them out of action for years, creating long-term post-war problems for the civilian population.[19]

No matter what the technological level of sophistication, NLWs have historically had three basic requirements; counter-personnel, counter-material or counter-capability. NLWs technology runs the gamut from low technology to high end technology. This gamut of technology provides the user the ability to match the non-lethal weapon system to the target in order to obtain the users desired effects.

NLWs technology low end includes capabilities which have been in use for many years with varying degrees of success. These include riot batons, pepper spray, and sponge grenades. The advantage to these weapons is simplicity and low cost. The disadvantages are the lack of "standoff" capability and applicability only to limited scenarios like hand-to-hand confrontations and riot control.[20] Whether integrated with

high technology or just low tech, NLWs need to be compatible and complementary to current and future weapon systems and produce near instantaneous results without affecting friendly troops. That is often a difficult goal to achieve.

For NLWs to realize their fullest potential, they must be capable of delivering varying levels of effects. This characteristic-a "rheostatic" or "tunable" quality- allows commanders to increase or decrease the degree of influence used to effect compliance. A "rheostatic" capability provides the range of effects necessary to achieve a complete "continuum of force." It is not necessary that individual NLWs possess "rheostatic" characteristics only that the family of NLWs as a whole provide this capability.[21] A popular example of a "rheostatic" weapon is *Star Trek's* phaser. The phaser is designed go from stun to lethal, to disrupt, and back down to stun all with a change of the dial. The addition of a "rheostatic" non-lethal weapon into the military's inventory would greatly reduce the logistical footprint of today's weapons. It would also provide the user and commander the opportunity to rapidly engage targets with little concern about getting the right weapon for the right situation. Any time would be the right time to engage the target.

REQUISITE CRITERIA FOR EMPLOYMENT

In order to develop NLWs, requirements must be identified. These requirements, counter-personnel, counter-capability and counter-material, are areas that NLWs must have overwhelming dominance in order to support mission needs. Some requirements are in their advance stages of development while other areas are in the conceptual phase.

Non-Lethal Weapons: Counter-Personnel

Non-lethal counter personnel weapons function to incapacitate personnel through the ability to distract, seize, render incapable of performing an activity or deceive individuals or groups. It also includes the ability to control movement (stopping, dispersing, or canalizing crowds), to affect crowd perceptions by disorienting, confusing, or deceiving them, and to either isolate or separate out individuals whether belligerents or "human shields".[22]

An example of controlling a crowd is identifying an agitator and firing a marking round at the person's arm, leg, or center mass of the body. The marking round is a frangible case that falls apart upon impact and spreads a micro-encapsulated infra-red (IR) dye and malodorant. When the person checks for injuries, they generally break the capsules and become marked and traceable through IR scanners. The malodorant takes effect by forcing people around the belligerent to leave the area and allowing a "snatch-and grab team" to apprehend the person. If he decides to run he can be tracked by the IR signature or smell. This separates belligerents from non-belligerents. It also reduces further crowd belligerency and violence once the belligerent is apprehended, since there is not as much sympathy for the wounded as there would be for the dead.

In addition to controlling crowds, the use of malodorants can separate people from sensitive equipment, deny them access to facilities and separate non-combatants from combatants. When used in an urban setting, malodorants act as warning to people not to come into an area or it drives them away from an area. Civilians do not have protective masks and will flee the area, leaving it to military forces.

Another example of counter-personnel is the coating of a bridge with slippery foam to deny its use by a hostile crowd or military force. The slippery foam prevents personnel or vehicles from traversing the sprayed area by providing a frictionless surface. Those identified belligerents willing to continue forward clearly demonstrate their intent. One of the potential uses of this system, in conjunction with the Hand Emplaced Non-Lethal Mine (HENLM) or Taser Anti-Personnel Mine (TAPM), is to protect USAF ballistic missile silos from demonstrators or intruders until USAF Security Police arrive on location.[23]

Non-Lethal Weapons: Counter-Material

Non-lethal counter-material is the ability to deny an area to vehicles through restricted movement in urban or open terrain and denying vehicular access to facilities and natural and man-made terrain. This includes disabling or neutralizing aircraft, vessels, facilities, railroad engines, automobiles, trucks, heavy equipment transporters, and military vehicles including armor. When dealing with automobiles, the goal is to temporarily disable the vehicle and guide it to a controlled stop. The driver and the passengers are either apprehended or let go with little or no damage to vehicle or personnel except a loss of time. Destroying the car or rendering it useless only invokes the ire of the occupants. For some people a car is the most important and expensive item the family owns.

An example of this weapon is the X-Net. The X-Net is a one time use net that is remotely activated. It is able to bring a moving vehicle, from a car to a 4 ton truck, to halt usually within 75 meters The X-Net is a strong, flexible polyethylene net with a row

of spikes that is laid across the road. It envelops the front wheels of the vehicle, dissipating kinetic energy through the net. This brings the vehicle to a safe standstill, causing minimum damage. This allows security forces to control the situation without having to resort to deadly force to stop the vehicle. It protects the occupants and the security forces while minimizing vehicular damage and maintaining force protection measures.[24]

Non-Lethal Weapons: Counter-Capability

Non-lethal weapon counter-capability technology has two goals. The first goal is to use select, precise non-lethal fires to disable or neutralize electrical generating facilities, C4ISR systems, IDAS, weapon systems, optical sensors, electrical sensors, and navigation capabilities. Additional non-lethal needs include deceiving adversarial reconnaissance efforts with illusions of barriers, obstacles, and/or forces and concealing and/or covering friendly activities or movements particularly within complex urban terrain.[25]

The second goal is to deny the use of weapons of mass destruction (WMDs) to adversaries by rendering them inoperative, by containing the potential release of deadly agents/contaminants, and preventing or neutralizing the production, storage, deployment (transport), employment, and delivery of such weapons. Non-lethal capabilities allow the neutralization of WMDs within populated or sensitive terrain during and prior to the initiation of armed conflict with a reduced chance collateral damage.[26]

NEW DEVELOPMENTS IN NON-LETHAL WEAPONS

New developments in non-lethal weaponry are supported by emerging technologies. The three requirements counter-personnel, counter-material, and counter-capability remain the guiding requirements. Some of these new technologies include:

High-Power Microwave and Millimeter-Wave Technology. This class of NLWs-high-power microwave (HPM) and millimeter-wave technology-are grouped into two sub-categories: (1) those designed to disrupt electronic systems, such as communications and computer networks; and (2) those designed to produce a physiological effect on an individual.

Applications in the first category (electronic disruption) include the capability of disabling or destroying electronic equipment. All sensitive electronics-including computers, cell phones and radios, Global Positioning System (GPS) receivers, and engine ignition systems-are potential targets. HPM systems provide this capability without accompanying blast effects, physical damage, or death to nearby personnel characteristics of explosive or other high-kinetic energy devices. HPM systems designed to produce these effects utilize conventional millimeter-wave and RF generators combined with a suitable transmitter, such as a microwave horn or antenna. Unconventional approaches to generating and delivering HPM include Marx banks or explosives devices that produce a single, intense pulse. These are usually referred to as electromagnetic pulse (EMP) devices.[27]

The possibility for disturbing modern electronic circuitry through a short-duration pulse of electromagnetic energy has created a significant amount of concern in recent

years. Electromagnetic pulses (EMP) can be generated by converting the energy from conventional explosives or nuclear reactions in radio-frequency pulses. Such pulses can disturb or damage communications and information equipment by entering directly through antennas or indirectly through physical holes. EMP-type vehicle-immobilization systems are under development to stop vehicles traveling at various speeds.

A key concern with this technology centers on the vulnerability of modern civilian equipment in highly computer dependent Western societies. Efforts are under way to access the likely impact of different wavelengths and power levels. The potential costs for transportation and key infrastructures such as hospitals could be substantial, as could the ensuing social disarray.

Another issue of concern is the ability to identify a target and figure out its "electronic wavelength fingerprint" and dial an EMP round to attack just the target and nothing surrounding the target. Basically, it is a precision EMP round. Gathering electrical equipment available in any commercial store, it is possible to craft a one time use vehicle-portable system that disturbs unprotected computer equipment, thereby causing a loss of date and no access to hard disk, as well as shutting computers down. The unlikelihood of detecting or tracing such weapons opens up numerous possibilities for those wishing to wreck havoc upon financial institutions; air traffic control systems; oil and natural gas plants; and other technologically dependent industries and organizations.[28]

Stun guns. Stun guns inject an electrical energy into a human at a high voltage, high frequency, low current, and with very short pulses. There are approximately a dozen manufactures of such weapons, and each uses slightly different pulse parameters.

The stun gun incapacitates an individual by stimulating nerve cells proximate to the discharge region and temporarily overriding normal motor control signals, causing uncontrollable muscular contractions. Complete recovery occurs within about 15 minutes after the stun gun is turned off. Off-the-shelf stun guns are widely used in law enforcement because of their high degree of effectiveness.[29]

Active Denial System (ADS). The Active Denial System represents the first NLW with the potential for providing more than tactical, short-range capabilities for individual soldiers. The ADS operates in the 95 gigahertz range and heats the skin to 130 degrees Fahrenheit (54 degrees Centigrade) while it fires a precision micro-wave beam.[30] The individual receives a near instantaneous feeling of pain throughout their body and quickly leaves the area or seeks cover. The advantages of this weapon is that it has a larger stand off range so in some situations intentions are quickly known, such as crossing into restricted areas. It also provides precision, pin-point fires on one person instead of a group thereby allowing the agitator or belligerent, and not the group, to be attacked and separated from one another.[31]

Microcapsules. Microcapsules may be deployed in areas to be denied to opposing troops. They may be dropped by air (for example, from unmanned aerial vehicles [UAVs]), or delivered by mortar shells or missiles. When trodden upon, the shells will rupture and release a malodorant or derivative of pepper spray. In a chemically-activated release, previously deployed microcapsules can be activated by water cannon when the shell is dissolved thus releasing the malodorant.[32] Malodorants attack the sense of smell and either drives people out of an area or effectively denies an

area to them. They smell of vomit, human excrement, urine, human sweat, rotting fish, decomposing bodies or burned hair.

Hand Emplaced Non-Lethal Mine (HENLM) or Taser Anti-Personnel Mine (TAPM). Once activated by sensors in the device or motion detectors, the taser mine sends out darts connected by wires to a power source within the mine. Individuals engaged by the darts receive repeated periodic shocks. The subjects remain conscious and coherent but cannot control their limbs until the power has been turned off and they recover. A variety of operational settings for this type of mine are possible, such as border control, school protection and area control.[33]

The Advance Tactical Laser (ATL). The Advance Tactical Laser is a chemical-oxygen iodine laser that is said to be able to accurately place a four-inch spot at twenty kilometers when deployed in an aircraft or helicopter. It is able to cut through metal up to four inches thick. Potential targets include ADA sites, command and control sites, ballistic missile facilities, and aircraft to name a few. Another energy option is a **Pulsed Energy Projectile (PEP)**. PEP works by explosively ablating surfaces of targets, thereby generating recoil that exerts a mechanical impulse. The tunable effects range from lethal to non-lethal; the latter are said to include causing 'shrapnel-less flash-bang, cutaneous peripheral afferent nerves (pain, susceptibility to chemical agents, lesions) cutaneous peripheral efferent nerves (temporary paralysis, choking, fibrillation), central nervous system (disorientation).[34]

The Chemical Oxygen Iodine Lasers (COIL)/Medium to High Energy Lasers. COIL technology offers unique contributions to the non-lethal counter-material and counter-capability areas by providing the capability to strike targets with ultra-

precision, controllable effects from long standoff ranges while minimizing collateral damage. A derivative of this technology being testing in a missile defense role is the Air Force Airborne Laser program.

Rigid Foam. Rigid foams provide significant utility for creating temporary barriers, particularly in entryways, and for disabling the support functions of facility existence (i.e., power distribution, communications, etc). Additionally they can be used to disable vehicles and other equipment by jamming moving parts. The capability has potentially broad application in the counter-material and counter-capability areas. Technical challenges still exist to reduce the hardening/curing time and to increase structural strength. The system has the potential of being used in a binary configuration in order to enable standoff and long-range delivery. It is not to be used against personnel due to the possibility of covering an individual's face and suffocating them.

Nanoparticles. Nanotechnology has the potential of reducing the harmful effects of releases of chemical and biological agents. The future use of nanoparticles is to decompose chemical agents or to destructively absorb biological agents. Nanotechnology also has the potential of advancing materials development by enabling the production of very high shear and tensile strength fibers that are extremely lightweight. Such material could enable the development of new, highly effective entanglement systems that can be used for both non-lethal counter-personnel and counter-material applications.[35]

Frangible casings. Frangible casings are casings that upon explosion do not send out the typical metal shards and potentially harming a person or persons. Instead, the casing, such as the non lethal sting ball grenade has a rubber casing that upon detonation

disperses rubber casing material. The effect is the discharge of small rubber balls that cause intense pain upon exposed skin. This type of casing is also being used for the sting ball/flash bang grenade. The grenade explodes and showers the personnel with sting balls while overwhelming the targets visual senses through a brilliant flash and temporarily deafening individuals hearing with a 135-138 dB.[36]

Additional Non-Lethal Technology

The following is list of existing and emerging non-lethal technologies. The *italicized* text signifies emerging technologies; normal text signifies existing technology.

Electricals	**Reactants**
Pulsed Current	*Super corrosives*
Sticky Shocker	***Combustion Alteration-Air/Fuel***
Stun Guns	*Combustion Alteration-Fuel Viscosity*
Taser Munitions	*Lubricant Contaminants*
Direct Current	*Depolymerizers*
Radio Frequency	*Embrittlers*
Non-Nuclear EMP	*Emulsifiers*
Microwave	**Mal-Odorants**
High Power Microwave	Scatole
Millimeter Wave	Mercaptons
Millimeter Wave Projector	**Riot Control Agents**
Infrared	OC (Pepper Spray)
Lasers	CS
Chemical Oxygen Iodine Lasers	CN, Mace
CO2 Lasers	**Anti-Traction**
HF/DF Lasers	Slippery Foam
Solid State Lasers	**Foams**
Visible	*Sticky Foam*
Laser Scattering Obscuration	***Rigid Foam***
Laser Illuminators	*Nanoparticles*
Holograms	***Magnesium Oxide***
Laser Light Bullets	
Isotropic Radiators	**Combined Technologies**
Flashes & Flares	Flash Bang Devices
Strobes	*66mm Vehicle Launched Grenade*
Ultraviolet	*Multi-Sensory Distraction Device*
Laser Ionizer	

	Audible/Infrasonic/Ultrasound
Markers	
Dyes	**Mechanical & Kinetic**
Liquid Dyes	**Barriers**
Foam Dyes	Caltrops
Smoke Dyes	Tire Spikes
Flourescent	*Air Bag Mines*
Invisible-UV Light Visible	**Entaglements**
Paint Ball Guns	Portable Vehicle Arresting Barrier
Taggers-Active	Running Gear Entanglement System
	Net Mines
Non-Lethal Casings	**Cloggers**
Frangible Casings	*Vessel Exhaust Stack Blocker*
Combustible Casings	**Blunt Impact Devices**
	Projectile
Encapsulants	Rubber Balls
Microencapsulation	Modular Crowd Control Munitions
Pressure Released	40mm Crowd Dispersal Cartridge
Temperature Released	66mm Vehicle Launched NL Grenade
	Liquid Filled Baton
	Water Stream Cannon

Figure 2. Additional NLWs

This list of NLWs is not complete as some systems are removed due to budget constraints, impracticality, or added to the list, or classified.[37]

NON-LETHAL RESPONSE TO THE THREAT

The purpose and conduct of war has fundamentally changed as seen with the First Persian Gulf War and the use of precision weapons. The collapse of the bipolar order that characterized the Cold War drastically altered the international security environment and forced the United States military to reevaluate its purpose and strategies. Dealing with this very different strategic environment requires new tools and tactics. In order to

recognize the need for new types of weapons, it is important to understand the new situations and threats the U.S. armed forces will face the post-Cold War world.

In the new strategic environment, the primary goal of the United States is to maintain stable, status quo, balances of power and protect vital national interests. Global economic inter-dependence, and the dominance of American military power have all but reduced the probability of large-scale war between major nations. Instead, the most pressing security threats facing the Untied States are the risk of low-intensity conflicts caused by ethnic or nationalist rivalries between or within states, rogue behavior by nations or non-state actors that threatens fundamental American interests or its allies, and indirect threats, such as the proliferation of weapons of mass destruction, refugee flows, and humanitarian crises resulting from state failure.

NLWs offer this country's leaders the opportunity to delay armed conflict and allow negotiations to start or continue. They allow a gradual escalation of forces or delay the escalation until U.S forces are in position to influence nations through overwhelming military force. What should be addressed is not just the strategic level of conflict, but at the local level also. NLWs, when properly supported by supporting military elements, can neutralize a situation, target, or personnel with a minimum casualties and collateral damage.

INTELLIGENCE CHALLENGES IN SUPPORT OF NON-LETHAL WEAPONS

NLWs face a unique challenge in that they are not designed to engage combat forces in a force on force scenario. Instead, they are designed to compliment lethal force by neutralizing enemy material and capabilities, while separating combatants from non-combatants in war, peacekeeping, peace-enforcement and humanitarian missions. They can only do this with the proper support from the intelligence community.

Level and Types of Threat

The challenge to the intelligence community is that it must provide accurate, intelligence regarding the location of military operations to operators at the strategic, joint, operational and tactical level so they may act swiftly and decisively against the threat. Information must include what forces the commander and soldier faces, whether military, paramilitary, insurgents, and civilians. Failure to do so risks operational failure.

Enemies without Borders

In addition to these localized threats, strategic planners must have information and establish intelligence databases about "enemies without borders," including known and suspected terrorists, insurgency groups and international criminals. This database must also include any known alliances among the groups and organizations. These groups include drug cartels, international smugglers, the illegal transfer of material, particularly Chemical, Biological, Radioactive, Nuclear and High-Explosive (CBRNE), expertise related to the production of weapons of mass destruction or the proliferation of small

arms are all direct challenges to national security of the United States and its Allies.[38] Such groups and organizations will also challenge the national security and long term stability of the host nation. Intelligence must identify and track all groups and organizations whether in a permanent, semi-permanent or transitory status.

Intelligence Challenges

The end of the bipolar balance of power has drawn more attention to traditional religious, ethnic and nationalistic rivalries and increased the likelihood of smaller-scale regional conflicts. Effectively responding to these conflicts requires more creative prevention and control strategies, and less reliance on overwhelming military power.[39] For instance, the civil wars in Liberia, Northern Ireland and the ethnic tensions in Bosnia and Kosovo are all examples, with varying degrees and types of violence, of the nature of low-intensity conflicts and the challenges U.S forces face.

For example, if U.S. Forces occupy a city with multiple ethnic and religious groups, they must have current and accurate intelligence informing them which groups get along with one another and which groups are in conflict with one another. Intelligence must also include which groups support the U.S. and its efforts and which ones oppose the U.S. Included in the intelligence brief is the identification of primary leaders and secondary leaders of the group; the religious holidays in order to provide security to groups, especially minority groups; and any cultural issues. In essence, intelligence must provide the user with relevant actionable intelligence in order to prevent social, cultural and religious missteps.

This is critical for the employment of NLWs. It may be that U.S. forces intervening in a dispute or action is justified by the Rules of Engagement (ROEs), but not perceived as a justified action by local populace. On the other hand, the dispute or action could also be easily rectified through talks and NLWs. At other times, a show of force is needed to persuade a group to cease activity. The combination of NLWs supported by lethal force gives the civilian group the option of going home or engaging the military unit. The military unit decides whether non-lethal or lethal force is necessary based on intelligence and group dynamics.

In conclusion, in order for NLWs to work they must be relevant not only today, but in the future as well. The only way to make sure of their future relevancy is by coordinating their development with sociologists, cultural anthropologists, psychologists and intelligence personnel in order to prepare for future conflicts. As civil wars and unrest play out on the international stage, the United States must be prepared to deal not with organized, disciplined armies, but individuals and groups who are just as deadly and determined to inflict casualties on us or cause an international incident that embarrasses the United States.

The next chapter will address the intent of NLWs and their operational use in conventional and asymmetrical warfare operations, the "Three Block War" concept and SASO.

CHAPTER THREE

NON-LETHAL WEAPON OPERATIONAL USES

This chapter addresses the use of non-lethal weaponry. It focuses on the intent of the user, the environment in which it is used, the type of risks incurred with their use, the training required to maximize effectiveness and rules of engagement.

As mentioned in previous chapters, NLWs can be employed at the strategic, operational, and tactical levels to support decision makers and military commander's on the ground. NLWs also support operational missions such as offensive and defensive actions, stability operations and support operations in order to protect U.S. personnel and national interests with minimal casualties and collateral damage.

NON-LETHAL INTENT

NLWs provide alternatives to, or raise the threshold for the application of lethal force, augment lethal capabilities, and protect friendly forces while minimizing collateral damage. Non-lethal weapon capabilities are employed with the intent to compel or deter adversaries by acting on people or material while minimizing collateral damage to people, equipment or facilities.

Warfare is broken down to two basic components, offensive and defensive operations. Offensive operations are conducted to destroy or defeat an enemy. Their purpose is to impose U.S. will on the enemy for decisive victory. Non- lethal weapons

and effects, in conjunction with lethal weapons and effects, are used to protect the force, shape the battle space, and support decisive operations in offensive operations.[40]

Defensive operations defeat an enemy attack, buy time, economize forces, or develop conditions favorable for offensive operations. Non lethal weapons in conjunction with lethal weapons protect the force and shape the battle space, setting the conditions for a counter-offensive that regains the initiative and leads to a decision.[41]

Finally, offensive and defensive operations can be conducted in combination or sequential manner such as a unit conducting offensive operations, then halting and preparing defensive positions for either a counter-attack or to repulse an unexpected enemy force on the battlefield in a rapid manner.

OPERATIONAL ENVIRONMENT

NLWs are used in a variety of operational environments and types of warfare. Conventional operations are operations that involve two or more nations conducting war against one another in order to gain territory, while attempting to inflict the greatest amount of damage upon the opposing side. Conventional warfare tends to follow historical convention and codified rules, while emphasizing offensive actions of rapid, maneuver warfare of organized units working in concert with one another to achieve a single or multiple goal(s) while preventing enemy forces from impeding their activities.

Asymmetrical operations are engagements where there are dissimilarities in organization, equipment, doctrine, capabilities, and values between other armed forces (formally organized or not) and U.S. forces. Asymmetric engagements tend to be

extremely lethal, especially if the defender is not capable of mounting an adequate defense. Asymmetric advantages can erode over time as adversaries adapt to dissimilarities exposed in action. Countering asymmetric attacks requires the disadvantaged side to alter rules of engagement, organization, doctrine, training or equipment. The higher the echelon, the longer it takes to remedy an enemy asymmetric advantage.[42] Asymmetrical operations position the disadvantaged in a defensive posture until they are strong enough to conduct offensive actions against the aggressors.

The "Three Block War" concept is a sequential operation where military units or elements of units must rapidly shift their physical and mental disposition from peacekeeping, to humanitarian to war and then back again, all within a small area under complex situations.[43] Though physical endurance is still important, mental flexibility and situational understanding are critical to operational success. This is the most likely future situation for U.S. forces to face, and one that they must master, in order to be effective in tomorrow's wars.

SASO promotes and protects U.S. national interests by influencing the operational and strategic environment through a combination of peacetime developmental, cooperative activities and coercive actions in response to crises. These types of operations are critical to national interests and objectives, especially when such operations occur in countries that are fragile and need a strong, stabilizing force, but not an overwhelming military presence.

In urban terrain, non-lethal capabilities mitigate the enemy's advantage above, below and on the ground, through clearing and neutralizing facilities without the employment of excessive lethal force, thus minimizing collateral damage and civilian

casualties. In shaping operations, the key is to denying the enemy access to areas where he can mass forces, deny access to key avenues of approach and neutralizing key facilities thus setting the conditions for a rapid transition to decisive operations. In decisive operations, they neutralize his perceived advantage to use "human shields" and hugging tactics that mitigate the overmatching precision lethality of the force.[44]

These operations can occur in urban areas where sections or block of areas are subject to intense fighting to occupy territory. Near the fighting, other friendly forces have occupied territory or city blocks, preparing for an attack. Historical examples include the U.S. Marine occupation of Hue, South Vietnam, Stalingrad, and Berlin during World War II. This is a key point since future conflicts may occur in historically ancient countries with a multitude of national, ethnic, cultural and religious shrines located throughout the country. Destruction of these locations would not only be a historical loss, but could also be seen as a personal and cultural attack upon the people although that is not the intention.

Regardless of the operational environment, the intent for non-lethals is to maximize mission success without incurring unwarranted death and destruction. For example, the military police corps uses non-lethals in conventional, asymmetrical, urban and SASO operations simultaneously.

The U.S. Army military police are specifically trained to effectively SASO, the "Three Block War" concept and stability and support operations. The military police corps has five functions: Maneuver and Mobility Support, Area Security, Internment and Resettlement, Law and Order and Police Intelligence Operations. These five functions provide the Combatant Commander or local commander with one source to do a

multitude of critical tasks. In addition, military police are able to engage various threat levels. Threat levels include Level I threats such engaging enemy-controlled agents; enemy sympathizers, terrorism and terrorists and civil disturbances. Level II threats include engaging guerilla forces, unconventional forces and small tactical units. They are not able to actively engage Level III threats of large, combined arms operations.[45]

In addition, military police must also must know and possibly engage in a coordinated effort, national or international organized crime elements in theater or their area of operations, narcotic traffickers, narcotics terrorists, extremist groups, paramilitary groups, ethnic or religious disputes and individuals or groups willing to trade in illegal weapons or strategic materials.[46] Compounding these tasks are various interoperability challenges the military police face such differing political objectives and capabilities of allies and the host nation, and cultural/language differences.[47]

One task the military police train in is interpersonal relationship skills. They are trained to know how to talk to people, gather information, and deescalate situations before they get out of control. They establish a rapport with the local population and learn needs, desires, and grievances.

Military police also provide female military police officers for culturally sensitive situations; for example talking to the local female population to get a better understanding of what is going on in the community when it would be inappropriate for male military police officer to talk to them. Therefore, the military police provide "bottom up" human intelligence (HUMINT) to the intelligence community so a clearer picture and understanding of what's occurring at the local "cop on a beat" level is developed. The intelligence community can provide information of what is going on in

the overall, broad picture of a city or town. This is important when employing NLWs, especially at the local level. The platoon leader conducts patrols with full combat loads, expecting the worse but hoping that nothing occurs. If the patrol is to carry NLWs due to a possibility of an illegal demonstration or civil disturbance, then intelligence must be extremely accurate. The patrol is going out to control the disturbance with a mix load of lethal and NLWs and is consciously giving up part of its lethality. It is extremely vulnerable to lethal weapons. The patrol could be ineffective or incur casualties due to inaccurate intelligence.

NON-LETHAL WEAPONS RISKS

Though some politicians and military personnel may support non-lethal weapon employment due to their reputed bloodless nature, there are potential risks when NLWs are employed.

The first risk is the likelihood of escalation if the use of NLWs leads to "unintended and unwanted involvement," in a situation or conflict. This prospect can be made unnecessary by a comprehensive understanding of non-lethal weapon capabilities and limitations; careful, coherent, and integrated planning; and clear identification of the enemy.

The second risk is of "retaliation in kind," that is, enemy NLWs directed against "mirror-image" vulnerabilities: such as EMP rounds used against U.S. banks and financial institutions, power plants and airports. U.S. and Western dependence on

technology and financial infrastructure increases this vulnerability. (Computer viruses do not fall into the NLWs spectrum, though they are non-lethal in design.)

The third risk is proliferation. Much military research and development is based on mimicry; other countries might develop NLWs, which may fall into the hands of renegades and non-state actors. No degree of restraint by the United States in development of NLWs will prevent their appearance in other countries. Russia, the United Kingdom, France, Italy, and Israel have made significant inroads. Anti-proliferation measures are costly and maybe counter-productive.

The fourth problem is that NLWs program can not perform to the public's unrealistic expectations. If the public expects bloodless warfare and therefore requires that NLWs always be used before lethal weapons, disappointment and unnecessary exposure to danger will result for both soldier and civilian. On the other hand, in the proper setting non-lethal weapon employment could increase the safety of U.S. troops and the effectiveness of American policy.

The fifth problem is in measuring cost-effectiveness. There is an argument that proposes that casualty-limiting benefits of NLWs can be achieved more quickly and at less cost by increasing the precision of lethal arms. This argument negates the very definition of complex operational environments as well as the range of options provided by non-lethal weaponry. In the final analysis, NLWs technologies are not expensive compared to their potential benefits or to the development, procurement, training, and operation of other weapon systems.[48]

NON-LETHAL WEAPONS TRAINING

All commanders develop training plans that incorporate all facets of military equipment and knowledge into training exercises so that their soldiers are prepared for war, humanitarian operations or peacekeeping missions. The challenge with NLWs is that there lacks a grading system to test effectiveness of the system and soldier use. Another factor is that training ammunition is also the ammunition used in the actual event. Besides the potential lack of training with NLWs, commanders must know how to assess, with a high degree of reliability, the effectiveness of the system in order to be confident that it will work during specific situations. This is especially difficult to monitor when the target walks, runs, or drives away after being engaged with non-lethals.

Finally, the commander must have some reference as to how to train properly train soldiers. Established military training program that addresses NLWs will allow units to be more effective in the operational environment. Ideally, soldiers trained in the unit and transferred into another unit or post, should not have different levels of knowledge regarding NLWs. When in a situation where NLWs are to be employed, those soldiers should perform efficiently and effectively based on knowledge of non-lethal weapon systems. Without this coherence the unit and mission success stands in jeopardy.[49]

One option that assists in developing individuals to use NLWs is the Non-Lethal Individual Weapons Instructor Course (INIWIC) at Fort Leonard Wood, Missouri. The course is designed to "train the trainer" and produce instructors who will conduct *basic*

user level non-lethal capability set training. In addition, the INIWIC graduate may also serve as the non-lethal operations advisor to his/her respective commander.

The INIWIC student is taught that the non-lethal mindset is more than batons, rubber bullets, or new technology. It is a tool in the commander's toolbox that provides alternative options to the traditional, and sometime lethal, response. INIWIC provides well-trained personnel that can recognize their environment, understand the ramifications of their actions in relation to the tactical situation, and act accordingly.[50] The key to this training is that it is not just for military police. All branches may attend, but the real issue is that it is a very small segment of the non-lethal community. It only addresses the basic user level, not the intermediate or advanced level training that should be occurring at professional military schools. The implementation and standardization of NLWs training throughout the military will assist units in achieving their goals in the operational environment.

RULES OF ENGAGEMENT

The Rules of Engagement (ROEs) are defined as directives issued by competent military authority to delineate the circumstance and limitations under which naval, ground, and air forces will initiate and/or continue combat engagement with other forces encountered. ROEs have their genesis in the international law of armed conflict. While the law of armed conflict serves as the basis for ROE, it cannot be used as a substitute for the law of war. In fact, ROEs are more restrictive than the law of war and serve to emphasize those critical aspects of the law relevant to a specific mission. Besides the law

of war there are numerous other factors that make a significant impact on ROEs. These elements include domestic law, U.S. policy, diplomacy, and operational concerns.[51]

The ROE for lethal weapons are more developed then those for NLWs. The MAGTF JA (Deployed Marine Air-Ground Task Force Judge Advocate Handbook) observes that service members want to know what level of force they can use at what time, and ROE source authorities simply do not provide the level of detail that service-members desire. In ROE and Rules of Force (RUF) training, service members often present fact-specific scenarios and ask for black-and-white answers to gray questions, such as what levels of force are appropriate in complicated situations. Using the standing rules of engagement (SROE) as an example, the best answer often involves a vague discussion of making reasoned evaluations of hostile acts and hostile intent and proportionality (based on all the facts known at the time). With regard to non-lethals, these simply expand the range of alternative levels of force.

The Chairman, Joint Chiefs of Staff Instruction 3121.01A, *Standing Rules of Engagement for U.S. Forces*, establishes Secretary of Defense approved SROE implementing the inherent right of self-defense and providing guidance for the application of force for mission accomplishment. Fundamental policies and procedures governing action to be taken by U.S. force commanders during military operations and contingencies are specified. The SROE apply to U.S. forces during military attacks against the United States and military operations, contingencies, and terrorist attacks occurring outside the territorial jurisdiction of the United States. Peacetime operations conducted by the U.S. military within its own territorial jurisdiction are governed by use-

of-force rules contained in other directives, or on a case-by-case basis for specific missions.[52]

The SROE are intended to implement the right of self-defense, which is applicable worldwide to all echelons of command; provide guidance governing the use of force consistent with mission accomplishment and be used in peacetime operations other than war, during transition from peacetime to armed conflict or war, and during armed conflict in the absence of superseding guidance.[53] Although the guidance was not originally meant to include non-lethals, non-lethal weaponry simply builds on these existing policies.

SROE DEFINTIONS

Some of the Standard Rules of Engagement are listed along with a discussion of how NLWs maybe applicable in certain situations. This is not comprehensive and is based on the situation and possible future events. The availability of NLWs to the unit and training of personnel must also be taken into account.

Inherent Right of Self-Defense: A commander has the authority and obligation to use all necessary means available and to take appropriate actions to defend the commander's unit, and other U.S. forces in the vicinity, from a hostile act or demonstration of hostile intent. Neither these rules, nor the supplemental measures activated to augment these rules, limit this inherent right and obligation. At all times, the requirements of necessity and proportionality, as amplified in these SROE, will form the basis for the judgment of the on scene commander as to what constitutes an appropriate

response to a particular hostile act or demonstration of hostile intent. NLWs can be used in self-defense. The advantage is that is meet self-defense while not incurring death or collateral damage. An example of this is a child soldier aiming a weapon at U.S. soldiers. U.S. soldiers have a right to self-defense, but may not wish to kill the child. Non-lethal would provide a suitable alternative to lethal force.

Unit Self-Defense: The act of defending a particular U.S. force element, including individual personnel thereof and other U.S. forces in the vicinity, against a hostile act or demonstrated hostile intent.[54] NLWs can be used to defend operational units. An example is the employment of a non-lethal minefield to discourage and repulse hostile crowds.

Individual Self-Defense: The inherent right to use the necessary means available and to take all appropriate actions to defend oneself and U.S. forces in one's vicinity from a hostile act or demonstrated hostile intent. Commanders have the obligation to ensure that individuals within their respective units understand and receive training on when and how to use force in self-defense. NLWs can be used for individual self-defense in confinement facilities. For example, the employment of pepper sprays against enemy prisoners of war or internees who are rioting or getting out of control.

Hostile Act: An attack or other use of force against U.S. forces. It is also force used directly to preclude or impede mission and/or duties of U.S. forces, including recovery of U.S. personnel and vital U.S. government property. A hostile act is behavior that is, by definition and nature, direct, emphatic, and unequivocal. Moving away and down a scale from a hostile act is behavior that is clearly hostile intention. Between clearly hostile intent behavior and not threat perceived or present is that challenging gray

area, which requires discipline, judgment, and careful attention to the totality of the circumstance.[55] NLWs can be used to preclude a hostile act. For example, coating a museum or U.S. Embassy with slippery foam in order to protect it from crowd vandalism or penetration of embassy grounds.

Hostile Intent: The threat of imminent use of force against U.S. forces. It is also the threat of force to preclude or impede the mission and/or duties of U.S. forces, including the recovery of U.S. personnel or vital property. The context of hostile intent is imminent and demonstrated or exhibited. Imminent does not necessarily mean "immediate" or "instantaneous." The logic of responding to hostile intent is to preempt a hostile act. The hostile intent must be demonstrated or exhibited by behavior. In the absence of specific criteria, hostile intent is a determination based on behavior and the totality of the circumstances surrounding the behavior-the context of the behavior. Hostile intent may be characterized as behavior that, if not responded to, becomes hostile action. The challenge is using force based on hostile intent is "when" and "how." The when is based on necessity, and the how is based on proportionality. Responding too soon risks misinterpreting the behavior, and responding too late is a moot point; the hostile intent would have become hostile action. This indicates that there are thresholds between a hostile act, hostile intent, and no perceived threat.[56] NLWs can also deter hostile intent or assist in determining intent. Bullhorns and speakers can warn persons to avoid an area while a gradual use of NLWs, such as the employment of ADS, TAPM's, the MK-19 Machine Gun 40mm non-lethal rounds and stingball grenades, are used in a phased escalation process.

Elements of Self-Defense: Application of force in self-defense requires the following two elements: **Necessity**: When a hostile act occurs or when a force exhibits hostile intent. **Proportionality**: When force is used to counter a hostile act or demonstrated hostile intent must be reasonable in intensity, duration, and magnitude to the perceived or demonstrated threat based on all facts known to the commander at the time.

Means of Self-Defense: All necessary means available and all appropriate actions may be used in self-defense. The following guidelines apply for individual, unit, national, or collective self-defense:

Attempt to De-Escalate the Situation: When time and circumstances permit, the hostile force should be warned and given the opportunity to withdraw or cease threatening actions. For example, the use of bullhorns, speakers and a show of force may be enough to discourage persons or at least separate belligerents and bystanders.

Use Proportional Force to Control the Situation: When the use of force is self-defense is necessary, the nature, duration, and scope of the engagement should not exceed that which is required to decisively counter the hostile act or demonstrated hostile intent.

Attack or Disable or Destroy: An attack to disable or destroy a hostile force is authorized when such action is the only prudent means by which a hostile act or demonstration of hostile intent can be prevented or terminated. When such conditions exist, engagement is authorized only while the hostile force continues to commit hostile acts or exhibit hostile intent.[57]

Threat Behavior- No threat. No threat behavior is common, ordinary human activity. Hostile intent builds until it crosses into hostile act. A hostile act is a direct,

definite and unequivocal act against someone, a group or groups or material. The difference between hostile intent and hostile act is not in the differences or nuances between the two in observing the same behavior but in the necessity to use force proportionally to the circumstance. A hostile act and hostile intent pull the same trigger of necessity. Threat and proportionality are a matter of balance with the stated point of balance being proportional force that decisively counters the threat.

Regardless of the circumstances, the ROE regarding the use of deadly force has always had to be defined within a clear criteria. Deadly force is "force that a person uses causing, or that a person knows or should know would create a substantial risk of causing, death or serious bodily harm." The use of deadly force by a service member has a very high and very specific threshold.[58]

The use of non-deadly or non-lethal force has a very low and a non-specific threshold. DoD policy states that "non-lethal weapons, doctrine, and concepts of operation shall be designed to reinforce deterrence and expand the range of options available to commanders." NLWs should enhance the capability of U.S forces to accomplish the following objectives: discourage, delay, or prevent hostile actions; limit escalation; take military action in situations where the use of lethal force is not the preferred option; better protect our forces; and temporarily disable personnel (material also). The availability of NLWs shall not limit a commander's inherent authority and obligation to use all necessary means available and to take all appropriate action in self-defense. NLWs shall not be required to have zero probability of producing fatalities or permanent injuries. However, while complete avoidance of these effects is not guaranteed or expected, when properly employed, NLWs should significantly reduce

them as compared with physically destroying the target. NLWs may be used in conjunction with lethal weapon systems to enhance the latter's effectiveness and efficiency in military operations. Implied use of non-lethals, but not specifically stated, is the intent of non-lethal tactics and techniques to physically control or otherwise restrain another person.[59]

Deadly force's high and specific threshold and non-lethal weapon's force's low and non-specific threshold is apparent when reviewing the most commonly used force continuums and ROE mnemonic devices. Deadly force occupies a specific and clear space in force continuums and ROE mnemonics.[60]

THREAT RESISTANCE BEHAVIOR

Cooperative-Compliant: Individual/group responds appropriately to service member presence, direction, and control. **Passive Resistance**: Individual/group refuses, with little or no physical action, to cooperate with directions. This can assume the force of a verbal refusal or consciously contrived physical inactivity. **Active Resistance**: Individual/group uses non-assaultive physical action to resist service member's direction. Examples would include pulling away to prevent or escape control or overt movements, such as walking toward or away from. Running away is another example of active resistance.[61]

Assaultive/Bodily Harm: Individual/ group attempts to apply (or applies) force to service members: attempts or threatens, by an act or gesture, to apply force to any service member, if individual has, or causes other service members to believe upon

reasonable grounds that individual has, present ability to effect an individual's purpose (to assault). Examples include kicking and punching but that may also include aggressive body language that signals the intent to assault.

Assaultive/Serious Bodily Harm or Death: Individual/group exhibits actions that a service member reasonably believes are intended to (or are likely to) cause serious bodily harm or death to any service member. Examples include assaults with a knife, stick, or firearm, or actions that would result in serious injury to any service member.[62]

FORCE-RESPONSE OPTIONS

Cooperative Controls/Service Member Presence (Show of Force): While not strictly a use-of-force option, the simple presence of service members can affect both the individual/group and the situation. **Communication**: Service members can use verbal and nonverbal communication to control and/or resolve the situation. **Contact Controls/Physical Control**: There are two levels of physical control: soft and hard. In general, physical control means any physical techniques used to control the individual/group that does not involve using a weapon. Contact controls are soft techniques that are control-oriented and have a lower probability of causing injury. **Compliance Techniques/Physical Control**: Compliance techniques are "hard" techniques that are intended to stop an individual/group's behavior or to allow application of a control technique and have a higher probability of causing injury. The technique includes countermeasures designed to overcome the subject's degree of resistance, such as using pain compliance applications and chemical irritants.

Defensive Tactics: These are countermeasures designed to cease the subject's non-lethal assault, regain control, and ensure continued compliance. This includes baton strikes, escape techniques, and blocking defenses.

Deadly/Lethal Force: This use-of-force option involves the use of any weapons or techniques that are intended to, or are reasonably likely to, cause serious bodily harm or death.[63]

The concepts of gradualism and minimalism are antithetical to the reasoning behind force continuums, use-of-force models, and the SROE. When self-defense is the issue, the hostile act or hostile intent must be decisively countered using proportional force. Gradualism and minimalism (with respect to the use of force in self-defense) are dangerous experiments risking the personal safety of those threatened and demonstrates indecisiveness and lack of resolve. NLWs; tactics, techniques, and procedures; and equipment provide a means to respond decisively and proportionately while maintaining personal safety in situations where deadly force is not required or contraindicated.[64]

NLWs provide a "forgiving" means of determining hostile intent (or forcing an adversary to declare his intent) without reasonable risks. In Somalia, a service member shot and killed a boy who was approaching service members while holding a small box. The boy failed to heed, hear, or understand verbal warnings to stop. Based on the totality of circumstances, a service member shot and killed the boy. The box contained candy. The service members had only two options available, verbal warnings and deadly force. The situation represents that true gray area of determining hostile intent. Hindsight is always 20/20, but if non-lethal options had been available to the service member, the situation might have ended differently. The boy's intent could have been determined

with the impact of 12-gauge or 40-millimeter non-lethal projectiles. The boy's continued advance after being struck with a 12-gauge fin-stabilized NL projectile would have provided certainty as to his intent. If he had staggered away after being struck, the service members would have remained safe, and the boy's injury, a bruise, would have faded.[65]

In summary, the Rules of Engagement have not changed substantially from the use of lethal or NLWs. The underlining problem is that a soldier is authorized to fire his lethal weapon under the ROE. The employment of NLWs may take longer due to the lack of information the higher headquarters has on the various systems and an understanding of the situation on the ground where NLWs are to be employed. The key to success is the understanding of non-lethals and their proper employment by the command group and subordinates.

There are many in the military community that believe that specialized rules of engagement for non-lethals are needed. They argue that non-lethals have been developed as a separate weapon system, have unique technologies, and are used mainly in areas where there is more policing than combat. They also argue that only a few select troops be trained in the use of non-lethals.

Either way, commanders must consider developing non-lethal ROEs and trust their subordinates to make the right decision and act accordingly in a hostile or tense situation or risk jeopardizing mission goals.

ROEs are intended to provide general guidelines on self-defense. Additionally, they provide guidance governing the use of force consistent with mission accomplishment. They can be used in operations other than war, during transition from

peacetime to armed conflict or war, and during armed conflict in the absence of superseding guidance. ROEs are usually tailored to the mission at hand and can range from very permissive one suitable for MCOs to very restrictive ROEs suitable for humanitarian or SASO missions, where the use of lethal force is not always the first option. The SROE provides the implementation guidance on the inherent right and obligation of self-defense and the application of force for mission accomplishment. In peacetime, the SROE allows the use of force only in self-defense to a hostile act or hostile intent.[66]

The constraints on U.S. military action are based on the principles of proportionality and necessity. These principles reflect the desire to minimize noncombatant casualties and collateral damage while preserving the legitimacy of military operations. Despite the military's best efforts they are not always able to eliminate the possibility of noncombatant casualties without placing friendly forces or mission accomplishment at risk. When such noncombatant casualties occur-even as the unavoidable result of actions taken under clear military necessity-they are immediately and graphically reported worldwide by the networked media organizations. Such reporting often creates considerable local, international, or domestic U.S. opposition to the continued presence of U.S. forces in the area of crisis. This can result in the loss of perceived legitimacy and severely limit the utility of military force as a policy option in the furtherance of national interests.[67]

Traditional military weapons require commanders to make difficult "trade off" decisions regarding the proper balance between mission accomplishment, force protection, and the safety of noncombatants. Military commanders may relax the rules of

engagement in order to enhance mission accomplishment or force protection through increased freedom in the application of firepower, but this potentially decreases the safety of noncombatants. Conversely, when the command group is focused on noncombatant safety through restrictions on the use of lethal force, the troops in the field become potentially more vulnerable and their mission more difficult to achieve.[68] Either way, finding the right mix of lethal or non-lethal weapons is a commander's dilemma. The wrong weapon for the wrong situation can quickly escalate the situation to deadly levels.

However, the need to reduce the risks of serious injury to personnel is not limited to crowd control scenarios or to military operations other than war. Tactical applications for NLWs may exist in any military operation. During urban operations, for example, some of the local civilian populace may remain in an urban area in the midst of battle. The traditional solution to such challenges has been the implementation of restrictive rules of engagement. Non-lethal capabilities offer commanders more flexibility, allowing adoption of less restrictive rules of engagement without necessarily increasing casualties or destruction. Such permissive rules provide subordinates freedom to employ appropriate levels of measured military force to accomplish their missions while minimizing casualties and collateral damage. Another operation might include a "peace enforcement" mission in which NLWs are used in an area-denial role. This allows military forces to forcibly separate combatants without a counterproductive resort to lethal force. Even in conventional combat operations, non-lethals might be used to capture enemy soldiers for interrogation.[69]

NLWs provide a means to engage early and decisively. Necessity to act can be a dilemma. A hostile act or demonstrated/exhibited hostile intent with a board or edged

weapon at 3 meters has a more immediate impact on the determination of necessity than the same behavior at 30 meters. Distance can make the difference between a hostile act and a demonstration of hostile intent. One situation may require the instant application of deadly force, the other deliberate application of non-lethal force.[70]

In summary, the application of force demands split second decision making by the soldier. The challenge to the soldier is to comprehend the rules of engagement and know when to engage a person or persons with the right amount of force. Too little force and the person or crowd gains confidence and threatens the soldier and his unit. Too much force and the soldier's actions cause grievous injury or death to someone and the tactical, operational and strategic situation changes to one of the weak victim dictating terms and conditions to the superior force.

CHAPTER SUMMARY

NLWs offer a unique opportunity to influence an enemy while enhancing the U.S. and its Allies position in a region or situation. The key is to understand when to employ NLWs in order for them to be effective. In addition, understanding what non-lethals limitations are will only occur if the military embraces non-lethals and views them as a force multiplier rather than a force divider.

Another factor to be considered is the public's perception and media attention. NLWs and their capabilities must be understood by commanders and public affairs officers in order to address media questions and explain their purpose of such weapons. Operational experience indicates that novel capabilities provoke significant media

interest. Personnel participating in interviews or briefings must be prepared to address the role of NLWs in such a manner as to provide a clear understanding that the presence of a non-lethal capability in no way abrogates the option to employ deadly force in appropriate circumstances. This stance is necessary both to deter potential adversaries and to avoid misperceptions by the news media.[71]

Another consideration is that NLWs may play an important strategic role by buying time for the President in a crisis or war by confounding the enemy or disrupting his military, intelligence, logistics flow, or civilian activities. The effects of NLWs may be enhanced by psychological operations and information warfare. The relatively reversible effects of NLWs may be an attractive feature to policy makers. Throughout the spectrum of conflict, NLWs will play a vital role in future warfare. Their use can deter war or conflict, minimize civilian casualties and collateral damage, and limit damage to infrastructure. They can be used to shape the battle space, thereby reducing the enemy's ability to wage war. By conducting a series of parallel attacks against an enemy's centers of gravity, it may be possible to prevent conflict escalation or even inflict strategic paralysis solely by non-lethal means. The strategic interdiction of war-making necessities would strongly degrade an enemy's war machine.

The addition of NLWs will have the net effect of increasing both the range of response options and the lethality of joint forces.[72] The issue of risk comes into play when politicians and the military view NLWs as the answer to a problem or as a solution. When NLWs fail to produce the desired results, senior military officials could dismiss them as a novelty item instead of as a force multiplier.

The next chapter discusses use and proliferation of NLWs by allies and enemies.

CHAPTER FOUR

THE HISTORY AND DEVELOPMENT OF NON-LETHAL WEAPONS

This chapter addresses the history of NLWs, from Biblical times to current and future uses. It focuses on the technological aspect of NLWs, from low technology to high technology and the proliferation of such technology to allies, and enemies.

The use of NLWs and their goals are not new to modern warfare. Throughout history, men have sought ways to defeat and deter their enemy while conserving their own forces for the final battle. It is a basic strategic principle to inflict the maximum amount of pain, or destruction, upon the enemy at minimal cost to friendly forces.

There are many historical examples of the use of NLWs. For example, the story of Joshua's use of non-lethal weaponry is well known. The Lord said to Joshua,

> See, I have given into your hand Jericho, with its king and mighty men of valor. You shall march around the city, all the men of war going around the city once. Thus you shall do for six days. And seven priests shall bear seven trumpets of rams' horn before the Ark; and on the seventh day you shall march around the city seven times, the priests blowing the trumpets. And when they make a long blast with the ram's horn, as soon as you hear the sound of the trumpet, then all the people shall shout with a great shout; and the wall of the city will fall down flat, and the people shall go up every man straight before him.[73]

The use of acoustics brought the walls of Jericho down and the destruction of the Canaanites.

The Aztecs also used non-lethal weaponry. Their form of warfare and battle was highly ritualized that followed mutually accepting codes of conduct for both the Aztecs and their enemies. Their principle weapon was a wooden sword, studded along its cutting edge with slivers of obsidian or flakes of flint, designed to wound but not to kill. The greatest warriors sought the enemy warriors of equal or higher rank and fought them.

The warrior tried to maneuver into position to inflict a wounding blow upon their enemy, primarily at their legs, the cutting of a hamstring, or the crippling of a knee. The wounded warrior was then grappled to the ground and subdued. The Aztec victors then led their prisoners to Tenochtitlan for the eventual ritual sacrifice.[74]

Genghis Khan's Mongol Army used NLWs in order to minimize casualties among their small army. The Mongols rounded up the enemy's herds and stampeded them toward the enemy battle lines or homes, causing great confusion among the enemy. The Mongols then followed close behind and attacked the disorganized enemy. Another non-lethal weapon was noise. Before an attack, the Mongols would seek to confuse the enemy and wreck havoc among their forces. One of the most common forms of attack was the Crow Swarm or Falling Stars attack. At the signal of a drum, or by fire at night, the horsemen galloped at the enemy from all directions. The enemy was shaken and unnerved by the sudden assault and equally sudden disappearance and the roaring noise followed by a greater silence. Before the enemy could respond in an organized manner, the Mongol army had disappeared to fight at another opportune time.[75]

The Mongol army used various non-lethal devices to insight confusion within enemy ranks and to scare them off the battlefield. The Mongols adopted the Jurchen firelance to disorient their enemies and panic their horses. This made it easier to kill their enemies. The firelance was a bamboo stuffed with gunpowder that when lit produced a slow burn that spewed sparks, flames, and smoke out of one end like a flamethrower. The Mongols used incendiaries to spread fires, but it was also used as smoke bombs and to create terrible smells that Europeans thought were evil magic and a source of disease.[76] The Mongols use of NLWs allowed them to win battles by softening the enemy before

the final battle. They were also used as a psychological tool in order to instill fear and terror in the hearts and minds of their enemies and while reducing their will to resist.

The Sioux Indians used a "counting coup" method as a form of non-lethal warfare. They would fashion a wooden stick and nudge or tap the enemy warrior in battle. This brought the warrior who tapped the enemy warrior great status within the tribe. Killing an enemy warrior at long range did not count as a *coup* and neither did outnumbering the enemy count. To have the enemy count coup on oneself was a great dishonor.[77]

In Italy, from A.D. 1200 to 1500 a group of mercenaries on the Italian peninsula called the *condottieri* waged what is often regarded as a form of non-lethal warfare. They were hired by the various mercantile city-states to protect vital interests. Many of the major engagements between these city-states' *condottieri* were known not for their casualties, but the lack thereof. According to Niccolo Machiavelli, the battle of Zagonara in 1424 was a "defeat, famous throughout all Italy,[in which] no death occurred except those of Lodovico degli Obizi and two of his people, who, having fallen from their horses, were drowned in the mire." Several reasons have been proposed for this low lethality. Once of the more plausible reasons is the simple fact that the armor of the day was much superior to most offensive weaponry. A more personal reason is the fact that the surest way for a mercenary to lose his source of livelihood was for the *condottieri* to obliterate his enemies. As a result, mercenaries rarely sought set piece battles, choosing instead to fight relatively minor and extended campaigns. Engagements between mounted warriors often resembled jousts and those between infantry often turned into shoving matches.[78]

In July 1932, The United States Government employed tear gas against World War I veterans, the Bonus Marchers, who had marched to Washington seeking war bonuses. The Federal Government had promised veterans payment for their war service at a later date, but the onset of the Great Depression forced many veterans to demand immediate payment. On 28 July, 1932, a scuffle broke out between Washington D.C. police and bonus marchers with a police weapon accidentally discharging and killing two veterans with three policemen injured in the aftermath. President Hoover called Secretary of War Hurley for the Army's assistance in the matter. After a two hour delay, Army units moved in the direction of a large gathering of bonus marchers located in some buildings along Pennsylvania Avenue. Clearing the area of pedestrians, Army units were ordered to don gas masks, rushed into the buildings occupied by the bonus marchers and tossed tear gas grenades "by the handful" with marchers scurrying out of the gases effects.[79] The Army engaged other bonus marchers and their families across the river in Anacostia. The use of tear gas allowed the Army to clear an area quickly and safely, though the rampant use of tear gas indicates that tear gas was seen as a novelty and not a tool to assist a commander in reaching his goal through moderation.

During the Vietnam War, two weapons employed by the United States that fell within the NLWs category, herbicides, and O-chlorobenzylidene malonontrite (CS). To deny enemy forces cover and destroy suspected enemy food plantations, the United States conducted aerial spraying of large tracks of land with various herbicides. The herbicides, designated Agents Green, Pink, Purple, White, Blue and Orange, contained dioxin, defoliated huge tracks of land in Vietnam between 1961 and 1971. The United States also employed CS gas. The CS gas was not used to control riot situations, but to

root the enemy out of his place of cover and concealment so as to make him an easier target for conventional fighting. CS was also used extensively to root out enemy soldiers in caves, tunnels and bunkers.[80]

The British Army and Royal Ulster Constabulary (RUC) used various NLWs to control crowds in Northern Ireland. Tear gas, water cannons, rubber and plastic bullets, and baton rounds were used as anti-riot weapons. The blunt trauma impact weapons were designed to "maximize pain while constrained to minimize hazard levels". Various NLWs employing sound were reportedly used by the British Army to cause a psychological effect on certain individuals.[81] This is the first time that a modern government dedicated resources to develop and employ NLWs specifically for the use against individuals and crowds.

The U.S. military used NLWs in 1995 during Operation United Shield in Mogadishu, Somalia. U.S. Marines employed beanbag rounds, pepper spray, sticky foam, aqueous foam, stinger grenades, caltrops and 40mm and 12 gauge non-lethal munitions to subdue rioting crowds and to keep personnel away from withdrawing forces.[82] The ability to control crowds or deny them the ability to freely operate allowed the Marines and United Nation forces to control the situation and prevent it from becoming a hostile environment. It met operational needs by allowing Marine and United Nations forces to withdrawal with minimal civilian casualties.

The history of NLWs shows that it is not unique to just Western cultures. It is global and all armies at all places have used them. Past non-lethal uses may have been complementary to lethal warfare, or an intricate part of a larger, ritualized ceremony. History has also shown that NLWs will be used if available to the user. It has only been

of late that NLWs have evolved from direct contact to one of an even greater stand off range to avoid personal contact. The ultimate goal is the employment of directed energy weapons with extended engagement ranges to meet future operational requirements.

CONTEMPORARY NON-LETHAL WEAPONS AND PROLIFERATION

NLWs and their use are nothing new. History indicates that various NLWs can assist an army in achieving its goals on the battlefield. What has changed over time is the increasingly sophisticated nature of NLWs technology. Currently, the U.S. leads the world in the development of new NLWs. These developments are based on the future operational needs of U.S. forces and diverse operational environment implied by asymmetrical warfare.

Current technology focuses on kinetic energy or "blunt trauma" to stop a person or object. The Italian Navy is preparing to deploy the ART (Ammunition at Reduced Time of Flight) in order to combat illegal smuggling of weapons of mass destruction via sea lanes. The ART is aimed and fired at a ship's rudder with the goal of disabling the ship without sinking it or injuring the crew. The ART will also have a micro-wave programmable multifunction fused explosive warhead to meet military requirements. Its enhanced accuracy and long range make it an ideal system from threats including swarming boats and sea-skimming missiles.[83]

At the other end of the spectrum, high technology NLWs range from directed energy, lasers, pulsed energy weapons, and electromagnetic pulse systems (EMPs). EMPs are generated by converting the energy from conventional explosives or nuclear

reactions into radio-frequency pulses. Such pulses disturb or damage communications and information equipment by entering directly through antennas or indirectly through physical holes.

INTERNATIONAL NON-LETHAL PROLIFERATION CONCERNS

The proliferation of NLWs by others dramatically impacts future programs in the U.S. First, countries that lack a non-lethal program or the robustness of the U.S. program could take what the U.S. has developed and copy the systems at greatly reduced cost. This is a copyright violation and cost the U.S. government and businesses in time and research funds. Second, non-lethal proliferation virtually guarantees that NLWs will find their way into the hands of non-state actors and belligerents. This raises the prospect that potential enemies may develop effective counter-measures.

One of the most often ignored areas of NLWs is the proliferation and ability by individuals, groups, organizations or countries to develop counter-measures. This is important since NLWs are "effects based." If a counter-measure is developed, then the employment of non-lethals jeopardizes the user and the target. The user might resort to lethal force as a last resort unless highly disciplined and able to extricate themselves from the situation or control the situation some other way. The targets might find themselves engaged with lethal ammunition and either wounded or killed. The local crowd control actions then become elevated to the strategic level. NLWs effectiveness is greatly reduced.

A key concern with this technology centers on the vulnerability of modern civilian equipment in highly computer-dependent Western societies. The potential costs for transportation and key infrastructures such as hospitals could be substantial, as would the ensuing social disarray. While sophisticated, high-powered EMP weapons carried in bombs and other such devices might pose the greatest scale of danger, researchers from the Dutch TNO Physics and Electronics Laboratory determined, with the electrical equipment available in any commercial store, that it is possible to craft a vehicle-portable system that disturbs unprotected computer equipment, thereby causing a loss of data and no access to hard disk, as well as shutting computers down. The unlikelihood of detecting or tracing such weapons opens up numerous possibilities for a nationwide attack.[84] Terrorists could target the EMP weapon against banks, power plants, fuel processing centers, or a city's electrical grid and leave before anyone knew what had happened. This is especially important since an EMP weapon is able to slip "under the nation's radar screen" and does not fall within the CBRNE criteria. It could also be used against our allies and later on used as a weapon of blackmail.

The concepts of proliferation and the arms trade are linked. Proliferation has generally been used to mean the transfer of technology, equipment, knowledge and strategic goods to countries who do not possess them. Two patterns of proliferation have been used to describe the spread of weapons- horizontal and vertical. Horizontal proliferation is the spread of weapons to other countries of other areas, whilst vertical proliferation is when talking about quantitative or qualitative advances of weapons within a state. More recent terminology speaks of armament dynamic, supply side and demand side aspects of proliferation.

"Armament dynamic" is the total process of developing, acquiring and maintaining a particular type of weaponry for the armed forces as well as developing the necessary procedures to integrate that weaponry into military doctrine.

"Supply-side proliferation" is the flow of technology, equipment and knowledge from states possessing these commodities to states lacking them and is determined by geopolitical, bureaucratic, economic and technological motivations. In some cases the supplier transfer through export control policies, diplomacy and other political means. Finally, it must be understood that the development aims of NLWs in the West is to minimize injury while maintaining order. Non-Western countries employment of NLWs might not meet Western standards or goals, but instead are intended to cause long-term disablement.[85]

The proliferation of NLWs is not a major concern to the U.S. government. The United States leads the world in NLWs development. Its budget, though not robust by Department of Defense standards, is quiet generous when compared to other nations such as Great Britain and Israel. Other nations tend to view non-lethal more as a function of law enforcement than a function of military operations.

The concern for the United States lies in the transfer of information regarding the directed energy program and the proliferation of EMP information. The employment of such weapons against U.S. targets could be devastating to the United States and to its prestige in the world. The ability for terrorist groups to acquire NLWs, primarily directed energy and EMP technology, and use them against the U.S. is of concern. Terrorists attack targets that are symbolic of a society that they feel is evil or corrupt. They do not attack targets to count casualties. Examples of symbolic targeting for terrorists,

intelligence, and the NLWs community include Terry Nichols and Timothy McVeigh's destruction of the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma, on 19 April, 1995. The building contained a number of federal agencies, to including the Federal Bureau of Investigation (FBI), the Drug Enforcement Agency (DEA) and the Bureau of Alcohol, Tobacco, Firearms and Explosives. It is believed that both Terry Nichols and Timothy McVeigh bombed the building as revenge for the Branch Davidians Compound incident in Waco, Texas exactly two years earlier.[86]

The September 11, 2001, hijacking of four planes and the destruction of New York City's Twin Towers and damage inflicted on the Pentagon by three of the aircraft, with the fourth crashing into a Pennsylvania field, indicates that terrorists attack symbolic targets. The Twin Towers represent American business and its economic might. The Pentagon represented the American military while it is thought that the fourth plane's target was either the White House or the Capital Building, both symbols of American political power.

NLWs are the perfect weapon for terrorists. The terrorists attacked these symbols not to inflict casualties, but to damage American symbols of power. If the terrorists wanted to inflict massive casualties, then attacking a football stadium during a game would cause more casualties. The terrorists wanted to prove to their people and to the world that America is not invincible and that it did not take much to inflict a serious blow to the country and its psyche. The terrorist's acquisition of a non-lethal EMP system would allow them to employ the system and avoid detection. The terrorists may target other symbols of American power such as Wall Street; the power grid; oil production facilities, or a major airport. Such an attack would cause great damage and loss of life to

the United States, inflict a damaging wound to the nation's psyche, while the terrorists would claim responsibility and open the door for other terrorist acts against the United States, whether lethal or non-lethal.

INTERNATIONAL AGREEMENTS

International treaties and agreements are intended to limit the proliferation and use of certain types of capabilities; in particular, nuclear, biological, and chemical weapons. They also limit use of electromagnetic technology to interfere with peacetime communications. The concept of NLWs does not propose to violate international treaty or agreements to which the United States is a party and is subject to treaties and other agreements to which the United States may become a party.

Principal treaties or international agreements to which the United States is a party or signatory that may affect potential military non lethal capabilities are the following:

A. The Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare of 17 June 1925 ("Geneva Protocol"). The Geneva Protocol limits first use (but not possession) of chemical or biological weapons. The U. S. understands this to limit first use only of lethal or incapacitating chemical weapons; in 1969 the U.S. unilaterally renounced all methods of bacteriological (biological) warfare. (This renunciation subsequently was codified in the 1972 Biological Weapons Convention). At the time of U.S. ratification of the Geneva Protocol, the U.S. renounced first use of riot control agents or herbicides in war except in defensive military modes to save lives; this policy remains in effect in

Executive Order 11850 notwithstanding U.S. signature of the 1993 Chemical Weapons Convention. Consistent with this policy, riot control agents have been authorized for use in recent operations such as Somalia and Haiti.[87]

B. The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction of 10 April 1972 ("BW Convention"). This convention avows "never in any circumstances to develop, produce, stockpile or otherwise acquire or retain…microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purpose, [or] weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict." No distinction is made with regard to lethal or non lethal intent of the user.[88]

C. The Convention of the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques of 18 May 1977 ("ENMOD Convention"). This convention regulates use of environmental modification as a method of war, prohibiting such use only where it has effects as a means of destruction that are "widespread, long-lasting or severe."[89]

D. The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction of 13 January 1993 ("CWC"). The CWC prohibits "under any circumstances" the development, production or other acquisition, stockpiling or retention of chemical weapons. While chemical weapons are defined as those "specifically designed to cause death or other harm" and "any chemical which through its chemical action on life processes can cause death,

temporary incapacitation or permanent harm to humans and animals," the intent was to prohibit the use of chemicals for antipersonnel or anti-material purposes. The CWC also prohibits the use of riot control agents (RCA) as a "method of warfare." Although the Clinton Administration suggested that this would limit the use of RCAs where combatants are present, Executive Order 11850 remains in effect (permitting use of RCAs against combatants in defensive missions to save lives, such as combat search and rescue), pending Senate advice and consent to U.S. ratification.[90]

E. Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction of 13 January 1993 ("CWC"). The CWC prohibits "under any circumstances" the development, production or other acquisition, stockpiling or retention of chemical weapons. While chemical weapons are defined as those "specifically designed to cause death or other harm" and "any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans and animals," the intent was to prohibit the use of chemicals for antipersonnel or anti-material purposes. The CWC also prohibits the use of riot control agents (RCA) as a "method of warfare." Although the Clinton Administration suggested that this would limit the use of RCAs where combatants are present, Executive Order 11850 remains in effect (permitting use of RCAs against combatants in defensive missions to save lives, such as combat search and rescue), pending Senate advice and consent to U.S. ratification.[91]

F. The Nairobi International Telecommunications Convention of 10 January 1986 restricts the use of electromagnetic weapons. Article 35 (1) prohibits "harmful interference" with the radio services or communications of member states. The United

States is not a party to this treaty, but it has nonetheless implemented its provisions by incorporating them into law (47 U.S. Code 502). The treaty's provisions do not apply during wartime; although "wartime" is not defined, it would certainly apply to major regional conflict.[92]

G. The 1977 Environmental Modification Convention (that is, the Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques, or ENMOD) defines "environmental modification techniques" as "changing through deliberate manipulation of natural processes the dynamics, composition, or structure of the Earth, including its biota, lithosphere, hydrosphere, and atmosphere, or of outer space." ENMOD prohibits methods having widespread (several hundred square kilometers), long-lasting (months), or severe (serious or significant disruption or harm to human life, natural and economic resources, or other assets) environmental effects as a means of destruction, damage, or injury to any other state party.[93]

H. The first review conference (October 1995) for the *United Nations Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be Deemed to be Excessively Injurious or Have Indiscriminate Effects*, also known as the *United Nations Convention on Conventional Weapons* (UNCCW), adopted a fourth protocol prohibiting the use of blinding laser weapons. The U.S. is not a signatory to this protocol, but has firmly implemented it. Protocol IV defines blinding laser weapons as "weapons specifically designed, as their sole combat function or as of their combat functions, to cause permanent blindness to unenhanced vision, that is the naked eye or to the eye with corrective eyesight devices." Devices such as range finders, target designators, or NLWs such as dazzlers are not blinding laser weapons. The protocol and

US policy require commanders to take all feasible precautions (such as trough training and ROE) in the use of laser systems to avoid the incidence of permanent blindness to unenhanced vision.[94]

As other countries investigate, develop, field, and/or sell NLWs and counter-measures, U.S. forces could be vulnerable to such weapons. Moreover, resourceful adversaries will develop and exploit NLWs technologies with or without U.S. efforts in the same technologies if they see an advantage in doing so. In general, NLWs could represent an asymmetric threat to the United States and its Allies.[95] This particularly true when so few nations have the research and development capabilities of the United States. Thus, nations, and even non-state actors may develop NLWs that have cause social disruption on a massive scale, such as an EMP weapon.

The last issue is that not all countries, particularly European countries, view NLWs as the United States does. Europeans want kinetic energy weapons and are fearful of the U.S.'s seemingly disregard for Chemical, Biological Conventions and the future use of directed energy weapons. They are concerned that as the nature of military operations shift from a purely military effort to one of combined military/peacekeeping, and peace-enforcing/humanitarian operations that non-lethal technologies that separated military and police will now be joined as one. They may not be able to distinguish military operations from police operations.[96]

The existence of a capability or technology gap between the United States and its European Allies has been well documented.[97] The technology gap refers to the disparity between the Untied States' application of "high" military technologies such as stealth

technology, long-range precision-guided munitions and uninhabited aerial/combat vehicles, compared to the European Allies' lethargic embrace of new technology. The presence of this gap would seem automatically to imply that the US will take the lead on all new developments of these new technologies.[98] In essence, the United States will develop a non-lethal weapon and the European might accept it, as long as it does not run counter to their concerns over chemical, biological or directed energy systems and the violation of various treaties covering the these areas.

For the United States, such concerns run counter to their agenda of national security. The United States' primary concern is security and dealing with rogue nations while European countries may view and act on security issues in a totally different manner than the United States. Europe may instead be concerned first with failed states, the migration of legal and illegal immigrants and integrating other European nations into the European Union followed by security.

In summary, this chapter addressed the historical development of non-lethal technology from crude acoustics and kinetic energy to non-lethal chemicals and finally to sophisticated energy weapons, the concern over the proliferation of non-lethal weapons, and the legal agreements the United States must abide by as it develops NLWs.

The next chapter addresses the employment of NLWs in various scenarios and the concern that NLWs lack the institutional support in order to be an effective tool in future military operations.

CHAPTER FIVE

NON LETHAL SCENARIOS

In order to develop training plans, realistic, plausible scenarios must be developed and employed in NLWs training. Scenario training acts as a mental exercise for soldiers and prepares them to transition from wartime, to a humanitarian, to peacekeeping mission and back to wartime mission in a rapid manner. It also allows soldiers and the command structure to become familiar with NLWs while developing a sense of when NLWs should be employed in a given situation.

The situation and scenarios were chosen because they represent a futuristic battlefield in which U.S. forces must accurately employ both lethal and non-lethal force either separately or in combined operations to achieve operational success. A majority were taken from a report while others where made up by the author. The scenarios include operations in complex, urban terrain, pre-emptive strikes against an opposing force, engaging a rioting crowd near the U.S. Embassy, peacekeeping operations in the country while two opposing forces hinder peace-enforcement operations; a maritime interdiction operation to prevent linkage and resupply of opposing forces; the protection of the country's cultural heritage by preventing looters access to the museum and finally, the protection of a food convoy on a humanitarian aid mission.

In order for these operations to be a success, operational forces must have accurate intelligence as to where opposition forces are located, their equipment and intent. This will assist the commander and the user in determining the best possible

weapon system to neutralize the opposition while reducing U.S. and civilian casualties and collateral damage.

SCENARIO #1: HUMANITARIAN MISSION AND USE OF NON-LETHALS

The United States has deployed a joint task force to provide humanitarian assistance to a Third World nation. That country is suffering famine as a result of civil war and anarchy. The operational environment is non-permissive, uncertain, and chaotic. The capital city, scarred by heavy fighting, is home to several hundred thousand people. The present population is a combination of longtime residents, displaced refugees from rural areas, relief workers, and thousands of armed gunmen whose factions frequently fight pitched battles in the streets as they struggle for control of various neighborhoods.

The tactical situation is unpredictable. U.S. patrols may be met by smiling crowds on one corner and by gunfire on the next. A day later, the situation is reversed. Attempts to distribute emergency supplies are hazardous. Whenever emergency workers appear, huge crowds invariably gather. Scattered amidst the hungry civilians seeking relief are the armed members of various factions. However, many of the armed individuals in the crowd are armed only for their own safety. The people swarm impatiently. Some, including children, dart onto trucks and attempt to steal supplies. Rocks are thrown, sometimes at random, sometimes between factions within the crowd, sometimes at U.S. military personnel and relief workers. It is impossible to distinguish friends from potential foes.

To add to the complexity of the situation, a neighboring state has recognized one of the more violent armed factions as the legitimate government. At the invitation of this faction, the neighboring country's army has crossed the border and occupied a long-contested district. The occupiers possess strong conventional military forces, including tanks and artillery. These units have not taken any hostile action against U.S. forces, but have conducted artillery attacks against opposing local factions. They are also supplying weapons and ammunition to local forces in order to influence the outcome of the crisis.

The Joint Task Force (JTF) has set up roadblocks within the capital city and begun aggressive patrolling in order to establish a visible presence. JTF troops emplace strong points near key urban terrain, hoping to promote a sense of order and to restore stability in neighborhoods. Other JTF forces provide security and other assistance to non-government organizations distributing relief supplies.

The JTF commander has established rules of engagement (ROE) which permit the use of force in self-defense, to protect noncombatants, and to facilitate mission accomplishment. The ROE allows the use of NLWs when hostile intent is uncertain or to protect noncombatants so long as they use of such weapons does not endanger friendly forces. In all cases, the ROE clearly maintains the right and responsibility to employ deadly force when necessary for individual and unit protection in the face of hostile acts or hostile intent.

Lessons learned is that this is a Three Block War scenario where U.S. forces conduct peacekeeping, humanitarian and war within confined spaces. U.S. forces need intelligence to provide them with information on who the community leaders are, their

goals and intent. Intelligence must also identify all factions and any linkages they may have within the country.

SCENARIO #2: URBAN OPERATIONS AND THE USE OF NON-LETHALS

This scenario describes the use of unmanned ground vehicles (UGVs) and non-lethal counter-personnel capabilities to clear a building while reducing U.S., civilian, and belligerent casualties.

Because the JTF's mission is humanitarian assistance, the commander's policy is to avoid becoming involved in the host nation's internecine warfare unless it threatens U.S. forces, noncombatants, or mission accomplishment. The first challenge to this policy occurs late at night when rival clans begin a firefight in a crowded neighborhood near a U.S. strongpoint. A few rounds of small arms fire impact near the American position. These appear to be simply stray rounds but it is impossible to be certain. In any event, the ROE clearly permits the use of deadly force in self-defense. However, the noncommissioned officer in charge at the strongpoint knows that the neighborhood is crowded with noncombatants and does not believe that the immediate danger to the U.S. squad justifies returning fire. He contacts higher headquarters and requests assistance.

A reaction platoon quickly arrives on the scene, mounted in armored personnel carriers (APCs). The platoon leader swiftly assesses the situation and identifies two buildings that appear to harbor gunman. Two small, unmanned ground vehicles (UGVs) deploy from one of the APCs. These move rapidly into the two buildings, guided by remote control. Once inside, the UGV's employ a non-lethal counter-personnel weapon,

a malodorant, that almost immediately causes the belligerents to clear the room. The rapid reaction platoon launches sting ball grenades through building widows, temporarily incapacitating the belligerents through sight, sound and pain.

The troops of the reaction platoon advance into the buildings in tactical formation and with weapons ready. Once inside, they move quickly from room to room, recovering weapons and using flexible handcuffs to secure all persons suspected of having participated in the firefight. One gunman, who apparently escaped the effects of the non lethal weapon, attempts to fire his rifle. A reaction force soldier unhesitatingly shoots him.

Within a few minutes, the effects of the non lethal weapons begin to wear off though the smell lingers on the belligerents. Meanwhile, the reaction platoon collects all suspects and firearms in the street. As the suspects are evacuated to the rear for processing, an APC runs over the weapons, destroying them on the spot. An interpreter accompanying the U.S. troops uses a bullhorn to explain to the local residents what has occurred. He offers medical assistance to anyone wounded in the firefight or who might have suffered ill effects from the non lethal weapon. A mother brings forward a child with a broken arm, apparently sustained in a fall.

A television crew following the reaction platoon recorded the entire event. The reporter interviews the reaction platoon's leader, a lieutenant, who acknowledges the regrettable death of one gunman. He stresses, however, that the availability of NLWs allowed him to quickly stabilize the without resorting to a traditional, firepower-intensive, building-clearing procedure which would certainly have resulted in numerous noncombatant casualties and collateral damage. The reporter conjectures that the child's

broken arm was probably caused by a fall resulting from the effects of the NLWs. The lieutenant acknowledges that possibility, but also notes that the child's injuries are relatively minor. He reiterates that, while NLWs may have resulted in a broken arm, they certainly saved many lives and prevented many potentially crippling wounds.

The lessons learned are that instead indiscriminately returning fire, U.S. forces pinpointed a possible location and clear it of belligerents with minimal casualties all parties involved. The capture of the belligerents allows intelligence personnel to determine if they were rogue gunmen or members of a faction. The capture of the gunmen may allow other persons in the neighborhood to provide intelligence to U.S. forces as to location of other hostile gunmen.

SCENARIO #3: PREEMPTIVE STRIKE AND THE USE OF NON-LETHALS

This scenario presents a difficult choice to the JTF commander. He can engage the opposition with overwhelming lethal force, but project an image as a strong man willing to use force rather than diplomacy, or he can use NLWs to neutralize the threat at minimal risk to his forces while maintaining respect and prestige among the regional leaders and governments. The commander will employ UAVs, EMP weapons, carbon fiber spools and slippery foam.

Within the disputed border region, military forces from a neighboring state continue to consolidate their positions. The members of the regional cooperative security organization are divided concerning this state's claim to the disputed territory. The compromise solution is to issue a nonbinding request that the neighbor withdraw its

troops and cease its arms deliveries to the warring factions. This request goes unheeded. Instead, the invading force steps up its military activity, extending patrols beyond the disputed border region into a district soon scheduled to receive relief supplies under U.S. military escort. This increased military activity is accompanied by a propaganda campaign labeling U.S. intervention as "the reckless act of a colonialist bully."

It is not entirely clear, however, that the invading force has any hostile intent with respect to U.S. forces. At best it can be said that the JTF faces a *potentially* hostile force in position to interfere with mission accomplishment. Additionally, the regional cooperative security organization has not demonstrated the will to support U.S. military action. While the JTF is clearly capable of decisively defeating the neighboring nation's forces, the resulting casualties might have unfavorable political repercussions. These might weaken the perceived legitimacy of the U.S. presence and thus threaten both regional support and mission accomplishment.

The JTF commander elects to eliminate the threat of hostile action through a preemptive strike using non-lethal counter-material weapons. Land and sea based aircraft and UAVs carry out a non-lethal attack under cover of darkness using EMP bombs, carbon fiber bomblets and slippery foam. As electronic warfare aircraft blind hostile radars, strike aircraft attack large concentrations of vehicles, artillery, and air defense weapons. UAVs engage a number of smaller, outlying positions. The ordnance used affects electrical systems. The strike disables approximately 30 percent of vehicles in the target area and almost all of the mobile electric power generators associated with air defense systems. The potentially hostile force has suffered no personnel casualties but

has been rendered operationally immobile and unable to defend itself against further air strikes, should these prove necessary.

The JTF commander issues a statement to the press describing this non lethal counter-material strike. He also expresses his resolve to apply whatever *measured military force* is necessary in order to protect the JTF, ensure the safety of noncombatants, and prevent interference with mission accomplishments.

The lessons learned is that NLWs strikes can prevent an unwarranted escalation of a situation by rendering weapon systems temporarily or permanently inoperative. This allows the other regional nation's to deal with the hostile nation on their terms where before they may not have had the material or the will to do so. This also shows a controlled measured response by the U.S. commander. The air strikes could not have occurred without accurate intelligence. The threat IPB changes due to a reduction in threat forces.

SCENARIO #4: RIOT CONTROL AND THE USE OF NON-LETHALS

This scenario is probably the most typical scenario U.S. force will face in a foreign country; protecting the U.S. Embassy from an angry mob. This scenario is can best utilize bullhorns, the X-Net, PVAB, aqueous foam and malodrants to deny access to the surrounding area and the Embassy.

In the neighborhood surrounding the American Embassy, U.S. forces have established roadblocks to prevent the movement of weapons into the area. Security personnel halt and search all civilian vehicles at roadblocks, confiscating weapons. JTF

civil-military relations units have spread the word throughout town that weapons will not be permitted near the Embassy and that those who normally travel armed for their own protection should stay away from that area. On a number of occasions, armed gunmen have "tested the system," only to have their weapons confiscated after tense confrontations.

A civilian vehicle approaches the roadblock at higher than normal speed. To security personnel, it appears that the driver does not intend to stop. As the vehicle crashes through the wooden gate, the troops open fire, killing three locals, including a small child. An examination reveals that the vehicle's brakes had failed and the occupants were an unarmed and innocent family.

As word of the incident spreads, crowds of angry locals begin to gather in the neighborhoods surrounding the U.S. Embassy, chanting anti-U.S. slogans. It is evident that while a few personnel are armed, the vast majority are not. At an emergency press conference, reporters challenge the actions of the U.S. troops, asking why non lethal means were not employed to halt the vehicle. Acknowledging the unfortunate incident and offering sympathy for the victims, the JTF commander reminds the reporters of the previous incidents in which U.S. forces sustained casualties under similar circumstances. He explains that the automobile in question had to be considered a threat and that the actions of security personnel were appropriate under the circumstances. He further explains that the JTF will continue to take all reasonable precautions to protect both noncombatants and JTF forces. He notes, however, that the presence of non lethal weapons in the area of operations can not guarantee that accidents will never occur in an environment like this one, characterized by danger and uncertainty.

Later, a very large and angry mob surges through roadblocks and gathers in front of the U.S. Embassy. A few people hurl rocks at guards behind the fence, causing no injuries. Then, someone throws two homemade firebombs into the Embassy compound. As guards move to extinguish the flames, an unseen gunman, lost within the huge crowd, fires two shots. A bullet smashes the windshield of a truck parked behind the Embassy fence. In accordance with the established ROE, the guards take cover and immediately return fire using non lethal weapons: aqueous foams laced with irritants. These have some effect on the nearest rioters but the remaining continue to press toward the compound. A small UAV suddenly appears, swooping low along the street. It drops malodorants throughout the crowd. The crowd flees the area.

After and hour of relative calm, crowds begin to gather in the neighborhoods around the U.S. Embassy. Intelligence agents report that armed men are attempting to rally their adherents, whipping the people into a frenzy for another assault on the U.S. Embassy. Without waiting for the mob to grow, the JTF commander calls for non lethal weapons to defuse the situation. Soon, a helicopter appears some distance away, mounting a non lethal counter-personnel area-denial system. From over a kilometer away, the helicopter crew directs the weapon through laser target designators from the U.S. Embassy rooftops. As the system takes effect, the belligerent members of the crowd immediately flee.

Once a state of relative calm has returned, the JTF commander meets with local civil leaders and explains his decision to employ non lethal capabilities to restore order. He expresses relief that the system succeeded in this instance but warns that further

violence, especially when weapons are involved, might require the JTF to use deadly force. The civil leaders agree to spread the word among their people.

The lessons learned are that NLWs should have been employed further out from the U.S. Embassy in order to capture the vehicle. This would have prevented the needless deaths. Intelligence needed to provide information as to who the belligerents were and confirm those individuals with trusted members of the government. U.S. forces could have conducted "Snatch and Grab" operations on the belligerents and interrogated them for more information.

SCENARIO #5: LETHAL/NON-LETHAL FORCE IN URBAN OPERATIONS

This scenario presents one of the roles NLWs are required to do, the separation of non-combatants from combatants. This scenario also takes place within a city, negating the use of lethal force in order to minimize collateral damage and reduce civilian casualties. Acoustic weapons are employed.

The JTF's presence has caused the armed factions to withdraw from those sections of the city regularly patrolled by U.S. forces. As these groups attempt to establish their dominance in other sections of the city, fighting breaks out and soon reaches major proportions. For the first time since the U.S. deployment, the factions use their heavy weapon systems: howitzers, heavy machine guns, mortars, and even a few older-model tanks. The fighting results in a mounting toll of noncombatant casualties and significant collateral property damage. In one sector of the city, fire rages out of control. It has already consumed most of a city block.

The National Command Authorities direct the JTF commander to restore order. Thus the mission shifts from humanitarian assistance to peace enforcement. As JTF units approach the embattled sectors of the city, reconnaissance units report that some of the factions are forcibly detaining civilians within their homes. One intelligence report indicates that the factions expect to gain protection from superior U.S. firepower through this ploy. The JTF begins its assault. Despite the radically altered tactical situation, it is not necessary to modify the ROE. Non lethal weapons remain an important tool for conducting building clearing operations. Lethal force is still authorized at the discretion of local commanders when it is necessary or prudent to ensure adequate force protection or mission accomplishment.

Using standard MOUT tactics, U.S. units isolate a neighborhood and deploy to attack. Several armored personnel carriers mounting unusual antennas take up positions near the JTF's first objective. Two of the vehicles adjust position slightly as the antennas pitch and roll on their mounts, responding to cues from a digital position and direction finding system. In a few moments, an indicator light flashes on a control panel to show that the antenna array is properly set and the system is ready for operation. A vehicle crewman throws a switch. The system propagates an acoustic energy beam, which the antenna array directs against one of the buildings. The same sighting device that normally serves the vehicle's antitank missile system is connected to the antenna array via computer. As the vehicle commander takes aim through the sight, the antennas adjust their alignment, changing the direction of the beam. Within a few seconds, the firing slackens and the acoustic energy beam is shut down. Infantrymen dismount from the APCs and maneuver rapidly toward the building. Inside, they find most of the occupants

temporarily incapacitated. The noncombatants are huddled together in a few rooms, while the shooters are positioned throughout the building but unable to fire their weapons. The JTF infantrymen evacuate prisoners and captured weapons to the rear. Civil-military relations teams follow up the assault with medical attention for those who have been wounded in the fighting. There are no deaths or injuries attributable to the acoustic energy weapon or to U.S. firepower. Television journalists record the entire event and transmit their stories in near-real time via satellite.

This scene is repeated several times as the JTF moves from block to block, clearing and securing buildings. The process is not always flawless. Enemy heavy weapons crews, firing from covered positions outside effective range of the JTF's acoustical systems, have to be taken out with precision-guided munitions (PGMs). Overall, however, the results of the day's action are very satisfying for the JTF commander. The factions have withdrawn, apparently recognizing that the new weapons rob them of the protection they expected to gain by fighting from civilian-occupied buildings in the presence of television cameras. Noncombatant casualties are minimal-far fewer than would be normally expected in a MOUT situation using traditional weapons. Media reaction is very positive. It appears that the journalists have begun to understand that non lethal weapons are intended to augment, but not replace, deadly force.

The lessons learned is that once U.S. forces defeat and enemy on U.S. terms, the enemy will employ tactics that minimize or negate U.S. lethal firepower. Commanders must employ other means, in this case, non-lethal acoustic weapons to against combatants and non-combatants to neutralize the situation. This is also an example of the Three Block War method where certain areas of a city or section come under U.S. attack.

Another method would have been to employ malodorants. Non-combatants would not have protective masks while combatants could possibly have masks. The use of civilian television crews to presents U.S. forces in a positive light. Accurate intelligence, especially human intelligence, allows precise employment of the acoustic weapon and assists in identifying belligerent from non-belligerents.

SCENARIO #6: PEACEKEEPING

This scenario presents a situation where large factions have withdrawn to the countryside but are still near populated enclaves. The commander is trying to isolate the enemy forces from each other and from the rest of the country. In order to prevent needless deaths, a non-lethal obstacle belt is employed to control the enemy consisting of Hand Emplaced Non-Lethal Munitions (HENLM) and Taser Anti-Personnel Mine (TAPM), barbed wire, the X-Net and Portable Vehicle Arresting Barrier (PVAB), vehicle disablers, pepper spray and ADS. Lethal force overwatches the non-lethal obstacle belt.

The largest factions have withdrawn to the countryside surrounding the capital city, salvaging many of their heavy weapons. The latter include mortars and a few tanks which once belonged to the now-defunct national army. They have established enclaves in two populated valleys separated by a high, rugged ridgeline running from the country's heavily jungle interior to a point about eight kilometers from the coast. The terrain between the spur of the mountain range and the sea is flat and thickly forested. A coastal highway passes through the area, as do several smaller roads and trails connecting the neighboring valleys now harboring the opposing armed factions. An informal boundary

line has been drawn between these armed camps. Although there has been no heavy fighting since the battle in the city, some incidents have occurred as noncombatants attempt to traverse this boundary in search of food or lost relatives. Gunman have harassed and sometimes killed hapless refugees, causing the rival faction to retaliate.

The National Command Authorities direct the JTF to maintain peace until such time as a combined regional force operating under the auspices of the United Nations can assume the mission. The JTF commander plans an obstacle and barrier system to assist in controlling movement across the boundary. This economy of force measure will free other forces to continue humanitarian assistance operations. After consulting the JTF staff judge advocate and the engineer officer, the commander elects to emplace a non-lethal barrier system. The use of non-explosive, non lethal barrier devices will mitigate the post-deployment hazards associated with traditional mines.

The system includes a combination of old and new technologies. Traditional barbed wire marks the line and serves as a deterrent to the merely curious. JTF troops man checkpoints near the roads crossing the boundary. Each of these checkpoints includes a hardened strongpoint armed with conventional anti-armor and antipersonnel weapons. At all other points along the boundary where the warring factions might be tempted to infiltrate vehicles, engineers emplace automated systems that dispense a variety of "vehicle stoppers." Upon the approach of an unauthorized vehicle, these can be activated by either remote command or an automatic sensing device. These weapons are nontoxic and "environmentally friendly." The barrier system also includes non lethal counter-personnel devices. Like the vehicle stoppers, these can be activated by command or automatically activated by sophisticated sensors programmed to detect human

presence. These systems use a combination of effects, emplaced in "layers" starting with pepper spray and entangling devices and escalating to non lethal directed energy weapons. Intruders who attempt to infiltrate through this non-lethal barrier will encounter a series of personnel effects of ever increasing intensity. Most important, the entire obstacle belt is kept under continuous observation through a combination of patrols, observations posts and sensors. It is also covered by conventional lethal weapons, just like a traditional obstacle system. The factions are advised that any attempt to force the barrier will be met by overwhelming firepower.

Following the installation of the barrier, the factions conduct probes, attempting to infiltrate small groups of armed men. Most turn back after encountering the initial layers of non lethal counter-personnel devices. In one instance, however, a squad size group presses on and attempts to destroy one of the directed energy transmitters within the obstacle belt. A JTF reaction force counterattacks immediately, killing two gunmen and wounding three. Attempts to penetrate the barrier soon cease.

A coordinated effort of lethal force overwatching non-lethal force allows the commander flexibility while denying enemy forces the room to maneuver and while isolating them from the populace. The ability to deny enemy forces the freedom of movement without having to kill them shows not a sign of weakness, but of controlled, measured of aggression to either force the enemy to negotiate or to leave the area. Intelligence can receive information from its sources as to the effectiveness of the non-lethal barrier and what alternative actions the enemy is willing to take, to include finding another access point for supplies.

SCENARIO #7: MARITIME INTERCEPTION

This scenario addresses the supply of enemy forces from the sea. The object is to identify enemy boats and deny them the opportunity to offload their supplies to enemy forces using helicopters, UAV's, vessel stoppers and boarding parties.

The boundary between the factional territories ends at the sea. When the barrier system proves effective in halting infiltration by land, the factions attempt to circumvent it using seaborne infiltration. Off the coast, U.S. naval forces support the peacekeeping effort by boarding and inspecting suspicious vessels in order to prevent such infiltration.

Most of the local coastal traffic consists of slow fishing vessels which naval patrol craft easily monitor and board. One of the factions, however, has acquired two very fast commercial speedboats. At night, one of these boats attempts a high-speed run from a river outlet, moving rapidly along the coast toward the coastal portion of the opposing faction's enclave. U.S. naval units detect the boat and immediately determine that due to its very high speed patrol craft will not be able to overhaul it prior to its arrival near the opposing faction's enclave. A destroyer launches a UAV which flies an intercept course under remote guidance to the high speed boat. The destroyer then launches its helicopter. The helicopter's onboard sensors detect and lock on to the boat via sensors onboard the UAV. An operator aboard the helicopter then activates a "vessel stopper" system on the helicopter causing the boat's engine to die. As the boat drifts, a U.S. patrol craft arrives. An interpreter orders the occupants of the boat to prepare to receive a boarding party. The American sailors confiscate several weapons, arrest the boat's crew and passengers, and rig it for towing back to the capital city's port.[99]

Accurate intelligence assisted in identifying and capturing the vessel intact with no loss of life. Intelligence is able to determine the needs of enemy forces and advise the JTF commander accordingly. U.S. naval forces are able to stop a vessel via remote systems and not risk passengers or crew lives. Once the vessel is stopped, boarding parties can assault and confiscate the vessel immediately or wait them out.

SCENARIO #8: NON-LETHAL PROTECTION OF A CULTURAL HERITAGE SITE

This scenario shows that NLWs can not only protect human lives, but also protect important cultural centers and act as force multipliers for unit commanders. In this situation, rigged foam, malodorants, TAPM and UAVs allows a military police unit to secure a museum to prevent looting while freeing them of guard duty, allowing them to conduct other missions.

The JTF commander tasks his commanders to rapidly occupy and secure a city and its high value targets. Commander's receive the map overlays and identify bridges, intersections, airports and so forth in their areas. A military police platoon is sent to the National Library and National Museum in order to secure it from potential looters. The platoon arrives at the museum and locates the curator. They talk to the curator through a digital language translator and inform him that they need to secure the museum from looters. They take his picture and his employee's picture with a Biometric scanner located in a hand held computer. They then inspect the museum and locate all entrances/exits in the building, including underground and rooftop.

After evacuating everyone, platoon members begin to spray the windows and surrounding ledges and support mechanism's and the door and its frame inside and outside with rigid foam. The foam is compressed into a disposable bottle and quickly expands and hardens like steel in seconds. The doors and windows are sealed from looters. The platoon leader then orders her men to emplace the Taser Anti-Personnel Mine (TAPM) and establish a non-lethal anti-personnel minefield around the building. The TAPM shoots out pepper spray and TASAR darts at its target. Once its payload is expended, it signals to the rest of the mines that it is out and the other mines compensate by "jumping" to fill in the gap. It also signals its higher headquarters of its operational status. The platoon leader then initiates a signal that activates and deactivates the minefield from afar. Prior to activation, the platoon moves to an isolated, secure area, puts on Tyvek protective suits and back packs and then walks back to the museum and starts spraying a malodorant on and around the building. The malodorant produces a smell of burning bodies, rotting flesh, vomit, burnt hair and fecal matter and is used to deter or deny activity in an area.

The platoon leader then takes a GPS reading and informs the commander and the S-2 of their current status. The leader also passes off the GPS grid coordinates to the S-2 to either confirm or update his map to reduce potential collateral damage to a national building. The S-2 programs the battalion's tactical UAV's to recognize that grip point and to frequently fly over it. The platoon leader then gathers her soldiers and heads over to the national library and repeats the process of securing the building. Once the war is over or there are enough troops, the military police platoon leader will return, deactivate the TASER minefield, spray a substance to counteract the malodorant and use an

environmentally safe solvent to unseal the museum. Collateral damage is minimal and looting non-existent. This is scenario provides the human resource force multiplier equation when non-lethals are employed.

The lesson learned is that commanders may not have enough troops in country or in the right place to guard and protect all high value sites at once. NLWs act as a deterrence to looters and the curious. Damage to the building is kept to a minimum and the museum and its contents are intact. It demonstrates to the local population that U.S. forces are concerned about their cultural heritage and are not their enemies. Preservation of cultural sites prevents them from becoming rallying points to rise up against U.S. forces.

The intelligence lesson is that prior identification and protection of cultural sites, especially sites located in diverse communities, can assist in future military operations. It indicates to the local populace the military's concern for their heritage and sensitivity towards their cultural landmarks. This may lead to increased intelligence with more local inhabitants providing U.S. forces with information on the local area.

SCENARIO #9: PROTECTING A RELIEF CONVOY

This scenario has U.S. force escorting a food convoy to a distribution site in restricted terrain. U.S. forces must deter the local population from looting the vehicles without using lethal force. U.S. forces have both lethal and non-lethal ammunition available to them. Non-lethal systems include the Vehicle Mounted Active Denial

System (VMADS), the 40mm NL Long and Short Range rounds fired from the MK-19 Machine Gun and M16A2 40mm M203 weapon system, and sting ball grenades.

The JTF commander is tasked to provide security to a United Nations relief convoy making its way to the United Nations food distribution site. The military police are tasked to provide security for the convoy. The MP's deploy Vehicle Mounted Active Denial System (VMADS) vehicles and bring non-lethal 40mm sponge grenades for the M16A2's M203 grenade launcher. They also bring sting ball grenades and a box of MK 19 40mm machine gun, short range, non-lethal ammunition. The convoy can fight with non-lethal or lethal force as needed.

While on the road to the food distribution site, the convoy must cross a bridge over a non-fordable river and go through a village. The convoy commander receives a call informing her that a group of villagers have blocked the bridge and demand food from the convoy. The commander tells the convoy to go to a higher alert level, orders them to slow down and passes command of the convoy to her executive officer while she races ahead to access the situation. Upon arriving at the bridge, the commander informs her translator to tell the people to clear off the bridge since a convoy is on its way and there's not enough room with both trucks and people to safely traverse the bridge. The people refuse and the commander gets back in her vehicle and heads back to the convoy. She orders the convoy to prepare for individual and crowd control measures using non-lethal munitions. The VMADS are brought to the front of the convoy and powered up. As the convoy proceeds towards the bridge, the commander observes the people still lingering on the bridge. She orders the VMADS to engage the people and drive them off

the bridge. The VMADS gunners start engaging civilians on the bridge with long range precision fire. The people quickly leave the bridge and the surrounding area.

The convoy commander and the VMADS cross over the bridge and continue to engage personnel still lingering near the bridge and road. The convoy follows and crosses the bridge with the commander and VMADS back in their convoy positions. As they enter the town, the commander tells the translator to inform the people to stay away from the convoy or risk being shot. Some people ignore the warning and are shot by the VMADS; 40mm sponge grenades or 40mm short range rounds from the MK 19 weapon system. The convoy makes it through town and reaches the United Nation food distribution site. A small portion of the unit remains in a non-lethal mode to control crowds receiving food while the rest of the unit deploys with lethal force to protect the United Nations center and maintain order.

The lessons learned from this scenario is that long range, non-lethal precision fires and the use of short range non-lethal fires minimizes casualties without causing needless deaths. The mission was completed and the people deterred from assaulting the convoy. The lack of casualties allowed the convoy commander and the United Nations commander to act from a position of strength when dealing with local officials. The death of a local person would have negated that power. Good intelligence allowed the convoy commander to determine what lethal and non-lethal ammunition the convoy would carry. It allowed the convoy to have the right system for the right reasons at the right time.

The scenarios, operations in urban terrain; preemptive strikes using NLWs; controlling a riot near the U.S. Embassy; separating combatants from non-combatants,

Stability and Support Operations (SASO); maritime interception; the protection of cultural heritage sites and food convoys provide a hypothetical, but plausible situations that U.S. forces could find themselves in the future. NLWs offer the commander another option other then the use of lethal force or doing nothing. Though not perfect, NLWs allow the commander the operational flexibility to control the operational tempo levels of escalation while achieving mission success with a minimal amount of casualties and collateral damage. Strategic, operational and tactical goals are accomplished.

In summary, NLWs offer commander's the opportunity to have a flexible response to situations as long as they have accurate intelligence as to the intentions of the threat. They also offer the commander the ability to keep the opposition off balance by having them react to NLWs instead of having them anticipating certain actions or weapon systems. Though not all inclusive, the scenarios prove that in the future, weapons packages, both lethal and non-lethal, will need accurate intelligence in order to be an effective force multiplier for the commander at all levels of command.

CHAPTER 6

NON-LETHAL SYNOPSIS

ISSUES AND CONCERNS

This chapter addresses the issues and concerns regarding the future use of NLWs in military operations. The problems include a lack of education programs that focus on NLWs, a lack of doctrine that addresses the role of NLWs in future military operations, a need for NLWs Tactics, Techniques and Procedures (TTPs), an inadequate budget to support NLWs development in order to meet the users needs, the lack of coordination and clearly defined lines of authority of who authorizes the employment of NLWs and the legal implications of using NLWs in a foreign country with coalition or allied partners.

Training programs for NLWs are limited. What is available is the Interservice Non-Lethal Individual Weapons Instructor Course (INIWIC) at Fort Leonard Wood, Missouri. This program trains and certifies instructors so they can fulfill the "train the trainer" role in their unit. The course focuses on the basic user level non-lethal capability set and goes beyond just batons and rubber bullets but emphasizes the ability to escalate or de-escalate a situation based on a perceived threat. In essence, the students are trained that non-lethals provide an alternative option to lethal force when applicable.

The concern is that INIWIC emphasizes just the basics of NLWs. What is lacking is a training program that trains all officers, regardless of service or branch, on the use of non-lethal and the philosophy of NLWs. This must also be mirrored the non-commissioned officer courses as well. This will ensure that officer and NCOs are trained

to advise operational commanders as to the role of NLWs in operational settings and the philosophy behind their employment.

The Joint community must educate officers at Command and Staff Colleges and War Colleges as to how NLWs are employed and how they are force enablers in the strategic, operational and tactical levels, to include conventional and asymmetrical types of warfare. This must also occur at the Sergeants Major Academy (SMA). This will ensure that the Joint community is familiar with NLWs and treats NLWs as another force multiplier for the operations of tomorrow.

Additionally, senior officers of all services and branches need to treat NLWs and their employment as integral parts of military operations. If senior officers do not support NLWs and demand the establishment of non-lethal support elements, then the program will cease to exist. As long as senior officers treat NLWs as a novelty item and not a tool in their kit bag, NLWs will not receive the endorsements, the funding or respect it deserves

Develop non-lethal doctrine. Currently, there is no doctrine as to the employment and utilization of NLWs in future operations. The current emphasis is on developing weapons, but doctrine is not being developed to meet operational needs. Without doctrine, the Joint community has no foundation or direction as to where it wants to go with NLWs or what to expect from such weapons. Joint Forces Command must develop doctrine in conjunction with the other services non-lethal proponents. It must address NLWs integration into future operations to include conventional operations, asymmetrical warfare, the "Three Block War" concept and SASO to include peacekeeping, peace-enforcing and humanitarian missions.

Establish Tactics, Techniques and Procedures (TTP) for NLWs. There are currently no standardized Joint or service TTP's for NLWs employment. This makes training with NLWs virtually impossible and does not allow the development of situational and training scenarios where NLWs could be employed. The National Training Center (NTC) at Fort Irwin, California and the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana should incorporate NLWs in their training plans in order to familiarize leaders and soldiers as to their uses and effects. They should also be incorporated in modeling and simulations and electronic exercises.

Increase the NLWs budget. The current DoD for JNLWD is between $30-40 million a year. This is inadequate to support research and development into NLWs. Some programs are in a dormant status until more funding becomes available for further research and testing while new technology and programs are presented for consideration on a monthly, if not weekly basis. The February 2004 report from the Council on Foreign Relations recommends that the NLWs budget increase to $300 million per year.[100] An increase in funding will not only allow adequate research and development, but increase education and training of non-lethal capabilities within the military.

Establish intelligence support for NLWs employment. Before a non-lethal weapon is employed, it must receive accurate and actionable intelligence in order to fulfill its mission. This is especially important in urban settings. Unlike lethal weapons which allow the user to defend himself in hostile situations, non-lethal must have accurate intelligence so that they do not engage hostile, lethal forces; that they enter a situation with the right mix of NLWs; or they take no action since the individual or crowd has no hostile intent. This intelligence should include demographics, the social structure

of the urban area, the religious make-up and divisions within the city, cultural settings and religious holidays and cultural and holy sites. The intelligence community must also identify primary and secondary secular and religious leaders and incorporate the use of NLWs intelligence preparation of the battlefield (IPB). This intelligence must by-pass traditional methods of filtering information from higher to lower to directly to lower in an instantaneous manner so information is actionable. The user of NLWs must report to the intelligence community the results of employment of NLWs. The intelligence community must also provide feedback as to the psychological and political impact of employing NLWs on the battlefield. Based on the effectiveness of the NLWs at certain situations, effects based targeting will be used for future employment All of this must be incorporated into non-lethal doctrine and training.

Additionally, the operational and intelligence communities must coordinate their efforts as to who authorizes the use and employment of NLWs. Intelligence may have information that is needed immediately at the user level and must authorize the use of NLWs and then inform the operations community. On the other hand, advanced knowledge of situations requiring the use of NLWs will allow the operations community to tailor a response to the situation. Either way, a clearly defined chain-of-command release authority must be developed. Certain weapons may have automatic release authority, such as the employment of M203 40mm sponge grenade rounds by U.S. forces, but that the employment of ADS or malodorants will require release by a higher authority. This due to a high demand on a limited number of ADS systems in theater or the employment of a non-toxic, non-persistent chemical may require higher release authority. This decision may be driven by the type of unit employing the weapon and

their operational experience with NLWs. The critical factor with NLWs is having them available so they can be employed in a rapid manner at critical situations. Having to wait around for release authority will only jeopardize soldiers and mission success. The operations and intelligence community must also be prepared to react to enemy NLWs use. This must be addressed in the operations order. Due to the potential employment of chemicals and malodorants by opposition forces against U.S. forces, personnel trained in nuclear, biological, and chemical operations must be prepared to decontaminate friendly personnel and equipment in order to counteract their effects. The possibility that opposition forces could use NLWs against U.S. force and its allies must also be addressed in the operations order.

The non-lethal community needs a catalog of non-lethal products. The non-lethal community should develop a catalog where units can order those items they want and in the quantities they need. It does them no good to buy a Non-Lethal Capability Set just to get access to certain items such as sting-ball grenades, 40mm sponge grenades, and slippery foam. The supply system must be developed to meet the users need, not the material developer's desires.

Monitoring the proliferation of NLWs. The intelligence community must maintain over watch on the development and acquisition of NLWs in other nations and among third party actors. As NLWs technology shifts from kinetic to energy weapons, there is a concern that EMP rounds will be readily available for use against the United States and its allies. Also of concern is the use of "rheostatic" weapons in the hands of other nations and third party members. The "rheostatic" weapon will allow anyone to go from non-lethal to lethal and back to non-lethal in a turn of a dial. The weapons system

can them be used against U.S forces abroad and against law enforcement and people in the United States.

NLWs and doctrine must support Homeland Security and Counter-Terrorism. As the NLWs program develops, it should work closely with Homeland Security to meet their needs especially in the areas of counter-terrorism. NLWs act as force multipliers went used in conjunction with lethal weapons to assist in controlling terrorist activities.

Legal implications of the use of non-lethals in international community must be understood. No one has addressed whether the development and deployment of NLWs, primarily directed energy weapons, will have legal implications overseas. This issue needs addressing. It may be that certain countries will accept non-lethal kinetic energy weapons, but will deny the deployment of directed energy weapons. This may effect Coalition operations in that some countries may not work with a system that they feel violates international treaties. This also includes the use of lasers, chemical and biological weapons. In addition, a legal ruling is needed as to whether U.S. forces must provide NLWs to Coalition partners. Additionally, a decision must be made as to the legal implications of U.S forces if they train Coalition partners in the use of NLWs and Coalition partners abuse NLWs.

SUMMARY

In summary, U.S. military forces will face an ever increasingly complex operational environment whether conducting peacekeeping operations or war and with or without Coalition support. The U.S. Government and the American public demand success on the battlefield while achieving minimal casualties. In order to meet these demands military forces must integrate NLWs into military operations at the right time, for the right reasons, in the right amount to obtain the right results. This becomes more important as the lines between strategic, operational and tactical operations and objectives become blurred in an ever changing geo-political environment.

The definition of NLWs are weapons that are explicitly designed and primarily employed so as to temporarily incapacitate personnel or material, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment. The military has employed NLWs in the First Persian Gulf War when Tomahawk cruise missiles dropped carbon fiber spools over power grids and the 709th Military Police Battalion's use of the 40mm sponge grenades at Sevce, Kosovo. Non-lethal technology is gradually moving away from blunt trauma weapons to directed energy weapons, electromagnetic pulse (EMP) systems to ultimately the "rheostatic" weapon that allows the user to switch from non-lethal to lethal and back again at the flip of a switch. But NLWs are only as good as the intelligence support provided to them. Without intelligence support NLWs fail to be the force multipliers for the operational commander.

Intelligence support ensures that the right weapon is employed against the right target while registering results from such an engagement. NLWs need intelligence support, especially in complex urban environments, to prevent the needless loss of life of soldiers and civilians. There is a need for a non-lethal intelligence preparation of the battlefield that encompasses social, religious and cultural issues along with demographics and the identification of primary and secondary secular and religious leaders. This will assist in reducing situations that are local in nature but quickly escalate to strategic levels. In addition, there is a need for intelligence to monitor the proliferation of high technology NLWs such as directed energy weapons, EMP systems and "rheostatic" weapons so that they do not fall into the hands of domestic and international terrorists and third party actors. Access and employment of such systems could wreck havoc on the world's economy, world energy production output or truly terrorize the world with a flip of a switch.

NLWs can support conventional and asymmetrical warfare, along with the "Three Block War" concept and SASO operations while engaging terrorism. The Military Police Corps is the Army's multi-purpose branch that operates in these operational environments. It is the Army's proponent for NLWs and supports the integration of NLWs into the Joint community. It provides qualified personnel who are experts in the use and employment of NLWs to units through the "train the trainer" methodology. Once an individual is trained on the employment and use of NLWs they can train the unit in NLWs and employment, while acting as an advisor to the unit commander.

Currently, NLWs have a link to the Rules of Engagement when confronting situations such as the inherent right of self-defense; unit self-defense; individual self-

defense; hostile acts and hostile intent. Instead of using deadly force or doing nothing, NLWs are used due to the authorization by the Rules of Engagement. Soldiers can defend themselves without having to wait for higher authority approval. Some countries will still want a specific non-lethal Rules of Engagement do to unique properties of NLWs and their employment. Either way, the Rules of Engagement should not hinder operational objectives or soldier safety.

As NLWs go forward and develop into more sophisticated weapons, the NLWs community faces a number of challenges. The proliferation of , such as directed energy, EMP systems, and "rheostatic" weapons are not classified as threat weapons as are CBRNE systems. With government agencies monitoring for CBRNE threats, terrorists or third part actors could bring in or make an EMP system and infiltrate this country or any country and cause significant economic damage upon detonation. The NLWs program also lacks significant funding. The demand for NLWs will only increase as U.S. forces become involved in Third World countries. If the current level of funding stays the same, the NLWs community will be unable to provide more advanced weapon systems in a timely manner.

Finally, the NLWs program needs General Officer support in order for NLWs to be accepted and employed throughout the military. Dealing with this issue from a bottom up approach is a futile effort. The problem is that integration of new weapon systems into the military is complex for it demands new methods of conducting warfare doctrinally and logistically while being accepted into the military community.

In conclusion, this thesis has provided an overview, and indicated requirements for doctrine, training, legal clarification on international laws, proliferation, integration of NLWs into military operations and schooling, and intelligence sharing for NLWs.

[1] U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-23.40, *Concept for Nonlethal Capabilities in Army Operations* (Fort Monroe, VA: U.S. Army TRADOC, 15 August 2003 Final Draft), 2. Cited hereafter as U.S. Army TRADOC Pam 525-3-23.40. TRADOC Pamphlet 525-3.23.40 is based on complying with guidance provided by Department of Defense Directive 3000.3, dated 9 July 1996, Subject: Policy for Non-Lethal Weapons.

[2] U.S. Army TRADOC Pam 525-3-23.40, 6.

[3] U.S. Army TRADOC Pam 525-3-23.40, 3.

[4] U.S. Army TRADOC Pam 525-3-23.40, 3-5.

[5] U.S. Army TRADOC Pam 525-3-23.40, 5.

[6] LtGen M.R. Steele, USMC, Deputy Chief of Staff for Plans, Policies, and Operations, letter to the Joint Non-Lethal Weapons Community, subject: "Joint Concept for Non-Lethal Weapons," 5 January 1998, URL:<www.fas.org/man/dod-101/sys/land/docs/NONLETH.HTM>, accessed 17 April 2004. Cited hereafter as Joint Concept Letter, 5 January 1998.

[7] National Research Council of the National Academies, *An Assessment of Non-Lethal Weapons Science and Technology* (Washington, DC: The National Academies Press, 2003), 53. Cited hereafter as National Research Council.

[8] "U.S. Suspects Opiate in Gas Used in Theater." Center for Cognitive Liberty & Ethics (October 2002), URL: <www.cognitiveliberty.org/dll/knockoutgas2.htm>, accessed 19 June 2004.

[9] Victor Wallace, "Non-Lethal Weapons: R2IPE for Arms Control Measure?" in *The Future of Non-Lethal Weapons. Technologies, Operations, Ethics and Law*, ed. Nick Lewer (London: Frank Cass Publishers, 2002), 141. Cited hereafter as *The Future of Non-Lethal Weapons*.

[10] LTC James B. Brown, USA "Civil Disturbance Lessons Learned From Kosovo," *Military Police Bulletin*, PB 19-03-1 (April 2003): 27-32. LTC Brown also spoke about his experiences in Sevce, Kosovo at the Non Lethal Technology Academia Research Symposium (NTARS) at San Diego, CA on 15 November 2002.

[11] *The Future of Non-Lethal Weapons*, 141.

[12] **NOTE**: The meaning of Joint in this case is not two services coordinating their efforts to develop a weapons program, such as the development of the M1 Abrams tank. Instead, all services have a voice in deciding what non-lethal weapons programs get funded while advocating their own unique non-lethal programs. Their success is based on practicality and budget constraints.

[13] Nonlethal Center of Excellence, *Mission Statement*, URL:<www.wood.army.mil/usamps/NonLethal/Default.htm>, accessed 31 May 2004.

[14] U.S. Army TRADOC Pam 525-3-23.40, 4.

[15] U.S. Army TRADOC Pam 525-3-23.40, 4.

[16] U.S. Army TRADOC Pam 525-3-23.40, 4.

[17] U.S. Army TRADOC Pam 525-3-23.40, 5.

[18] U.S. Army TRADOC Pam 525-3-23.40, 8.

[19] Center for Strategic and International Studies (CSIS). *Non-Lethal Weapons Policy Study Working Group Policy and Strategy Panel Agenda* (Washington DC: CSIS October 1998) Cited hereafter as CSIS Non-Lethal Weapons Policy Working Group, October 1998

[20] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998. Elements of the 709th Military Police Battalion engaged the populace with 40mm sponge grenades fired from the M16A2 rifle 40mm, M203 grenade launcher at Sevce, Kosovo. At close range, for example 5 meters, the 40mm sponge grenade would more likely cause massive internal organ damage or a broken arm or leg if shot in those locations. If shot at a 10-15 meter range the aggressor would be stunned and either go down or limp off or be carried off by supporters. If shot at a greater range it is highly improbable that the 40mm sponge grenade would cause enough pain to force the aggressor down or to flee the situation. It should be noted that before non-lethal weapons are employed, those individuals who will use non-lethal weapons are properly trained by a qualified, military schooled trained non-lethal weapons expert. Because of the physical limitations imposed by kinetic energy weapons, the military is conducting research on vehicle mounted directed energy weapons.

[21] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998.

[22] U.S. Army TRADOC Pam 525-3-23.40, 12-13.

[23] Personal idea of (b) (6), JMIC Student, Class of 2004.

[24] "National Security & Resilience" *QinetiQ*, URL:<www.security.qinetiq.com/products_xnet.asp?id=408909009911506>, accessed 22 June 2004.

[25] U.S. Army TRADOC Pam 525-3-23.40, 12-13.

[26] U.S. Army TRADOC Pam 525-3-23.40, 12-13. **NOTE**: **Deny Enemy Freedom of Action**. Key to success with the use of non-lethal weapons is the ability to maintain an unprecedented level of freedom of maneuver at the strategic, operational, and tactical levels, in all environments. Equally as critical, is denying the enemy the freedom of action. Denying the enemy freedom of action includes proactive measures to leverage the physical environment to isolate enemy forces, deny key terrain, and deny, impede, canalize enemy movement, in order to protect friendly forces and their freedom of action, and to place enemy forces in positions of disadvantage. Non-lethal capabilities for point and area denial, trafficability, and traction reduction and counter-material are required. **Enable Force Protection and Security**. Provides layered and integrated actions, to prevent or mitigate hostile actions against joint and Army forces, resources, facilities, and critical information, through proactive attack, defensive, and standoff measures, that tie together point and area protection of nodes and operating areas. These actions conserve the force's fighting potential, so it can be applied at the decisive time and place,

and incorporates the coordinated and synchronized offensive and defensive measures, to enable the effective employment of the joint and Army force, while degrading opportunities for the enemy. Provide full range of security operations, including proactive measures and response forces, to foster protected movement of forces between operating areas in 'gray spaces' (includes cueing and early warning to the lowest level). **Engage and Control Populations**. Population engagement is the ability to proactively provide the necessary control, over demographically diverse populations, to ensure maneuver, MS, and maneuver sustainment forces are encumbered in the conduct of their respective operations. Populations are most often classified as Enemy Prisoners of War (EPWs), civilian internees (CIs), detainees, refugees, displaced persons, stateless persons, war victims, evacuees, resident stay-put populations, or mass transiting civilian populations. They can also include local insurgent groups, organized crime syndicates, and other governmental, law enforcement, political, informational, military, economic, religious, and social leaders (legitimate or otherwise). Capabilities must facilitate the commander's ability to conduct rapid and decisive combat operations; deter, mitigate, and defeat threats to populations that may result in conflict; reverse conditions of human suffering; and build the capacity of a foreign government to effectively care for, and govern, its population. U.S. Army TRADOC Pam 525-3-23.40, 20.

[27]National Research Council, 30.

[28] Brian Rappert, *Non-Lethal Weapons as Legitimizing Forces. Technology, Politics and the Management of Conflict* (London: Frank Cass Publishers, 2003) 48-49. Cited hereafter as *Non-Lethal Weapons Legitimizers*.

[29] National Research Council, 32.

[30] *Non-Lethal Weapons Legitimizers* 49.

[31] Nick Lewer, "Introduction," in *The Future of Non-Lethal Weapons*, ed. Nick Lewer (London: Frank Cass Publishers, 2002) 3. Cited hereafter as *The Future of Non-Lethal Weapons*.

[32] *The Future of Non-Lethal Weapons*, 2. **NOTE**: Anti-material non-lethal weapons being considered include combustion modifiers, anti-additives, fuel contaminants, lubricant contaminants, viscosity-enhancing agents, depolymerization agents, and abrasives for use against engines and vehicles. Corrosive agents, depolymerization agents, and embrittlement agents could be applied to infrastructures such as bridges to make them unable to support heavy equipment thereby controlling where the adversary crosses a river. The concern with these weapons is how they are delivered and what are their effects on humans and the environment. National Research Council, 27.

[33] *Non-Lethal Weapons Legitimizers*, 47.

[34] *Non-Lethal Weapons Legitimizers*, 50.

[35] U.S. Army TRADOC Pam 525-3-23.40, 26-28.

[36] U.S. Army TRADOC Pam 525-3-23.40, 26-28.

[37] U.S. Army TRADOC Pam 525-3-23.40, 25.

[38] CSIS Non-Lethal Weapons Policy Working Group, October 1998.

[39] CSIS Non-Lethal Weapons Policy Working Group, October 1998.

[40] U.S. Army TRADOC Pam 525-3-23.40, 8-9.

[41] U.S. Army TRADOC Pam 525-3-23.40, 8-9.

[42] U.S. Army, Field Manual (FM) 3.0, *Operations*, online ed. (Washington, DC: Department of the Army, 14 June 2001), URL:<www.adtdl.army.mil/cgi-bin/adtl.dll/fm/3-0/ch4.htm#par4-5>, accessed 19 May 2004. Cited hereafter as U.S. Army FM 3.0, online ed.

[43] Mark Burgess, *The Marines' Three Block War in Iraq*, Center for Defense Information, 28 October 2003 (Washington, DC: CDI, 2003), URL:<www.cdi.org/friendlyversion/printversion.cfm?documentID=1834>, accessed 19 May 2004

[44] U.S. Army TRADOC Pam 525-3-23.40, 10. **NOTE**: Requirements to minimize collateral damage and non-combatant casualties require exponential enhancements in the fire control, range, accuracy, and effectiveness in non lethal weapons to the level of "the third window from the left on the second floor."

[45] U.S. Army, Field Manual (FM) 3-19.1, *Military Police Operations*, online ed. (Washington, DC: Department of the Army, 22 March 2001), URL:<www.wood.army.mil/usamps/DOT/Doctrine/PDF_files/FM_3-19.1.pdf>, accessed 20 May 2004. Cited hereafter as U.S. Army FM 3-19.1, online ed.

[46] U.S. Army FM 3-19.1, online ed.

[47] U.S. Army FM 3-19.1, online ed.

[48] LTC Margeret-Anne Coppernoll, ARNG, "The Non-Lethal Debate," *Naval War College Review* (Spring 1999), URL:<www.nwc.navy.mil/Review/1999/art5-SP9.htm>, accessed 10 November 2003. Cited hereafter as Non-Lethal Debate, 1999.

[49] **NOTE**: The employment of non-lethal weapons takes on the problems of training and targeting but also understanding crowd dynamics and actions; tactics; how to operate in such an environment; scenario development; logistic support and rules of engagement (ROEs) and legal constraints.

[50] USMC Detachment, *Individual Non-Lethal Individual Weapons Instructor Course* (INIWIC) Overview. URL:<http://mcdetflw.tecom.usmc.mil/INIWIC/NIOVERVIEW.asp>, accessed 15 May 2004.

[51] (b) (6)

[52] SSG Paul K. Shupe, "Nonlethal Force and Rules of Engagement," *Military Police Bulletin*, PB 19-03-1 (April 2003): 43-45. Cited hereafter as *Nonlethal Force*.

[53] *Nonlethal Force*, 43-45.

[54] *Nonlethal Force*, 43-45.

[55] *Nonlethal Force*, 43-45.

[56] *Nonlethal Force*, 43-45.

[57] *Nonlethal Force*, 43-45.

[58] *Nonlethal Force*, 43-45.

[59] *Nonlethal Force*, 43-45.

[60] *Nonlethal Force*, 43-45.

[61] *Nonlethal Force*, 46-48.

[62] *Nonlethal Force*, 46-48.

[63] *Nonlethal Force*, 46-48.

[64] *Nonlethal Force*, 46-48.

[65] *Nonlethal Force*, 46-48.

[66] U.S. Army TRADOC Pam 525-3-23.40, 29.

[67] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998.

[68] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998.

[69] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998.

[70] *Nonlethal Force*, 46-48.

[71] Joint Concept Letter For Non-Lethal Weapons, 5 January 1998.

[72] Non-Lethal OUSD(P), 28 January, 14-16.

[73] Joshua. 6:1-5 RSV

[74] John Keegan, *A History of Warfare* (New York: Alfred A. Knopf, 1993), 110-111.

[75] Jack Weatherford, *Genghis Khan and the Making of the Modern World* (New York: Crown Publishers, 2004), 92-94. Cited hereafter as Weatherford, *Genghis Khan.*

[76] Weatherford, *Genghis Khan*, 95, 147.

[77] George J. Vogler, "Counting Coup in Ancient Ways and Courtroom Days," *AE ProNet,* (1991), online study, URL:<www.aepronet.org/pn/vol14-no1.html> accessed 29 May 2004.

[78] Majors Joseph W. Cook III, David P. Fiely and Maura T. McGowan, USAF, "Nonlethal Weapons. Technologies, Legalities, and Potential Policies," *Airpower Journal* (1995), URL:<www.airpower.maxwell.af.mil/airchronicles/apj/mcgowan.html>, accessed 25 May 2004.

[79] D. Clayton James, *The Years of MacArthur, Volume I, 1880-1941*, (Boston: Houghton Mifflin Company, 1970), 395-400.

[80] Nick Lewer and Steven Schofield, *Non-Lethal Weapons: A Fatal Attraction? Military Strategies and Technologies for 21st Century Conflict* (London: Zed Books, 1997), 63-65. Cited hereafter as *Non-Lethal Weapons: A Fatal Attraction*.

[81] *Non-Lethal Weapons: A Fatal Attraction* 59-62.

[82] *Non-Lethal Weapons: A Fatal Attraction* 68-72.

[83] "New Non-Lethal Weapons to Support U.S. Proliferation Security Initiative," *Finmeccanica S.p.A.* (5 May 2004), URL:<www.network54.com/Forum/thread?forumid=211833 &messageid=1083876036&lp=1083876036>, accessed 25 May 2004.

[84] *Non-Lethal Weapons Legitimizers*, 48-49.

[85] *Non-Lethal Weapons Legitimizers*, 24

[86] Tony Clark, Correspondent, CNN, "The Worst Terrorist Attack on U.S. Soil: April 19, 1995," Web-only essay, 30 December 1995, URL:<www.cnn.com/US/OKC/daily/9512/ 12-30/index.html>, accessed 30 May 2004.

[87] U.S. Army TRADOC Pam 525-3-23.40, 22-23.

[88] U.S. Army TRADOC Pam 525-3-23.40, 23.

[89] U.S. Army TRADOC Pam 525-3-23.40, 23.

[90] U.S. Army TRADOC Pam 525-3-23.40, 23.

[91] U.S. Army TRADOC Pam 525-3-23.40, 23.

[92] Non-Lethal Debate, 1999.

[93] Non-Lethal Debate, 1999.

[94] U.S. Army TRADOC Pam 525-3-23.40, 23.

[95] National Research Council 91.

[96] Lothar Ibrugger, *Special Report Emerging Technologies and Their Impact on Arms Control and Non-Proliferation*, October 2001, URL:<www.nato-pa.int/archivedpub/comrep/ 2001/au-223-e.asp>, accessed 26 May 2004. Cited hereafter as *NATO Special Report*.

[97] *NATO Special Report*

[98] *NATO Special Report*

[99] Joint Concept For Non-Lethal Weapons Letter, 5 January 1998.

[100] Richard L. Garwin, Project Director, "Nonlethal Weapons and Capabilities," *Council on Foreign Relations* (February 2004), online ed., URL:<www.cfr.org/pdf/Nonlethal_TF.pdf>, accessed 31 May 2004. Cited hereafter as Nonlethal Weapons and Capabilities.

BIBLIOGRAPHY

Brown, LTC James B. USA. "Civil Disturbance Lessons Learned From Kosovo." *Military Police Bulletin*, PB 19-03-1 (April 2003):27-32.

Center for Strategic and International Studies (CSIS). *Non-Lethal Weapons Policy Study Working Group Policy and Strategy panel Agenda*. Washington, DC: CSIS, October 1998.

Clark, Tony, Correspondent, CNN. "The Worst Terrorist Attack on U.S. Soil: April 19, 1995." Web-only essay, 30 December 1995. URL:<www.cnn.com/US/OKC/daily/9512/12-30/index.html>. Accessed 30 May 2004.

Cook, Joseph W. III., David P. Fiely and Maura T. McGowan, Majors, USAF. "Nonlethal Weapons. Technologies, Legalities, and Potential Policies." *Airpower Journal* (1995). URL:<www.airpower.maxwell.af.mil/airchronicles/apj/mcgowan.html>. Accessed 25 May 2004.

Coppernoll, LTC Margeret-Anne, ARNG. "The Non-Lethal Debate" *Naval War College Review* (Spring 1999). URL:<www.nwc.navy.mil/Review/1999/art5-SP9.htm>. Accessed 10 November 2003.

The Future of Non-Lethal Weapons. Technologies, Operations, Ethics and Law. Ed. Nick Lewer. London: Frank Cass Publishers, 2002.

Garwin, Richard L. Project Director. "Nonlethal Weapons and Capabilities." *Council on Foreign Relations* (February 2004). Online ed. URL:<www.cfr.org/pdf/Nonlethal_TF.pdf>. Accessed 31 May 2004.

(b) (6) [redacted]

Head, National Security Law Branch, Department of the Navy, Office of the Judge Advocate General, International and Operational Law Division. Memorandum to Ms. Susan LeVine, Joint Non-Lethal Weapons Coordination Cell. Subject: "Preliminary Legal Review of Proposed Chemical Based Non-Lethal Weapons." 30 November 1997.

The Holy Bible, Revised Standard Edition, *Joshua, 6: 1-5*. online ed. URL:<wyllie.lib.virginia.edu:8086/perl/toccer-new?id=RsvJosh.sgm&images=images/modern&data=/text>. Accessed 25 May 2004.

Ibrugger, Lothar. *Special Report Emerging Technologies and Their Impact on Arms Control and Non-Proliferation*. October 2001. URL:<www.nato-pa.int/archievedpub/comrep/2001/au-223-e.asp>. Accessed 26 May 2004.

James, D. Clayton. *The Years of MacArthur, Volume I, 1880-1941*. Boston: Houghton Mifflin Company, 1970.

Keegan, John. *A History of Warfare*. New York: Alfred A. Knopf, 1993.

Lewer, Nick and Steven Schofield. *Non-Lethal Weapons. A Fatal Attraction*. London: Zed Books, 1997.

Morehouse, David A. *Non-Lethal Weapons. War Without Death*. Westport, Connecticut: Praeger Publishers, 1996.

National Research Council of the National Academies. *An Assessment of Non-Lethal Weapons Science and Technology*. Washington, DC: The National Academies Press, 2003.

"National Security & Resilience" *QinetiQ*. URL:<www.security.qinetiq.com/products_xnet.asp?id=408909009911506>. Accessed 22 June 2004.

Rappert, Brian. *Non-Lethal Weapons as Legitimizing Forces? Technology, Politics and the Management of Conflict*. London: Frank Cass Publishers, 2003.

Shupe, SSG Paul K. "Nonlethal Force and Rules of Engagement." *Military Police Bulletin*, PB 19-03-1 (April 2003): 43-45.

Steele, LtGen M.R., USMC, Deputy Chief of Staff for Plans, Policies, and Operations, Letter to the Joint Non-Lethal Weapons Community. Subject: "Joint Concept for Non-Lethal Weapons." 5 January 1998. URL:<www.fas.org/man/dod-101/sys/land/docs/NONLETH.HTM>. Accessed 17 April 2004.

Swett, Charles., Office of the Under Secretary of Defense (Policy), Non-Lethal Weapons Policy Study Final Briefing, 28 January 1999.

U.S. Army. Field Manual (FM) 3.0. *Operations*, online ed. Washington, DC: Department of the Army, 14 June 2001. URL:<www.adtdl.army.mil/cgi-bin/adtl.dll/fm/3-0/ch4.htm#par4-5>. Accessed 19 May 2004.

_____Field Manual (FM) 3-19.1. *Military Police Operations*, online ed. Washington, DC: Department of the Army, 22 March 2001. URL:<www.wood.army.mil/usamps/DOT/Doctrine/PDF_files/FM_3-19.1.pdf>. Accessed 20 May 2004.

U.S. Army Training and Doctrine Command (TRADOC). Pamphlet 525-3-23.40, Concept for Nonlethal Capabilities in Army Operations. Fort Monroe, VA: U.S. Army TRADOC, 15 August 2003, Final Draft.

U.S. Army Military Police School Nonlethal Center of Excellence, *Mission Statement*, Web only access. URL:<www.wood.army.mil/usamps/NonLethal/Default.htm>. Accessed 31 May 2004.

U.S. Marine Corps., U.S.M.C Detachment, Fort Leonard Wood, *Individual Non-Lethal Individual Weapons Instructor Course (INIWIC)*, Overview. Web only access. URL:<http://mcdetflw.tecom.usmc.mil/INIWIC/NIOVERVIEW.asp>. Accessed 15 May 2004.

"U.S. Suspects Opiate in Gas Used in Theater." Center for Cognitive Liberty & Ethics (October 2002). URL: <www.cognitiveliberty.org/dll/knockoutgas2.htm>. Accessed 19 June 2004.

Volger, George J. "Counting Coup in Ancient Ways and Courtroom Days." AE ProNet. Online study,1991. URL:<www.aepronet.org/pn/vol14-no1.html>. Accessed 29 May 2004.

Weatherford, Jack. *Genghis Khan and the Making of the Modern World*. New York: Crown Publishers, 2004.