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Newport, RI

NON-LETHAL WEAPONS IN CONVENTIONAL COMBAT OPERATIONS: Leveraging Capabilities or Violating the Rules of War?

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

DISTRIBUTION STATEMENT A
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Signature: _____

17 May 1999

DTIC QUALITY INSPECTED 4

19991122 141

Security Classification This Page

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED	
2. Security Classification Authority:	
3. Declassification/Downgrading Schedule:	
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.	
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT	
6. Office Symbol: C	7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207
8. Title (Include Security Classification): (U) NON-LETHAL WEAPONS IN CONVENTIONAL COMBAT OPERATIONS: Leveraging Capabilities or Violating the Laws of War?	
9. Personal Authors: LtCol W. M. Callihan, USMC	
10. Type of Report: FINAL	11. Date of Report: 17 May 1999
12. Page Count: 18	
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.	
14. Ten key words that relate to your paper: Non-Lethal Weapons, NLW, Smaller Scale Contingencies, SSCs, anti-personnel, anti-materiel, Law of War, Three Block War, non-lethal technology, MOOTW, MOUT	

15. Abstract:

NLW technologies hold great promise for revolutionizing conventional combat operations. Faced with scenarios involving the intermingling of the levels of war and problems associated with identifying combatants and non-combatants, non-lethal technologies could provide the operational commander with a full range of weaponry and more balanced options for applying force.

While leaps in non-lethal technology provided expanded opportunity for weapons development, this same factor caused weaponization to supercede policy development and implementation. A political environment bounded by the Rules of War and numerous international treaties and conventions places further development at risk to legal, moral, and ethical roadblocks. This situation complicates all aspects of non-lethal technology: R & D, policy formulation, operational concepts development, and procurement. Although not all the issues have immediate solutions, there are steps that policy makers can take in the areas of international law, policy, and NLW development to expedite their acceptance.

16. Distribution / Availability of Abstract:	Unclassified	Same As Rpt	DTIC Users
	X		

17. Abstract Security Classification: UNCLASSIFIED	
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT	
19. Telephone: 841-6461	20. Office Symbol: C

Security Classification of This Page Unclassified

INTRODUCTION

Non-Lethal Weapons (NLWs) technologies hold great promise for revolutionizing conventional combat operations in the next millennium. Faced with scenarios involving intermingled levels of war and problems with identifying combatants and non-combatants, non-lethal technologies provide the operational commander with a full range of weaponry and more balanced options for applying force. Despite all this promise, serious concerns exist within the international policy realm due to potential legal, ethical, and moral issues affecting non-lethal technology.

The expectations of our political leadership and the global community at large for reducing casualties, makes NLWs employment a critical issue for further development and incorporation within our National Military Strategy. The rapidly changing geo-political climate and violent disagreements among numerous nation-states and ethnic groups will undoubtedly continue to involve the deployment of U. S. military forces. The crowded, chaotic, and ill-defined nature of tomorrow's battlefield will constrain conventional operations. However, NLWs provide a means to leverage non-lethal and lethal capabilities to meet mission objectives across the spectrum of conflict. As the principal arbitrator and enforcer of global peace, the United States must maximize this technology to enhance its operational effectiveness.

The Changing World: 21st Century Realities

Although the most dangerous threat to the United States originates from super-power confrontation, conflict will most likely occur in Smaller-Scale Contingencies (SSCs). In fact, U. S. forces were involved in forty-five operations of this type between 1989-1997, as compared to sixteen between 1947-1988.[1] These conflicts will continue to take place in the developing world, where regions are undergoing great change—the Balkans, Africa, Asia, and Latin America. In general, these regions face multiple problems that tax government's ability to effectively address the forces of change. Among these problems, the issue of uncontrolled population growth imposes a problematic condition with direct impact on military operations—increasing urbanization.

The unprecedented growth in urban populations reflects shifting global demographics. According to the Marine Corps Intelligence Activity:

> Today, 45 percent of the world's population—2.5 billion people—live in cities. At projected rates, the world's urban population will double—to 5 billion—by 2025, making 61 percent of the entire world's population urban dwellers...Of the cities of more than a million people, two-thirds are now in the developing world. As much as 90 percent of the world's population growth will occur in the cities of the developing world.[2]

Due to these significant demographic shifts, future conflicts involving U. S. forces will undoubtedly require the capability to operate within chaotic and crowded urban environments. The U. S. Marine Corps envisions this as an asymmetrical battlefield where our adversaries will fight on their terms—avoiding a second Desert Storm. Coining the phrase "three-block war" to describe this environment, the Corps foresees:

> In one moment in time, Marines will be feeding and clothing displaced refugees and providing humanitarian assistance. In the next moment, they will

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[1] National Defense University. Institute for National Strategic Studies. Strategic Assessment 1998: Engaging Power for Peace (Washington: 1998), 156.
[2] Headquarters, U. S. Marine Corps. Expeditionary Operations (MCDP-3). (Washington: 1998), 17-18.

> be holding two warring tribes apart, conducting peacekeeping operations and, finally, they will be fighting a highly lethal mid-intensity battle, all on the same day, all within three city blocks.... In this environment, conventional doctrine and organizations may mean very little. It is an environment born of change and adaptability....[3]

The military significance of urban sprawl is a key factor supporting expanding NLW employment concepts. Besides the structures themselves, numerous other characteristics in non-industrialized urban areas multiply operational complexity. The compartmentalized terrain swallows ground forces—requiring greater numbers to be employed. Lacking modern urban planning, the city's infrastructure is often characterized by numerous meandering roads and narrow alleyways that tend to restrict and slow traffic flow. Although the restricted terrain favors infantry forces in general, the urban environments greatest advantage belongs to the defender particularly when on his home turf.

The events in Mogadishu, Somalia on 3-4 October 1993, demonstrate the problems surrounding engaging an indigenous adversary within the confines of a densely populated disorganized shantytown. During the battle between Task Force Ranger and Habr Gidr clan militiamen, determining combatant from non-combatant proved nearly impossible. The casualty estimates for the Somalis were over 500 dead among more than a thousand casualties.[4] Although an accurate count of the non-combatant casualties is unknown, descriptions provided by participants in the battle convey a scene of confusion, indistinguishable hostile forces, and close-quarters combat that provided little time for selectively engaging targets.

The 1993 Somalia action generates a number of critical questions that directly apply to NLW employment today: Do we have a means to identify combatant from non-combatant? If

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[3] Headquarters, U. S. Marine Corps. Concepts and Issues '98: Building A Corps For The 21st Century (Washington: 1998), 14-15.

so, can we target and engage the combatant without casualties to non-combatants or excessive collateral damage? In the absence of overwhelming manpower, can we leverage technology so that small units can generate the equivalent combat power of a larger force? Although posing extremely difficult problems, the answers to these questions are available within existing NLW technology.

Non-Lethal Weapons: Policy and Ground Combat Applications

Non-Lethal Weapons (NLWs) are most often associated with Military Operations Other Than War (MOOTW)—Humanitarian Assistance (HA), Non-Combatant Evacuation Operations (NEO), and Peacekeeping (PK). Predominantly viewed as non-combat in nature, these operations have focused NLW employment within the confines of law enforcement roles such as crowd control. Even so, nothing within the current Department of Defense (DoD) Policy for Non-Lethal Weapons restricts their use solely to non-combat applications.

The U. S. policy definition for NLWs states:

> Non-Lethal Weapons are explicitly designed and primarily employed so as to incapacitate personnel or material, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment.... Unlike conventional lethal weapons that destroy their targets principally through blast, penetration and fragmentation, non-lethal weapons employ means other than gross physical destruction to prevent the target from functioning.[5]

By these statements, it appears that U. S. policy is more concerned with the physical effects of NLWs versus limiting their operational employment. In fact, the NLWs Policy Directive specifically addresses their employment, "...in conjunction with lethal systems to enhance the latter's effectiveness and efficiency in military operations. This shall apply across the

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[4] Mark Bowden, Blackhawk Down (New York: Atlantic Monthly Press, 1999), 333.
[5] Department of Defense, Policy for Non-Lethal Weapons. DoD Directive 3000.3. (Washington: 1996), 2.

range of military operations...."[6] Considering the increasing frequency of U.S. military involvement in extremely volatile situations that can escalate from non-combat to combat in a matter of seconds, it seems an appropriate time to consider expanding NLWs policy and operational concepts.

Non-Lethal technologies are generally divided into two categories or core capabilities: counter-personnel and counter-materiel. Counter-personnel technologies are subdivided based on weapon type, such as chemical incapcitants, and optical, acoustic, and kinetic weapons. Counter-material technologies are subdivided by the method used to target various systems and components, such as combustion inhibitors, filter cloggers, anti-traction agents, optics obscurants, embrittlement agents, and supercaustics.

The Joint Concept for Non-Lethal Weapons describes these core capabilities as the fundamental competencies which enable us to achieve desired operational outcomes. Within counter-personnel non-lethal technology the United States seeks specific capabilities in four areas: capability for crowd control, capability to incapacitate individual personnel, capability to deny personnel access to an area, and a capability to clear facilities and structures of personnel. Within counter-material non-lethal technology we focus on two specific capabilities: capability to deny land area to vehicles and a capability to disable or neutralize specific types of equipment and facilities.[7]

Although there is near universal agreement on the physical effectiveness of both categories of weapons[8], there is much less consensus on the ability to employ them with a

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[6] Ibid., 3.

[7] "A Joint Concept for Non-Lethal Weapons," Commandant, U. S. Marine Corps, Non-Lethal Weapons Directorate, Quantico, VA, 5 January 1998, 11-13.

[8] Several of the works referenced in the Bibliography include operational scenarios that describe specific weapons and their envisioned employment based on contemporary operational experience and test data. See: A Joint Concept for Non-Lethal Weapons, A14-22, and Nonlethal Weapons: War Without Death, 93-122.

desired degree of selectivity. The discussion's recurring theme centers on the potentially uncontrollable effects of weapons designed to inflict little lasting harm. This relates directly to the internationally accepted Law of War that weapons should not be indiscriminate in their effects.[9] These legal aspects, developed over time, emphasize the moral and ethical dimensions of conflict. They are largely based on the experiences of past wars—unfortunately, their effect on today's NLW technology is significant and by some interpretations, severely limits their employment in all situations involving armed conflict.

Limitations

In general, the body of law that has evolved concerning conventional weapons employment and warfare provides rules governing the Law of Armed Conflict. Additionally, the international community has sought to limit a number of specific weapons through prohibition and restrictions. The Chemical Weapons Convention (CWC), Bacteriological Weapons Convention (BWC), and Certain Conventional Weapons Convention (CCWC) each focused on a particular weapon or class of weapons that were determined to be particularly inhumane. These three conventions reflect the efforts of the global community to moderate unnecessary suffering and the effects of war—particularly on non-combatants.

Two concepts in particular, *humanity* and *proportionality*, form the basis for discussing general principles that impact NLW development and employment. In their discussions on the subject, Nick Lewer and Steven Schofield describe the concept of proportionality as balancing suffering against military necessity. The general concept of humanity, which includes the former, demands that combatants and non-combatants not be subjected to

[9] Malcolm Dando, A New Form of Warfare: The Rise of Non-Lethal Weapons (London: Brassey's, 1996), 15.

unnecessary suffering. As they accurately point out—both concepts are difficult to qualify and subject to interpretation.[10]

In the realm of non-lethals, exactly what constitutes *unnecessary suffering* is difficult to determine. Previous prohibitions focused on weapons that were designed with lethality in mind, such as poison gas and hollow-point (dumdum) ammunition. However, these weapons also possessed characteristics intended to inflict considerably suffering when not fatal. Using a similar argument, some opponents of non-lethal technology consider the uncontrollable choking and convulsions produced by chemical irritants and incapcitants under the same definition of unnecessary suffering. In their minds, these non-lethal agents fail the proportionality test.

A similar argument is made when dealing with the *non-discriminatory* impact of NLWs. The issue is not so much with the accuracy of their delivery against a military target, but the weapons' effects over an area also occupied by civilians. This issue of collateral damage affects both classes of NLWs in varying degrees based on the weapon. Particularly vulnerable to these charges are the previously mentioned chemical irritants and incapcitants, as well as, aqueous foam, and anti-traction, embrittlement, bio-deterioration, and supercaustic agents.

Rapid technological advances have produced numerous non-lethal technologies that have the potential for drastically altering military operations. However, these same technologies developed without time to consider policy and ethical guidelines with respect to existing international law. With the exception of "blinding lasers", none have been specifically addressed by convention, but most are effected by existing international agreement or customary practice. As an example, in a study undertaken by the Institute for Defense

[10] Nick Lewer and Steven Schofield, Non-Lethal Weapons: A Fatal Attraction? (London: Zed Books, 1997), 83.

Analysis, fourteen anti-personnel non-lethal technologies were evaluated for their political implications under four criteria: potential lethality, long-term human effects, environmental effects, and legality. Seven of the technologies were either prohibited by current treaty or found to violate the spirit of existing agreements.[11]

Although weapons limitation treaties are not a new phenomenon, the effect of existing treaties on advanced and emerging technology is becoming more pronounced. A review of several international conventions provides evidence, including the following:

- *Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons (BWC).* [12]Ratified in 1975, it prohibits development, production, and stockpiling of BW agents—potentially impacting the development and use of Bio-deterioration agents.
- *Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD).*[13] Ratified in 1980, it prohibits any technique for changing the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space—potentially impacting non-lethal technology that affects plant life or the physical structure of the earth. A wide range of non-lethal technology could be affected, such as: Chemical Defoliants, Incapcitants, Anti-traction agents, and Supercaustics.

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[11] Lexi Alexander and Julia L. Klare, The Role of Non-Lethal Technologies in Operations Other Than War Institute for Defense Analysis, (Alexandria, VA, June 1996), 39-40.
[12] "Biological Weapons Convention," 26 March 1975, United States Treaties and Other International Agreements, TIAS 8062 (1975) v. 26, pt. 1, 583-592.
[13] "Environmental Modification Convention," 17 Jan 1980, United States Treaties and Other International Agreements, TIAS 9614 (1979) v. 31, pt. 1, 333-342.

- *Chemical Weapons Convention (CWC).* [14] Signed by the President and forwarded to the Senate in 1993. Prohibits the employment of munitions and devices specifically designed to cause death or other harm through the toxic properties of chemical weapons. Although Riot Control Agents (RCA) are allowed for military use in "law-enforcement like roles", the use of RCAs as a *method of warfare* is prohibited. This impacts the most common non-lethal technologies: Chemical Irritants and Incapcitants.
- *Convention on Prohibition or Restrictions on the Use of Certain Conventional Weapons (CCWC).*[15] Approved by the President and forwarded to the Senate in 1997. One of its protocols bans the use of laser weapons specifically designed, as their sole combat function, to cause permanent blindness to unenhanced vision. Unfortunately, it has apparently unintended impact on other non-lethal technologies that are in the early development stage, such as: Acoustics, Microwave, and Direct-Energy Weapons.

In reviewing these four conventions, the potential impact on non-lethal technology development is apparent. Significant political repercussions could arise from the employment of non-lethal systems viewed as prohibited or restricted under existing international law. It is unlikely that any government would invest significant monies into technology that could be restricted or banned. Unfortunately, many of the most promising NLW technologies fall into this category.

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[14] "Chemical Weapons Convention," Oct 1993, Treaties in Force: A List of United States Treaties and Other International Agreements in Force on Jan 1, 1998, Senate Treaty Document 103-21, KAV 5059 (1993).
[15] "Certain Conventional Weapons Convention," 7 Jan 1997, Treaties in Force: A List of United States Treaties and Other International Agreements in Force on Jan 1, 1998, Senate Treaty Document 105-1, KAV 5077 (1997) CIS S-385-1 (MF).

Another mitigating factor is the unknown impact on the environment resulting from NLW employment. Research and Development (R & D) efforts focus on a system's ability to meet effect on target criteria not on its long-term environmental impact. Over time, the *green factor* has taken on a more important role—as evidenced by the Environmental Modification Convention. This is particularly true in the United States, where environmental concerns abound. The concerns over collateral damage contain an implied subset of minimizing environmental damage. Non-green weapons could have staggering clean-up costs—particularly as the frequency of NLW employment rises. Regardless of its effectiveness, it seems unlikely that any weapon system would be approved for production if its employment generates a new set of problems.

A final thought on limiting factors addresses issues under an umbrella of arms control. Weapons proliferation has remained a topic of concern for generations—whether focused against the acquisition of Weapons of Mass Destruction (WMD) or protecting transfer of conventional weapons technology to an adversary. Some opponents believe that accelerated NLWs development by the United States only serves to excite the interests of others in procuring this technology. Additionally, they believe that a significant risk exists, "as second generation non-lethal weapons are developed, first generation weapons will gravitate into increasingly less responsible hands."[16] A corollary argument concerns the risk of United States vulnerability to non-lethal attack. Again, the Council on Foreign Relations NLW Task Force observed that, "The United States in many ways is the most open, technology-dependent, and vulnerable society. Power grids and computer systems in particular are

[16] Council on Foreign Relations. Non-Lethal Technologies: Military Options and Implications: Report of an Independent Task Force. (New York: 1995), 9.

potential targets."[17] Many question the rationale of developing weapons that could easily be used to attack a critical U. S. vulnerability.

Undoubtedly, numerous factors exist that limit aspects of non-lethal technology. The nature of these issues—whether legal, environmental, arms control, or political—demands a coordinated effort in moving operational concept development forward. Otherwise, the risk of unintended consequences rises exponentially with the likelihood of NLW employment. From another perspective, it would be equally ironic if "lethal weapons were employed because ambiguities in international law prevented the use of non-lethal weapons."[18]

Conclusions

The global environment is rapidly changing and the influences that shaped the U. S. military of the 20th Century are giving way to a new set of influences in the 21st Century. Currently, we see these changes in fractured nations such as Somalia or the former Yugoslavia. The physical conditions in these regions pose the greatest challenge to conventional operations. As populations continue to rapidly expand, varied groups are brought into closer contact. Competition for space and resources generates friction and problems inevitably arise. Ethnic and tribal conflicts create virtual seas of humanity—congested, confused, and indistinguishable masses. Identifying and separating combatant from non-combatant becomes the first priority and the most difficult objective to achieve. These will be the everyday circumstances faced by operational commanders on the urbanized battlefields of tomorrow.

[17] Ibid., 9.
[18] Ibid., x.

While leaps in non-lethal technology provide expanded opportunity for accelerating weapons development, this same factor causes weaponization to supercede policy formulation and implementation. The current political environment, bounded by the Rules of War and numerous international treaties and customary law, places further development at risk to legal, ethical, and moral roadblocks. Many of the existing protocols were created to restrict specific weapons considered inhumane from further development and use, such as poison gas in the aftermath of World War I. However, the agreements themselves were written with such ambiguity that current technology often falls within their confines. This situation complicates all aspects of non-lethal technology: R & D, policy formulation, operational concept development, and procurement.

The dilemma is not a single-source problem, but one with multiple aspects. In a cluttered and chaotic environment, the primary concern is selectively engaging targets with minimal collateral damage without exposing friendly forces to undue risk. Although not a "silver bullet", non-lethal technologies possess the capability to provide options to increase our probability of success in this regard. The answer to the question "Why non-lethal weapons?" is addressed in the 1997 Joint Non-Lethal Weapons Program Annual Report:

> ...Operational use of non-lethal weapons (NLW) is driven by increasing urbanization of warfare and recognition of the potential for massive collateral damage (unintended civilian casualties and property damage) caused by modern weapons of war. When fighting occurs in urban terrain, adversaries have a much greater opportunity to blend with the civilian population and/or hostages for protection from counterattack. In the rural environment, non-lethal weapons may help reduce noncombatant casualties, because of their inherent reversible effects on personnel and limited destructive effects on material property and the environment. Changes in the nature and perception of warfare and the increasing involvement in MOOTW and MOUT are increasing the need for a non-lethal weapons capability in the U. S. military.[19]

[19] Joint Non-Lethal Weapons Program, Annual Report, 1997 (Quantico, VA: Feb 1998), 1.

Although facing significant issues that currently hinder full-spectrum application, NLWs provide significant leverage across the spectrum of conflict. "In sum, non-lethal technologies have the potential for providing new strength for diplomacy, new credibility for deterrence, new flexibility for the military, and new strategic options for policymakers."[20]

Recommendations

Not all of the issues have solutions that can be immediately implemented. Many of the root problems fall into the realm of international law and policy. Treaties often take years of negotiation to finalize and additional time to ratify or make common practice. NLWs themselves are in their infancy in some areas—making both their effectiveness and long-term impact unknown. Although universal clarity cannot be claimed, there are steps that National civilian and military policy makers can take to expedite their acceptance:

Legal

- Existing international law should be reviewed and clarified regarding non-lethal technology. The intent is to tighten definitions on prohibited weapons vice a general loosening of conventions and protocols. Although a time consuming process, renegotiating treaties would make them more relevant to current non-lethal technology.
- Review Joint Standing Rules of Engagement to initiate changes necessary to allow more effective employment of NLWs.

[20] Non-Lethal Technologies: Military Options and Implications, xii.

Policy

- At the national-strategic level, non-lethal policy must be coordinated throughout the government. The dual-use nature of many non-lethal technologies puts a premium on close coordination between the Departments of Defense and Justice.
- The significant legal and moral issues that encompass NLWs must be delineated in National policy so that our limited resources are not allocated toward systems unacceptable to the world community.

NLW Development

- Priority should continue on "concepts based" development of non-lethal technology.
- Encourage open exploration of emerging technology to exploit advances and encourage innovative thinking.
- Operational concepts should reflect NLWs applicability across the spectrum of conflict—away from its current location in the MOOTW toolbox, alone. Experimentation should continue as a coordinated effort between the Services, particularly the Army and Marine Corps, who will reap the greatest benefit from a fully developed non-lethal capability. This should include force-on-force wargaming and exercises focused on leveraging non-lethal and lethal technology.
- U. S. allies must be included in developing non-lethal technology and operational concepts. Many have established NLWs programs and extensive operational experience that could prove valuable in developing international consensus on non-lethal applications.

Summary

The potential for non-lethal technology to revolutionize operational concepts of warfighting is undeniable. The operating environment in the 21st Century will follow the shifting global demographics patterns. Increased urbanization will undoubtedly lead to more interaction between civilian populations and U. S. operating forces. On this crowded and chaotic landscape, military effectiveness will likely be judged by minimizing noncombatant casualties and limiting collateral damage.

Turning this concept into operational reality is not without difficulty. A multitude of issues—legal, moral, ethical, environmental, and political—must be addressed to optimize non-lethal technology. Undoubtedly, the legal dimension is the most difficult to resolve due to the interwoven nature of existing treaties and the lengthy process for negotiation. Finding solutions and building consensus in the international community will not be easy but a determined effort must be made.

In an increasingly complex international environment, the rheostatic characteristic of NLWs allows military force to be applied across the conflict spectrum. Incorporating non-lethal technology with its lethal counterpart provides the operational commander a full range of weaponry and increased flexibility to meet mission objectives—delivering levels of force appropriately scaled to the overall threat.

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