REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
10-05-2007	FINAL	

4. TITLE AND SUBTITLE

Non-Lethal Weapons: Considerations for the Joint Force Commander

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Jeffrey W. Voetberg, Major, United States Air Force

Paper Advisor (if Any): William Hartig, Colonel, USMC

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Joint Military Operations Department
Naval War College
686 Cushing Road
Newport, RI 02841-1207

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Distribution Statement A: Approved for public release; Distribution is unlimited.

13. SUPPLEMENTARY NOTES 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. ABSTRACT

The allure of non-lethal weapons has continued to grow, and will only accelerate as the United States continues to confront complex irregular combat scenarios, often in urban environments. Despite their promise, numerous concerns about their development and use have been raised by persons both in and out of the military. While all the concerns deserve consideration, this paper discusses the issues raised primarily by those outside the military. The concerns raised need to be addressed by everyone in the non-lethal weapons community, from the most senior policy-makers to the most junior soldier employing them. This paper focuses on what the operational commander can do to attend to potential complaints against non-lethal weapons. It is the thesis of this paper that properly crafted Rules of Engagement are one tool that the operational commander can use. General guidelines for use when developing Rules of Engagement are offered to minimize the concerns raised and help ensure the legitimacy of both the weapons employed and the United States.

15. SUBJECT TERMS

Non-Lethal Weapons (NLW), Rules of Engagement (ROE), International Law

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			Chairman, JMO Dept
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED		24	**19b. TELEPHONE NUMBER** *(include area code)* 401-841-3556

Standard Form 298 (Rev. 8-98)

NAVAL WAR COLLEGE
Newport, R.I.

NON-LETHAL WEAPONS: CONSIDERATIONS FOR THE JOINT FORCE COMMANDER

by

Jeffrey W. Voetberg

Major, United States Air Force

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.

Signature: _____

10 May 2007

Contents

Abstract

The allure of non-lethal weapons has continued to grow, and will only accelerate as the United States continues to confront complex irregular combat scenarios, often in urban environments. Despite their promise, numerous concerns about their development and use have been raised by persons both in and out of the military. While all the concerns deserve consideration, this paper discusses the issues raised primarily by those outside the military. The concerns raised need to be addressed by everyone in the non-lethal weapons community, from the most senior policy-makers to the most junior soldier employing them. This paper focuses on what the operational commander can do to attend to potential complaints against non-lethal weapons. It is the thesis of this paper that properly crafted Rules of Engagement are one tool that the operational commander can use. General guidelines for use when developing Rules of Engagement are offered to minimize the concerns raised and help ensure the legitimacy of both the weapons employed and the United States.

The list of U.S. military actions in the past twenty years highlights an obvious trend: The military is now expected, for the most part, to operate in urban areas against irregular enemies in a sectarian environment, all the while subject to the most intense and immediate media scrutiny seen to date. One type of technology that seems to hold great promise for use in future complex irregular urban warfare scenarios is a class of weapons known as non-lethal. Yet, this new technology also presents some challenges to the operational commander.

To set the stage for later discussion, described here first is the state of the art for various sub-categories of non-lethal weapons (NLWs). Next is a brief summary of some of the pertinent legal and policy restrictions that will govern how the Joint Force Commander (JFC) uses NLWs.

Despite the potential of NLWs, many scholars continue to resist development of NLW technology. The origin and nature of these objections will be examined next in this paper. I will, however, make no effort to examine the validity of these objections as this is beyond the scope of the paper. The reader must consider what is offered regarding the nature of NLW technology and the language of international law and apply sound judgment to reach a conclusion. To the maximum extent possible, the objector's own words will be used, although some inference is offered where the arguments offered are otherwise somewhat obscure. It should be noted that there are some within the Department of Defense offering arguments against NLWs as well. These arguments tend to deal with such things as training time, proficiency with standard lethal weapons, and budgetary considerations. While many of these arguments deserve consideration, the focus of this paper is on the moral and legal challenges to NLWs presented by non-military agencies.

The main portion of the paper deals with ways the Department of Defense, and the JFC in particular, can effectively balance military necessity with the need to preserve U.S. military

legitimacy. This presupposes that global approval, or at least acquiescence, is crucial to sustained U.S. military operations, and can be threatened by non-governmental agencies campaigning against our non-lethal weapons. It is my assertion that well constructed Rules of Engagement (ROE) governing NLW use can be issued by the JFC that ensure the accomplishment of military objectives, minimize collateral damage including non-combatant fatalities, and assuage the objections raised to NLW use. I will propose some general guidelines for the operational-level planner to follow when developing ROE for the use of NLWs.

Categories of Non-Lethal Weapons

Prior to developing ROE for NLW, it is first necessary to bound the issue for the JFC by describing the currently available technology. NLWs can be categorized by their technological roots, method of action, or by their intended target—either anti-materiel or anti-personnel. Other authors have extensively described recent advances in NLW technology. I will only attempt here to describe the most developed and most controversial types to set the stage for what follows. More detail can be found in the Appendix and in the sources listed therein.[1]

Among the most commonly used NLWs are kinetic devices. These include rubber or plastic bullets, bean-bag rounds, and water cannons. Recent efforts have focused on making these types of weapons more accurate at distance, increasing their range, and decreasing the possibility of lethal outcomes.

Another commonly used type of NLW is certain chemical agents. Into this category falls pepper spray, used by law-enforcement personnel. Beyond improving these irritant chemicals, research in this area has focused on developing receptor agents to induce fear or sleep. This

1. See for example David A. Koplow, *Non-Lethal Weapons: The Law and Policy of Revolutionary Technologies for the Military and Law Enforcement* (New York: Cambridge University Press, 2006), or Brian Rappert, "Towards an Understanding of Non-Lethality," in *The Future of Non-Lethal Weapons*, ed. Nick Lewer (London: Frank Cass, 2002).

category also includes super lubricants and adhesives designed to deny access to or use of selected areas. Some research has also focused on caustic agents that could corrode or make metals or plastics brittle. The third category in use today is electric weapons. These deliver incapacitating shocks either directly or though a projectile. Research has attempted to increase the range of these weapons, and to make them more effective in penetrating through layers of clothing.

Recently, directed energy weapons have been in the forefront of research and development efforts. Into this category one may find visible light weapons, including dazzling and laser systems. Also included are audible and inaudible sonic weapons. The highly publicized microwave energy weapons are also in this category.

The last category of NLW is mechanical devices. This includes everything from traditional barbed-wire to pop-up vehicle barriers and ship entanglement devices as well as projectile nets and snares that can be fired some distance and entrap individuals or small groups. Other anti-access devices such as tire spikes or anti-personnel caltrops are also included in this category.

Non-Lethal Weapons and the Law of Armed Conflict

In addition to the types of NLWs available, other important considerations for the JFC and his planning staff are international law and treaty constraints. International law has long held that the means of warfare are not without limits. Conventions, treaties, and international custom all place restrictions on the types of weapons that may be used, and to some degree, how they may be used. Other authors have written more exhaustively on the topic; what follows is only an attempt to frame the discussion of the next two sections.

One of the fundamental premises of the Law of Armed Conflict is proportionality, also called "military necessity."[2] Proportionality holds that the means used to achieve a military objective must not be excessive, relative to the value of that object. Wanton destruction, even when directed toward a military goal, is prohibited. From this premise springs the idea of undue suffering. Weapons must be designed and employed in a way to minimize suffering. Mushrooming "dum-dum" bullets and glass projectiles are two examples of specific weapons that are outlawed because of their potential to cause undue suffering.[3]

A second fundamental premise is that of discrimination. Military commanders must, to the degree possible, avoid targeting non-combatants. As long as it does not unduly jeopardize their forces or mission accomplishment, commanders must attempt to discriminate between enemy forces and civilians. It is not illegal to cause collateral damage while attacking military targets. However, collateral damage must not be excessive relative to the anticipated military advantage sought.[4]

Certain types of weapons have received more scrutiny than others. The leading examples are chemical and biological weapons, which are subject to their own conventions. 175 States are party to the Chemical Weapons Convention (CWC), signed in 1993. Article One states that parties undertake to "never under any circumstances… develop, produce… or transfer, directly or indirectly, chemical weapons to anyone… to use chemical weapons… to engage in any military preparations to use chemical weapons" or "use riot control agents as a method of

2. U.S. Navy, *The Commander's Handbook on the Law of Naval Operations*, Naval Warfare Publication (NWP) 1-14M (Norfolk, VA: Naval Doctrine Command, October 1995), 6-5.
3. "Convention on Prohibitions or Restriction on the Use of Certain Conventional Weapons which May Be Deemed to be Excessively Injurious or to Have Indiscriminate Effects and Protocols," protocol 1, 2 December 1983, http://disarmament.un.org (accessed 16 April 2007).
4. U.S. Navy, NWP 1-14M, 8-2.

warfare."[5] Intended to capture future chemicals, the definitions for chemical weapons and riot control agents are fairly vague. In practice, States generally refer to the Schedule to determine which specific chemicals are banned.[6]

Entering into force in 1975, the Biological Weapons Convention states that signatories vow "never in any circumstances to develop, produce, stockpile or otherwise acquire or retain: (1) 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 purposes; (2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict."[7] Parties continue to meet to "promote common understanding and effective action on biosecurity, national implementation measures, suspicious outbreaks of disease, disease surveillance and codes of conduct for scientists."[8]

While there are numerous restrictions on the use of weapons in warfare, none of these impinge on the inherent right of self-defense. Article 51 of the Charter of the United Nations clearly demonstrates the right of individual and collective self-defense, "if an armed attack occurs."[9]

Objections to the Use of NLWs

As the potential for deployment of NLWs comes closer to becoming a reality for the JFC, there are a growing number of voices urging caution or raised in outright opposition. If the

5. "Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction," 29 April 1997, article 1, http://www.cwc.gov/cwc_treaty_articles.html (accessed 19 March 2007).
6. Defense Threat Reduction Agency, "Defense Treaty Inspection Readiness Program," http://dtirp.dtra.mil/tic/CWC/cw_art02.htm (accessed 19 March 2007).
7. "Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction," 26 March 1975, http://www.state.gov/t/ac/trt/4718.htm (accessed 19 March 2007).
8. Department of State, "Biological Weapons Convention," http://www.state.gov/t/ac/bw/ (accessed 19 March 2007).
9. United Nations, General Assembly, *Charter of the United Nations*, Chapter VII, Article 51, http://www.un.org/aboutun/charter/ (accessed 19 March 2007).

commander is going to be able to effectively employ NLW and attempt to quell the opposition to their use, it is first necessary to understand the nature of the objections. To that end, this section will describe the origin and nature of the most commonly raised objections.

As previously discussed, there are internationally recognized limits to the methods of warfare. One of the fundamental tenets of international law is the protection of non-combatants from unnecessary suffering. To this end, civilians can not be targeted. Stemming from this principle, the first objection to the use of NLWs is that many of them are intentionally non-discriminate.[10] Their design and intended use is against groups of people known to include both combatants and non-combatants. Modern conflict has seen numerous examples of belligerents using civilians as human shields or simply intermingling with innocent bystanders. Such actions are deplorable and contrary to international law, but do not relieve the other belligerents from their duties to adhere to legal and customary restraints. Even in such ambiguous circumstances, efforts must be made to avoid causing harm to non-combatants. This is especially true when one considers how a certain NLW may have differing effects on individuals based on age, gender, pre-existing medical condition, or interaction with other factors. That is to say, an agent strong enough to incapacitate a young male terrorist may kill or severely injure the infant or elderly woman also exposed to the applied agent. To support their case, opponents point to the use of what is believed to be a derivative of the opiate fentanyl, used by Russian military forces against Chechen terrorists in Moscow in October 2002. Unable to control the dosage or the environment, the action unfortunately killed 130 of 830 hostages.[11]

10. Joseph W. Siniscalchi, "Nonlethal Technologies and Military Strategy," in *The Technological Arsenal: Emerging Defense Capabilities*, ed. William C. Martel (Washington, DC: Smithsonian Institution Press, 2001), 139.
11. David P. Fidler, "The Meaning of Moscow: 'Non-lethal' Weapons and International Law in the Early 21st Century," *International Review of the Red Cross* 87 No. 859 (September 2005): 532.

A related legal concern is that NLWs will weaken existing legal constraints on the use of force. There are numerous scholars proposing that the Chemical Weapons Convention (CWC) and the Biological Weapons Convention (BWC) do not and should not apply to NLWs.[12] The second objection is that NLWs raise the likelihood that key weapons restraints will be discarded in order to pursue non-lethal technologies at the margins of existing conventions. This would then open the door to the pursuit of new and more heinous lethal weapons.[13] It is feared that key signatories of the conventions might weaken their provisions while acting with only the best intentions. First-world nations would be able to justify their actions by firstly pointing to the goal of a more humane weapon and, secondly, by not developing the types of lethal weapons originally in mind when the CWC and BWC were signed. Nevertheless, such actions would give less benevolent actors the leeway to produce banned weapons.

The history of military technology is one based on competition. There is always an ongoing race to develop a bigger, better, faster, more effective weapon or a counter to a better weapon. There exists concern that NLWs will be no exception.[14] The third objection then, is that NLWs may spark a new global arms race. This concern is especially disconcerting if one considers the ability of many technologies described herein to become lethal, and to cause horrific suffering in the process. Such an arms race could result in the proliferation of cheap, portable, and easy-to-use weapons. Proliferation would also pave the way for misuse, which is the next objection raised.[15]

---

12. Nick Lewer and Steven Schofield, *Non-Lethal Weapons: A Fatal Attraction?* (London: Zed Books, 1997), 130.
13. David A. Koplow, *Non-Lethal Weapons: The Law and Policy of Revolutionary Technologies for the Military and Law Enforcement* (New York: Cambridge University Press, 2006), 133.
14. Robin M. Coupland, "'Calmatives' and 'Incapacitants': Questions for International Humanitarian Law Brought by New Means and Methods of Warfare with New Effects," In "Bradford Non-Lethal Weapons Research Project – Research Report 5," ed. Neil Davison and Nick Lewer, (research paper, Bradford UK: University of Bradford, Centre for Conflict Resolution, May 2004), 38.
15. Koplow, 137.

Employment of NLWs must be bound by clearly articulated and evenly enforced rules and restrictions. In the wrong hands, however, NLWs can become the instruments of state repression and individual torture. The ability of NLWs to be used for immoral ends, even more so than lethal means currently available, is the fourth objection. Lack of lasting effects and no evidence of their use—beneficial characteristics from the proponent's perspective—allow NLWs to become the perfect tool to put down peaceful anti-government demonstrations. A report from the European Union identified 33 countries in which NLW had been used in human rights violations.[16] Their ability to cause repeated and precise amounts of pain is ideally suited for the torture chamber. Terrorists could use NLWs to target civilian transportation, communication, and economic systems, causing massive disruptions in highly developed countries. NLW could well become the next generation of WMd, meaning Weapons of Mass disruption, a definite threat in the computer dependant global economy.[17] Koplow also points out that some NLW technology could be used in the pursuit of criminal enterprise.[18]

Even more disturbing than the potential for misuse is the way in which NLWs lower the psychological barrier against violence. Application of deadly force has clear cut and readily observable consequences. Psychological research has shown a strong human resistance toward killing; military indoctrination to some degree is designed to overcome this resistance and allow the soldier to kill when ordered.[19] NLWs, by their very intent, will not offer the same moral consequence. The fifth objection, therefore, is that NLWs make interventions appear low cost,

16. Omega Foundation. *Crowd Control Technologies: An Assessment of Crowd Control Technology Options for the European Union.* Luxembourg: European Parliament, Directorate General for Research, Directorate A, Division of Industry, Research and Energy, Scientific and Technological options Assessment, 2000.
17. Thanks to Colonel Hartig of the Naval War College for the idea of MWd.
18. Koplow, 138.
19. Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Boston: Little, Brown and Co., 1995), 35.

and lower the threshold for intervention by armed forces.[20] NLWs may offer the hope of fewer deaths, but they also raise the specter of more war. Further, if policy makers feel freer to introduce armed forces into situations, there is no guarantee that the opponent will refrain from using lethal weapons. In fact, the third Clausewitzian truism is the Theory of Escalation and the history of conflict is stark evidence of humankind's tendency towards escalation.[21] Given the inherent right of self defense written into the UN Charter, the original belligerent may discard his NLWs in favor of lethal means. So, with the best of intentions, NLWs may cause greater loss of life due to the relaxed criteria for the introduction of armed force.

Developing Rules of Engagement for Non-Lethal Weapons

Now that the JFC is aware of the non-lethal tools available, the constraints and restraints imposed by international legal standards, and the objections of concerned scholars, he and his planning staff can begin looking at the best way to employ NLWs. This section will examine ROE as one means the JFC can use to ensure legal and moral use of this emerging set of weapons. Looking at each of the stated objections separately, we find that ROE can address the complaints, but other actions would also need to be taken to tackle more completely some of the concerns.

Humanity

On a traditional battlefield, using NLWs against only legal combatants should prove no more difficult than applying discrimination with current lethal weapons. With the limited

20. Douglas C. Lovelace, Jr. and Steven Metz, *Nonlethality and American Land Power: Strategic Context and Operational Concepts* (Carlisle, PA: Strategic Studies Institute, 1998), 12.
21. Clausewitz, in describing war in theory, states "…we can then take a review of our own means, and either increase them as to obtain a preponderance, or, in the case we have not the resources to effect this, then do our best by increasing our means as far as possible. But the adversary does the same; therefore, there is a new mutual enhancement, which, in pure conception, must create a fresh effort towards an extreme." Carl von Clausewitz, *On War*, trans. J.J. Graham (London: Kegan Paul, Trench, Trubner and Co., 1918), 6. While political restraints imposed on solders limit escalation, the concept of a "mutual enhancement" race has innumerable examples, such as the evolution of the medieval long bow into the modern intercontinental ballistic missile.

effective range of today's NLWs, confirmation of targets may in fact be easier as compared to longer-range lethal weapons. As current Standing ROE address the concept of targeting discrimination, introduction of NLW into a traditional battlefield should pose little threat to U.S. legitimacy as long as adherence to those Standing ROE is maintained .

Operations in Somalia, Haiti, Yugoslavia, and Iraq, however, demonstrate to the planner the implications of the non-traditional and non-linear battlefield. In these cases, we have inadvertent and sometimes deliberate intermingling of enemy combatant and civilian populations. Instigators can organize and agitate a mob to engage in threatening behavior, and may attempt to employ lethal means from within that mob. Combatants may seek shelter in homes, businesses, religious buildings, or medical facilities. It is in these scenarios that NLWs hold so much promise for the JFC, but also so much peril. Faced with a potentially dangerous mob, the on-scene commander, armed with directed-energy weapons, may want to sweep the crowd, dispersing them. This could very easily have dire consequences for the legitimacy of the NLW and the U.S. force employing them if some truly innocent bystanders are hit with the NLW and suffer unexpected reactions. An unscrupulous enemy may coerce expectant women and infirm elders to participate, hoping for the so-called CNN factor to give him a strategic victory from the engagement. Operational-level plans must take this into consideration.

ROE for NLW must emphasize the fact that discrimination in targeting still applies.

In the mob scenario, NLW should be used only against recognized instigators whenever possible. If the mob still poses a credible threat of serious injury or death, NLW should be targeted against those directly participating in threatening activities. As with lethal weapons, planners must recognize that one cannot indiscriminately employ NLWs.

Recurring and pre-deployment training scenarios should also be developed to instill the operational commander's intent in the joint force. More than just weapons familiarization, such training should allow the force to identify and engage the instigators quickly and accurately, thereby defusing the situation before more lethal means are necessary.

In the instance when the combatant takes flight and hides among civilians or in civilian buildings, this is even truer. Again, the temptation would be to apply some sonic weapon or malodorant against the entire building in an effort to cause the occupants to return to the streets. While this would reduce the time and risk to U.S. service members, it could jeopardize the legitimacy of the operation. Injuries could result in the rush to exit the building, or the NLW agent could again have unintended consequences on some of the non-combatants. Clearing operations should first rely on compliance with verbal instructions to remove as many individuals as possible and then soldiers must engage in the time-consuming and hazardous business of clearing room by room.

ROE for clearing operations should limit the use of NLW to individual, actively resisting persons.

This ROE must maintain the difficult balance between a desire to protect U.S. forces while simultaneously affirming the humanity of the civilian population. In examining the issue as a student at the Naval War College, Lieutenant Commander Michael Douglas suggests that NLW ROE must "always *first* protect U.S. forces, but should recognize the importance of maintaining the 'moral high-ground' by accommodating U.S. and international values [emphasis in the original]."[22] Unfortunately, this concept is backwards. The JFC currently enjoys the means to protect his forces almost completely. Our sensors can detect troops and equipment before they can see us, and our weapons easily outrange those of the enemy. But we do not use

22. Michael W. Douglas, "Rules of Engagement for Non-Lethal Weapons" (research paper, Newport, RI: U.S. Naval War College, Joint Military Operations Department, 1998), 10.

artillery, rockets, and bombs to destroy entire building complexes when we know enemy combatants occupy one room. Commanders place American values first and accept additional risk to our troops to use the most discriminate means available to engage the target. We minimize the risk through the use of well-developed tactics, techniques, and procedures, but that is still far riskier than could be. The same principle should apply for NLWs as well.

Weaken Legal and Treaty Constraints

International law and treaties lie in a realm far above the operational military commander. For those nations and groups who wish to pursue chemical and biological weapons, the slightest pretence will serve to justify their vile aims; often, no semblance of justification is needed. For example, Saddam Hussein used prohibited weapons repeatedly without the provocation of a U.S. NLW program. Al Qaeda-associated terrorists were attempting to use poison in the United Kingdom regardless of the mandates of international law. Bad actors will continue their bad acts with or without the U.S. NLW program. The idea of chemical or biological NLWs ushering in a new age of horrific lethal weapons does not hold much weight in light of recent history. In any event, the decision to pursue or develop particular NLW falls outside the scope of both the operational commander and this paper. While the JFC is not able to address the underlying source of this objection, ROE still can help preserve the legitimacy of chemical and biological NLWs, assuming they are developed and fielded.

As described above and in the attached Appendix, there are numerous types of chemical and biological NLWs. Those used as riot control agents, like traditional tear gas or oleoresin capsicum (OC) sprays, are clearly outlawed "as a method of warfare" by the CWC.

ROE for riot control agents must be in compliance with the CWC.

Many of the proposed chemical NLW technologies, however, fall into a much less well-defined arena. A chemical designed to foul internal combustion engines, for example, would

clearly not be classified as a riot control agent. If used on a battlefield, the propaganda that could be generated by the enemy is still nevertheless significant. Balancing the military utility of such agents against the possible public outcry should only be done by the JFC and above.

ROE for the use of certain chemical and biological NLWs should not be delegated to a Joint Task Force Commander but rather release authority must reside with the Combatant Commander or higher.

Restricting weapons utilization is common with ROE; this would be another case of a weapon, however non-lethal, whose use is dictated at the highest levels. This restraint may be needed only for some chemical agents, such as incapacitating agents, calmatives, and receptor agents, which have the highest probability of unintended effects on a larger group of people. Release authority for super adhesives or super lubricants, as anti-access measures, could likely be held lower in the command hierarchy. In all cases, the command and control architecture needs to be in place to allow utilization decisions to be quickly communicated to the JFC in order to exploit fleeting targets or prevent unnecessary military or civilian casualties.

Arms Race

As with the thought that NLWs may weaken laws or treaties, the impact on the global arms market is far beyond the operational commander's sphere of control. Similar to the above objection, individuals or groups intent on obtaining NLWs are free to do so whether or not the United States explores and fields the technology. In fact, there is already some evidence of electroshock devices being used outside law enforcement channels. Yet despite their proliferation, there is nothing to suggest we are on the verge of another arms race, because the natural escalation seen in an arms race has already occurred in the form of lethal weapons. A conventional army is able to counter NLW technology easily with cheap and readily available lethal arms, such as the ubiquitous AK-47. In addition to state actions to limit the transfer of

NLW technology, however, the operational-level commander is able to do his part to avoid an arms race by diminishing the possibility for proliferation.

A proliferator has many ways to obtain the desired technology including theft and sales from arms dealers. The military commander can help prevent this spread by maintaining close control of NLW arms depots and ensuring strict accountability for issued NLWs.

ROE should be crafted to allow for the full range of force to be used to defend and recover NLW technology.

The danger here is that over time U.S. Forces will view NLWs in the same category as other non-lethal supplies, such as fuel, and will therefore not secure and defend them as the weapons they are. ROE must enforce the idea that NLWs are still weapons. Such ROE should also be widely published in the operations area. Proper protection will reduce the opportunities for proliferation and reduce the chance that they will be used against U.S. Forces.

Potential for Misuse

As argued above, the United States cannot control the miscreants of the world; it can only attempt to influence them. The U.S. needs to take political, economic, and informational steps to keep bad actors from obtaining the means to spread fear and misery, which includes lethal weapons, weapons of mass destruction, and NLWs. Can the operational commander also address this concern? Yes, but only to the degree that it addresses the misuse by U.S. forces and those acting in conjunction with them.

Brian Rappert, a Post-Doctoral Fellow in the School of Sociology and Social Policy at the University of Nottinghom, uses the term "affordances" to describe the "perceived properties of an artifact that suggest how it might be used."[23] In his terms, some NLW afford very little

23. Brian Rappert, "Towards an Understanding of Non-Lethality," in *The Future of Non-Lethal Weapons*, ed. Nick Lewer (London: Frank Cass, 2002), 66.

visibility, that is, leave few tell-tale signs of use.[24] It is therefore important that such technologies be used only in so-called "open" or auditable situations.

ROE for "low visibility" NLWs should place restrictions on when and where they may be used to ensure international organizations can monitor and report on their use.

This will not only address the objection to NLW as means of torture, but will also protect U.S. forces by allowing a quick and credible counter to any claims of U.S. abuse. The ability of a respected third party to refute claims of abuse would be a valuable contribution the JFC's information operations campaign. Commanders may wish to go even further and prevent even the presence of NLWs in certain locations; for example, TASER-style electric weapons may be geographically separated from enemy prisoner of war or detainee camps as policy, even if conventional lethal weapons are stored or carried nearby.

Rappert goes on to discuss the interplay of affordances and how that interaction may result in unacceptable conditions of use.[25] A simple example would be the use of excessive amounts of tear gas, indoors, against a crowd that includes infants. In this example, the preceding ROE would prohibit the misuse of tear gas by strictly limiting where it may be used, namely, only outdoors. Further ROE are needed to address the issue raised in the tear gas example of who may be the legitimate targets of NLWs.

ROE should limit the use of NLW to predetermined targets—as defined by their physiological state.

The young, the old, and those hor's de combat should not be targeted with NLWs. Not only would such ROE address concerns about potential abuse, but would also speak to the concerns about variable effects raised in the first objection—targeting discrimination—above. Unfortunately, there have been examples of young children taking part in hostilities. The

24. Ibid., 69.
25. Ibid., 70.

preceding ROE should not be interpreted as limiting options against valid targets. Here too the JFC must ensure a rigorous training program equips the force with the ability to appropriately apply NLWs.

Lower Restraint on Use of Force

Even without NLWs, the military has the ability to present a continuum of responses, to include non-lethal actions. Sailing a carrier strike group through contested waters in a freedom of navigation operation is one example. The inherent right of self-defense with lethal means when threatened with serious bodily injury or death, as we saw earlier, is not diminished by the availability of NLWs. Senior decision-makers must know that the presence of military personnel will always have with it the possibility of enemy and friendly casualties. The JFC needs to communicate clearly up the chain of command the fact that forces will not be deployed without the ability to defend themselves effectively from all foreseeable threats.

ROE for NLW must emphasize that engagement with lethal means is authorized when facing lethal threats.

This is not to say that lethal attacks will always merit a lethal reply, only that we must never restrict our forces into an unsafe reliance on NLWs. ROE must allow the on-scene leadership the discretion to use the full continuum of force. Until NLW technology provides a true rheostat between non-lethal and lethal, the operational solution is to deploy NLW with lethal weapons. This is not a new idea. In 1995, the U. S. Marine Corps produced a list of do's and don'ts for NLWs that included the idea that units using NLWs should be covered with lethal weapons as a back-up.[26] What I am suggesting is that the original motivation, protecting U.S. forces, also serves the purpose of maintaining at an appropriate level the national reluctance to deploy U.S. military forces overseas.

26. Lewer and Schofield, 71.

Conclusion

NLWs will increasingly be part of the JFC's planning considerations. They hold great promise for reducing the pain and grief caused by the unnecessary deaths that have been a feature of warfare throughout history. Before that can happen, much work still remains. The technologies as well as the concepts of employment need to mature. Policymakers, commanders, and staff judge advocates need to determine how NLWs will fit into the law of armed conflict and international treaties. The many humanitarian and moral questions surrounding their development, use, and possible misuse must be addressed.

There are many possible ways to address these issues. The JFC can use ROE as one way. Regardless of what happens in the realm of policy and legal constraints, ROE will have to be developed to guide soldiers' actions during all future conflicts. This is true whether or not NLWs are deployed.

In some cases, ROE are unable to address fully the core complaints raised against NLWs; policymakers, lawyers, researchers, and program managers all have their roles to play. The operational commander would be remiss, however, if he did not craft ROE which gives clear guidance on how soldiers, sailors, marines and airmen are to balance military necessity and humanity, effectiveness and discrimination. Yet none of this is new. These very considerations form the basis for today's ROE. NLWs, like any new weapon, will be integrated into the soldier's repertoire of skills. Likewise, planning for the legal and morally acceptable use of NLWs will become routine. Well considered and articulated ROE will not only benefit those using NLWs, but will help address the legitimate concerns raised and help preserve their legitimate place on the battlefield, and also the legitimacy of the United States.

Appendix: Current NLW status[27]

Category	Examples	Status
Kinetic	Rubber Bullets	Efforts underway to make rounds more accurate and reduce probability of serious injury or death.
	Bean-Bag Rounds, Night Sticks, and Water Cannons	In use globally.
Chemical Agents	Pepper Sprays	Readily available. Some include markers to facilitate later identification
	Calmatives/Sedatives	Used by Russian forces with numerous casualties. Research focused on more uniform effects.
	Receptor agents (other)	Little practical research. Concept was to induce disabling panic, apathy, or sexual desire.
	Foam Barriers	Not deployed due to fears of accidental suffocation.
	Lubricants/Adhesives	Focused on means of application and removal.
	Corrosives	Concern over collateral damage and inability to remotely access effectiveness.
	Combustion inhibitors	As with corrosives.
Electric Weapons	TASER-style weapons	Short range devices readily available. Research focused on improving range and penetration of layers of clothing.
	Electric rounds	Bullets which transfer stored electric current. In development by private firms.
	Electrified shields	Hand-held shields which shock upon contact. Deployed by police/internal security forces.
	Electrified fences	In common use, especially for fixed assets.
Directed Energy	Microwave	Superheats outer dermis. Requested for deployment in Iraq.
	Acoustic	In addition to normal bullhorns and loudspeakers, private firms demonstrated directional sound weapons. Concerns about permanent damage.

[27] See also the Bradford Non-Lethal Weapons Research Project Research Reports available at http://www.brad.ac.uk/acad/nlw/research_reports/

Category	Examples	Status
	Optical/Lasers	Blinding lasers outlawed by convention. Non-blinding lasers for targeting/range finding common. 'Dazzling' lasers for temporary blindness under development by private firms.
	Electro-Magnetic Pulse	Non-nuclear EMP could disable electronic devices. Concerns about collateral damage.
Mechanical	Vehicle entanglement	Used to stop cars and ships. In development.
	Projectile nets	To ensnare groups of belligerents. Concerns over range and accuracy.
	Anti-vehicle spikes	In use by police/internal security forces.
	Anti-personnel spikes/caltrops	Supplemented other barriers during Operation United Shield.[28]
Biological	Biodegrading agents	Largely theoretical. Micro-organisms to destroy certain materials, such as POL stores, rubber, or plastics. Almost certainly prohibited by the BWC.

28. F.M. Lorenz, "Non-Lethal Force: The Slippery Slope to War?" *Parameters* (Autumn 1996), 56.

SELECTED BIBLIOGRAPHY

Bedard, E. R. "Nonlethal Capabilities: Realizing the Opportunities." *Defense Horizons*, 9 (March 2002): 1-6.

Brown, James B. "Non-Lethal Weapons and Moral Preeminence in Peacekeeping Operations." https://www.jnlwp.com/Resources/Articles/LtColJamesBrown.htm (accessed 21 February 2007.

"Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction." 29 April 1997. http://www.cwc.gov/cwc_treaty_articles.html (accessed 19 March 2007).

Council on Foreign Relations. *Nonlethal Weapons and Capabilities*. New York: Council on Foreign Relations Press, 2004.

Dando, Malcolm. *A New Form of Warfare: The Rise of Non-Lethal Weapons.* London: Brassey's, 1996.

Fidler, David P. "The Meaning of Moscow: "Non-lethal" Weapons and International Law in the Early 21st Century." *International Review of the Red Cross* 87, No. 857 (September 2005): 525-552.

Grossman, Dave. *On Killing: The Psychological Cost of Learning to Kill in War and Society.* Boston: Little, Brown and Company, 1995.

Hamilton, Charles A. "Policy Implications of Non-Lethal Weapons." Research paper, Carlisle, PA: U.S. Army War College, 2002.

Koplow, David A. *Non-Lethal Weapons: The Law and Policy of Revolutionary Technologies for the Military and Law Enforcement.* New York: Cambridge University Press, 2006.

Lamb, Timothy J. "Emerging Nonlethal Weapons Technology and Strategic Policy Implications for 21st Century Warfare." Research paper, Carlisle, PA: U.S. Army War College, 1998.

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

Lewer, Nick, ed. *The Future of Non-Lethal Weapons.* London: Frank Cass, 2002.

Lorenz, F.M. "Non-Lethal Force: The Slippery Slope to War?" *Parameters* (Autumn 1996): 52-62.

Lovelace, Douglas C., Jr., and Steven Metz. *Nonlethality and American Land Power: Strategic Context and Operational Concepts.* Carlisle, PA: Strategic Studies Institute, 1998.

Okum, Lisa A. "A Case for the Use of Non-Lethal Weapons in the Range of Military Operations." Research paper, Newport, RI: U.S. Naval War College, Joint Military Operations Department, 2006.

Perry, Joseph M. "Joint Doctrine for Nonlethal Weapons." Research paper, Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1999.

Rappert, Brian. *Non-Lethal Weapons as Legitimizing Forces?* London: Frank Cass, 2003.

Rice, Charles R. "An Analysis of the Strategic Application of Non-Lethal Weapons to Provide Force Protection." Research paper, Carlisle, PA: U.S. Army War College, 2001.