

UNCLASSIFIED

NAVAL WAR COLLEGE
Newport, R.I.

**NON-LETHAL WEAPONS AND CONVENTIONAL WAR: FACING THE
COMMANDER'S ISSUES AND DILEMMAS (U)**

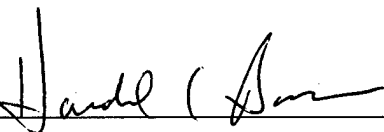
by

Harold C. Bass
Major, U.S. Marine Corps

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



13 February 1998

DISTRIBUTION STATEMENT A

Approved for public release
Distribution Unlimited

19980709 004

Faculty Advisor

Date

UNCLASSIFIED

DTIC QUALITY INSPECTED 1

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): Non-Lethal Weapons and Conventional War: Facing the Commander's Issues and Dilemmas (U)			
9. Personal Authors: Harold C. Bass, Major, USMC			
10. Type of Report: FINAL		11. Date of Report: 13 Feb 1998	
12. Page Count: 20			
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, Non-lethality, Weapons, Commander, War, Warfare, Conventional, Policy, Doctrine, Technology			
15. Abstract: Although the usefulness of non-lethal weapons during Military Operations Other Than War and in enhancing lethal weapons' use is widely recognized, future political and public expectations may change current policies regarding the use of non-lethal force. This paper explores the potential issues and dilemmas that future commanders who possess a substantial non-lethal capability may face during conventional war.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

**NON-LETHAL WEAPONS AND CONVENTIONAL WAR: FACING THE
COMMANDER'S ISSUES AND DILEMMAS**

New and future non-lethal weapon technologies can provide policy makers and commanders with another means for achieving political and military objectives by bridging the gap between diplomatic failure and the use of lethal force. Therefore, many of the emerging technologies and employment concepts for non-lethal weapons focus on Military Operations Other Than War and on minimizing the lethality of existing lethal weapon systems. However, high public and political expectations of future non-lethal technologies may eventually call for the expanded use of non-lethal weapons to replace lethal force during conventional war.

The future commander who has a substantial non-lethal capability may be faced with a number of dilemmas during a conventional conflict. Political and public demands for reducing or replacing lethal force may cause non-lethal weapon policies to change or pressure the commander to use non-lethal force as a step before lethal force. Therefore, the political, operational employment, force structure and logistics issues associated with non-lethal weapons' use during conventional war must be identified early to help the "non-lethal" commander avoid these dilemmas. Looking forward to ensure that the necessary policy and doctrine for non-lethal "conventional" warfare reflects current and future capabilities and limitations is critical towards resolving many of these issues.

Introduction

New and future non-lethal weapon (NLW) technologies can offer policy makers and commanders greater flexibility when it becomes necessary to use force. These weapons can provide another means for achieving political and military objectives by bridging the gap between diplomatic failure and the lethal force option. Since many of the situations that seem most promising for the effective use of NLWs revolve around Military Operations Other Than War, most emerging policy and employment concepts center on these types of operations. Additionally, NLW “hybrid” systems (NLWs designed and employed to facilitate or enhance the effectiveness of lethal weapons) are the current focus of non-lethal technical development for both the defense industry and the Department of Defense.¹ However, as the U.S. develops and fields NLW technology, high public and political expectations concerning the potential of NLWs to minimize enemy and civilian casualties may call for their expanded use during a conventional war. As John Alexander, program manager for non-lethal defense at the Los Alamos National Laboratory, observed, “In most wartime scenarios we are going to win, so how you win becomes important.”² Low tolerances for friendly, civilian and enemy casualties, public expectation that the United States is going to win anyway, and the political desire to maintain the “moral high-ground” while waging war may pressure a commander to use NLWs either as a step before or as a replacement to lethal force.

Department of Defense Directive 3000.3 defines NLWs as “weapons that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the

¹ David Morehouse, Non-lethal Weapons: War Without Death (Westport: Praeger Publishers 1996), 4.

² “Government/Military” Aviation Week & Space Technology, 24 January 1994, 20.

environment.”³ This broad definition encompasses a wide variety of systems and techniques, from information warfare to precision-guided munitions. However, this paper will focus on some of the implications presented by emerging and future NLW capabilities that have the potential to replace lethal force during a conventional conflict. The intent is to investigate the issues and dilemmas that future commanders with a non-lethal capability may face during a conventional war. Identifying important NLW issues and exploring solutions before NLW technology overcomes current policy and employment concepts is a critical step towards easing the public and the military into the age of non-lethal warfare.

³ Department of Defense (ASD SO/LIC), Policy for Non-lethal Weapons, DODD 3000.3 (Washington: 1996), 1.

Issues and Dilemmas

1. Political

a. Expectation of "Bloodless War." Public and political expectations that military objectives may be attainable through fighting a "bloodless war" could put the commander in conflict between the appropriateness of NLW use and the politician's desire to use them. "Non-lethal weapons may create options that appear so attractive, politically or otherwise, that decision-makers will be tempted to use them in inappropriate circumstances and be led into a quagmire."⁴ In the commander's judgment, a conventional war may very well present a number of these inappropriate circumstances. If that proves to be the case, how will a commander resolve the differences between his judgment that NLWs are not the right force option for achieving his military objectives and the fact that he may be directed to use the non-lethal option anyway? The potential exists that non-lethal force options could put a commander at odds with policy makers over how and when U.S. forces should use NLWs. While it may be unrealistic to think that NLWs will allow adversaries to fight wars without casualties or collateral damage,⁵ that does not mean that future political leaders will not place unrealistic demands upon the commander who possesses non-lethal capabilities. Anyone who expects that adversaries can fight bloodless battles is doomed to disappointment.⁶

b. Existing Policy and Wartime Realities. Current DOD policy states that "neither the presence nor the potential effect of non-lethal weapons shall constitute an obligation for their

⁴ Non-lethal Technologies: Military Options and Implications. Report of an Independent Task Force sponsored by the Council on Foreign Relations (New York: 1995), 8.

⁵ Lexi R. Alexander and Julia L. Klare, "Non-lethal Weapons: New Tools for Peace," Issues in Science and Technology, Winter 1995-96, 71.

⁶ Non-lethal Technologies: Military Options and Implications, x.

employment” and that “in all cases, the United States retains the option for immediate use of lethal weapons, when appropriate, consistent with international law.”⁷ While this policy position is clear, will it remain so as new NLW technologies are fielded and become a viable alternative to lethal force during a conventional conflict? If a non-lethal force option is available to the commander and he decides not to use it, what sort of scrutiny and criticism will that decision bring? Would General Schwarzkopf have been the hero of the 1991 Gulf War if he could have employed non-lethal force to stop the Iraqi retreat on the “Highway of Death,” but decided against it? If a decision to use the non-lethal force option fails while causing American casualties, it is certain to bring the same level of scrutiny and criticism. Even if the policy remains unchanged as non-lethal technology matures, it may not reflect political reality once war begins. Politicians and the public may feel that commanders have a responsibility to use non-lethal force before lethal force:

Possessing a non-lethal capability may create the perception, especially among more liberal political figures, that U.S. forces have an obligation to use non-lethal force in every situation, even when it may be operationally unwise or impractical. Political pressure to use NLWs in other than ideal circumstances may eventually lead to American casualties and add to the argument against using NLW at all.⁸

While the decision of whether or not to use NLWs is currently in the hands of the commander, political realities may not allow it to remain that way during the next war. In either case, a commander’s actions could be subjected to a much harsher than usual examination from the

⁷ DODD 3000.3, 2.

⁸ Timothy J. Hannigan, and others, Mission Applications of Non-lethal Weapons: Report for OASD (SO/LIC) (Washington: 1996), 29.

public, media and politicians. “The American people want to be protected, but they want everyone else protected, too.”⁹

c. Perception of Non-lethality. Most non-lethal weapons possess the potential for lethality. Many may be designed to enhance the effectiveness of lethal weapons and have little to do with neutralizing or saving enemy personnel. Labeling these weapons as “non-lethal” raises expectations that war can be fought without causing fatalities, serious injury or collateral damage. This perception is false and could put the U.S. and the commander in an untenable political position if the non-lethal option fails to perform as expected. “Exaggerating the impact of non-lethal technologies could lead to future disappointments, particularly when adversary casualties are minimized while placing American soldiers at greater risk.”¹⁰

2. Operational Employment

a. Temporary Effects. Department of Defense policy states that intended NLW characteristics are that “they have relatively reversible effects on personnel or material” and “affect objects differently within their area of influence.”¹¹ If a commander decides to employ NLWs and the intended effects are temporary and reversible, how can he be sure that the soldiers and equipment neutralized by a non-lethal attack would not be used against friendly forces later in the conflict? While preserving a country’s infrastructure through NLW

⁹ Greg Schneider, Non-lethal Weapons: Considerations for Decision Makers. ACDIS Occasional Paper, (Champaign, IL: The Program in Arms Control, Disarmament, and International Security). 4.

¹⁰ John Barry and others, Non-lethal Military Means: New Leverage for a New Era. National Security Program Policy Analysis Paper 94-01 (Cambridge: Harvard University, 1994). 13.

¹¹ DODD 3000.3, 1.

employment is a major advantage of non-lethal attack, what of the enemy forces and equipment that are left behind, ready to fight another day?¹²

Any target that is neutralized by a non-lethal attack will require constant surveillance to ensure that it does not become a later threat. Neutralizing a large number of targets could easily overwhelm a commander's reconnaissance and surveillance capability. Further, the additional problem of having to risk friendly forces as they carry out repeated NLW attacks to keep the enemy neutralized may make many large-scale non-lethal force options unattractive or impractical.

The use of non-lethal means to neutralize enemy equipment and facilities carries with it the requirement for surveillance, to ensure that the subject equipment remains neutralized. Using non-lethal methods then will become more resource intensive, as reconnaissance assets will have to be allocated to watch targets and missions will have to be scheduled to repeat the non-lethal attacks to maintain the desired effect.¹³

Many NLW advocates have touted the U.S. Navy's successful use of Tomahawk cruise missiles filled with carbon filaments during the 1991 Gulf War to incapacitate a large portion of Iraq's electrical grid as an example of NLW effectiveness that limited damage to the country's electrical infrastructure. While these attacks were successful and proved the potential (although temporary) effectiveness of a non-lethal option, many of these advocates failed to point out that air strikes with conventional bombs were later used to reduce the electrical plants to rubble.¹⁴ Why should a commander expend the additional resources while unnecessarily risking forces to attack the same target twice when it could have been permanently neutralized or destroyed if lethal force had been used first? "A tank park hit with

¹²Schneider, 23.

¹³Martin Stanton, "Non-lethal Weapons: Can of Worms," U.S. Naval Institute Proceedings, November 1996, 60.

¹⁴John Barry and Tom Morganthau, "Soon, 'Phasers on Stun,'" Newsweek, 7 February 1994, 25.

non-lethal means has to be watched and reattacked. A tank park hit with 2,000 bombs is a scrap yard.”¹⁵

b. Battle Damage Assessment (BDA). Assessing the damage inflicted on enemy forces and determining the enemy’s readiness to carry on the fight is arguably one of the most difficult wartime tasks. With conventional munitions that are intended to destroy soldiers and equipment, determining accurate BDA is difficult at best. Inaccurate assessments or uncertainty in the effectiveness of a lethal attack often result in a target being engaged more than once to ensure that it is “dead.” “If BDA was hard [during the Gulf War] when two thousand bombs were being used, how will it be easier with non-lethal weapons?”¹⁶ An inability to accurately assess non-lethal effects could provide another means for the enemy to deceive friendly forces and significantly increase uncertainty during the fight. Although current DOD policy requires that NLWs “achieve an effect that is worth the difficulty of providing the intelligence support required for mission planning and damage assessment,”¹⁷ that support may prove to be inadequate to the task.

c. Operational Surprise. A commander’s decision to use non-lethal force before employing lethal weapons could result in the loss of operational surprise. If non-lethal attacks prove ineffective in neutralizing enemy forces or fail to achieve the commander’s objectives, further lethal attacks could be met by an enemy who is prepared for the lethal assault and increase the risk to friendly forces. Further, “if it becomes ‘expected’ that the U.S., for moral or political reasons, will employ non-lethal means as the weapons of first resort, it may be at

¹⁵Stanton, 60.

¹⁶Schneider, 23.

¹⁷DODD 3000.3, 3.

the expense of operational surprise in the subsequent use of force.”¹⁸ Any use of NLWs before lethal force, especially if it becomes U.S. policy, could cost a commander operational surprise.

d. Countermeasures. Although there are countermeasures for many existing lethal weapons systems, NLWs appear to be especially vulnerable. “The countermeasures for thwarting virtually all non-lethal options are usually apparent, quickly learned, and readily available.”¹⁹ While surprise may ensure that the initial use of a NLW system is successful, a vulnerability to countermeasures can diminish non-lethal effectiveness in subsequent attacks. This characteristic may force a commander to resort to lethal means to maintain the same level of effectiveness that initial non-lethal attacks provided. Why should the commander exercise a non-lethal option in the first place if it can be easily defeated and require subsequent lethal attacks? Even though current DOD policy for NLW acquisition states that NLWs should “not be easily defeated by enemy countermeasures once known; or if they could, the benefits of a single opportunity to use the weapon in a given context would be so great as to outweigh that disadvantage,”²⁰ the full vulnerabilities of many NLW systems may not be revealed until commanders use them on the battlefield.

e. Lethal Response. Exercising a non-lethal force option may be interpreted by an adversary as a lethal act and prompt a lethal response. “An aircraft coming to drop slime bombs looks the same as an aircraft coming to drop conventional bombs.”²¹ Since an

¹⁸John Barry and others, Non-lethal Military Means: New Leverage for a New Era, 14.

¹⁹Charles Heal, “Non-lethal Technology and the Way We Think of ‘Force,’” Marine Corps Gazette, January 1997, 28.

²⁰DODD 3000.3, 3.

²¹Martin, 60.

adversary will not generally be able to distinguish between a lethal or non-lethal attack, a non-lethal attack could quickly evolve into a unintended lethal conflict.

f. Force Protection. Current NLW employment concepts do not envision the use of NLWs without adequate lethal means to protect friendly forces. "Troops equipped with non-lethal weapons should always have clearly adequate lethal weapons available, together with authorization to use them as necessary."²² However, a decision to deploy and use NLWs could come at the expense of lethal combat power. A unit or weapons system that specializes in NLWs may require logistics, maintenance and force structure that could be used to increase conventional lethal capabilities. If friendly forces are facing an adversary that possesses a significant lethal threat, diluting a commander's combat power for a non-lethal capability could increase the risk to his forces.

g. Rules of Engagement (ROE). Joint Publication 1-02 defines ROE as "Rules which delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered."²³ The addition of NLWs to a conventional conflict would certainly raise some ROE issues that may create confusion in the lower levels of command. Would commanders at all levels be sure about which situations justify the use of lethal force, especially considering that the original intent was to conduct a non-lethal attack? Hesitation to employ lethal weapons at any level during a conventional conflict could be fatal and defeat the original purpose of employing NLWs.

h. Risk and Uncertainty. Many non-lethal force options could inherently increase the risk to friendly forces. Ranging from uncertain assessments of a non-lethal attack to delivery

²² Non-lethal Technologies: Military Options and Implications, x.

²³ Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms (Joint Pub 1-02) (Washington, D.C.: U.S. Government Printing Office, 1 December 1989), 317.

systems that expose friendly troops to lethal fire, a commander who uses NLWs may have to accept additional operational risk. Some NLWs may increase risk to individuals, others to the force as a whole.

Various non-lethal weapons concepts makes clear that serious uncertainties are likely to arise from their use, principally the BDA issue and the fact that many threats will live to fight another day. Uncertainties increase risk. Risk is a natural, unavoidable part of conflict, but decreasing risk, not increasing it, is the desirable direction to proceed....²⁴

Commanders must take risk in war. However, they assess and carefully weigh the risks against the potential costs of conducting any military action. Since non-lethal force options may require the commander to accept higher levels of uncertainty, why should he increase the risk to his forces to save enemy soldiers and their equipment?

3. Training and Logistics

a. Force Structure and Training. The fielding and use of future non-lethal technologies may involve a combination of both existing conventional weapons platforms and specially designed NLW delivery systems. "Scenarios that envisage a mix of lethal and non-lethal weapons could overload ground troops unless separate NLW units are formed."²⁵ Will commanders have to form or employ separate NLW units using existing force structure? Considering current (and future) budgetary and manpower limitations, commanders may have to sacrifice some traditional war fighting capability to support NLW units. If non-lethal weapons systems are assigned to conventional units, will proficiency in these systems come at the expense of lethal training?

²⁴Schneider, 28.

²⁵Congressional Research Service, Non-lethal Weapons and Operations: Potential Applications and Practical Limitations, CRS Report for Congress (Washington: 1995), 5.

b. Logistics. Once NLW units are formed or equipped, the commander will have to prioritize the phasing of non-lethal forces into theater. Further, the nature of many NLW systems and technologies under development may require a disproportionately large logistical support structure if they are to be employed on a large scale. If the intent is to employ NLWs as the first force option, a commander may have to sacrifice some initial lethal capability by diluting conventional combat power with NLW units and supporting logistics. Although current policy does not require a commander to employ non-lethal force as a step towards lethal force, that policy could change as non-lethal technologies develop. During a conventional conflict, will the logistics required to deploy, operate and maintain NLWs so that they will have a significant operational impact be worth the logistical support lost for lethal weapons and munitions?

Conclusions and Recommendations

Not all of the potential issues and dilemmas have easy solutions. Policy makers and commanders may not resolve many of these issues until non-lethal technology matures and its effectiveness proven. Other issues may have no answers. However, there are some steps that policy makers and commanders can take now and in the future to address some of these issues and potential dilemmas:

a. Political. A substantial non-lethal capability will cause commanders to confront a number of difficult political and moral issues during the next war. **As the U.S. develops non-lethal technology, military leaders and technical experts must thoroughly educate political leaders, the media and the public concerning realistic NLW capabilities and limitations.** While many idealistic advocates may never be convinced why U.S. forces cannot use NLWs in place of lethal force in most circumstances, many widespread unrealistic expectations could be avoided and the public better prepared for the aftermath of non-lethal use. This, in turn, would put the commander in a much better position to defend his decisions on which force options he exercised during the conflict.

The attractiveness of the non-lethal option may prompt future policy makers to direct the use of non-lethal force in inappropriate circumstances. **A commander should never be bound by a policy that requires the use of NLWs as a step before lethal force.** The decision on when, where and how to exercise the non-lethal force option must remain with the commander. Non-lethal weapons are another tool that a commander can use to influence the battle to achieve his objectives. Directing NLW use in inappropriate circumstances could lead to disaster.

b. Temporary Effects. The temporary and reversible characteristics of NLWs introduces additional uncertainty and increases risk to a commander's forces. These characteristics make NLWs best suited for augmenting, not replacing, conventional combat power. **Planning NLW employment to facilitate neutralizing enemy forces until captured or eliminated will reduce the need for continuous surveillance, reduce risk and lessen uncertainty.** Further, precision-guided lethal munitions have proven their ability to minimize casualties and limit collateral damage. This fact makes their use generally more acceptable to the public than less discriminate weapons and may partially satisfy the intent behind using NLWs. **Using precision-guided lethal munitions on many potential NLW targets may provide a better "long term" option during a prolonged conflict while reducing the number of attacks necessary to keep a target neutralized.**

c. Battle Damage Assessment. Non-lethal weapons will only be as effective as a commander's ability to measure their effects and maintain surveillance on the neutralized target or facility. If the capability to access the effectiveness of a non-lethal attack is not available to the commander, then exercising a non-lethal force option could increase, rather than decrease, the risk to friendly forces and significantly contribute to battlefield uncertainty. **The U.S. should develop the technology and means to conduct non-lethal attack assessment concurrently with NLWs.** Further, when planning NLW employment, commanders will have to account for the increased surveillance and reconnaissance requirements by deploying additional intelligence assets and dedicating them to the non-lethal fires planning and attack process. **Integrating and executing non-lethal fire-planning, attack and assessment through a dedicated non-lethal fires employment cell may help to reduce this problem.**

d. Operational Surprise. If a non-lethal attack fails to reduce the enemy's capability to resist, NLWs could negate the advantage that surprise conveys to friendly forces and raise operational risk. However, the surprise lost may be worth the effects achieved by the non-lethal attack. If a further lethal attack is required, the adversary's ability to defend and respond would probably be reduced by the effects of previous non-lethal attacks on command and control facilities, lines of communication, etc. Therefore, using NLWs to increase the effectiveness of lethal weapons would justify any loss of surprise. Further, an adversary must not be assured that the U.S. will use NLWs as a mandatory step before lethal force.

Retaining a policy of keeping the use of lethal force available as a first option, regardless of non-lethal capabilities, will reduce an enemy's ability to predict a commander's actions on the battlefield.

e. Lethal Response. An inability to distinguish between lethal and non-lethal attacks would likely result in a adversary's lethal response. **If the commander intends to exercise a non-lethal force option and wants to avoid an adversary's lethal response, he might consider making his intentions concerning NLW usage known to the enemy.** While this could result in the enemy preparing for the non-lethal attack or sacrifice surprise, the potential for avoiding a lethal encounter may be worth the risk. Additionally, a commander must be prepared to use lethal force when employing NLWs. **Non-lethal attacks should not be planned and executed unless the commander is authorized and prepared to proportionally respond with lethal force to an adversary's use of lethal force.**

g. Rules of Engagement. The potential exists that units performing non-lethal missions could hesitate to employ lethal force if ambiguities exist in the ROE. Units performing non-lethal missions must not be timid about using lethal force if the situation

requires it. **During planning, the commander must specifically and thoroughly outline ROE for both lethal and non-lethal use while ensuring it is not too restrictive or complicated. He must also make sure that commanders at all levels performing non-lethal missions clearly understand the ROE for lethal force.**

h. Risk. The concept of neutralizing an adversary who may only be able to respond with lethal force could put U.S. forces at risk to save enemy soldiers and their equipment. Further, uncertainties generated by inadequate non-lethal damage assessment, dilution of combat power to employ NLWs, and the temporary nature of their effects could all contribute to increased operational risk. Weighing the risk of using the non-lethal force option can only rest with the judgment of the commander. **Since allowing the commander flexibility in determining which force option to use to achieve his objectives is the best way to mitigate risk, policy makers and politicians must keep the decision to use NLWs in the commander's hands.**

i. Force Structure. While some NLWs will be fielded with existing conventional forces, many others may require the formation of special NLW units. Given current and future manpower and budgetary limitations, pressure to form these units using existing force structure may increase as NLW technology develops. Conventional combat capability should not be replaced by NLWs. **As NLWs are developed and fielded, force structure should be added to account for these new weapons systems.** If a commander intends to use NLWs, non-lethal units and employment systems should be specifically trained and equipped for that mission, but not at the expense of the conventional force.

j. Logistics. The logistics required to deploy, operate and maintain NLWs so that they will have a significant operational impact during a conventional conflict is likely to be

large in proportion to their capabilities. While planning for NLW employment, commanders should not dilute their lethal combat power unless the potential non-lethal capability greatly outweighs the risk. **When phasing forces into theater, building conventional lethal capability should remain the commander's priority if future NLWs systems require the anticipated large logistics support unless those systems enhance conventional lethal combat power.** Once sufficient lethal force is deployed, non-lethal systems and units would follow.

Summary

In the past, new weapons systems and technologies have significantly preceded the development of the doctrine and employment concepts important for their effective use in war. "Military history teaches that the time elapsing between the introduction of a weapon and its satisfactory incorporation in doctrine is typically 20 years."²⁶ As non-lethal technology continues to develop, current U.S. policy towards non-lethal weapons could be overcome by new capabilities, unrealistic expectations and the political attractiveness of non-lethal force options. Looking forward to ensure that the necessary policy, employment concepts and doctrine for non-lethal conventional warfare appropriately reflect current and future non-lethal capabilities and limitations will be critical towards resolving many potential problems before they arise. While NLWs can play an important role during a conventional conflict, insufficient or outdated policy and doctrine regarding their use may compound a commander's dilemma.

²⁶Non-lethal Technologies: Military Options and Implications, 15.

Bibliography

- Alexander, Lexi R. and Julia L. Klare. "Non-lethal Weapons: New Tools for Peace," Issues in Science and Technology, Winter 1995-96, 67-74.
- Barry, John and Tom Morganthau. "Soon, 'Phasers on Stun.'" Newsweek, 7 February 1994, 24-26.
- _____, Michael W. Everett and Allen G. Peck. Non-lethal Military Means: New Leverage for a New Era. National Security Program Policy Analysis Paper, 94-01. Cambridge: John F. Kennedy School of Government, Harvard University, January 1994.
- Congressional Research Service. Non-lethal Weapons and Operations: Potential Applications and Practical Limitations. CRS Report for Congress. Washington: September 1995.
- Department of Defense. Policy for Non-lethal Weapons, DOD Directive 3000.3, July 9, 1996.
- "Government/Military." Aviation Week & Space Technology, 24 January 1994, 19-20.
- Hannigan, Timothy J., Lori Raff, Rod Paschall and others. Mission Applications of Non-lethal Weapons. Report for Office of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict (Policy Planning). McLean, Virginia: August 1996.
- Heal, Charles. "Non-lethal Technology and the Way We Think of 'Force.'" Marine Corps Gazette, January 1997, 26-28.
- Morehouse, David. Non-lethal Weapons: War Without Death. Westport: Praeger Publishers, 1996.
- Non-lethal Technologies: Military Options and Implications. Report of an Independent Task Force, sponsored by the Council on Foreign Relations, Inc. New York: 1995.
- Schneider, Greg R. Non-lethal Weapons: Considerations for Decision Makers. ACDIS Occasional Paper. Champaign, Illinois: The Program in Arms Control, Disarmament, and International Security, University of Illinois at Urbana-Champaign, January 1997.
- Stanton, Martin. "Non-lethal Weapons: Can of Worms." U.S. Naval Institute Proceedings, November 1996, 58-60.
- U.S. Joint Chiefs of Staff. Department of Defense Dictionary of Military and Associated Terms (Joint Pub 1-03) Washington, D.C.: December 1, 1989.