



Nonlethal Weapons

A Technological Gap or Misdefined Requirements?

By Ofer Fridman

The internal and international conflicts that have taken place in the last few decades have significantly raised the issue of interacting with civilian populations, a problem that has been worsened by urbanization. In the last few decades of the 20th century, a universal respect for human life became

a crucial variable within the international community in general and Western societies in particular.¹ In this new political reality, the military seeks new technologies that have “greater precision, shorter duration, less lethality, and reduced collateral damage . . . [as these technologies] may provide more effective power than their larger and more destructive, but also more inexact and crude, predecessors.”² Nonlethal weapons (NLW) would seem to be the perfect answer for

this military quest; however, observers point out that, to date, “few non-lethal weapons incorporating new technologies have actually been deployed on a large scale”³ and that “operational use of available non-lethal weapons by the military has been limited.”⁴ Despite the reasonable demand for the employment of less lethal military technologies on the battlefield, then, it seems that such technologies are still far from becoming a reality.

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German soldiers form crash line at riot control training on Joint Multinational Readiness Center in Hohenfels, Germany, October 2014 (U.S. Army/Lloyd Villanueva)

In 2009, the U.S. Government Accountability Office (GAO) reported that “the joint non-lethal weapons program has conducted more than 50 research and development efforts and spent at least \$386 million since 1997, but it has not developed any new weapon.”⁵ There are three possible explanations for this detrimental situation: ineffective management of the provided resources, significant technological gaps that cannot be filled within the framework of the existing funding, or an incorrect translation of the desired capabilities into the technological requirements that define these gaps. In other words, the current situation with NLW has been caused by one of the following: ineffective management by the Department of Defense (DOD), insufficient resources, unbridgeable technological gaps, or the misdefinition of these gaps. While the GAO report points at DOD’s ineffective management as the main reason for the inability to field

operationally useful NLW, this article argues that the main problem can be found in misdefined requirements for nonlethal weapons that, in their turn, lead to incorrect characterization of technological gaps.

NLW in the U.S. Military

In the early 1990s, the American military was caught up in the theory of a revolution in military affairs, which consisted of the implementation of new military technologies combined with fundamental shifts in military doctrine and organization. Speculations about new military technologies that have revolutionary potential did not overlook NLW; for example, a prominent think tank held that “if U.S. forces were able . . . to incapacitate or render ineffective enemy forces without destroying or killing them, the U.S. conduct of war would be revolutionized.”⁶

DOD started to pay more coherent attention to nonlethal weapons in 1995

during Operation *United Shield*, the effort where U.S. forces supported the withdrawal of United Nations peacekeepers from Somalia. The process of the institutionalization of NLW in DOD was led by a Non-Lethal Weapons Steering Committee established in 1994 and was promoted by groups such as the Council on Foreign Relations. The process was finalized in 1996 with the establishment of the Joint Non-Lethal Weapons Program (JNLWP). In July 1996, DOD Directive 3000.3, “Policy for Non-Lethal Weapons,” defined *nonlethal weapons* as “[w]eapons 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 environment.”⁷

Since 1996, the JNLWP has had five defined missions: identifying and understanding current and projected operational requirements and capability



Mongolian police officer operates X26 taser during nonlethal weapons training at Five Hills Training Area, Mongolia, August 2013 (U.S. Marine Corps/Ben Eberle)

gaps; identifying and developing technologies into operationally suitable and effective less lethal solutions that are cost-effective; facilitating the acquisition and fielding of less lethal capabilities; advancing awareness of policy and public understanding through strategic communication and support for education and training; and efficiently managing resources and support.⁸ However, despite 18 years of activity and millions of dollars spent, most of the NLW that have been adopted by the military are commercial off-the-shelf systems produced for the law enforcement market (for example, Taser X26, Long-Range Acoustic Device, and FN 303 riot gun) rather than a product of JNLWP research and development.⁹ Moreover, the flagship of the JNLWP's activity and investment, the Active Denial System, has never been used.¹⁰

Today it seems that the promised revolutionary change offered by NLW is still far out. This raises the obvious question

of whether these systems are necessary on the current and future battlefield because only the existence of such a necessity could justify efforts to improve the current detrimental situation with NLW.

Does the U.S. Military Need NLW?

An understanding of the necessary military capabilities requires a comprehensive analysis of current and future threats, possible adversaries, broad political and military environments, and many other noteworthy factors. In an attempt to answer the question of the relevance of NLW on the modern battlefield, this article analyzes three primary official documents that consider all required aspects and define current and future military environments: the Joint Chiefs of Staff's *Capstone Concept for Joint Operations: Joint Force 2020* (CCJO); DOD Defense Science Board's *Challenges to Military Operations in Support*

of U.S. Interests (CMOSUSI); and U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66, *Force Operating Capabilities* (FOC).

The purpose of CCJO is to provide general guidelines for future force development and describe the future operating environment. Its main concept, *globally integrated operations*, defines how the joint force should prepare itself for the future security environment. Describing one of the key elements of this concept, the CCJO states:

Future Joint Operations will be increasingly discriminate to minimize unintended consequences. The increased transparency of the future security environment . . . heightens the need for force to be used precisely when possible. . . . In the saturated information environment of tomorrow, even minor lapses in conduct or application of fires could seriously damage the international reputation of the United

*States. This reality places a premium on joint operations informed by values and professionalism.*¹¹

In other words, while the CCJO calls for increasing competence of the future joint force, it also states that undesired collateral damage would compromise U.S. activity and therefore has to be minimized. In addition to this statement in the CCJO, the Defense Science Board's report, which focuses on challenges that the United States has to be prepared for, clearly argues that "with respect to the human toll on innocent civilians, the U.S. strategy is to reduce 'collateral damage.'"¹²

Unlike the CCJO and CMOSUSI, TRADOC's FOC is a more specific document that formulates force operation capabilities desired for the U.S. Army in the short and long term. It analyzes the future security environment and describes specific military capabilities and requirements for future forces. Describing the complex nature of future conflicts, the FOC states:

*While the nature of war will remain a violent clash of wills between states or armed groups pursuing advantageous political ends, the conduct of future warfare will include combinations of conventional and unconventional, lethal and nonlethal, and military and nonmilitary actions and operations, all of which add to the increasing complexity of the future security environment.*¹³

In the section that describes the desired maneuver support, the FOC continues:

The major combat operation focus, coupled with the increasing likelihood of smaller-scale contingencies, clearly establishes the need for a full spectrum force. This force must be able to: execute [the] full spectrum of forces; minimize noncombatant fatalities, permanent injury, and undesired damage to property and environment; maintain force protection, reinforcing deterrence; and expand the range of options available to joint force commanders. All of these imperatives demonstrate a clear need

*for nonlethal weapons, even in conjunction with lethal weapons, to achieve a decisive outcome.*¹⁴

The FOC describes the future security environment as an increasingly complex one that will include a vast spectrum of operations, but it clearly states that nonlethal actions will unquestionably be a part of future conflict. Moreover, it defines the ability to *minimize noncombatant fatalities and undesired damage* as an option that has to be available to joint force commanders.

Thus, all three documents emphasize the need to minimize collateral damage and harm to innocents during future military confrontations. The first two formulate this general requirement and point toward the possible solution that is inherent in higher professionalism, better intelligence, better targeting, and precision weapons; the FOC translates this general requirement into feasible capabilities that should be provided by NLW. According to the FOC, nonlethal weapons should enhance the capability of the joint force in accomplishing the following objectives:

*(a) Discourage, delay, or prevent hostile actions; (b) Limit escalation; (c) Take military action in situations where the use of lethal force is either not the preferred option, or is not permitted under the established Rules of Engagement (ROE); (d) Better protect our forces; (e) Disable equipment, facilities, and enemy personnel; (f) Engage and control people through civil affairs operations and Psychological Operations (PSYOP); (g) Dislodge enemy from positions without causing extensive collateral damage; (h) Separate combatants from noncombatants; (i) Deny terrain to the enemy.*¹⁵

The analysis of these three fundamental documents clearly demonstrates that minimizing collateral damage and noncombatant fatalities is a military capability required by the reality of present and future conflicts, and NLW can be a practical tool in achieving this capability. There is no doubt that the U.S. military has to develop this capability to be prepared for

future operations, and consequently, there is an obvious necessity to field operationally useful NLW. While there are many different possible reasons that can explain the current lack of such NLW (for example, the GAO report mentioned above), the following examination suggests that the main cause is a failure to translate the demand described above into appropriate NLW policies and requirements.

Current Policies and Requirements

DOD Directive 3000.3E lists 10 different capabilities that NLW can provide to joint forces. According to the directive, NLW have the potential to enhance the commander's ability to:

*(1) Deter, discourage, delay, or prevent hostile and threatening actions; (2) Deny access to and move, disable, and suppress individuals; (3) Stop, disable, divert, and deny access to vehicles and vessels; (4) Adapt and tailor escalation of force options to the operational environment; (5) Employ capabilities that temporarily incapacitate personnel and materiel while minimizing the likelihood of casualties and damage to critical infrastructure; (6) De-escalate situations to preclude lethal force; (7) Precisely engage targets; (8) Enhance the effectiveness and efficiency of lethal weapons; (9) Capture or incapacitate high value targets; (10) Protect the force.*¹⁶

While these capabilities emphasize the nature of NLW, they insufficiently suit the general demand described in the CCJO and CMOSUSI documents—minimizing noncombatant fatalities on the battlefield. Furthermore, this list does not correspond with the required capabilities as defined by the FOC. For example, translating the complexity of the future battlefield and undesired consequences of collateral damage, the FOC accurately argues that nonlethal weapons have to be able to "dislodge [the] enemy from positions without causing extensive collateral damage" and "separate combatants from noncombatants." Unfortunately, these significant characteristics are not in the DOD directive, which in essence defines



U.S. Navy unmanned surface vessel is equipped with cameras, computer systems, and nonlethal weapons during Trident Warrior (U.S. Navy/Betsy Knapper)

policy and, therefore, the aims of the future development of NLW.

The Non-Lethal Weapons Requirement Fact Sheet (NLWRFS) is an official document published by the JNLWP that generalizes two initial capabilities documents and identifies requirements for nonlethal effects. The JNLWP is interested in investment in and promotion of new NLW that can support the tasks listed in the fact sheet. For example, the NLWRFS defines the following four counterpersonnel required tasks for NLW: “(1) Deny access into/out of an area to individuals (open/confined) (single/few/many); (2) Disable individuals (open/confined) (single/few/many); (3) Move individuals through an area (open/confined) (single/few/many); (4) Suppress individuals (open/confined) (single/few/many).”¹⁷

Like DOD Directive 3000.3E, this list again does not correspond with the desired capabilities defined by the FOC, and, therefore, barely addresses the future threats on the battlefield discussed in the CCJO and CMOSUSI.

Furthermore, on the one hand, the NLWRFS states that it addresses “specific non-lethal capability requirements for U.S. forces operating in complex environments.”¹⁸ On the other hand, it barely corresponds with the desired NLW capabilities and requirements as defined by FOC:

*The future Modular Force, specifically, must be provided with organic nonlethal capabilities to disrupt, dislocate, disorganize, disintegrate, fix, isolate, suppress, and destroy enemy functions. Joint force commanders (JFCs), furthermore, must be provided with multifunctional/multirole lethality options in integrated multipurpose system configurations. . . . The future Modular Force Soldier must have the ability to employ a wide array of lethal and nonlethal munitions based upon mission need and force protection.*¹⁹

The fact sheet neither refers to the whole spectrum of desired capabilities defined by FOC nor addresses one of the most important requirements—namely,

that nonlethal weapons “must be provided with multifunctional/multirole lethality options in integrated multipurpose systems.”²⁰ The NLWRFS fails to define required NLW as weapons that have an adjustable level of lethality and are integrated in multipurpose weapons systems; in other words, it fails to require the need, as correctly defined by the FOC, for weapons systems that integrate nonlethal and lethal capabilities.

As shown, DOD Directive 3000.3E and the NLWRFS clearly misdefine the required NLW capabilities and mislead the development of future NLW, decreasing the chances of new nonlethal technologies emerging that answer the demands of the future complex security environment. Thus, the analysis indicates that these two authoritative documents pave the way for NLW in an *incorrect* way, allowing an adaptation of off-the-shelf law enforcement technologies. The joint force is not a law enforcement agency, although it sometimes fulfills similar missions; therefore, military oriented nonlethal weapons have to be more



Marines from 1st Law Enforcement Battalion conduct first ever live fire with Non-Lethal/Tube-Launched Mmunition System, Camp Pendleton, California, September 2014 (U.S. Marine Corps/John Baker)

versatile and more integrated. While there is no expectation that the U.S. warfighter in Afghanistan will replace the M16 rifle with the Taser X26, FN 303, or Oleoresin Capsicum Dispenser, these nonlethal capabilities have to be integrated with the warfighter's M16 or other lethal weapons systems. This argument, however, raises the question about the ability to bridge the technological gaps related to such integration.

A Technological Gap (or Lack of It)

The current policies regarding nonlethal weapons clearly mislead military industries in defining the required capabilities. To address the existing and

future threats created by the increasing complexity discussed by the CCJO and CMOSUSI, nonlethal weapons have to answer the capabilities emphasized by the FOC—versatility and integration with existing lethal weapons systems. On the one hand, the JNLWP, and therefore DOD, do not define these capabilities as a technological gap that has to be bridged. On the other hand, examples of such systems are already employed by the U.S. military or are under development. Moreover, certain systems developed by foreign manufacturers clearly demonstrate the ability to integrate nonlethality with and within lethal systems.

Regarding U.S. technologies, the best example is the M26 Modular Accessory

Shotgun System (MASS). It is an under-barrel shotgun attachment for the M16 that, while preserving the lethal capability of the main rifle, simultaneously provides a warfighter with an additional capability of 12-gauge nonlethal ammunition.²¹ Unfortunately, MASS has remained outside the JNLWP scope of interest. Other good examples of emerging systems are the XM25 and 81 millimeter (mm) Non-Lethal Indirect Fire Munitions (NLIFM). The first is a 25mm air burst grenade launcher with various lethality, from highly lethal to nonlethal depending on the type of ammunition.²² The second system expands the existing capabilities of the M252 81mm mortar into the field of nonlethality.²³ Unfortunately, again, these

two systems are not in the JNLWP's focus. (The NLIFM was reported in the JNLWP annual review, but it is not included in the lists of current, developing, or future NLW supervised by the JNLWP.²⁴)

Given the achievements of international industries in the field of integrated nonlethal capabilities, it is important to look at Russia and Israel. In the last few years, Russian industries successfully demonstrated a range of nonlethal munitions based on irritant agents—munitions for rocket-propelled grenade launchers, different caliber mortar shells, heliborne KMGV-type dispensers, and even 500 kilogram cluster air bombs.²⁵ Alternatively, in Israel, the Israeli Military Industries propose the 120mm stun cartridge for tanks,²⁶ and a private company, L.H.B. Ltd., offers an attachment of an upgraded Russian-made compact kinetic less-lethal pistol PB-4-2, which can be attached as a foregrip to any lethal rifle.²⁷

While there is no confirmation that these nonlethal weapons have been adopted by the Russian or Israeli military, the mere fact of their existence clearly shows the technological ability to integrate lethal and nonlethal systems. Moreover, nonlethal capabilities of weapons, such as MASS, XM25, and NLIFM, demonstrate that American military industry understands the gap in the desired NLW capabilities of U.S. forces and—even without the direct lead of the JNLWP or DOD—is able to produce such capabilities.

Conclusion

In 2012, the previous director of the JNLWP, in addressing the problem of NLW, published an article titled “From Niche to Necessity” in this journal, which stated that “accepting nonlethal weapons as an integral element of the warfighter’s toolkit requires a cultural shift that is counterintuitive to the military, which understandably emphasizes the use of lethal force.”²⁸ This shift has to start with the Joint Non-Lethal Weapons Program itself and the way in which it defines the desired NLW. As discussed, there is a pressing need for integrated NLW that will provide warfighters with the capabilities to

minimize noncombatant casualties and collateral damage. To meet that necessity, DOD in general, and the JNLWP specifically, have to translate that need and incorporate it into their NLW policies and requirements.

Since World War II, the U.S. military has been the technological leader in military affairs, and the American military-industrial complex has been able to deal with all the technological challenges that confront it. Taking nonlethal weapons out of their niche and creating technologies that will answer the emerging necessity should not pose an enormous technological gap; it is a question of the right definition of the desired capabilities that will focus research and development efforts. JFQ

Notes

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⁴ *Ibid.*, 86.

⁵ U.S. Government Accountability Office (GAO), *DOD Needs to Improve Program Management, Policy, and Testing to Enhance Ability to Field Operationally Useful Non-Lethal Weapons: Report to Congressional Requesters* (Washington, DC: GAO, April 2009).

⁶ Michael J. Mazarr, *The Military Technical Revolution: A Structural Framework. Final Report of the CSIS Study Group on the MTR* (Washington, DC: Center for Strategic and International Studies, 1993), 43.

⁷ Department of Defense (DOD) Directive 3000.3, “Policy for Non-Lethal Weapons,” July 9, 1996.

⁸ The Joint Non-Lethal Weapons Program, “Purpose,” available at <<http://jnlwp.defense.gov/about/purpose.html>>.

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¹⁰ Tracy J. Tafolla, David J. Trachtenberg, and John A. Aho, “From Niche to Necessity: Integrating Non-Lethal Weapons into Essential Enabling Capabilities,” *Joint Force Quarterly* 66 (3rd Quarter 2012).

¹¹ *Capstone Concept for Joint Operations: Joint Force 2020* (Washington, DC: The Joint Staff, September 10, 2012), 7–8.

¹² Defense Science Board, *Challenges to Military Operations in Support of U.S. Interests*, Volume II, Main Report (Washington, DC: Department of Defense, December 2008), 9.

¹³ U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66, “Force Operating Capabilities,” March 7, 2008, 17.

¹⁴ *Ibid.*, 88–89.

¹⁵ *Ibid.*, 88.

¹⁶ DOD Directive 3000.3E, “Policy for Non-Lethal Weapons,” April 25, 2013.

¹⁷ The Joint Non-Lethal Weapons Program, “Non-Lethal Weapons Requirement Fact Sheet,” available at <<http://jnlwp.defense.gov/pdf/pressroom/NLW%20Requirements%20Fact%20Sheet%20Oct%202011.pdf>>.

¹⁸ *Ibid.*

¹⁹ TRADOC, 88.

²⁰ *Ibid.*

²¹ Dan Parsons, “Army, Marine Corps Succeed in Rapidly Fielding Specialized Individual Weapons (UPDATED),” *National Defense*, January 2013, available at <www.nationaldefensemagazine.org/archive/2013/January/Pages/Army,MarineCorpsSucceedinRapidlyFieldingSpecializedIndividualWeapons.aspx>.

²² *Project Manager Soldier Weapons Briefing for NDIA*, May 18, 2010, available at <www.dtic.mil/ndia/2010armament/TuesdayLandmarkBTamilio.pdf>.

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²⁶ Israel Military Industry, “120mm STUN, M337 Cartridge,” available at <www.imi-israel.com/home/doc.aspx?mCatID=67059>.

²⁷ L.H.B. Ltd., “Less-Lethal Multi-Purpose Pistol PB-4-2,” available at <www.lhbltd.com/advanced.php?id=1>.

²⁸ Tafolla, Trachtenberg, and Aho.