U.S. Marine Forces Africa (Lydia M. Davey)

Nonlethal grenade used during Non-Lethal Individual Weapons Instructors Course, U.S. Africa Command

From Niche to Necessity

INTEGRATING NONLETHAL WEAPONS INTO ESSENTIAL ENABLING CAPABILITIES

By TRACY J. TAFOLLA, DAVID J. TRACHTENBERG, *and* JOHN A. AHO

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The Department of Defense (DOD) conducts U.S. military operations in accordance with internationally recognized and accepted laws and principles governing the use of armed force. Those laws demand that the employment of force be judicious, proportionate to the threat, and tempered wherever possible by the deliberate avoidance of noncombatant casualties. The principle of civilian casualty avoidance is embedded in the Fourth Geneva Convention of 1949 and reflects an agreement among civilized nations that, while highly destructive, warfare should not be conducted indiscriminately. Indeed, a new DOD Law of War Manual is being drafted, reinforcing America's adherence to these standards of conduct.

U.S. restraint in the application of lethal force is not unusual. For example, during North Atlantic Treaty Organization (NATO) operations against Serbia in 1999, thousands of Serbs acting as "human shields" stood on bridges in Belgrade and Novi Sad to protect the structures from allied bombing attacks that would have killed civilians and been a public relations disaster.[1] The U.S. military has sought to exercise restraint in operations in both Iraq and Afghanistan.[2] More recently, U.S. forces supporting NATO air operations against Libya took extensive precautions to avoid civilian casualties.[3]

Contemporary military operations are unlike previous wars where success was measured in purely military terms. The importance of winning "hearts and minds" is now growing. Today's wars are mostly irregular conflicts fought not against countries but in complex environments against terrorists and extremists who wear no uniforms and operate within the civilian populace—often in a deliberate attempt to shield themselves from attack and maximize propaganda opportunities from civilian casualties.

Tomorrow's wars will likely see U.S. forces involved in a range of contingencies from traditional to irregular warfare operations. Former Secretary of Defense Robert Gates set DOD on course for a "rebalanced" military that is better postured to succeed in nontraditional operations while preparing for other types of contingencies. The recently released Strategic Defense Guidance notes that U.S. forces must be increasingly flexible and adaptable to deal with a dynamic security environment that "presents an increasingly complex set of challenges and opportunities."[4] In both asymmetric and conventional environments, avoiding noncombatant casualties has become increasingly important to the success of military operations. Nonlethal weapons can play a significant and strategic role in accomplishing this and helping to achieve mission success.

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What Are Nonlethal Weapons?

A current working definition of *nonlethal weapons* is "weapons, devices, and munitions that are explicitly designed and primarily employed to incapacitate targeted personnel or materiel immediately, while minimizing fatalities, permanent injury to personnel, and undesired damage to property in the target area or environment. [Nonlethal weapons] are intended to have reversible effects on personnel or materiel."[5] DOD policy recognizes that the use of nonlethal weapons may occasionally result in injurious or lethal effects, though that is not the intended outcome. Their use reflects an approach to warfare that seeks to reconcile the objective of defeating the enemy with the moral imperative of sparing innocent lives.

The current generation of nonlethal weapons includes counterpersonnel and countermateriel capabilities used for controlling crowds or stopping or diverting vehicles on land and vessels at sea. They provide escalation-of-force options that allow U.S. forces to determine intent of potentially hostile individuals and groups and modify behavior.

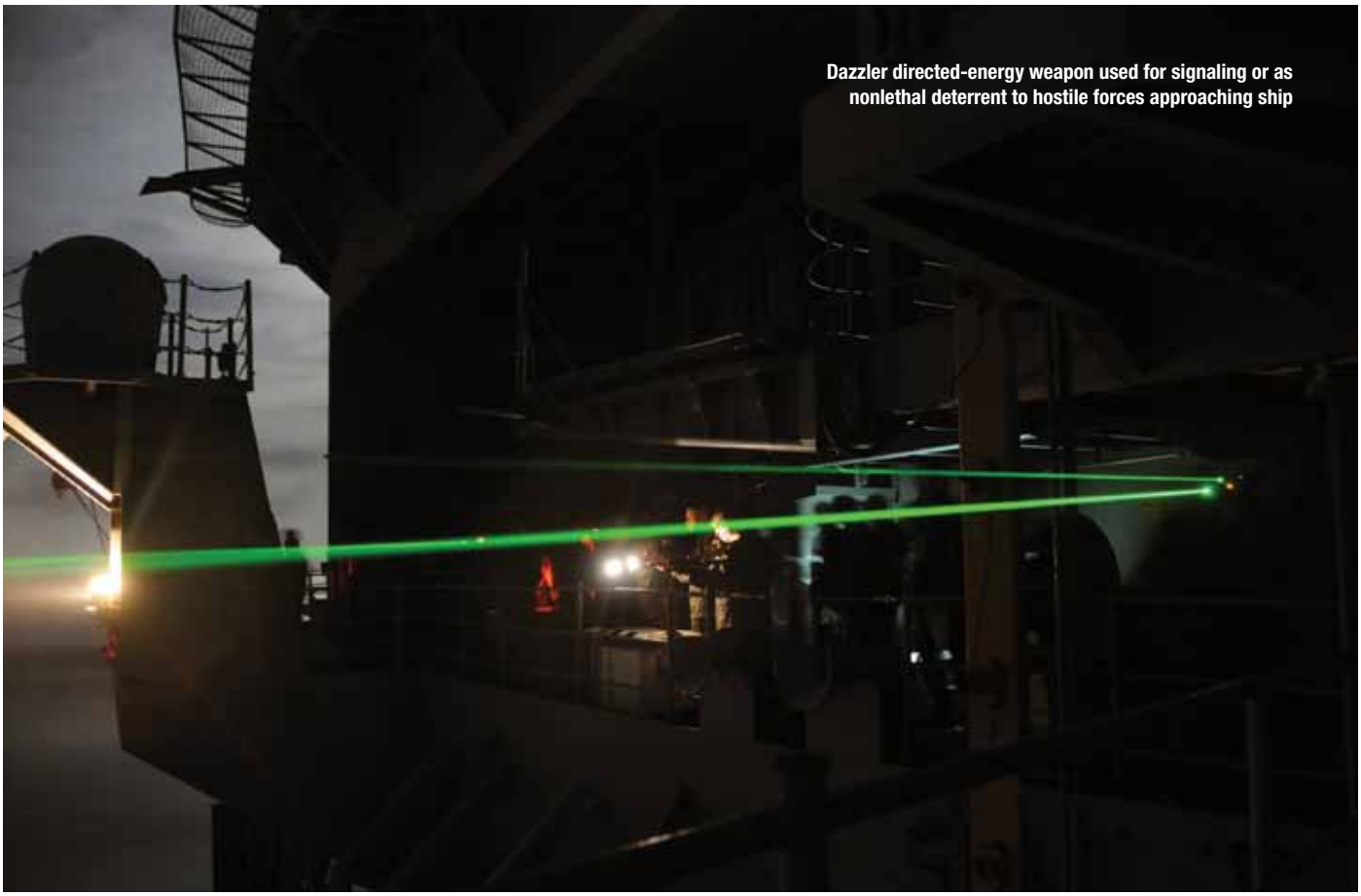
Examples of counterpersonnel systems currently used include *dazzling lasers*—optical distracters useful for temporarily overwhelming an adversary's visual sense by emitting a bright flash and glare effect—and *acoustic hailing devices* that emit loud warning tones or clear verbal commands over long distances. Also in use is an array of nonlethal munitions, grenades (and their delivery systems), and Tasers. Countermateriel systems include spike strips, caltrops (heavy-gauge steel-puncturing spikes), the Vehicle Lightweight Arresting Device, and Portable Vehicle Arresting Barriers and Running Gear Entanglers, designed to stop moving vessels.

More sophisticated nonlethal weapons are being developed with greater operational range, scalable to a variety of needs, to provide a layered defense against potential threats. These include airburst nonlethal munitions, pre-emplaced electric vehicle stoppers, and nonkinetic active-denial technology. Active-denial technology, which delivers precision nonlethal effects at extended ranges, offers promise in crowd control, area denial, and other applications. Active denial uses millimeter wave technology to create an invisible beam of directed energy that produces a strong heating sensation on the surface of the skin, which is completely reversible once an individual moves reflexively out of the beam's path.

Although applicable to a broad range of contingencies, nonlethal weapons are neither a panacea nor a substitute for lethal force, and this article is not meant to exaggerate the potential of nonlethal weapons to accomplish mission objectives. Their purpose is to complement the lethal capabilities in the warfighter's toolkit. Some current nonlethal systems have technical and operational limitations, including range, mobility, and weight considerations that necessitate tradeoffs and impact their usefulness and operational suitability to the warfighter. Those limitations, however, can be reduced through targeted investments in science and technology.

Challenges and Roadblocks

DOD began to focus coherent attention and resources on developing nonlethal capabilities as an outgrowth of U.S. humanitarian assistance efforts in Somalia in 1995, which highlighted a need for capabilities short of lethal means. In 1996, Congress directed the establishment of an executive agent for the DOD Non-Lethal Weapons Program in order to provide oversight on joint nonlethal matters, maintain insight into the various independent Service efforts, eliminate duplication and program redundancies, and facilitate the fielding of nonlethal weapons capabilities. The commandant of the Marine Corps was given this task, and the Joint Non-Lethal Weapons Directorate was established to conduct day-to-day management of joint programs and coordination of Service-unique programs on behalf of the executive agent.



Dazzler directed-energy weapon used for signaling or as nonlethal deterrent to hostile forces approaching ship

U.S. Navy (Luciano Marano)

Since then, significant progress has been made in developing nonlethal technologies and fielding existing off-the-shelf capabilities. Despite their relevance to today's contingency operations, however, nonlethal weapons remain an underutilized asset. Institutional resistance, bureaucratic inertia, competition with legacy programs for funding, inadequate training, doctrinal shortcomings, unclear requirements from the Services, and practical impediments to fielding—such as technological hurdles and insufficient quantities of nonlethal systems with greater standoff range—have impeded a more thorough integration of nonlethal capabilities into the total force. In addition, fostering a greater understanding of the role and utility of nonlethal weapons as an irregular warfare enabler, vice a niche capability commonly associated with force protection missions, remains a significant challenge.

The total cost of the DOD Non-Lethal Weapons Program, including all joint and Service-specific investment, is roughly $140 million annually. Yet the return on this investment can be disproportionate in terms of civilian lives saved, mission objectives achieved, strategic goals accomplished, and international support attained among allies and partners who appreciate efforts to protect civilians. Unfortunately, nonlethal weapons have not yet been fully embraced by military leadership and the policy community.

Importantly, in some quarters of the military, there is a cultural aversion to nonlethals. This is understandable in light of the military's training as a fighting force whose mission includes locating, closing with, and destroying the enemy. It requires a shift in mindset to convince the Nation's warriors that employing tools that allow for mission accomplishment without loss of life or highly destructive lethal fires where possible will not weaken the force.

Without a broader-based understanding of their value and a stronger commitment to their fielding, nonlethal weapons are unlikely to recognize their full potential for meeting the requirements of U.S. military strategy or the operational dictates of contingency operations.

Game-changers and Champions

Translating new, cutting-edge technologies into fielded systems has historically been difficult. Though the Global Positioning System (GPS) is ubiquitous today, its future was far from assured during its initial development. GPS was criticized as costly and unnecessary, a General Accounting Office[6] (GAO) report was highly critical, and its budget was cut. The individual Services pursued their own incompatible navigation and timing options. It was only through the vision of GPS advocates that funding was restored and the program was successful.

Similarly, as the importance of unmanned aerial vehicles (UAVs) to intelligence, surveillance, and reconnaissance missions has increased, so has resistance to shifting budgetary resources away from manned to unmanned platforms. Yet despite an initial reluctance to fund aircraft without pilots, the Air Force today "is training more pilots for advanced UAVs than for any other single weapons system."[7]

History is replete with similar examples where visionary approaches encountered

practical roadblocks. Billy Mitchell's vision of decisive airpower independent of land and sea forces was roundly criticized. And while today's operations continue to demonstrate naval and land force indispensability, many credit Mitchell's vision as a key contributor in the development of the modern-day aircraft carrier and widespread acceptance and employment of carrier-based air combat—an outcome that would have been unlikely in the absence of a high-level commitment to the concept.

The future of military technologies is often driven by cost, yet too often cost is confused with value. GPS, UAVs, and the aircraft carrier have proven their value despite the relative expense of developing them. Similarly, the value of nonlethal weapons for meeting mission requirements in today's challenging and complex military operational environments may outweigh the costs of developing these novel technologies.

Lessons for Tomorrow

The utility of nonlethal weapons in irregular conflicts, peacekeeping, and humanitarian operations is more than theoretical. As retired Lieutenant General Emil R. Bedard, USMC, has noted, "Every warfighter eventually realizes that non-lethal weapons are vital in creating the effects needed to defeat an adversary."[8] Their use in Somalia in the mid-1990s was credited with dissuading mob violence that previously had led to violent clashes between U.S. forces and Somali demonstrators.[9] During peacekeeping operations in Kosovo in 2000, U.S. forces effectively diffused an explosive situation by using nonlethal weapons during a confrontation with a crowd of hostile Serbs in the town of Sevce.[10] And in Afghanistan and Iraq, nonlethal weapons have played an important role. As one Army officer noted, their use "sends a strong message without the need to employ deadly force."[11]

Though important for irregular warfare missions such as counterinsurgency, nonlethal weapons have much broader applicability across the full range of military operations. For example, as a counterpiracy capability, the use of nonlethal counterpersonnel tools such as the acoustic hailing device not only prevented the hijacking of two vessels in the Gulf of Aden within 24 hours of each other, but also enabled the capture of 16 pirates without injury to them or to crew members[12]—a telling demonstration of their value in combating piracy and saving lives.

As the U.S. military is called upon to assist in humanitarian assistance/disaster relief operations overseas, nonlethal weapons can also be useful for crowd control and to deescalate tensions before violence erupts, helping U.S. forces maintain order during the distribution of food, water, and medical supplies to survivors after a natural disaster.

Future concepts of warfare may dictate the need for more innovative approaches to meeting mission requirements, placing greater stresses on commanders' freedom of maneuver and freedom of fires as well as flexibility and versatility in the force's response capabilities. And any future vision for nonlethal weapons must include a fully integrated inventory of scalable effects capabilities in which an individual weapons system can be "dialed up" commensurate with the scenario faced. The ability to isolate and segregate appropriate targets through nonlethal means may take on added importance, along with the ability to deny an adversary from seeing, hearing, communicating with, or reinforcing troops on the battlefield.

the ability to temporarily deny an adversary's use of infrastructure through nonlethal means allows it to be reactivated later

Because nonlethal weapons are applicable to a broad range of missions the U.S. military is likely to encounter, their potential utility across the range of military operations is increasing. To meet this growing utility, their transformation from force protection tool to force application capability to complement lethal effects is required, along with their institutionalization across the doctrine, organization, training, materiel, leadership and education, personnel, and facilities domains. Eventually, they may become as essential an enabler of mission success as GPS.

Tactical Uses, Strategic Impacts

The 2011 National Military Strategy emphasizes the importance of civilian casualty avoidance: "The risk we assume by minimizing collateral damage to innocents is balanced by a reduction of risk to turning even more people against our broader mission. Thus, the disciplined application of force is consistent with our values and international law, increases our chances of strategic and operational success, and more effectively advances national policy."[13] Nonlethal weapons are responsive to the National Military Strategy's direction.

In Afghanistan, civilian casualty avoidance has become a central warfighting requirement. The tactical directive governing the use of force acknowledges that civilian casualties have "strategic consequences" and calls the protection of Afghan civilians "a moral imperative."[14] It states, "*Every Afghan civilian death diminishes our cause* [emphasis in original]. If we use excessive force or operate contrary to our counterinsurgency principles, tactical victories may prove to be strategic setbacks."[15]

The negative consequences of civilian casualties are magnified by the instantaneous transmission of information, enabled by technology, and driven by the demands of an instant news cycle. Video and images of grieving families and destroyed homes can exacerbate negative perceptions of American military might. Greater reliance on nonlethal weapons can help mitigate this effect.

The tactical employment of nonlethal weapons can have other strategic benefits. For example, the ability to temporarily deny an adversary's use of infrastructure through nonlethal means not only allows it to be reactivated at a later date but also saves money in the long run by avoiding the need to rebuild. Likewise, employment of nonlethal devices or nondestructive fires to prevent enemy vehicles from crossing a bridge means that the bridge need not be destroyed by costly munitions. It also allows it to be used by friendly forces, thus avoiding future U.S.-borne reconstruction costs.

Estimates of the U.S. costs of reconstruction in Iraq highlight the strategic benefit that could be provided by the wider use of nonlethal weapons. By March 2011, the United States had spent approximately $61 billion on Iraq reconstruction, which included repair to economic infrastructure damaged in the conflict (for example, restoring electricity, communications, transportation, water, oil, and gas).[16] While not all of these costs could have been prevented through more extensive use of nonlethal capabilities, significant expenses might have been avoided if damage to Iraq's infrastructure had been minimized

U.S. Marine Corps (Daniel Balmer)

Marine demonstrates capabilities of X26E Taser

by the application of appropriate and effective nonlethal technologies and capabilities.

Likewise, in Afghanistan, the costs of reconstruction to the U.S. taxpayer have been significant, with the Special Inspector General for Afghanistan Reconstruction reporting that these costs have exceeded $85.5 billion.[17] While some of these costs are directed toward establishing civil governance institutions and other elements essential to the building of a democratic society, some portion of this spending has been allocated to repair and rebuild property and infrastructure damaged or destroyed in the counterinsurgency.

In addition, monetary restitution to grieving family members when innocents are accidently killed and the costs of sheltering those whose property is destroyed in kinetic engagements could be minimized through the wider application of nonlethal means.

In short, the use of nonlethal weapons can have a strategic "multiplier effect" by avoiding collateral damage to property and infrastructure, minimizing unintended civilian casualties, overcoming negative perceptions of the United States, denying opportunities for enemy propaganda victories, and minimizing long-term reconstruction costs. Perhaps no other capability allows for a broader range of employment options across a wider spectrum of contingencies with the capacity to affect outcomes from the tactical level to the strategic.

The Afghanistan Experience

Nearly a decade after the start of Operation *Enduring Freedom*, noncombatant casualties continue to strain the U.S.-Afghan relationship, undermining efforts to develop the trust and confidence of the Afghan people. This strain was recognized by International Security Assistance Force Commander General John R. Allen, who noted in his 2011 Tactical Directive that "Every civilian casualty is a detriment to our interests and those of the Afghan government, even if insurgents are responsible. We must redouble our efforts to eliminate the loss of innocent civilian life. . . . We must never forget that the center of gravity in this campaign is the Afghan people; the citizens of Afghanistan will ultimately determine the future of their country."[18] Former Chairman of the Joint Chiefs of Staff Admiral Mike Mullen warned, "Lose the people's trust, and we lose the war."

Civilian casualties in Afghanistan rose 15 percent from 2009 to 2010 and another 8 percent from 2010 to 2011,[19] yet three out of four civilian casualties are caused by Taliban and insurgent forces.[20] Nevertheless, so-called escalation-of-force incidents are the primary cause of civilian casualties by coalition forces.[21] Many occur at entry control points, convoys, and other controlled access areas. As former International Security Assistance Force (ISAF) Commander General David Petraeus noted, "Counterinsurgents cannot succeed if they harm the people they are striving to protect."[22] Wider use of nonlethal capabilities in such scenarios could mitigate this risk, allowing U.S. forces who must make split-second decisions to "pull the bullet back" should they engage suspicious individuals later deemed to be noncombatants.

Although some U.S. forces in Afghanistan are equipped with nonlethal capabilities, their overall availability remains limited. As General Joseph Dunford, assistant commandant of the Marine Corps, has stated, the "demand for effective nonlethal weapons right now exceeds the inventory. . . . Squads and platoons that are interacting with people [in Afghanistan] want to take decisive action but limit the possibility of injuring civilians."[23]

U.S. combatant commands have sought to expand the availability of nonlethal weapons, though progress has been slow. Recent surveys of deployed units indicate significant shortfalls in nonlethal weapons education, knowledge, training, and availability. Accordingly, U.S. Central Command recently reemphasized predeployment training requirements for nonlethal weapons.

Without Service institutionalization of nonlethal weapons training and equipping, deployed forces will continue to be called upon to exercise what some have called "courageous restraint" to minimize unintended casualties and damage. While such restraint has contributed to a 26 percent drop in the number of coalition-caused civilian casualties, it has also been controversial, raising concerns that it limits the ability of troops to protect themselves and thus increases their risks. Some have noted that restraint in the application of lethal force on ethical grounds "transfers risk" from enemy combatants and noncombatants to U.S. forces and that this creates "a false dilemma where one must choose between non-combatant lives, which have value, and soldiers' lives, which do not."[24] Here, also, the greater availability of nonlethal weapons may help alleviate these concerns.

The effects of unintended civilian casualties reach beyond the local population. The accidental killing of innocents can have a traumatic effect as well on young troops who must forever live with the consequences of their actions. The United States must do all it can to provide its uniformed men and women in harm's way with the tools they need to complete the mission and avoid inadvertent death or injury to noncombatants.

Setting the Record Straight

Communicating effectively about nonlethal weapons and how they can assist the warfighter in achieving the objectives of U.S. military strategy is a critical prerequisite to gaining acceptability and support for these capabilities. This effort, however, will be handicapped without the more active engagement of senior-level military and civilian leaders.

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. As former Army Vice Chief of Staff General Peter Chiarelli noted, "if we're really serious about fighting an insurgency, we have to change our culture and accept the importance, and sometimes preeminence, of non-lethal effects."[25] This is not the equivalent of "dumbing down" U.S. military capabilities. Nor is it a reflection of what some have called a "softer military."[26] As former USCENTCOM Commander General Anthony Zinni, USMC, noted, "Non-lethal weapons when properly applied . . . make the United States more formidable, not less so."[27]

Unfortunately, misunderstandings and mischaracterizations of the effects of nonlethal weapons are common. New technologies often raise ethical, cultural, and political concerns. The challenge of deploying a new technology is that it is not well understood and is easily subject to mischaracterization, especially in underdeveloped societies where cultural, ethnic, and religious differences may be exploited for political purposes by America's adversaries.

In response to a request from an operational commander, an Active Denial System was shipped outside of the continental United States—and was later ordered to return stateside, having never been used. Although the system has been demonstrated as safe in more than 11,000 tests on 700 human volunteers and does not cause any long-term or permanent health issues, the newness of the technology, coupled with concerns over its mischaracterization as a "microwave" weapon that "fries," "cooks," or sterilizes its targets, resulted in a lack of willingness to employ it. This experience highlights the power of perceptions to shape policy and reinforces the importance of ensuring they are based on fact rather than myth.

Shaping the information environment is just as important as shaping the military environment. Strategic communication is essential for generating understanding and advocacy of technological solutions to contemporary military/operational issues. A bottom-up approach, including at the unit level, is a necessary but not sufficient condition for success in achieving greater acceptance and integration of nonlethal weapons capabilities into current and future military planning and operations. The value of these capabilities must also be communicated from the top down.

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Signs of Progress

Notwithstanding the limitations of current systems and the challenges noted above, there appears to be a broad-based foundation of support for greater investment in and employment of nonlethal weapons—from senior leadership to deployed units to policymakers and opinion leaders. Several combatant commanders have now included nonlethal weapons on their annual Integrated Priorities List. General Chiarelli has also noted that "In a counterinsurgency, non-lethal effects are as important as—and, at times, more important than—kinetic effects."[28] Then–Major General Richard Mills, commander of ISAF's Regional Command–Southwest, stated, "I am a supporter of non-lethal weapons. I would like to see some suite of those weapons provided to us over here."[29] At the unit level, one Army officer who served in Iraq and Afghanistan commented, "To back away from applying non-lethal weapons in irregular warfare risks sending the message that the United States is incapable of either developing [a nonlethal weapons] arsenal or determining how to employ [nonlethal weapons], or is reluctant to attempt a form of warfare that involves dealing with dissatisfied people as human beings and not simply as targets."[30]

Congress has also expressed bipartisan support for nonlethal weapons. The Ike Skelton National Defense Authorization Act for Fiscal Year 2011 called for the procurement and fielding of nonlethal capabilities to "improve military mission accomplishment and operational effectiveness" in counterinsurgency operations.[31]

The House Armed Services Committee (HASC) in particular has highlighted "the value of non-lethal weapons in reducing risks to the warfighter and to non-combatants in current and prospective contingency operations."[32] The committee urged DOD "to accelerate its effort to field such systems, including active denial technologies; to ensure adequate funding for the non-lethal weapons science and technology base; and to develop policy, doctrine, and tactics for their employment."[33] The HASC also expressed concern that DOD "does not fully appreciate the important role non-lethal capabilities can play in helping to ensure mission success," arguing that "budgetary trends do not reflect an urgent need for non-lethal capabilities."[34]

U.S. Army (Martin Greeson)

M5 Modular Crowd Control nonlethal munition used to incapacitate large groups with flash bang and impact of rubber balls

U.S. Army (Phillip Valentine)

Soldier loads 40mm nonlethal rounds into launching system during training in Iraq

In 2004, the Council on Foreign Relations called for "incorporating . . . nonlethal capabilities more broadly into the equipment, training, and doctrine of the U.S. armed services," concluding that doing so "could substantially improve the United States' ability to achieve its goals across the full spectrum of modern war."[35] In 2007, a RAND study highlighted the "inadequacy" of nonlethal capabilities and the negative political fallout from killing noncombatants.[36] In 2009, RAND called for a range of capabilities that are scalable for maximum effectiveness, concluding that "creating and mainstreaming this capability requires vision, initiative, commitment, and persistence on the part of those soldiers' civilian and military leaders."[37] And Brookings Institution scholar Michael O'Hanlon has argued, "Rather than ask our troops to make a choice between being at risk and taking actions that could kill innocent Afghans and set back the war effort, we should give them the [nonlethal] tools they need to do their job."[38]

More recently, a report by the Center for Strategic and Budgetary Assessments noted that nonlethal weapons—including directed-energy technologies—can play a valuable role in countering the antiaccess/area-denial strategies of adversaries.[39] It is precisely these kinds of threats that the new Defense Strategy Guidance argues the United States is increasingly likely to confront.[40] Moreover, the employment of nonlethal capabilities to support antiaccess/area-denial operations is recognized in the new Joint Operational Access Concept.

Conclusion

Many future conflicts are likely to be unconventional and irregular and take place in environments where it is difficult to distinguish between combatants and noncombatants. Conventional operations may also occur in urban environments within close proximity to civilians and critical infrastructure. In these circumstances, nonlethal weapons can play an increasingly useful role in support of U.S. military goals and objectives. Yet this transformation is unlikely to happen without a greater understanding of the tactical and strategic benefits of these weapons.

Nonlethal weapons are not a substitute for the application of lethal force. When employed, nonlethal weapons are always backed by lethal means. As an adjunct to lethal force, however, they can be a powerful addition to the warfighter's toolkit. For example, nonlethal weapons can:

- close the gaps in existing counterpersonnel and countermateriel capabilities
- create a more capable and versatile force without loss of lethality
- help determine intent and provide important deescalatory options for warfighters between shouting and shooting
- avoid negative consequences that could emerge as a result of the use of lethal force including to young troops where the costs of a wrong decision on the use of force can be psychologically devastating
- be applicable to anticipated contingencies and changes in the strategic environment
- conform to U.S. military strategy
- be consistent with the moral principles that guide U.S. military actions
- reflect an American approach to war that is compliant with international law and its requirement to use force judiciously, proportionately, and discriminately
- reduce unintended civilian casualties and inadvertent damage to property
- avoid expensive reconstruction costs associated with rebuilding infrastructure damaged as a result of traditional kinetic military operations
- help achieve mission success.

To accomplish these objectives, the value of nonlethal weapons must be better appreciated by everyone from the civilian and military leadership down to the operator on the battlefield. Because of their transformative strategic benefits across a range of military operations, the role nonlethal

weapons can play in likely future contingencies should be explicitly referenced in policy and strategy documents such as the Quadrennial Defense Review.[41] Persistent myths must be dispelled with dispassionate reasoning and reliance on facts.

nonlethal weapons provide capabilities with unique value that may offset their monetary cost

Nonlethal weapons must be affordable, reliable, and scalable to circumstances. They should be operationally effective, suitable to a variety of scenarios, adaptable to current weapons systems, and provide improved capabilities and increased range. Moreover, they must be available in sufficient quantities to make their investment worth the cost.

All of the Services must integrate nonlethal weapons more broadly into their doctrines, training, exercises, and deployments. Greater acceptability of nonlethal capabilities will not occur unless forces are properly trained and equipped to use them. They should be treated as an integral component of the warfighter's capabilities from the beginning, not a costly add-on down the road. Integration of nonlethal weapons can enable greater freedom of maneuver for the force and will enhance the array of fires available to facilitate the offense.

The capabilities provided by nonlethal weapons can help enable mission success across the full spectrum of conflict—from irregular warfare to more traditional contingencies—and the forces likely to benefit from their employment must take the lead in demonstrating their utility. In this regard, the importance of tracking and highlighting incidents where nonlethal weapons have avoided the consequences of using deadly force and successfully deescalated the potential for violence cannot be overestimated.

Most importantly, cost should not be confused with value. Nonlethal weapons provide capabilities with unique value that may well offset their monetary cost. Recognition of this fact is needed to develop the requisite levels of advocacy and sustained funding that allow them to be integrated more fully into the "rebalanced" force of the future.

Finally, there is no substitute for senior-level advocacy in shaping the environment within the defense bureaucracy, among key decisionmakers and leaders, and throughout the general public. Such advocacy is essential to highlight the growing relevance of nonlethal technologies and the ability of nonlethal weapons to help achieve the objectives of U.S. military strategy. Although the top military and civilian leadership of DOD has acknowledged the importance of avoiding noncombatant casualties to mission success, there has yet to be an explicit public articulation of the role nonlethal weapons can play in accomplishing this task. That would be an important step as DOD reconciles its military strategy, plans, and programs with fiscal realities.

Like our experiences with the Global Positioning System and the unmanned aerial vehicle, the transformation of nonlethal weapons from a niche capability to one with scalable effects useful across the spectrum of contingencies depends on those with the vision to see their broad-based, across-the-board utility in helping achieve mission success. And their effective integration into the warfighter's toolkit will not only help us achieve our strategic and tactical goals and objectives but will also help us remain true to our core values as a nation. **JFQ**

NOTES

[1] "Human Chains Guard NATO Targets," BBC News, April 9, 1999, available at <news.bbc.co.uk/2/hi/europe/314953.stm>.

[2] See, for example, George Will, "Futility in Afghanistan: An NCO Fires Off a Round of Illumination," *Jewish World Review*, June 20, 2010, available at <www.jewishworldreview.com/cols/will062010.php3>.

[3] Cheryl Pellerin, "Gates Cites Efforts to Avoid Civilian Casualties in Libya," American Forces Press Service, March 23, 2011, available at <www.army.mil/article/53647/Gates_cites_efforts_to_avoid_civilian_casualties_in_Libya/>.

[4] Department of Defense (DOD), *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: DOD, January 2012), 1.

[5] This updated definition appears in DOD Directive 5210.56, "Carrying of Firearms and the Use of Force by DOD Personnel Engaged in Security, Law and Order, or Counterintelligence Activities," available at <www.dtic.mil/whs/directives/corres/pdf/521056p.pdf>. Nonlethal weapons have also been referred to by some, including within the law enforcement community, as "less lethal" or "less than lethal" weapons. In 1996, the term "nonlethal weapons" was established in DOD lexicon and formally codified in DOD Directive 3000.3, "Policy for Non-Lethal Weapons," available at <www.dtic.mil/whs/directives/corres/pdf/300003p.pdf>. The term *non-lethal weapons* also appears in Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms* (Washington, DC: The Joint Staff, November 8, 2010, as amended through March 15, 2012), available at <www.dtic.mil/doctrine/dod_dictionary/>. Admittedly, the term is not always a best fit in describing the capability and is arguably unappealing to the combat arms community. The continued expansion of the nonlethal weapons portfolio may require reconsideration of the term.

[6] The General Accounting Office was subsequently renamed the Government Accountability Office.

[7] Secretary of Defense Robert M. Gates, speech at the U.S. Air Force Academy, Colorado Springs, CO, March 4, 2011.

[8] E.R. Bedard, *Non-Lethal Capabilities: Realizing the Opportunities*, Defense Horizons 9 (Washington, DC: NDU Press, March 2002), 1.

[9] Cited by Paul R. Capstick, "Non-Lethal Weapons and Strategic Policy Implications for 21st Century Peace Operations" (Carlisle, PA: U.S. Army War College, February 26, 2001), 9.

[10] As a commanding officer of the U.S. peacekeeping contingent stated, "The non-lethal rounds achieved a tremendous effect: Everyone backed up immediately and settled down." See Lieutenant Colonel James Brown, commanding officer of the Army's 709th Military Police Battalion, quoted in Eric Adams, "Shoot to Not Kill," *Popular Science* (May 2003), 90.

[11] Colonel Douglas A. Tamilio, Project Manager for Soldier Weapons, cited in DOD Non-Lethal Weapons Program, *Non-Lethal Weapons for Today's Operations* (Quantico, VA: DOD, 2011), 11, available at <www.jnlwp.usmc.mil/misc/publications/AR2011.pdf>.

[12] Ibid., 9.

[13] *The National Military Strategy of the United States of America* (Washington, DC: Joint Chiefs of Staff, February 2011), 7.

[14] International Security Assistance Force News Release 2010-08-CA-004, "General Petraeus Issues Updated Tactical Directive: Emphasizes 'Disciplined Use of Force,'" August 1, 2010, available at <http://smallwarsjournal.com/documents/isafnewsrelease2.pdf>.

[15] Ibid.

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