STRATEGY RESEARCH PROJECT

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POLICY IMPLICATIONS OF NON-LETHAL WEAPONS

BY

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Policy Implications of Non-lethal Weapons

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ABSTRACT

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As the U.S. military continues to adjust to the post-Cold War era and prepares to protect and advance the nation's interests in the 21st century, it faces vexing choices on the programs, capabilities, and weapon systems it will develop. In his guidance to the panel conducting the Department of Defense's Quadrennial Defense Review, Secretary of Defense Donald Rumsfeld told the members of the panel "...U.S. forces should have the capabilities and concepts to meet the uncertain challenges of the future." He also told the panel "New combinations of technologies, combined with innovative concepts of operations and organizational arrangements will serve as the multipliers of future U.S. forces, both active and Reserve." Among the new technologies is a class of weapons called non-lethal weapons. Non-lethal weapons are devices designed to thwart the efforts of opposition forces without a high risk of inflicting life-threatening injuries. Some non-lethal weapons achieve this result by temporarily incapacitating humans, some by immobilizing equipment, and some by emplacing barriers to movement. In order to dominate any opponent across the spectrum of conflict from peace monitoring to full-scale war, U.S. forces must take advantage of the capabilities provided by non-lethal weapons. As with any weaponry, the capabilities realized are dictated by the choices made during research, development, and acquisition. With the immature state of some of these technologies, there is a fleeting opportunity to influence the future of non-lethal weaponry. It behooves the well-rounded military expert to become conversant with those technologies and the employment potential they represent.

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POLICY IMPLICATIONS OF NON-LETHAL WEAPONS

> Operation Allied Force was modern war- limited, carefully constrained in geography, scope, weaponry, and effects. Every measure of escalation was excruciatingly weighed. ... The highest possible technology was in use, but only in carefully restrained ways. There was extraordinary concern for military losses on all side.
>
> —General Wesley Clark[1]

General Wesley Clark's book, "Waging Modern War," describes his experiences as the military leader of the North Atlantic Treaty Organization's campaign to halt the government of Yugoslavia's attacks on its own citizens in the province of Kosovo. Gen Clark was describing a type of warfare radically different from that we've come to accept as typical- the large force-on-force engagement with practically no means of destruction withheld and often-national survival at stake.

The idea that something less than complete annihilation of the enemy could be a goal of an army going to battle might seem new but is, in fact, quite old. For instance, at one time champions were sent to do battle in lieu of armies. Sun Tzu tells us "The acme of skill is not winning in a hundred battles, but to subdue the armies of the enemy without fighting. Thus, those skilled in war subdue the enemy's army without battle, They capture his cities without assaulting them and overthrow his states without protracted operations."[2] Before the ascent to power of Napoleon, war typically did not involve the resources of an entire nation.

So, while the concept of going to war with the goal being something less than total annihilation of the enemy might not be new, Gen Clark's experience and recent experience of the military forces of the United States in events in Kosovo, Bosnia, Somalia, East Timor, and other places suggest it is becoming more prevalent. As this form of combat is becoming more prevalent, so too is a class of weapons beginning to emerge from technological advances in all parts of modern society, non-lethal weaponry.

Dr. Steven Metz, writing in the Spring and Summer 2001 issue of Joint Force Quarterly, tells us that"...except for a few futurists, defense analysts and military leaders regard non-lethality as a sub-theme in force planning, largely because the revolution in military affairs has been considered technological and operational, assuming that the nature of war will remain constant. However, global trends suggest otherwise. Some changes underway in the form and substance of warfare indicate that more lethal forces are not what is needed but rather greater precision and strategic utility in an interconnected world."[3]

Non-lethal weapons for warfare are not new developments. For weaponry, the police truncheon certainly dates back hundreds of years and the police baton is similar to, if not evolved from, the first clubs used by ancient man. American troops deployed to Kosovo today could potentially be armed with those devices. Rubber bullets and beanbag rounds date from the 1960s when they were used by police forces in attempts to control crowds of demonstrators or rioters. Tear gas, or variations thereof, was also used by police departments in the 60s and beyond.[4] Tear gas shells have been a part of the arsenal of the U.S. military for decades now. It should be noted, however, those rounds are now outlawed by the Chemical Weapons Convention, with the United States among the signatory nations. Water cannons are another non-lethal weapon many observers might recall from news reports of crowd or riot control efforts from the 1960s.[5] Electrical devices, including handguns that can stun or shock human beings, are probably not as well known but have also been in existence and in use by police departments for years.

Methods of non-lethal warfare are not new either. In fact, war to the level of total war, although heavily documented throughout history, might not even be the most prevalent form or warfare. Certainly, the tradition of sending a champion from each side and agreeing to abide by the result of that singular combat dates to biblical times. One need only recall the story of David and Goliath. There are also plentiful examples of warfare by maneuver. Field Marshall Montgomery, recounting Hannibal's campaign against the forces of Rome tells us "Maharbal urged Hannibal to march on Rome straightaway. He refused. As we have said, his strategy was not to prosecute a war to the death, but simply to bring Rome to terms; and in any case, he lacked the resources to undertake a massive siege."[6]

David R. Morehouse argues, "Philosophically speaking, our generation's mission is to offer the future inhabitants of this planet an alternative to that inevitable, rehearsed destiny. Specifically, we need to develop a balanced force structure that offers leadership more options. Nonlethal weapons and technology offer that alternative through the destruction of war machines, not human life; in essence, by allowing control without destruction."[7] While his point on offering leadership more options is well taken, his theory that a durable range of non-lethal options will allow the destruction of war machines seems rather starry-eyed.

Recent technological developments on many fronts have led to the emergence of more and more widely varied types of non-lethal technologies. Along with the already existing non-lethal tools, they are worthy of close consideration for use in military situations.

It is vitally important to note that the term non-lethal, while commonly accepted as describing this class of weapons, is not necessarily descriptive. The term non-lethal is

somewhat misleading and could result in false expectations. The flaw in the term non-lethal is that these weapons are not necessarily non-lethal. There are instances where many of these technologies could result in deaths. Certainly, they could kill when employed incorrectly, but some could also result in fatalities when employed correctly. A rubber bullet or bean bag round, when fired at too close a range, could cause fatal injuries, particularly if it were to strike the wrong part of the body. The sticky foam described later in this monograph could cause suffocation if sprayed on the face of a belligerent rather than at his feet. A microwave weapon, set at a level to disable the able-bodied young male combatant, could be delivering fatal levels of sound or microwave energy to the grandmother or young child nearby. It will be critical for policymakers, when preparing to equip U.S. troops with non-lethal weapons, to make it perfectly clear to all who will listen the potential consequences of the use of non-lethal weapons. It is also important for those developing non-lethal technologies and those in government directing development programs to continue to emphasize the need for precision in employment of the weaponry, consistent with the limitations of the individual technology, the planned method of employment, and the intended effects.

NON-LETHAL TECHNOLOGIES

Before considering the benefits and drawbacks of the use of non-lethal technologies in military employment, it is worthwhile for us to spend some time examining the specific technologies in existence or development and consider the possible strengths and weaknesses of each type.

The United States Department of Defense established a Joint Non-Lethal Weapons Directorate in 1997 to manage its non-lethal weapons program.[8] Subordinate to the Joint Non-lethal Weapons Directorate is the Joint Non-lethal Weapons Program. That function has published a document called "Joint Vision for Non-lethals: Meeting the Demand of Future Military Operations."[9] Appendix D to that document has a terrific summation of the general categories of non-lethal technologies and is worthy of review.

"Joint Vision for Non-lethals" categorizes non-lethal weapons in six general areas. They are acoustics, biotechnology, chemical, mechanical, optical, and electromagnetic.[10]

ACOUSTIC/OPTICAL TECHNOLOGIES

Within the category of acoustics are acoustic/optical. These devices could be Flash Bang or Stun Grenades. Flash Bang devices are pyrotechnic devices that emit a loud sound and dazzling light when ignited. They are intended to cause temporary confusion and can be delivered by 37 to 40 mm launching devices and 12 gauge shotguns.[11] Stun Grenades are also acoustic and optical devices with intended effects similar to Flash Bang devices.[12]

Blast Wave Projectors are also acoustic devices. A pulsed laser can be a blast wave projector. A pulsed laser creates a hot, high-pressure area of air in front of the target that then creates a flash and acoustic wave. This type of device is currently being developed.[13]

Various types of high intensity sound may be employed. One device, called the curdler unit, produces a shill sound at a decibel level just below that which would cause damage to the human ear. A device called a squawk box emits two ultrasound frequencies that, when mixed in the ear, produce a sound that is intolerable. It purportedly produces giddiness, nausea, or fainting and the beam is small enough to aim at individuals.[14]

Infrasound is very low frequency sound. Infrasound has been touted as being able to travel long distances and easily penetrate most buildings. It also has been purported to cause nausea, disorientation, vomiting, and internal organ damage. DoD research into infrasound has

failed to produce devices that could generate the frequency and volume thought to be needed to produce the above effects nor has any laboratory testing demonstrated any significant effects on subjects. The Joint Non-lethal Weapon Program has discontinued any further research on infra-sound.[15]

BIOTECHNICAL TECHNOLOGIES

In the category of biotechnical, the Joint Non-lethal Weapon Program is considering the usefulness of behavior altering drugs. Among these are calmatives. Calmatives are sedatives or sleep-inducing drugs. They may be mixed with dimethyl sulfoxide which promotes quick absorption through the skin. Another grouping of drugs are gastrointestinal convulsives. These drugs would directly affect the gastrointestinal tract and cause convulsions, diarrhea, and vomiting.[16]

Malodorants are another type of biotechnology. Malodorants include foul smelling gases and sprays. Malodorants could be applied using munitions and could be encapsulated to control the effects. The effects of malodorants would be subject to the weather and wind. Experiments are being conducted to determine if malodorants will consistently produce the desired effects in humans.[17]

Biodegrading microbes produce acids or enzymes and can be tailored to degrade substances like concrete, metals, rubber, and fuels.[18] Such engineered microbes could be used to attack an enemy's aviation, land, or marine fuels, motor oils, rubber products such as tires, or other materials. Delivery of those microbes could be a particular tactical challenge and it is almost a certainty that contaminating an enemy's fuel supply in such a way would be particularly difficult.

CHEMICAL AGENTS

In the category of chemicals are markers. Markers can mark individuals or groups for later identification. Chemicals used to do this could be dyes, paints or powders. Some markers could be designed to be invisible under normal conditions and made to fluoresce with ultraviolet or laser light.[19]

Obscurants are chemicals used to reduce visibility. Obscurants can be smoke but can also be agents that harden and cover vision ports or vehicle optics. Obscurants can be

delivered by ground devices or air platforms. Some obscurants could cause permanent damage to optical devices.[20]

The chemical agent category of reactants includes combustion alteration agents, chemical compounds, embrittlers, and riot control agents. Combustion alteration agents would change fuel characteristics or contaminate fuel to degrade engine performance or completely inhibit combustion. They could be added to the fuel source or delivered as a vapor to be ingested by the air induction mechanisms of the target vehicles.[21]

Chemical compounds are also called supercaustics, superacids, supercorrosive bases, and C+ and would be designed to dissolve metals such as gold or platinum as well as organic compounds. They could be delivered in binary delivery devices to mix the compound in its final form only at the target area. A significant consideration in the employment of these compounds is their possible effect on humans. Another consideration is the possible danger to humans from the failure of buildings and other structures.[22]

"Embrittlers operate by altering the molecular structure of base metals or alloys."[23] These agents would cause the attacked structure to lose its elasticity and thus be more prone to failure. They could be used on aircraft, bridges. tanks, vehicle treads, and other structures. As with supercaustics, planners would need to carefully consider the possible dangers to human life from structural failure due to brittle metals.

Riot control agents are designed to cause eye irritation and tearing, sensitivity to light, irritation of the upper respiratory passages, or a burning sensation on the skin. Mace and tear gas are examples of riot control agents, as is oleoresin capsicum, a compound derived from chili peppers. Riot control agents can be delivered as liquids, vapors, or powders by a variety of munitions or devices and their effects typically last between 3 and 10 minutes.[24]

MECHANICAL DEVICES

Mechanical devices can be chemical or mechanical barriers, batons, stun devices, chemical and mechanical entanglement devices, and blunt impact projectiles. Barriers can be created using chemicals or physical devices. Chemical devices consist of slippery coatings and sticky coatings and foams. Slippery coatings are Teflon-type substances that significantly reduce friction thus restricting movement in an area. Most slippery coatings are currently applied as a powder and then wetted to activate them. They are usually non-toxic and non-corrosive and can later be washed off or peeled off after they dry.[25]

Sticky foams and aqueous foams are similar to the foams used in fire fighting and can be sprayed to a depth of up to four feet. They can be used to cover mechanical obstacles such as concertina wire, fences, and caltrops to make it more difficult to defeat them.[26]

Spikes and spike strips are mechanical barriers typically used to restrict passage on roads. Spikes are commonly designed to be blunt enough that they will not penetrate the shoes of a person while still being able to penetrate vehicle tires. Spike strips are flat strips with retractable spikes. When the strip is activated the spikes extend so as to puncture the tires of vehicles as they roll over them.[27]

Expandable batons are compact when closed to facilitate carrying but rapidly expand to 16 to 18 inches when opened to increase their effectiveness. Electrical batons are typically battery powered and deliver a low voltage electrical shock designed to stun a person.[28]

Stun guns deliver electrical voltage to the target individual and cause the individual's muscles to contract continuously to incapacitate them. Some versions of these guns fire barbed contactors with small trailing wires. Stun belts are self-defense devices worn by individuals. They deliver mild electrical shocks on command.[29]

Entanglements include clogging chemicals and cords, lines, ropes, and nets. Clogging agents include polymers and sticky foam. They can be used to clog the intakes or other openings of engines, cooling systems, and the like and can also be used to immobilize personnel. Cords, lines, ropes, and nets can be used to entangle people and mechanical devices such as propellers, axles, and ships' screws.[30]

Projectiles can be used for a number of non-lethal purposes. Bean bags are fabric bags filled with lead shot and conform to the shape of the target upon impact. They can be fired from 12 gauge shotgun or 37 mm launchers. By conforming to the shape of the target, they distribute their ballistic energy over the contact area and produce less damage than rigid projectiles. Liquid-filled projectiles are hollow rubber devices filled with a liquid. They deform upon impact to produce lesser amounts of damage. Rounds might be filled with liquid dye to mark the subject. Ring airfoil grenades are rubberized donut shapes with airfoil cross sections. This permits them to be fired at greater distances without increasing the muzzle velocity. They may contain riot control agents in cavities in the projectile body. Rubber balls or sting balls are 3/8 or 5/8 inch rubber balls fired from shotguns or a Claymore-type device. A potential for injury exists if these balls strike a person's eye. Velocity-adjusting launchers adjust the muzzle velocity of rubber bullets to control velocity based on range to the target. A water cannon can project a continuous, forceful stream of water for riot control purposes.[31]

OPTICAL TECHNOLOGIES

Holograms project images to target audiences. These images can be of friendly soldiers or forces to cause the enemy to believe more forces exist than actually do. Lights can be used as dazzle weapons. Dazzle weapons emit extremely bright visible light, temporarily blinding opposition forces. Flares generate visible or near-visible light and can obscure the surrounding environment by saturating vision. Illuminating grenades can be fired from an M203 launcher and have the same effect as flares. Isotropic radiators are special munitions that generate light of laser brightness and can cause the same retinal effects as low energy lasers. Stroboscopic devices are high intensity lights that flash at a frequency near that of the human brain and can cause vertigo, disorientation, and vomiting.[32]

ELECTROMAGNETIC TECHNOLOGIES

In the radio portion of the electro-magnetic spectrum, electro-magnetic interference, electro-magnetic pulses, and radio frequency weapons can be used in non-lethal ways. Electro-magnetic interference (EMI) is the label given interference caused by electro-magnetic devices. These devices are typically high power transmitters that can interfere with radio or television signals or cause malfunctions in other electronic devices like navigation systems. Although the effects are usually temporary, the results of the loss of guidance to an aircraft, or perhaps temporary loss of control of a vehicle, can be serious. Electro-magnetic pulses (EMPs) are short-duration; high intensity bursts of microwave energy that can disable electronic circuitry. EMPs are typically caused by explosions and the effects are permanent, depending on the power level and the distance from the source of the burst to the equipment. Radio frequency (RF) weapons deliver short, high power pulses of electromagnetic radiation. These weapons could disrupt computers and communication systems.[33]

Microwave weapons are also being researched under the non-lethal umbrella. High powered microwaves (HPMs) are generated electronically or through explosions. As with EMPs and RF weapons, they cause disruptions in the operation of electronic devices and can interfere with navigation systems, computers, and radios. Focusing HPM or RF radiation is challenging. Electronically steered antennas have been developed to focus RF transmissions but cannot be used for HPMs because of their high power. Generating HPM or RF radiation is also difficult.[34]

Thermal guns are microwave devices delivering directed energy in the same band as microwave ovens. They heat water molecules in the target and cause pain from burning with the pain increasing in intensity with increasing proximity and power levels.[35]

INFRARED TECHNOLOGIES

Tactical lasers are high-energy lasers with multiple kilowatts of power. In non-lethal applications, they can be used against materiel targets and can be used for exceptionally precise targeting. Lasers are, however, susceptible to interference from weather and require large sources of power. Scaling the equipment needed to produce the laser to tactical sizes is also a technical challenge. Non-lethal researchers are looking at low energy lasers for counter-personnel uses. A low energy IR laser could be used to heat the skin of a target individual and thus dissuade them from an action or deter their presence in an area. Visible lasers can be used to deter actions by individuals or crowds. Eye safe lasers can be used to create a wall of light through which opponents cannot see. In addition, eye safe visible laser designators can be targeted on individuals and can cause apprehension or even flight. Researchers are exploring a technique by which a laser would create an ionized air conduit between the weapon and a target individual. An electrical charge sufficient to stun the individual would then be sent through the conduit leading to the creation of a wireless stun gun with up to 2 km range. Pulsed chemical lasers can produce high power for short duration. Non-lethal experimenters are attempting to used pulsed chemical lasers to create a gas plasma flash in front of the target. The mechanical pressure from the flash would then incapacitate the subject.[36]

POLICY CONSIDERATIONS

As can be seen, the field of non-lethal weapons is very broad, ranging from simple mechanical devices, to advanced polymers, to highly specialized microbes, and it is greatly influenced by advances in technology. But the mere existence of a technology is not reason enough to justify its use. To be useful to American armed forces, non-lethal weapons must advance the national security interests of the United States; they must increase the ability of the Department of Defense to execute its mission of creating and implementing a national military strategy to support the national security strategy.

DOD GUIDANCE

Secretary of Defense Donald Rumsfeld issued instructions to those uniformed and civilian members of the American defense establishment participating in the 2001 Quadrennial Defense Review. In these instructions, Secretary Rumsfeld spelled out a new defense strategy for the United States and specified four defense policy goals. He said our defense strategy is to "Assure allies and friends by demonstrating the U.S.'s steadiness of purpose, national resolve, and military capability to defend and advance common interests. Dissuade, to the extent possible, potential adversaries from developing threatening forces or ambitions. Deter threats and counter coercion against the U.S., its forces, friends, and allies. Decisively defeat an adversary at the time, place, and in the manner of our choosing."[37] Secretary Rumsfeld also directs "... the QDR will focus on the task of transforming the U.S. defense posture to stay ahead of and hedge against the uncertain eventualities of the future while continuing to meet current U.S. security responsibilities. The current period of U.S. military preeminence is the best time to transform for the challenges of the future. An overriding objective of these transformation efforts is to maximize the operational effectiveness of the most valuable but most scarce resource: the men and women in uniform. New combinations of technologies, combined with innovative concepts of operations and organizational arrangements will serve as the multipliers of future U.S. forces, both active and Reserve."[38] Several times in the document, Secretary Rumsfeld speaks of the need to enhance the employability of U.S. forces and to allow them to strike with precision. In the report of the Quadrennial Defense Review, the senior civilian and military leaders involved in conducting the review call for planners to build "... build a portfolio of capabilities that is robust across the spectrum of possible force requirements, both functional and geographical."[39]

CROWD CONTROL

All these charges to the defense establishment describe attributes of non-lethal weapons. Non-lethal weapons can help demonstrate U.S. resolve and ability to defend common interests by providing American policymakers a force choice that bridges the gap between diplomacy and intervention with lethal force. Non-lethal capabilities can help dissuade groups with interests antithetical to America's, especially those who intend to operate at levels of activity below that which would provoke major military intervention, that their efforts will not succeed and will be opposed directly by America and the international community. Non-lethal technologies can better enable U.S. forces to respond across the spectrum of force requirements by providing U.S. troops a choice of action between doing nothing and employing lethal force.

General Anthony Zinni, U.S. Marine Corps, was commander of U.S. forces during the early part of the efforts to provide food to the residents of Somalia. He spoke of the frustrations the soldiers and marines under his command encountered in the streets of Mogadishu. The soldiers were occasionally faced with unruly crowds of people at food distribution points and had no options available to them between allowing the crowd to act in any manner it chose or employing lethal weapons.[40]

PEACEKEEPING

Another issue to consider in the employment of non-lethal weapons arises when U.S. forces are deployed in peace operations. As the opposing sides adjust to the presence of peacekeepers, they learn to take actions at levels below that which will invoke an intervention by the peacekeeping forces and exploit opportunities to act when the peacekeepers cannot or will not respond. Non-lethal technologies provide the commanders of peacekeeping forces the opportunity to act early in the cycle, or in a preemptive manner, to keep aggressive forces and groups from provoking actions or outright attacks. Commanders can use the non-lethal weapons to separate the combatants and to enforce exclusion zones. Additionally, employing non-lethal weapons can help engender or maintain positive feelings of the local populace toward the peacekeepers by not destroying property or killing belligerents of either side, and by demonstrating their willingness to act with restraint.[41]

ALTERNATIVE TO SELF-DETERRENCE

During a meeting of the Institute for Foreign Policy Analysis Non-lethal Weapons Working Group in August of 1995, attendees proposed that the measure of utility by which non-lethal weapons should be judged is whether they provide U.S. policymakers a choice between doing nothing (which they labeled "self-deterrence") and using lethal force. The contention here is that non-lethal weapons do provide an alternative to self-deterrence. Some of the working group's participants asserted that individuals who are not deterred by lethal force would hardly be deterred by non-lethal force.[42] This argument ignores the truth that in the world today there are individuals and groups who are not willing to die to achieve their aims, although they are willing to cause others to die or force them to become refugees. A prime example of this is the actions of the Serbian government of Yugoslavia in the provinces of Bosnia and Kosovo. While the leaders of that group were willing to commit genocide against the inhabitants of those regions, they were not willing to continue those acts when their homes and cities were threatened.

DETERRENCE

Another aspect of deterrence is deterrence by denial wherein the United States makes it difficult or impossible for an adversary to accomplish his objectives. If U.S. forces deployed on a peacekeeping mission have the ability, through non-lethal means, to prevent one hostile group from inciting a riot which would increase tensions in the region, the knowledge such a capability exists could prevent the group from acting aggressively. As the range of capabilities the U.S. possesses in the non-lethal arena becomes widely known, it could cause groups to abandon plans for aggressive action completely and attempt to achieve their aims through other means. Non-lethal technologies could be helpful in deterring major theater war too. If the U.S. possesses a publicized capability to incapacitate large numbers of tanks in a short period of time, it might prevent a regional aggressor from sending forces across the border of a neighboring nation.[43]

By narrowing the gap between solely diplomatic efforts and some type of direct involvement, non-lethal technologies can have a deterrent effect. By lowering the threshold for U.S. action, non-lethals can convince groups and nations that actions inimical to the interests of the U.S. and its allies will result in U.S. action.

DRAWBACKS

While there are features of non-lethal technologies that argue strongly in favor of their continued development and employment, there are potential drawbacks to the employment or potential employment of non-lethal weapons as well. It's certainly in the best interests of the United States for policymakers, technologists, tacticians, and strategists to be fully aware of those limitations when making investment, development, and deployment decisions.

LABELLING

One drawback to the category of non-lethal weapons is the term non-lethal. As was mentioned earlier, non-lethal technologies can sometimes be lethal. The infrasound weapon set to incapacitate the healthy young male warrior may cause the grandmother nearby fatal injuries. The microwave weapon providing perimeter security by area denial might kill the determined intruder who continues to advance despite the pain he is encountering. Rubber bullets can cause fatal injuries. Sticky foam can suffocate if it attaches to a person's face. The particular challenge here is not to develop non-lethals that will never cause death, the challenge is for policy makers and leaders to ensure the public has realistic expectations of the potential results and pitfalls of employing non-lethal technologies. Before beginning an operation in which the use of non-lethals is anticipated, our political leaders must ensure that expectations of no deaths caused by U.S. forces are not raised. They must make it clear to the American public and to the world community that, while every effort will be made to avoid any deaths or injuries (if appropriate to the situation), unforeseen situations are almost certain to arise which might result in death or injury. Perhaps an even better approach is to specifically avoid divulging the planned use of non-lethal technologies at all, to merely equip the deploying forces as best we can for the mission and divulge the use of non-lethals as they occur and when appropriate. Either way, it is vital for American leaders to continue to address any instances where unintended injuries or deaths occur to be the result of imperfect implementation of the best intentions, reminding everyone of the challenges the members of our armed forces are given in these situations.

LINKAGE TO LETHAL WEAPONS

Another policy consideration when deciding to develop or deploy non-lethal weapons is the link between non-lethal weapons and lethal weapons. Decisions to deploy troops armed

solely with non-lethal weapons would be problematic and possibly even foolish. Any occasion on which we would deploy troops, be it for peacemaking, peacekeeping, or full-scale conflict, would be one in which we are attempting to impose our will or the will of the international community on a nation or group. In defying the international community, that nation our group must surely feel some vital or important interest is at stake and may therefore be willing to endure, through its citizens or members, whatever temporary pain the non-lethal technology may impose. It may take the use of or threatened application of lethal force or full-scale combat to cause them to capitulate.[44] In Kosovo, it was partly the real threat of a ground invasion that caused the Serbs to halt their assaults on the Kosovars. In a future scenario, it might be the real threat of lethal force backing the application of non-lethal force that will cause an opponent to bend to our will. Certainly recent experience in Somalia has shown us that even the most benign deployment of U.S. forces has the potential to escalate into a conflict requiring American soldiers to employ lethal force to protect themselves.

Another aspect of the linkage between non-lethal and lethal weapons is the potential for non-lethal weapons to augment the use of and increase the effectiveness of lethal force. In some cases, the non-precise property of some non-lethal technologies would increase the potential success of American forces by not requiring that enemy positions be precisely fixed before being engaged. If enemy troops in a given area could be temporarily incapacitated by a non-lethal weapon, friendly forces could then swoop into an area and secure the enemy by whatever means appropriate with lower risks.[45]

PRIOR USE REQUIREMENT

An area for particular caution for U.S. policymakers regarding the relationship between non-lethal and lethal technologies could be the perceived requirement to employ non-lethals prior to the employment of lethal force. Given the existence of non-lethal weapons and the declared U.S. willingness to employ them, an adversary, and perhaps even the world community, might believe the U.S. to be obligated to use non-lethal weapons prior to the use of lethal ones. Given such a perception, an adversary might take actions predicated upon the belief that the U.S. would have to take a sequence of intervening steps prior to using lethal force. To combat this, the U.S. government must forcefully declare that its forces would be authorized to use lethal force at any stage of an operation when appropriate, without the need to employ non-lethal technologies first.[46] In fact, DoD Directive 3000.3 states "The availability of

non-lethal weapons shall not limit a commander's authority and obligation to use all necessary means available and to take all appropriate action in self defense."[47]

For non-lethal weapons to have a deterrent effect, potential adversaries must know that the United States possesses them and is prepared to use them. This would be similar to the U.S. declaring its willingness to use nuclear weapons, given a nuclear strike against the U.S. or in response to a conventional attack in Europe. Caution would be needed when creating a declaratory policy to avoid revealing too many specific details about the non-lethal technologies in the American inventory. Prior detailed knowledge regarding American non-lethal weaponry could allow an adversary to develop countermeasures. Additionally, some uncertainty regarding non-lethal weapons could cause an opponent to project more capabilities or more significant effects than the weapons possess and increase the deterrent effect.[48]

There has been some debate as to whether, given the intended temporary effects of non-lethal weapons, they can have any deterrent effect at all. Again, the deterrent value depends on the perception in the mind of the opponent. If the opponent perceives that U.S. forces will use the period of incapacitation, if there is one, to their advantage and thereby prevent the opponent from achieving his aims, the non-lethal weapons would have a deterrent effect. An example of this could be American, coalition, or United Nations forces using a non-lethal technology to incapacitate a crowd of people and then disarming, separating, and detaining the hostile personnel who were using the crowd for cover.[49]

Non-lethal weapons can help bridge the gap between diplomacy and the use of lethal force. By providing decision-makers additional options for action short of employing combat forces with lethal power, non-lethal weapons can enhance deterrence by permitting them to continue to act in a proactive manner.[50]

CULTURAL INFLUENCES

One area in which to be cautious regarding non-lethal technologies is the cultural influence of the target group on the effectiveness of non-lethals. As is the case with any force employment planning, military leaders will need to consider the reaction of our adversaries to the use of non-lethal weapons, given the cultural background of the area. Non-lethal weapons, which produce the desired impact in one culture, might produce a different result in another.

PROLIFERATION

Proliferation of non-lethal weapons and countermeasures to them is another area for concern. While a declaration of the possession and preparedness to use non-lethal weapons is essential if they are to have any deterrent value, too great a level of detail in American policy statements could help accelerate the proliferation of non-lethal technologies. One reason to fear the proliferation of non-lethal weapons is they could, in turn, be used against U.S. forces deployed to distant shores. If the technologies are effective against a motivated, fit enemy, they will very likely be effective against American soldiers too. In addition, if the particulars of American non-lethal weapons and the planned tactics for their use are known in detail, an adversary could be expected to attempt to devise countermeasures to negate the effects.[51]

COUNTERMEASURES

The susceptibility to countermeasures of some non-lethal weapons needs to be included in any policy deliberations. Bean bag rounds, nets, foams, and most other forms of non-lethal weapons can be outranged by lethal weaponry. Therefore, American soldiers employing non-lethal weapons must also be equipped with lethal weaponry to negate any possible advantage to the opposition. Some of the methods of delivering non-lethal effects to targeted individuals are also susceptible to attack. Speakers used to broadcast ultrasound can be damaged by ballistic rounds and other projectiles. Generators needed to power some non-lethal weaponry can also be interdicted. Sticky foam or slippery coatings might be defeatable by throwing dirt on them. As any non-lethal technology is used, American forces should expect a determined and creative enemy to find ingenious ways to defeat it.[52]

CONCLUSION

The international security situation is uncertain and evolving. As the United States military continues to demonstrate its dominance in conventional combat, potential adversaries are certain to explore asymmetric methods for achieving their objectives. One method that has been tried and will continue to be used is to initiate acts that are below the level at which the United States will employ combat forces. In this way, adversaries can attain their objectives piecemeal.

Non-lethal weaponry can help the United States address this challenge. By lowering the potential consequences of force employment, non-lethal weaponry can provide decision makers a policy option when adversaries are attempting to stay below the force employment threshold.

Non-lethal weapons are useful in the missions given U.S. forces today too. Peacekeeping, peace enforcement, and humanitarian efforts are all enhanced by the capabilities provided by non-lethal technologies. By providing barriers to travel, non-lethal technologies can help peace enforcement forces keep belligerents separate. By providing non-injurious methods of crowd control, non-lethals can permit humanitarian assistance forces to aid needy peoples. By providing methods of negating hostile combatants, non-lethal weapons can allow peacekeepers to maintain the peace as well as retain the support of the local populace.

There are some cautionary notes to be sounded too. By lowering the threshold of engagement, non-lethal technologies could make it easier for policy makers to decide to commit U.S. troops at a time when our forces are already challenged with supporting ongoing missions. By promising the attainment of our national objectives without the loss of life on either side, the potential inherent in non-lethal weapons could lead to decisions to deploy American troops without lethal force for their self-protection. By raising expectations of bloodless operations, non-lethal weaponry could lead to outcries from the American public and press if lives are lost.

Clearly, the potential of non-lethal weapons, the types of non-lethals best suited for the future environment, and the optimal methods for employing those weapons all remain to be discovered. However, the potential for non-lethal weaponry to contribute to the attainment of American national security objectives is beyond debate. It is vital that our technologist, scientists, policy analysts, and acquisition specialists work closely with the soldiers, sailors, airmen, and marines who will employ non-lethal weapons to ensure the technologies this nation develops are the ones best suited to obtaining our objectives.

Word Count: 6917

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