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Headquarters, United States Army
Training and Doctrine Command
Fort Monroe, Virginia 23651-5000

TRADOC Pamphlet 525-73
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1 December 1996

Military Operations

CONCEPT FOR NONLETHAL CAPABILITIES IN ARMY OPERATIONS

Summary. This is a change to TRADOC Pam 525-73, 1 September 1996. The Joint Staff Memorandum of Law (MOL) identifies the impact of the Chemical Weapons Convention (CWC) on the types of weapons or chemical agents that can and cannot be used by U.S. forces and under what circumstances. The CWC covers all lethal and nonlethal toxic chemicals and the MOL defines "toxic chemicals" as any chemical "which...can cause temporary incapacitation..." The CWC explicitly prohibits the use of all toxic chemicals, except for "purposes not prohibited" and "riot control agents" as a method of warfare. As a result of this treaty, vomiting agents (chemicals that cause nausea/vomiting) have been stricken from the list of potential nonlethal technologies identified in appendix B. Changes have been made to appendix B deleting this nonlethal technology.

Suggested improvements. The proponent of this concept is the Deputy Chief of Staff for Combat Developments. Send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, TRADOC, ATTN: ATCD-BP, Fort Monroe, VA 23651-5000. Suggested improvements may also be submitted using DA Form 1045 (Army Ideas for Excellence Program (AIEP) Proposal).

1. Change TRADOC Pam 525-73, 1 September 1996, as follows:

1. Pages 7 and 8. Remove old pages and insert new pages. (The personnel effectors item Vomiting Agents and their description has been deleted from appendix B.)
2. Post these changes per DA Pam 310-13.
3. File this change in front of the publication.

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- f. The Army needs to determine vulnerabilities of developmental and fielded soldier systems to nonlethal attack and develop appropriate countermeasures.
- g. Environmental effects must be considered in employing some applications of nonlethal capabilities.

Appendix A References

Army Regulation 602-2
 Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process.
 Field Manual 100-5
 Operations
 Joint Pub 3-58
 Joint Doctrine for Military Deception
 TRADOC Pamphlet 11-9
 Blueprint of the Battlefield
 TRADOC Pamphlet 525-5
 Force XX1 Operations, A Concept for the Evolution of Full Dimensional Operations for the Strategic Army of the
 Twenty-First Century
 TRADOC Pamphlet 525-57 (S)
 U.S. Army Operational Concept for Operations in a Directed Energy Environment (U)
 TRADOC Reg 11-16
 Development and Management of Operational Concepts
 Black, Stephen. "Non-Weapons Systems: The potential impact of new technologies on Low Intensity Conflicts,"
 Ridgeway Viewpoints, Matthew B. Ridgeway Center for International Security Studies, No. 93-9, 1993.
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 DARPA. "Assessment of Mission Kill Concept, Requirements, and Technologies," System Planning Corporation,
 Final Report SPC 1361, Sep 90.
 Defense News. "Pentagon Units Jostle Over Non-Lethal Initiatives," 2 Mar 92.
 Global Strategy Council [Inc.]. "Nonlethality: A Global Strategy White Paper," 15 Jul 91.
 Jane's Defense Weekly Report. 9 Jan 93.
 Swett, Charles F. "Strategic Assessment of Non-Lethal Weapons," OASD(SO/LIC) Policy Planning, 9 Nov 93.

7

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Appendix B Potential Nonlethal Technologies

This appendix lists various types of nonlethal technologies and their potential application under this concept. Listing of technologies does not indicate there are ongoing U.S. programs to develop the technologies.

Personnel Effectors	Description
Infra/Ultra Sound	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel.
Noise	Acoustic generator that produces sufficient sound to disorient or incapacitate personnel.
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Malodorous Substances	Family of inorganic substances with pungent odors that causes discomfort to personnel.
Irritants	Substances that cause eye and respiratory irritation/discomfort (e.g., CS, CR, EA4923).
Nonpenetrating Projectiles	Family of projectiles that stuns personnel without penetrating.
Strobe Lights	Large, high-intensity stroboscopic light to disorient and confuse personnel.

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Combustible Dispersants	Family of substances that ignites when subject to pressure from personnel passing over.
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Enclosure Fillers	Substance or devices that rapidly fill an enclosed space, leaving occupants alive but incapable of movement (e.g., airbags).
Aqueous Foams	Family of foams that impedes mobility and create barriers especially when mixed with irritants.
Deceptions	Techniques intended to persuade groups to act against their self-interest.

**CONCEPT FOR NONLETHAL CAPABILITIES
IN ARMY OPERATIONS**

1 September 1996

FOREWORD

"...the Army must examine alternatives and explore new ideas that will ensure quick, decisive results in War and success in operations other than war -- at the least cost in lives and national treasure." (TRADOC Pam 525-5, Force XXI Operations, 1 Aug 1994)

The evolving nature of the geostrategic environment is causing the Army to change the way in which it carries out the resultant missions. Recent military technological advances will now permit commanders to utilize alternative approaches and means to fulfill these missions. Crowd control in conducting peacekeeping and humanitarian assistance missions is as likely a task for the Army as is destroying enemy armor and infantry forces in war. Political, diplomatic and economic demands dictate that future operations, where possible, minimize U.S. casualties while limiting collateral civilian casualties and collateral damage to civilian objects. TRADOC Pam 525-5, Force XXI Operations, recognizes this fact by projecting a force capable of producing overwhelming, decisive power that promotes quick, decisive operations with the minimum force necessary. Overwhelming, Decisive power is not solely traditional destructive firepower. For example in Operations Other Than War (OOTW), it may be food delivered to starving civilians or a demonstration of joint military capability so decisive that an adversary modifies its actions to meet friendly goals. New capabilities, or old capabilities recast, permitting accomplishment of friendly goals with minimum force are being contemplated and developed under the rubric of nonlethal capabilities. This concept seeks to give definition to these new tools and to highlight how existing tools may be used to produce nonlethal effects. This concept seeks to provide a vision of required nonlethal capabilities the Army must acquire to fully support warfighters in pursuit of decisive victory during War and success in stability and support operations.

Military Operations CONCEPT FOR NONLETHAL CAPABILITIES IN ARMY OPERATIONS

Summary. This pamphlet describes the concept of nonlethal capabilities and how they may delay, disrupt or degrade threat forces, combat functions and facilities in pursuit of operational and tactical objectives. This concept outlines how the Army will use nonlethal capabilities in military operations at the strategic, operational, and tactical levels. It outlines how nonlethal capabilities support all types of missions across the full range of military operations. It describes implications for doctrine, training, leader development, organizations, materiel and soldier support. This concept describes capabilities required to improve the ability of leaders and soldiers to effectively use nonlethal capabilities and defend against their use by an adversary. This concept does not include the use of directed energy laser weapons as a nonlethal capability.

Applicability. This pamphlet applies to all TRADOC elements, to include Headquarters (HQ) TRADOC staff, major subordinate commands, functional centers, schools, and activities.

Suggested Improvements. The proponent of this concept is the Deputy Chief of Staff for Combat Developments. Send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, TRADOC, ATTN: ATCD-BP, Fort Monroe, VA 23651-5000. Suggested improvements may also be submitted using DA Form 1045 (Army Ideas for Excellence Program (AIEP) Proposal).

Contents

Chapter 1

Introduction

Purpose.....	1-1
References.....	1-2
Explanation of abbreviation and terms.....	1-3

Chapter 2

General

Why the concept is needed.....	2-1
Threat.....	2-2
Operational context.....	2-3
Support to the umbrella concept.....	2-4
Limitations.....	2-5
Background.....	2-6

Chapter 3

Concept

General.....	3-1
Concept description.....	3-2
Required capabilities.....	3-3

Chapter 4

Doctrine, Training, Leader Development,

Organizations, Materiel, Soldier Implications

Doctrine.....	4-1
Training.....	4-2
Leader development.....	4-3
Organizations.....	4-4
Materiel.....	4-5
Soldier Support.....	4-6

Appendices

- A. [References](#)
- B. [Potential Nonlethal Technologies](#)
- C. [International Agreements and DOD and Joint Staff Policy](#)

Glossary

Chapter 1

Introduction

1-1. Purpose. This pamphlet provides a concept for nonlethal capabilities in support of Army missions across the range of military operations. The concept establishes a basis for developing nonlethal capabilities that complement lethal capabilities, providing commanders new options and tools to accomplish assigned missions. The concept also describes the applications of capabilities provided by new nonlethal technologies or new applications of existing technologies.

1-2. References. Required and related publications are listed in Appendix A.

1-3. Explanation of abbreviations and terms. The glossary contains explanations of abbreviations and terms used in this pamphlet.

Chapter 2

General

2-1. Why the concept is needed.

a. The Army's highly lethal forces remain the cornerstone of the decisive element of land power in the U.S. deterrent arsenal. However, U.S. forces will have to respond to a myriad of situations across the range of military operations. At the same time, the military will face increased media attention, worldwide environmental concerns, and a low national tolerance for long, lethal and, costly campaigns even where vital interests of the nation are clearly defined. Nonlethal capabilities can expand options and tools available to the National Command Authority (NCA) and commanders.

b. Operation Desert Storm provided a glimpse of warfare that relies on precision guided munitions and "discriminating" technologies. These capabilities permit the user to attack targets with precision and accuracy while reducing collateral damage and loss of life. Nonlethal capabilities complement and extend the nation's diplomatic and military options beyond the use of more traditional lethal weapons.

c. Nonlethal capabilities support the objectives of thwarting aggression and promoting stability. Recent experiences in Bosnia, Somalia, Rwanda, and Haiti highlight the complexity and danger of missions across the range of military operations. Soldiers are at risk in war as well as in other military operations, and it is essential that they be provided every means to employ overwhelming, decisive power to accomplish their missions.

d. Nonlethal capabilities afford expanded crisis and contingency response options. They enhance the Army's ability to meet requirements of applying force proportional to the threat and discriminating in the application of force during military operations. Nonlethal capabilities can reduce the risks of perceived excessive military force, promote international political support, alleviate environmental concerns, and enhance post conflict transitions and termination.

e. Potential adversaries have or are acquiring nonlethal capabilities. This concept also addresses the need for protection against adversarial use of nonlethal capabilities.

f. This concept accomplishes the following:

(1) Defines "nonlethal" and its operational context in Force XXI operations.

(2) Identifies the increased role of nonlethal capabilities throughout the range of military operations.

(3) Provides emphasis and direction for development of nonlethal technologies, capabilities, and counter-nonlethal capabilities.

(4) Provides information to the Army and the other Services, national, industrial, and allied agencies.

(5) Helps the Army enunciate the necessary requirements for these capabilities.

2-2. Threat.

a. Realignment of international relationships and alliances, coupled with social, economic, demographic, and political changes will continue to create a period of uncertainty for the nation and the Army. The proliferation of weapons (especially weapons of mass destruction) and technology with military applications, coupled with drugs, terrorism, and religious, ethnic, and cultural unrest, increase the danger for soldiers conducting operations. The diverse capabilities of states within regional nations and other groups seeking power, and the instability found in many nations pose serious threats to U.S. security and national interests and create challenges of unprecedented diversity, complexity, and scope for the Army.

b. Many nations have developed, or are in the process of developing nonlethal weapons. A proliferation of these weapons or technologies will pose a real danger to the U.S., its soldiers, equipment, and infrastructure. Some of these weapons and technologies, in the hands of terrorists and criminal elements, could pose a significant problem for national security, and international law enforcement.

2-3. Operational context. This concept describes capabilities that can support the entire range of military operations at all levels of war.

2-4. Support to the umbrella concept. The Force XXI Army will be capable of defining the battlespace, regulating tempo, ensuring initiative, and promoting quick, decisive operations with the minimum force necessary. This concept supports the full range of possible operations envisioned by Force XXI.

2-5. Limitations.

a. Laws and international agreements. National and international policies and laws, and existing treaties or agreements, impact on the use of selected nonlethal capabilities. This concept proposes the development and employment of systems that enhance our obligations under International Law and promote the humanitarian concepts for which those laws were developed. Nonlethal capabilities will be used only when required by military necessity. They will be used in a way to avoid suffering and their employment will be proportional to the threat.

b. Environmental concerns may limit the use of some nonlethal capabilities. Nonlethal capabilities will not be employed if widespread, long-lasting, or severe environmental effects are suspected.

c. This concept does not include the use of directed energy laser weapons as nonlethal capabilities.

2-6. Background. Military forces have long used nonlethal force to influence behavior of people and nations, to defeat adversaries with minimum use of lethal capabilities, and to weaken adversaries in order to more quickly, easily, or economically defeat them with conventional arms. Examples of classic nonlethal means include: show of force; deliberately delivered information or propaganda meant to dissuade or persuade actions; physical obstacles; noise to create or enhance psychological effects; electromagnetic energy to disrupt communications; smoke and obscurants to mask operations or defeat homing and guidance mechanisms; and, light or fires used to harass soldiers. Classic nonlethal means will remain relevant in Force XXI operations. This concept will focus on new nonlethal capabilities as a result of advances in technology or new ways of applying existing capabilities.

Chapter 3

Concept

3-1. General. Paramount to understanding this concept is recognition that nonlethal capabilities do not replace or diminish the role of lethal capabilities for the force. Nonlethal capabilities simply provide the commander additional options for applying military force consistent with the situation to accomplish stated or directed objectives. The military element of national power is fundamentally and unalterably based on lethal capabilities that allow the Army to achieve decisive results through the application of overwhelming force. However, recent experiences have highlighted requirements for new capabilities or new ways of applying existing capabilities in dangerous situations

where restrictive rules of engagement (ROE) dictate application of lesser force (force protection, food distribution orderliness) to achieve mission success.

3-2. Concept description. Nonlethal capabilities are employed with the intent to compel or deter adversaries by acting on human capabilities or materiel while minimizing fatalities and damage to equipment or facilities. This concept describes required capabilities that enable the Army to: employ nonlethal capabilities which provide alternatives to, or raise the threshold for, application of lethal force; augment lethal capabilities; and protect friendly forces. Missions such as food relief efforts in Somalia and Rwanda are superb examples where use of lethal weapons is conceptually inconsistent with the mission (except force security). Nonlethal capabilities will provide soldiers with the necessary means to control populations, enforce mandates, and protect themselves in consonance with the specified ROE for the operation.

a. Operational offensive measures employment. Nonlethal capabilities can be employed in a wide range of situations. It is not the intent of this section to address all possible situations but rather to provide an appreciation of the integration of nonlethal capabilities in the context of offensive and defensive measures. The use of nonlethal systems depends on METT-T and may occur across the entire range of military operations.

(1) Riot/mob control. There is a wide range of scenarios in which nonlethal capabilities could be employed in riot control situations. They could be used to disperse dangerous mobs or deny access to such critical facilities as weapon storage sites, embassies, enemy prisoner of war facilities, nuclear power plants, troop lodgments, etc.

(2) Sanctions. Nonlethal capabilities could be used to augment economic, information, or military sanctions by degrading key capabilities or scarce resources. They could exert pressure on a nation, state, or economic entity to change its behavior or intentions. For example, economic blockades could be improved by employing measures that could rapidly degrade vehicle tires and lines of communication (LOCs). This employment measure would severely hamper use of roads and passageways by wheeled vehicles, particularly if tires were a scarce resource.

(3) Interdiction of tactical/strategic resources. An important consideration in the future will be the ability to employ measures that degrade an adversary's capability to wage war, yet permit the re-establishment of the infrastructure with minimum costs. A belligerent state could be thwarted by taking measures to disable its production facilities. Such actions would be warranted to avoid large-scale conflict. The restoration of degraded facilities could be achieved faster and at lower cost following cessation of hostilities. Such measures could be employed while minimizing casualties and without the use of highly destructive measures such as bombing or artillery attack.

(4) Conflict intervention. Nonlethal capabilities could be employed preemptively before the onset of hostilities or covertly after initiation of open conflict between two countries. They could limit an adversary's capability to engage forces in the near term by neutralizing or limiting availability of equipment or supplies. Such measures could target the mobilization and sustainment capabilities of military forces to provide time for negotiations. Such interventions may be made more acceptable to the countries involved and to the American public if large numbers of U.S. military forces were not used in the intervention.

(5) Military incursions. U.S. forces may be required to go into a country to accomplish a single objective, such as destruction of chemical production facilities or the capture of nuclear weapons. Nonlethal capabilities could be employed to slow the country's military forces to prevent effective intervention in the operation and allow extraction of U.S. forces without a major engagement.

(6) Counterdrug/terrorist operations. U.S. forces may be required to provide surveillance over several areas, such as remote airfields or routes known to be used by drug runners or terrorists. Nonlethal capabilities could include the emplacement of unattended sensors designed to detect use of aircraft or vehicles. A munition could deliver a material that would clog the engine of unidentified aircraft or disperse an entanglement to delay movement of the vehicle until reaction forces could respond and investigate. Similar techniques could be used in any situation where few reaction forces are available to cover relatively large areas. Drug traffickers fly over an ocean area and air drop drug bundles to small boats which collect the bundles and disperse quickly. Unless U.S. vessels are in the immediate area, capture is unlikely. Lightweight, high-strength entanglements could be dropped from the air onto boats, providing time for U.S. surface vessels to intercept the traffickers.

(7) Hostage retrieval. This use of nonlethal capabilities could enable the neutralization of combatants when intermingled with noncombatants or friendly forces. This intermingling of combatants and noncombatants occurred in Somalia during Operation Restore Hope and in Kuwait during the flight of Iraqi soldiers from Kuwait City when Kuwaiti citizens were used for hostages. Nonlethal capabilities could be used to isolate an area preventing movement, reinforcement, or departure of a hostile force with hostages, providing additional time to negotiate surrender or prisoner release. The captors could be neutralized, permitting access to the captured before risking loss of life when forcible entry with lethal weapons occurs.

(8) Military operations in urban terrain (MOUT). Military operations in urban terrain offers many useful opportunities for employment of nonlethal capabilities. Access/escape routes can be blocked in buildings with

polyurethane-based foam or other measures to prevent surprise approach of reinforcements, channel movement through established firing zones, or protect areas from entry. Urban environments also increase the possibility of commingled combatants and noncombatants. In these areas it would be better to avoid employment of high explosive ordnance and the resultant high level of collateral damage.

(9) Large-scale operations. While much of the focus is the lower end of the range of military operations, some nonlethal capabilities could have a significant effect on larger operations. Strategic interdiction of warmaking necessities such as electricity and petroleum, oil, and lubricant (POL) resources could hasten the end of conflict. High-powered generators can disrupt electronic systems, severely limiting use of combat systems and command and control capabilities. Inserting computer viruses in combat and communication systems is far more effective than engaging individual systems with conventional means. Deception/electromagnetic intrusion of communications and computer driven systems can introduce widespread confusion in military operations and soldier distrust in their systems. The employment of nonlethal capabilities within the context of information operations could produce windows of opportunity for U.S. forces and give adversary leaders an incorrect sense of the effectiveness of their forces, causing major errors in judgment.

b. Defensive operations. Defensive operations involve the employment of nonlethal capabilities to enhance the effectiveness of positional defense or area security. Nonlethal capabilities could be employed to limit access to defensive positions, detect movement, or autonomously employ a counter-intrusion system. These applications could reduce the number of soldiers required to provide security in large areas.

c. Nonlethal countermeasures. The Army is potentially vulnerable to nonlethal capabilities employed by others because of its heavy reliance on advanced systems. Understanding these vulnerabilities must result in improved weapons systems, training, operations security measures, and doctrine to limit the susceptibility of U.S. personnel and materiel. The Army must possess and employ appropriate countermeasures (especially for mission critical resources) to an adversary's use of nonlethal weapons/systems.

3-3. Required capabilities. Nonlethal capabilities will affect human abilities/senses and materiel in order to disrupt or prevent normal operations. Nonlethal capabilities intended for use against personnel will have relatively reversible effects. It is the Army's intent to develop nonlethal capabilities that do not maim, permanently disable, or kill personnel. Required nonlethal capabilities include:

a. Affecting human capabilities.

- (1) Temporary disorientation.
- (2) Crowd control or dispersal.
- (3) Calm or stun personnel.
- (4) Immobilize personnel.
- (5) Sensory impairment

b. Defeating materiel systems.

- (1) Blind optical sensors and targeting devices.
- (2) Disable electronics in equipment.
- (3) Prevent movement of vehicles, including aircraft.
- (4) Cause computer driven systems failure or induce operating error malfunctions.

c. Providing security and surveillance.

- (1) Enhance tactical area security.
- (2) Isolate/segregate adversaries.

d. Attacking materiel support systems/infrastructure.

- (1) Weaken or change fuels and metals.
- (2) Disrupt utilities.
- (3) Defeat modern materials (composites, polymers, alloys).

Chapter 4

Doctrine, Training, Leader Development, Organizations, Materiel and Soldiers Implications.

4-1. Doctrine.

a. Proponency for the integration of nonlethal capabilities in Army operations has been established. The U.S. Army Infantry Center (USAIC) is proponent for nonlethal tactical applications and the U.S. Army Military Police School (USAMPS) is proponent for nonlethal law enforcement applications.

- b. Capabilities and functions which are widely used and generally accepted, and which are inherently nonlethal (e.g., classic electronic warfare (EW), psychological operations, smoke/obscurants, etc.) are described in current doctrine. Doctrinal revision to further describe current nonlethal applications may be required.
- c. Changes will be required in Army doctrine to incorporate future nonlethal capabilities. Changes in Army doctrine must include considerations of technology, resources, history and lessons learned, national policy and strategy, threats, international law, and the strategic, operational, and tactical implications of nonlethal capabilities.
- d. Nonlethal doctrine requires standard terminology. Accepted nonlethal terms must be defined in Army doctrinal literature.

4-2. Training.

- a. Training is a prerequisite for Army readiness to use nonlethal capabilities. Initially, training requirements may increase because of incorporation of nonlethal capabilities. These capabilities may incur training costs for implementation.
- b. The Army must train for use of nonlethal weapons on the battlefield. This training may require tactics, techniques, and procedures for identifying and reducing hazards associated with hostile and friendly use of nonlethal systems, weapons, and agents.
- c. The Army must conduct a comprehensive review of soldier training programs and identify nonlethal training requirements.
- d. This concept may impact training of units in local training areas, combat training centers, the Battle Command Training Program (BCTP), and the use of simulations. The use of nonlethal capabilities should be integrated into all appropriate battle simulations, command post exercises, and field training exercises throughout the Army.

4-3. Leader development. Army leaders must be educated about nonlethal technologies/capabilities and their integration and synchronization in Army operations. The leader development education systems (i.e., Officer, Noncommissioned Officer Education System, and Warrant Officer Education Systems) should include training in nonlethal capabilities.

4-4. Organizations.

- a. Adjustments may be needed in operational units to effectively employ nonlethal capabilities. For example, intelligence organizations may require augmentation to provide information and warning of adversary target susceptibilities as well as offensive capabilities. Special logistics and medical support organizations may be required.
- b. Specialized units or conventional units specially trained and augmented may be required for employment of some nonlethal capabilities.

4-5. Materiel.

- a. This concept suggests some nonlethal materiel requirements. Further cost and operational effectiveness analysis of nonlethal technologies is required. Operational suitability also must be a consideration in adoption of these technologies.
- b. Modeling, simulations, and other analytical tools are required to provide the basis for assessing the application of nonlethal capabilities in military operations. The acquisition of nonlethal capabilities will also require the development and integration of automation to support their application.
- c. The Army needs to determine vulnerabilities of fielded and developmental systems to adversary and friendly nonlethal attack or effects and develop necessary countermeasures, tactics, techniques, procedures, or shields.
- d. Numerous studies have been conducted that describe various types of nonlethal technologies and their potential application. At Appendix B is a list (not inclusive) of various technologies described in these studies.

4-6. Soldier support.

- a. To the maximum extent possible, nonlethal attack (offensive) capabilities and soldier/equipment protective materiel will be designed and fielded so as to be under the full control of the using soldier or the unit commander. This especially applies where the use of protective materiel imposes a burden or reduces or restricts the operational characteristics of protective equipment.
- b. Nonlethal capabilities and their countermeasures will not degrade soldiers' confidence and ability to perform their mission.
- c. Nonlethal capabilities require MANPRINT review (AR 602-2).
- d. Nonlethal capabilities require Health and Human Assessment for the user and the target personnel.
- e. The Army needs to determine the risk to soldiers using nonlethal technologies and develop/integrate necessary protective systems.
- f. The Army needs to determine vulnerabilities of developmental and fielded soldier systems to nonlethal attack and develop appropriate countermeasures.
- g. Environmental effects must be considered in employing some applications of nonlethal capabilities.

Appendix A

References

TRADOC Pamphlet 525-5
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Vomiting Agents	Chemicals that cause nausea/vomiting (e.g., DM).
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Strobe Lights	Large, high-intensity stroboscopic light to disorient and confuse personnel.
Stun Weapons	Family of weapons that subdues or immobilizes personnel.
Water Cannon	System that produces a high-pressure stream of water to disable or disburse crowds.

Optical Munitions	Family of explosive/electric flash devices to stun, dazzle, or temporarily blind.
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Entanglers/Containment Devices	Family of nets, meshes, and the like to ensnare.
Enclosure Fillers	Substance or devices that rapidly fill an enclosed space, leaving occupants alive but incapable of movement (e.g., airbags).
Aqueous Foams	Family of foams that impedes mobility and create barriers especially when mixed with irritants.
Deceptions	Techniques intended to persuade groups to act against their self-interest.
Holograms	Generator that produces holograms as decoys or deceptions.
Voice Synthesis/Morphing	Device to synthesize the voice or images of a known figure, to deceive, produce false orders, or gain access.
Markers	Family of substances that can be used to covertly mark personnel for later identification. Marking may be overt if so desired.
Obscurants	Family of smoke-like agents to obscure observation and disorient.

Material Effectors	Description
Special Electromagnetic Interference	Family of devices to provide electronic interference effects.
Binding Coatings	Family of adhesives that prevents movement of vehicles.
High-Voltage Shock	High-voltage generator to disrupt electronic systems.
Nonnuclear EMP	Device that duplicates the effects of nuclear weapons electromagnetic pulse, disrupting electronics.
Engine Killers	Family of agents that disables or destroys engines.
Filter Cloggers	Family of airborne agents that clogs air filters when ingested in engines.
Conductive Particles	Family of particles that short-circuits electronics when inserted.
Conductive Ribbons	Family of ribbons that short-circuits electronics when deployed over wires.
Fuel Additives/-Viscosifiers	Family of agents that cause fuel to solidify.
Radio Frequency	System that radiates a microwave burst, disabling electronics.
Obscurants	Family of smoke-like agents to obscure visual or electronic observation.
Optical Munitions	Explosive/electric flash device to stun, dazzle, or temporarily blind optical sensors.
Computer Moles/Worms	Family of programs that will burrow into enemy automation and report back various datum: status, location, etc.
Computer Viruses	Family of programs that will cause computers to malfunction.
Material Embrittlement	Family of substances that cause materials to quickly disintegrate or break down molecular bonding.
Optical Coatings	Family of materials that can be deposited on optical sensors or viewing ports to obscure vision.
Entanglers	Family of nets, meshes, and the like to ensnare vehicles.
Antitraction	Family of substances that causes lack of traction.
Soil Destabilization	Family of substances that causes soil to become soft or unstable, thus unusable by vehicles.
Tire Attack	Family of methods to destroy the tire/wheels of vehicles.
Supercorrosives/supercausti	Family of substances that corrodes structural materials such as metal.

cs	
Biodeterioration	Family of organic substances that corrodes structural materials or fuels.
Combustible Dispersants	Family of substances that ignites when subject to pressure from vehicles passing over.
Combustion Modifiers	Family of agents that causes mechanical failure when injected in combustion engines.
Antifriction	Family of substances that significantly reduce surface friction between mechanical components.
Adhesives/Abrasives	Substances that adhere to the surfaces of moving parts of machinery to damage them/prevent normal function.
Acoustic Waves	Acoustic waves beamed into systems, which rely on acoustic sensors, to spool the system.

Appendix C

International Agreements and DOD and Joint Staff Policy

C-1. International Agreements. International treaties and agreements are intended to limit the proliferation and use of certain types of capabilities, in particular nuclear, biological, and chemical weapons. They also limit use of electromagnetic technology to interfere with peacetime communications. This Concept does not propose to violate international treaty or agreements to which the United States is a party and will be subject to treaties and other agreements to which the United States may become a party. Principal treaties or international agreements to which the United States is a party or signatory that may affect potential Army nonlethal capabilities are summarized below (in chronological order).

a. Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare of 17 June 1925 ("Geneva Protocol"). The Geneva Protocol limits use (but not possession) of chemical or biological weapons. The U.S. understands this to limit first use only of lethal or incapacitating chemical weapons; In 1969 the U.S. unilaterally renounced all methods of bacteriological (biological) warfare. (This renunciation subsequently was codified in the 1972 Biological Weapons Convention, discussed *infra*). At the time of U.S. ratification of the Geneva Protocol, the U.S. renounced first use of riot control agents or herbicides in war except in defensive military modes to save lives; this policy remains in effect in Executive Order 11850 notwithstanding U.S. signature of the 1993 Chemical Weapons Convention, discussed *infra*. Consistent with this policy, riot control agents have been authorized for use in recent operations such as Somalia and Haiti.

b. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction of 10 April 1972 ("BW Convention"). This convention avows "never in any circumstances to develop, produce, stockpile or otherwise acquire or retain...microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purpose, [or] weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict." No distinction is made with regard to the lethal or nonlethal intent of the user.

c. Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques of 18 May 1977 ("ENMOD Convention"). This convention regulates use of environmental modification as a method of war, prohibiting such use only where it has effects as a means of destruction that are "widespread, long-lasting or severe." (Those terms are defined in the Understanding regarding the convention.)

d. Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction of 13 January 1993 ("CWC"). The CWC prohibits "under any circumstances" the development, production or other acquisition, stockpiling or retention of chemical weapons. While chemical weapons are defined as those "specifically designed to cause death or other harm" and "any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans and animals," the intent was to prohibit the use of chemicals for antipersonnel or antimaterial purposes. The CWC also prohibits the use of riot control agents (RCA) as a "method of warfare." Although the Clinton Administration has suggested that this would limit the use of RCA where combatants are present, Executive Order 11850 remains in effect (permitting use of RCA against combatants in defensive missions to save lives, such as combat search and rescue), pending Senate advice and consent to U.S. ratification.

C-2. Policy. National, Joint, and Army policy is the controlling factor in the Army capability to conduct nonlethal operations. Civil and military policy guidance is a continuous process which permits or restricts the amount and type of force available for use, if and how it can be used, the types of operations which may be conducted at any given time, as well as the tactics, techniques, procedures, and materiel which may be employed. Policy influences all RDA, DTLOMS, funding, fielding, and use of military nonlethal capabilities. Although organizations developing DTLOMS, and soldiers using capabilities are usually remote from policy decisions, awareness of policy considerations is necessary.

a. DoD and Joint Chiefs of Staff Policy.

(1) U.S. policy is that all new weapons or weapons systems are reviewed by The Judge Advocate General for compliance with the laws of war and other obligations IAW DoD Instruction 5500.16 and AR 27-53. The use of nonlethal capabilities is subject to the same legal constraints as lethal force, and nonlethal capabilities must undergo the same legal review whether those capabilities are to be used in international armed conflict or other military operations.

(2) Nonlethal capabilities must meet legal standards. They must show military necessity, must be able to be used proportionately, and must not result in unnecessary suffering.

b. Army Guidance. Some Army operational nonlethal guidance is published in Army Regulations (AR). Examples are:

(1) Carrying Firearms and Use of Force for Law Enforcement and Security Duties (AR 190-14). This discussion of "deadly force" contains the most extensive Army treatment of nonlethal force policy.

(2) Civil Disturbance (AR 350-7).

(3) Disturbances on Military Installations (AR 190-52).

Glossary

Section I

Abbreviations

DTLOMS - doctrine, training, leader development, organizations, materiel, and soldier support

EW - electronic warfare

IW - information warfare

IPB - intelligence preparation of the battlefield

MANPRINT - manpower and personnel integration

MOUT - military operations in urban terrain

NCA - National Command Authority

ROE - rules of engagement

Section II

Terms

Battle command

The art of battle decision making, leading, and motivating soldiers and their organizations into action to accomplish missions. Includes visualizing current state and desired future states and then formulating concepts of operations to get from one to the other at least cost.

Collateral damage

Incidental damage as a consequence of military operations that is beyond the necessary damage to accomplish a desired effect to meet military objectives or accomplish a mission.

Electronic warfare (EW)

Military action involving the use of electromagnetic or directed energy, with the exception of lasers, to attack an enemy's capability; protection of friendly capability against EW effects; and, surveillance of the electromagnetic spectrum for threat recognition in support of electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing.

Information Warfare

Actions taken to preserve the integrity of one's own information system from exploitation, to corrupt or destroy an adversary's information system, and in the process, to achieve an information advantage in the application of force.

Nonlethal

Not made to cause death; not intentionally deadly; a term used broadly to describe capabilities which affect targets, temporarily or permanently, without intentionally causing death to personnel or without unnecessary destruction or environmental damage.

Nonlethal capabilities

Capabilities employed with the intent to compel or deter adversaries by acting on human capabilities or materiel while minimizing killing and destruction of equipment or facilities.

Nonlethal Weapons

Nonlethal weapons are discriminate weapons that are explicitly designed and employed so as to incapacitate personnel or materiel, while minimizing fatalities and undesired damage to property and the environment. (DOD draft policy letter)

- a. Nonlethal. Not made to cause death; not intentionally deadly; a term used broadly to describe capabilities which temporarily affect targets without intentionally causing death to personnel and without unnecessary materiel destruction or environmental damage.
- b. Nonlethal capabilities. Capabilities employed with the intent to compel or deter adversaries by acting on human vulnerabilities or materiel while minimizing damage to equipment or facilities. (See Appendix B for a list of nonlethal technologies).
- c. Nonlethal weapons (Draft DOD Policy Directive for Non-lethal Weapons). Weapons that are explicitly designed and employed so as to incapacitate personnel or equipment, while minimizing fatalities and undesired damage to property and the environment. Nonlethal weapons have one or more of the following characteristics:
 - (1) Use means other than gross physical destruction to prevent the target from functioning.
 - (2) Have relatively reversible effects.
 - (3) Discriminate between targets and nontargets.

NOTE: The term "nonlethal capabilities" encompasses "nonlethal weapons" as defined above. While the DOD Policy Directive for Non-lethal Weapons and definition apply only to those systems designed specifically to be nonlethal, this concept addresses some existing capabilities that are not explicitly designed as nonlethal capabilities, but can be employed in specific situations to create "nonlethal" effects to achieve the commander's intent (e.g., use of electronic warfare jammers to negate command and control capabilities). This does not imply a discrepancy between the two documents. The concept is broader in scope because in addition to guiding development of new technologies or materiel, the concept serves as basis for developing doctrine, training, leader development and organizations that can provide commanders nonlethal options when lethal means may not be appropriate.

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