Improving the Prospects for Future International Peace Operations: Workshop Proceedings

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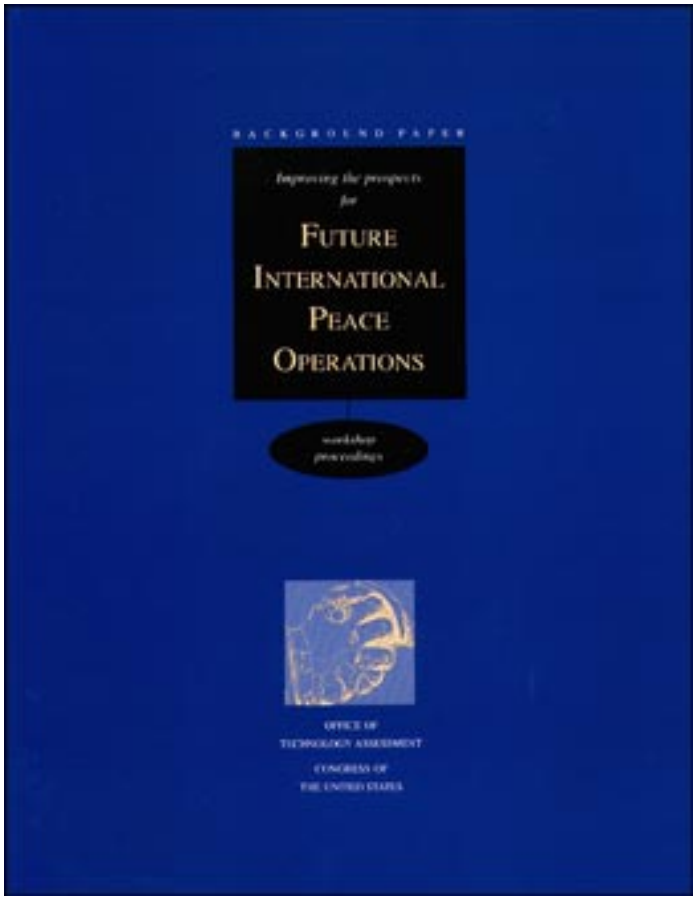

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Foreword

The years following the collapse of the Soviet Union and the consequent end of the Cold War have seen a rapid expansion in both the number and scope of international peace operations. Most of these endeavors have been carried out under the aegis of the United Nations, although there are some notable exceptions. Many of these operations have been of the traditional peacekeeping type, in which a truce, to which all parties agree, is maintained by the international force whose presence is accepted by all sides (e.g., Cyprus, Multinational Force and Observers in the Sinai). However, there has been an increasing tendency of these operations to go well beyond this traditional mold. In these operations, there may be an inclination for the international force to be caught up in processes that go well beyond maintaining a cease-fire or promoting a peace settlement. Unfortunately, as the scope of these interventions has increased, the United Nations has been unable to keep up with all the demands that they present. Severe setbacks in Somalia and Bosnia have demonstrated glaring weaknesses in its responses. Difficulties have been in part due to a scarcity of resources and a major increase in the number of operations to deal with. But another overriding problem has been an incoherence of organization, planning, doctrine, and policy on the part of the international body.

In 1994, the Office of Technology Assessment was asked by the House Armed Services Committee and by members of the Senate Armed Services Committee to examine the role that technology could play in improving the prospects for international peace operations. In June 1995, OTA convened a workshop that brought together some of the world's leading practitioners, academic experts, experienced diplomats, and leading technologists in order to study and discuss this issue.

This report contains a summary of the results of the workshop, along with the original papers presented. The chief conclusions are that the main problems with past peace operations have been political in nature. The participants suggested a number of means to deal with these issues, which are reported here, with the understanding that they reflect not OTA conclusions, but a consensus among these individuals. Further, most participants agreed that, although political and policy issues play a primary role in determining the performance of peace operations, the proper application of technologies, both new and old, can add significantly to the prospects of success for an operation, should one be initiated. Technological contributions can be made in the areas of sensors (especially for monitoring in the more traditional types of peacekeeping operations), intelligence gathering, communications, data fusion, countersniping technologies, mine clearance, and crowd control. Some technologies are well in hand, and others are being rapidly developed and may be available in a very few years. The use of several options among the less-than-lethal weapon categories may be quite effective, but will require some consideration of policy issues to determine a) compatibility with current or future international treaties and b) the vulnerability of U.S. forces to such weapons, if used against them.

ROGER C. HERDMAN
Director

Workshop Participants

M. Gen. John O. B. Sewall, USA, (ret.)
Chairman
Deputy Director
Institute for Strategic Studies
National Defense University

Juergen Altmann
Professor
Institut Für Experimentalphysik III
Ruhr-Universitaet
Bochum, Germany

Gilles Courregelongue
Defense Conseil International
Paris, France

Milton Finger
Deputy Assistant Director
Lawrence Livermore National Laboratory

Scott Gudgeon
Deputy Director
Multinational Force and Observers—Sinai
Rome, Italy

Virginia Gamba
United Nations Institute of Disarmament Research
Geneva, Switzerland

Lt. Col. Damien Healy
Staff Officer
Ministry of Defence
Australia

Adm. Jonathan Howe, USN (ret.)
Associate Director
Arthur Vining Davis Foundation

Dennis McLean
U.S. Institute of Peace

Lt. Gen. Satish Nambiar, Indian Army, (ret.)
Uttar Pradesh, India

General Sir David Ramsbotham, GCB CBE
British Army, (ret.)
London, United Kingdom

Lt. Col. Alan Roland-Price
Land Warfare Directorate
Ministry of Defence
United Kingdom

Steve Simon
National Security Council

Brig. Gen. Tryggve Tellesfen
Norway Defence Command
Oslo, Norway

Susan Woodward
Senior Fellow
Brookings Institution

Gerald Yonas
Vice President
Sandia National Laboratories

Prof. Mario Zucconi
Centro Studi di Politica Internazionale
Rome, Italy
&
University of Urbino
Urbino, Italy

Project Staff

Peter Blair
Assistant Director, OTA
Energy, Materials, and International Security Division

Alan Shaw
Program Director
International Security and Space

Anthony Fainberg
Project Director

Dean Cheng
Analyst

Xavier Maruyama
Detailee

CONTRACTORS

Alex Gliksman

Ivars Gutmanis

Lafayette Group

Thomas Neill

Mimi Turnbull

ADMINISTRATIVE STAFF

Jacqueline R. Boykin

Nathaniel E. Lewis

Donald Gallagher

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Non-Lethal Weapons: A Synopsis

13

by

Lt. Col. Alan Roland-Price
Directorate General, Development and Doctrine, Ministry of Defence, United Kingdom

PURPOSE

There has been much publicity regarding the development of non-lethal technologies and the deployment and use of non-lethal weapons (NLW). The purpose of this paper therefore is to examine the concept and utility of NLW in order to inform those involved with Force Development or the sponsoring and directing of research into non-lethal technologies.

The paper will not consider low-level tactical procedures nor the rules for the use of NLW. It will however discuss some of the legal implications of their employment.

AIM

The aim of the paper is to examine the concept and utility of NLW in order to determine their place in (Land Warfare) operations.

BACKGROUND

The ending of the Cold War has left a security environment that is both dangerous and uncertain. The absence of the stability that rested substantially on the nuclear balance has created conditions in which new and diverse threats to international peace and order can flourish. Arms proliferation has reached the point where the developing nations are increasingly acquiring sophisticated weapons, thus providing a new, lethal dimension to

Note: This paper has not yet been approved by the Ministry of Defence as a formal document, and should not be considered an authorized statement of position by that body or by any of its components.

ancient conflicts and schisms. Ethnic and religious disputes coupled with population and resource pressures will continue to generate tensions, but, without super-power restraint the potential for hostilities seems set to grow. More will be expected of the UN and other coalition forces to resolve such conflicts, disputes and tensions.

While the security environment is such that there is an increased likelihood of the measured use of force, there is also a political and public expectation, enhanced by the Gulf War, that when force is used, it will no longer result in high casualties and extensive collateral damage.

The view that force can now be used with few casualties and little collateral damage is enhanced by the increasing capability of modern weapon systems. Not only can these systems deliver a highly destructive capability at long range and with great precision, but there is now the possibility of denying the enemy many of his goals without inflicting large numbers of casualties. These latter systems, known generically as NLW, are designed either to temporarily immobilize or otherwise influence the enemy or to render his equipment useless for the tasks they were designed to do.

The use of NLW is not new. Weapons such as water cannons, rubber bullets, CS gas, stun grenades, and electronic jammers have been used throughout the world for a number of years in situations where the use of lethal weapons would be inappropriate. What is new and has enhanced the importance of NLW, is not only the increasing number and type of military operations being undertaken, many of which fall short of actual warfighting, but also their high visibility. The public, and hence political, concern for casualties among the combatants and civilian population have increased interest in the potential for NLW. The potential lies in the expectation that NLW can provide armed forces with a more appropriate, less than lethal response when required. The public expectation has been fueled by the increasingly high profile, some might say exotic, non-lethal technologies considered in the media.

DEFINITION AND CLASSIFICATION

NLW will increase the military options available to commanders, thereby allowing them to apply a graduated measure of force. The options available will include, at the lower end of the lethality scale, the use of NLW. Conflicts may involve NLW, but armed forces will always deploy with lethal force which may or may not be used. No conflict will be limited to a specific level of lethality and NLW will always contribute to the application of military force as part of an already existing spectrum of force. It is therefore wrong to talk about NLW in isolation or to suggest that they give rise to non-lethal wars. The term "non-lethal warfare" is therefore unspecific and is not used further in this paper.

The purpose of NLW is to allow military or political objectives to be achieved while causing the minimum possible harm to personnel and the environment. While this purpose is reasonably noncontentious, there is no agreed definition either within NATO or the United Kingdom. The Defence Scientific Advisory Council (DSAC) Sub-Committee established to examine the potential of NLW defines them as, "Discriminate weapons that are explicitly designed and employed so as to incapacitate[1] personnel or materiel, while minimizing fatalities and undesired damage to property and the environment."

While there are other definitions,[2] this is felt to be the most appropriate as it encapsulates the view that such systems can be targeted against individuals or equipment while minimizing, but not excluding, fatalities and collateral damage.

[1] To render incapable or unfit. Oxford English Dictionary.

[2] Further definitions include: a. Weapons that disrupt, destroy or otherwise degrade functioning of threat materiel or personnel without crossing the "death barrier," John Alexander, 1993, Los Alamos National Laboratories; b. Instruments used in combat which are designed to achieve the same tactical and strategic ends as lethal weapons but which are not intended to kill personnel or inflict catastrophic damage to equipment. Office of Secretary for Defence, 1991.

The use of the term "non-lethal" is misleading. There is a risk that the employment of NLW can be lethal, for example rubber bullets in Northern Ireland. For this reason, there have been suggestions that the term NLW should be renamed to, reduced, low or limited lethality weapons. Despite the terminology, NLW enhance the ability of forces to conduct their missions successfully with minimum casualties and little collateral and environmental damage.

The categorization of NLW can be difficult, depending upon the interpretation given to the definition used. For example, the precision offered by a cruise missile can limit collateral damage and the bombing of a runway can prevent future attack from the air, therefore by definition, both weapon systems could be classed as non-lethal. For simplicity, NLW can be categorized into those that are designed to impair or immobilize people or equipment:

People. Systems Targeted against personnel include:

1. **Psychological Operations (PSYOPS).** PSYOPS aim to influence attitudes and behavior, thereby affecting the achievement of military objectives. They have the potential to damage enemy C2 by lowering morale, instilling fear and breeding distrust.
2. **Acoustics.** Sound, whether it be audible or inaudible (infra- and ultra-sound) can be used to immobilize individuals or disperse crowds by causing discomfort, disorientation and nausea.
3. **Visual stimulus and illusion (VSI).** VSI uses high-intensity strobe, lighting and holography to cause temporary vertigo, disorientation, and nausea.
4. **Lasers, incapacitants and irritants.** Low energy (dazzle) lasers, incapacitants (i.e., stun grenades) and irritants (i.e., CS gas) are used to temporarily blind, dazzle, immobilize or disorient individuals.

Equipment and Materiel. Systems targeted against equipment and materiel include those designed to impair or prevent mobility, neutralize weapons, exploit, or disrupt communications or degrade the infrastructure. Such systems include:

1. Sensor damage lasers targeted against weapon system optics to prevent mobility and target acquisition.
2. Metal embrittlement, polymer and super adhesive agents to disable mechanical linkages and alter material properties causing general equipment and weapon failure.
3. Radio frequency weapons (RFW) to cause electronic disruption or failure ignition systems, communications, radars, computers and navigation aids.
4. Conductive ribbons to short circuit power lines, fuel additives to contaminate fuel supplies and the introduction of computer viruses to disrupt communication and economic centers.

A list of the technologies associated with NLW is in table 13-1 together with, as a result of some technology wargaming, their possible uses and disadvantages.

UTILITY

A major opportunity now exists to exploit the potential offered by non-lethal technologies in the development of affordable weaponry that can disable, disrupt, or destroy an enemy's capability without causing excessive casualties, property destruction or widespread environmental damage.

NLW will complement lethal weapons, especially in UN peacekeeping operations where a military response with something less than lethal force may be more appropriate. In such circumstances, proportionality is fundamental to maintaining consent. However, if the utility of NLW weapons were limited to peacekeeping operations, their potential would be unlikely to warrant the expense of their research, development, and procurement. Ideally, NLW will therefore need to be multi-roled, have utility across a wide spectrum of different operations and have the potential for dual (civil/military) use.

NLW will not replace other more lethal weapon systems nor will they cause a shift in the

TABLE 13-1: The Utility of Non-Lethal Weapon Technologies Across the Spectrum of Conflict

	Spectrum		
Level	**Peace**	**OOTW (Bosnia)**	**War**
Strategic (To deter or degrade the use of military power)	Psyops Voice synthesis Computer viruses Conductive ribbons	Psyops Voice synthesis Computer viruses Material embrittlement	Psyops Voice synthesis Computer viruses Conductive ribbons Biodeterioration
Operational (To degrade or defeat military forces)	Psyops Voice synthesis	Psyops Super-corrosives Super-adhesives HPM Material embrittlement Soil destabilization Combustion modifier	Psyops Anti-friction agents Super-adhesives HPM Material embrittlement Soil destabilization Combustion modifier All lasers EW Fuel additives
Tactical (To defeat or destroy the enemy's warfighting capability)	Psyops Infra & ultra-sound Noise/odors/lights Stun weapons HPM Low energy lasers Enclosure filler & foams	Psyops Infra & ultra-sound Noise/odors/lights Stun weapons HPM Low energy lasers Tire attack	Psyops All lasers Anti-traction agents Obscurants Optical coatings Tire attack

SOURCE: Alan Roland-Price, 1995.

way wars are fought. If deployed in accordance with the principles of proportionality and target discrimination, they will complement other weapon systems to give significant political, strategic, operational and tactical advantages in the conduct of military operations. An example of the utility of some NLW across the spectrum of conflict and at each level of command is in table 13-2.

In order to maximize the potential of NLW, these weapons must be employed in such a manner as to provide a gradual increase in capability. This can be achieved either by using NLW on their own provided there is recourse to lethal weapons or by using them to complement more lethal systems. Both cases enable land forces to react to situations with a greater degree of credibility and flexibility than has hitherto been possible.

Additionally, NLW offer certain advantages in their role as anti-mobility or anti-equipment weapons—especially in reducing injuries to personnel. Potential applications are listed in table 13-3.

TYPES OF FORCES THAT MIGHT BE EQUIPPED

There are three fundamental approaches that need to be examined when considering the types of forces that might be equipped with NLW. These are:

- The formation of dedicated units.
- The issue and use of NLW for specific operations only.
- Full integration.

Formation of dedicated units. The first approach would involve the formation of dedicated units trained in the whole spectrum of

TABLE 13-2: Uses and Disadvantages of Anti-Personnel Non-Lethal Weapon Technologies Across the Spectrum of Conflict

No.	Technology	Description	Uses	Disadvantages
P1 (M18)	Infra/ultra sound	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel; handheld or vehicle mounted	Crowds	Fratricide, injury, seizures
P2	Noise	Acoustic generator that produces sufficient sound to disorient or incapacitate personnel; vehicle mounted system	Crowds	Fratricide
P3	Chemicals	Family of chemical agents that incapacitate personnel; artillery, airborne, vehicle mounted or hand delivery	Terrorists, crowds	Fratricide, injuries, legality, environment
P4	Odors/nausea	Family of agents with pungent odors that cause discomfort to personnel; airborne, vehicle mounted or handheld delivery	Terrorists, crowds	Fratricide, legality, environment
P5	Biologicals	Family of biological agents with temporary effects; artillery, airborne, vehicle mounted or handheld delivery	Terrorists	Fratricide, legality, environment
P6	Non-penetrating projectiles	Family of projectiles that stun personnel without penetrating; handheld delivery	Terrorists, crowds	Injury
P7	Strobe lights	Large, high intensity stroboscope lights that disorient and confuse personnel	Crowds	Fratricide, seizures
P8	Stun weapons	Family of weapons that subdue or immobilize personnel; handheld weapon	Terrorists	Injury
P9	Water cannon	System that produces a high-pressure stream of water to disable or disperse crowds; vehicle mounted	Crowds	Injury
P10 (M11)	High-power microwave	System that produces microwave radiation, disorienting personnel; airborne, vehicle mounted or artillery delivery	Terrorists, soldiers	Fratricide, injury
P11 (M13)	Low-energy lasers	Laser device to flash blind personnel; vehicle mounted or handheld	Terrorists, soldiers	Injuries
P12	Optical munitions	Family of explosive flash devises to stun, dazzle, temporarily blind; artillery or handheld delivery	Terrorists, soldiers	Injury
P13 (M2)	Super adhesives & binding coatings	Family of adhesives that prevent movement of personnel; artillery, airborne, or vehicle mounted delivery	Terrorists, crowds, soldiers	Injury, environment
P14	Anti-traction compounds	Family of substances that cause lack of traction for personnel; artillery, airborne, or vehicle mounted delivery	Terrorists, crowds, soldiers	Environment
P15 (M25)	Combustible dispersants	Family of substance that ignite when subject to pressure from personnel passing over; artillery or airborne delivery	Terrorists	Injury, environment

(Continued)

TABLE 13-2: Uses and Disadvantages of Anti-Personnel Non-Lethal Weapon Technologies Across the Spectrum of Conflict (Cont'd.)

P16	Containment devices	Family of nets, meshes and the like to ensnare; airborne, vehicle mounted or handheld delivery	Terrorists, crowds, soldiers	None
P17 (M19)	Entanglers	Family of nets, meshes and the like to ensnare; airborne, vehicle mounted or handheld delivery	Terrorists, crowds, soldiers	None
P18	Enclosure filters	Substances that fills an enclosed space, leaving occupants alive, but incapable of movement; static system	Terrorists	Fratricide
P19	Foams	Family of foam that can impede mobility or create barriers; airborne or vehicle mounted	Terrorists, crowds	None
P20	Deceptions	Techniques intended to persuade groups to act against their self-interests	Terrorists, crowds, soldiers	None
P21	Holograms	Generators that produce holograms as decoys or deceptions; vehicle mounted	Terrorists, crowds, soldiers	None
P22	Indigenous vulnerabilities	Techniques for capitolizing on the ethnic or religious beliefs of a group or society	Terrorists, crowds, soldiers	None
P23 (M27)	Voice synthesis	Device to synthesize the voice of a known figure, to deceive the public or to produce false orders	Terrorists, crowds, soldiers	None
P24	Markers	Family of substances that can be used to covertly mark personnel for later identification; handheld delivery	Crowds	Environment
P25 (M12)	Obscurants	Family of smoke-like agents to obscure observation and disorient; vehicle mounted, airborne, or artillery delvered	Terrorists, crowds	None

KEY
1. Uses
Crowds: Dispersing crowds
Soldiers: Affecting soldiers in conventional wars
Terrorists: Subduing terrorists, rescuing hostages
Can also affect aircraft, computers, electronics, infrastructure, munitions, vehicle mobility, power generation and sensors
2. Disadvantages:
Environment: Possible permanent damage to environment
Fratricide: Possible effects on friendly forces, neutrals, or operator
Injury: Possible permanent injury of death
Legality: Possible treaty violation
Seizures: Possible seizures in epileptics

SOURCE: Alan Roland-Price, 1985.

NLW. While this option ensures NLW are kept in the hands of the experts, there are disadvantages:

a. The formation of such units, unless achieved at the expense of current manpower used as compensating reductions, would require substantial enhancements. In the current financial climate, this would be unlikely.
b. The formation of specialized units would mean that NLW and their use would become a "black art," the skills being known to a few specialists only.

TABLE 13-3: Uses and Disadvantages of Anti-Materiel Non-Lethal Weapon Technologies Across the Spectrum of Conflict

No.	Technology	Description	Uses	Disadvantages
M1	Electro-magnetic interference	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel; hand-held or vehicle mounted	Electronics, sensors, munitions	Fratricide
M2 (P13)	Bindings coatings	Family of adhesives that prevent movement of vehicles; artillery, airborne, or vehicle-mounted delivery	Mobility	Environment
M3	High-voltage shock	High-voltage generator to disrupt electronic systems; artillery, airborne, hand-held, or vehicle-mounted delivery	Electronics	Injury
M4	Non-nuclear EMP	Device that duplicates the effects of electro-magnetic pulses, disrupting electronics; artillery or vehicle-mounted delivery	Electronics, sensors, computers	Fratricide
M5	NOT USED			
M6	Engine killer projectiles	Family of agents that disable or destroy engines; hand-held or airborne delivery	Mobility, power	None
M7	Filter cloggers	Family of airborne agents that clog air filters when ingested in engines; artillery or airborne delivery	Mobility, power	Fratricide
M8	Conductive particles	Family of particles that short-circuit electronics when inserted; hand-held, artillery, or airborne delivery	Electronics, powers, computers	Fraticide, environment
M9	Conductive ribbons	Family of ribbons that short-circuit electronics when deployed over wires; hand-held, artillery, or vehicle-mounted delivery	Power, infrastructure	None
M10	Fuel additives/ viscosifier	Family of agents that cause a fuel to solidify; handheld or covert delivery	Mobility, power	None
M11 (P10)	High-power microwave	System that radiates a microwave burst, disabling electronics; airborne, artillery, or vehicle-mounted delivery	Electronics, sensors, aircraft	Fratricide

(Continued)

TABLE 13-3: Uses and Disadvantages of Anti-Materiel Non-Lethal Weapon Technologies Across the Spectrum of Conflict (Cont'd.)

M12 (P25)	Obscurants	Family of smoke-like agents to obscure visiual or electronic observation; airborne, artillery, or vehicle-mounted delivery	Sensors	None
M13 (P11)	High-energy lasers	Laser device to destroy optical sensors and navigation devices; airborne or vehicle-mounted weapon	Sensors	Injury
M14	Optical munition	Explosive flash device to stun, dazzle, temporarily blind optical sensors; hand-held or artillery delivery	Sensors	Fratricide
M15	Computer viruses	Family of programs that will cause computers to malfunction; handheld or covert delivery	Computers	None
M16	Materiel embrittlement	Family of substances that cause materials to quickly disintegrate; hand-held or artillery delivery	Mobility, infrastructure	Injury, environment
M17	Optical coatings	Family of materials that can be deposited on optical sensors or viewing ports to obscure vision; hand-held delivery	Sensors	None
M18 (P1)	Infra/ultra sound	Sonic generator that projects a low/high frequency acoustic beam to damage electronics; vehicle-mounted system	Electronics	Fratricide
M19 (P17)	Entanglers	Family of nets, meshes, and the like to ensnare vehicles; hand-held, airborne, or vehicle-mounted delivery	Mobility	None
M20	Anti-traction	Family of substances that cause a lack of traction; hand-held, artillery, airborne, or vehicle-mounted delivery	Mobility	Environment

SOURCE: Alan Roland-Price, 1995.

c. There are too many different types of NLW for dedicated units to be trained in them all.
d. New weapon systems should be made to suit the requirements of the user rather than the user having to be specially trained to meet the requirements of the weapon.

Use for specific operations only. The second option is for NLW to be retained for specific operations only, with units being trained in their use before deployment. This option would limit the utility of NLW to a specific role or purpose (as is the case with baton rounds for Northern Ireland) instead of using them to their maximum

potential across the spectrum of conflict. Their procurement could therefore be less cost-effective.

Full integration. This third option involves the full integration of NLW into the armories, of land forces. As NLW have such a wide variety of uses and capabilities across the spectrum of conflict, all forces will need to be equipped and trained to use a number of them depending upon:

a. **Corps, regiment, or specialty.** For example, signallers and communicators might use EW, jammers and microwaves; engineers might use anti-traction agents and agents to degrade infrastructures; military police might use calmative agents; and armored personnel might use laser adjuncts.
b. **The role and task of the unit.** Units, involved in crowd control will use personnel denial or disabling weapons; special forces in high-jacking situations may use acoustics, strobe or stunning agents; units deployed on counterterrorism operations may use PSYOPS; reconnaissance units may need to disable enemy vehicles quickly and silently; maneuver units may want to craze enemy optics and sights with DEW.

Full integration would inevitably involve sortie minor organizational changes. It would, for example, be necessary to integrate NLW into the command and control warfare (C^2W) cell within the headquarters command staff. It may also be necessary to enhance logistics units to cater for the additional burden of transportation, handling, storage, maintenance, and environmental control; medical units to treat specialized physiological and psychological effects; and gunnery units to provide the essential means of delivery.

Selected Option. It is recommended that U.K. land forces select the third option, full integration. Only by such integration will the full potential of NLW be realized, across the entire spectrum of conflict.

AN APPROACH TO USING NLW

If NLW are to be fully integrated with lethal systems, then the procedures associated with their use must be similar. There are four distinct phases.

Planning

- Three key factors in the planning phase are the need for Rules of Engagement (ROE), the requirement for detailed real-time intelligence, and the need for a carefully thought out media plan, especially in Operations Other Than War (OOTW). All three factors are necessary when planning lethal operations, but with NLW additional ROE are required to control their use below the lethal threshold. In addition, information/intelligence on the target may be more difficult to acquire (susceptibilities and vulnerabilities) so it will need careful management. A well rehearsed media plan is essential.
- Planning the use of NLW can be more complex than for lethal weapons because, in some situations, the enemy has to know that the weapon being delivered is non-lethal. It is, for example, pointless aiming a gun at the enemy to fire a NLW if the enemy perceives you to be firing a lethal weapon and responds accordingly. The dilemma therefore is whether or not to inform the enemy of your intent.

Means of Delivery

As with lethal systems, the means of delivery for NLW will be dependent upon the threat and the delivery assets available. However, as the purpose of NLW is to limit the number of casualties and collateral damage, it is likely that the use of robotics and unmanned vehicles (both air and ground) as a means of delivery will play an increasingly important role because—by separating the man from the weapons platform—they protect him from enemy lethal and non-lethal weapons.

Method of Employment

Some NLW could become an important element in C^2W, particularly PSYOPS to manipulate the perceptions of adversaries, allies and the public; to prevent the misinterpretation of NLW as lethal operations and to prevent adversaries from esca-

lating the level of violence accidentally through misunderstanding. While it is important for the enemy to understand that NLW may be used against him, such knowledge will inevitably mean that operational surprise is sacrificed. However, surprise at the tactical level can still be retained provided the tactical commander is given the authority and responsibility for determining the level of force and lethality to be used in response to a given situation. In making his choice, the commander will have to consider the need to minimize casualties and collateral damage on the one hand with the need to be decisive and persuasive on the other. However, the availability of NLW does not imply that such weapons must be used first, before the use of lethal weapons nor does it negate the right of soldiers to protect themselves or others with lethal force.

As with other weapon systems, NLW are most effective when used in synergy with other NLW or with more lethal systems. The synergistic use of such weapons can also provide simultaneity to overwhelm and confuse the enemy—an important function in the conduct of maneuver warfare. Although NLW can facilitate maneuver and augment and intensify the synergistic effects of combined arms, there is an ever present need to employ countermeasures. Many NLW use off-the-shelf technology, so their use by or proliferation to enemy forces must be expected.

Verification

There is a need for high confidence levels in the effectiveness of NLW when the consequences of their use are not materially visible. Not only is this important in order to assess their effectiveness, but also to counter enemy propaganda. This may require new techniques in Battle Damage Assessment.

FACTORS AND PRINCIPLES GOVERNING NLW USE

There are a number of factors that influence the principles governing the use of NLW. These are:

a. **Political.** The perception that military force can be used with few casualties may make the future use of force more acceptable as an instrument of government policy. It could therefore be argued that force might be used more frequently to resolve disputes and conflicts.

b. **Ecological and military.** Pressures to minimize damage to property and the environment will place emphasis on the need to seek a quick military solution, preferably before mobilization although such pre-emptive action may not be acceptable politically. The use of PSYOPS, EW and systems that degrade the infrastructure and prevent mobilization will play a prominent role in seeking such a solution.

c. **Media.** The ability of the media to influence public opinion emphasizes the importance of a clear media plan relating to the use of NLW.

d. **Legal**

- Current international conventions[3] and treaties could inhibit the use of some NLW. For example, the Chemical Weapons Convention prohibits the use of Riot Control Agents in war, but permits their use in OOTW—including peacekeeping, counterterrorism, and law enforcement. If such weapons are permitted in OOTW, then arguably they should be permitted in regional conflict and war; but clearly caveats would need to be incorporated to limit their use, toxicity and effect.
- Another legal issue that will require careful consideration before NLW are used is the matter of litigation resulting from the physical or psychological effects of their use. Such litigation may take years to surface as the long term effects of many non-lethal systems are unknown.

e. **Ethical.** The development and employment of NLW has an ethical dimension whose consequences must be carefully considered. This will include the definition of acceptability with regard to the extent to which a human

[3] Article 23(e) 1907 Hague Convention IV; Article 1 1972 Convention on Bacteriological and Toxin Weapons; The Chemical Weapons Convention 1993; Environmental Modification Treaty.

being can be "Incapacitated" through the use of NLW and the moral issue that arises from any decision not to use NLW. Clearly the use and effects of NLW must be acceptable nationally, militarily, and individually.

PRINCIPLES

The following principles give guidance for the employment of NLW:

a. NLW can either be used alone, provided they are backed by the political will to deploy and use lethal force, or as an adjunct to lethal weapons. Their use must be controlled by ROE and must not be allowed to jeopardize the right of soldiers to defend themselves with lethal force.
b. The employment of NLW must be consistent with current Treaties, Conventions, international and domestic laws. Their use must also be morally and ethically justifiable.
c. NLW must be used proportionately (the least destructive way of defeating the enemy) and discriminately (the protection of non-combatants from direct intentional attack).
d. NLW must be fully integrated with lethal weapons in order to provide a graduated response based upon the use of minimum force.
e. NLW must not be deployed without consideration to countermeasures, including the hardening and protection of our own systems.

SELECTION OF NON-LETHAL TECHNOLOGIES

The principles that govern the use of NLW give an indication as to which non-lethal technologies have military potential. Criteria that will influence the future development of such technologies will include:

a. **Acceptability.** Non-lethal technologies that contravene current legislation or whose use may be morally or ethically unjustifiable will have little military potential.
b. **Doctrine.** A maneuverist approach to warfighting dictates that future research into non-lethal technologies should be directed towards seeking and disabling or disrupting the enemy's vulnerabilities. These will include his C^3 assets, logistic supplies, his cohesion and will to fight. In OOTW, the use of all (both lethal and non-lethal) weapons will be dictated by the constraints of either domestic law, ethics or mandates. Those non-lethal technologies that permit operations to be conducted within such constraints will have military potential.
c. **Utility.** Unless cheap to procure, NLW will need to be either multi-roled or have utility in more than one specific scenario. Ideally, they should have utility across the spectrum of conflict. Those NLW systems with specific or limited utility are unlikely to have the military potential for further development.
d. **Affordability and technical risk.** Non-lethal technologies that attract low research and development costs or are cheap to procure and support will be more attractive and possibly more, cost-effective than those that carry a high degree of technological risk or are expensive to procure.

INTEROPERABILITY

The future use of force across the spectrum of conflict is likely to be both joint and combined. NLW should therefore be interoperable with those of our major allies and, where appropriate, with those of the other services and government departments.

LOGISTICS AND TRAINING

Logistics. Logistic constraints are difficult to identify until the various non-lethal technologies have been further developed. However, many NLW will require special handling, secure storage facilities and specialist transportation, One key issue must be the nature and size of the power-pack, which may be large and cumbersome. There will therefore need to be a "tradeoff" with more conventional weapons for strategic lift.

Training. Retaining a military capability across the spectrum of conflict imposes a heavy

training load. The acquisition of new weapons whose operation may be different from Conventional lethal weapons will add to this load. However, advances in training systems technology including synthetic environments may increase training efficiency and mitigate the problem. Routine training in the use of NLW must be based on doctrine and be fully integrated into combined arms training. Such training is a prerequisite to the conduct on non-lethal operations.

SUMMARY

Recent conflicts, especially in OOTW, have highlighted the limited capability of military forces to respond to situations with anything other than lethal force. Such a response is often inappropriate.

Non-lethal technologies are being developed that will offer a graduated response in the conduct of operations, across the full spectrum of conflict. The use of weapon systems utilizing such non-lethal technologies will enable some wars to be fought with fewer casualties and less collateral and environmental damage. This will be more acceptable both politically and publicly.

NLW must be fully integrated with more conventional weapon systems and, although they may be used alone or with other similar systems to provide a synergistic effect, they must always be underpinned by lethal force.

NLW provide a greater range of options to commanders at all levels. Their full integration and use as a weapon system will therefore require more detailed planning than had lethal weapons only been available. NLW could become an important additional Component of C^2W; it is therefore essential to integrate NLW within the C^2W cell of the appropriate theater headquarters.

The introduction of many NLW presents a number of legal issues which must be satisfactorily resolved and ethical questions which, at least, will need to be considered, before their use in operations.

The selection of non-lethal technologies that have military potential will be influenced by legal and moral constraints, doctrine, utility, and affordability.

CONCLUSIONS

The Army Policy and Resource Committee (Doctrine) is invited to note the military potential of NLW and accept that:

a. The proposed definition of "Discriminate weapons that are explicitly designed and employed so as to incapacitate[4] personnel or materiel, while minimizing fatalities and undesired damage to property and the environment" is the most suitable.
b. NLW could provide military commanders with an enhanced capability across the spectrum of conflict.
c. NLW should be fully integrated with conventional weapon systems to provide commanders with the flexibility of a graduated response if required.
d. The principles governing the use of NLW provide a sound basis for further work in the development of non-lethal technologies and their associated weapon systems.

[4] To render incapable or unfit. Oxford English Dictionary