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EXAMINATION OF CARRYING NON-LETHAL WEAPONS

Abstract

The examination of carrying non-lethal weapons can contribute to an optimization process to find those means of transporting which can help to find new ways for non-lethal weapons in innovation and in application processes. By means of these processes and this innovation possibility, greater safety and more effective using methods could be reached. The health and life of the user and that of the target's can be protected to a greater extent as well. Making use of this action, we can take a step towards to a safer world.

A nem halálos fegyverek hordozhatóságával kapcsolatos vizsgálatok hozzájárulhatnak ahhoz, hogy egy esetleges optimalizálással olyan hordozó „eszközöket” alkalmazzunk, melyeknek köszönhetően a nem halálos fegyverek alkalmazásának lehetőségei szélesednek, fejlesztési lehetőségeik új utakra léphetnek. Ezen a fejlődésen keresztül hatékonyabb és biztonságosabb működést érhetünk el és még nagyobb százalékban biztosíthatjuk a fegyvert kezelő személyzet és a célszemély testi épségének biztonságát. Így megtéve egy újabb lépést egy biztonságosabb jövő irányába.

Keywords: *non-lethal force, security, transporter, non-lethal weapon ~ nem halálos erő, biztonság, hordozó, rendvédelem, nem halálos fegyver*

INTRODUCTION

Our accelerated world is continuously changing and people have to face new challenges. The area of law enforcement is not an exception, either. Events occurring all of a sudden require quick reactions to handle them. For example, just think about the case of the migrants who have rapidly set off for Europe. This situation demands fast activity everywhere in Europe. This happens not only on a strategic level. There are also daily examples in connection with issues of law enforcement (for instance, a robbery situation) when the situation has to be handled quickly and effectively. It is not only easy to adjust to these abrupt occurring incidences legally and economically but also specialists meet many different kinds of technical challenges. New periods have new types of issues and need new solutions. Security questions play more and more important roles and receive more attention in the world, where people are becoming more and more interested in being a professional or civilian. Nowadays people learn about situations on a daily basis that make them worry about the security of their family's health and assets. Much more sophisticated implementing forms are available now, ensuring people's security and reactions of those taking part in law enforcement situations are faster and more effective than it used to be. Security cannot be guaranteed 100% because some risks always remain and it does not matter how precise the preparation is (because of unexpected occurrences). However, by taking some measures the risk can be reduced to a certain level. Armed protection is a resource to protect objects' and humans' security from a variation of attacks and purpose. Yet we cannot give these kinds of weapons into just anybody's hands, particularly those that can easily be used to cause indefectible or deadly injuries to other people. Nevertheless there is a possibility of handling this case. There exists a group of weapons that have been engineered differently than other traditional weapons. The aim of these weapons is not to cause indefectible or deadly injuries. On the contrary, these specially engineered weapons were created on the purpose of avoiding causing these types of injuries. This group is called Non-Lethal Weapons (NLW). Starting from the above mentioned difficulties we cannot make an irresponsible decision by giving "deadly force" (traditional weapons) into the hand of anybody but the claim is increasing to reduce the risk previously mentioned. It is worth examining the possibility offered by dynamically developing world of non-lethal weapons. Non-lethal weapons help us to maintain order and to stave off numerous kinds of law enforcement situations, ranging from sticks to microwave weapons. There are many variations with different sizes and different functional precepts. The functional precept of the non-lethal weapon does not influence on the expected impact during the application to incapacitate (without causing indefectible or deadly injuries) the person who practises intentional unlawful behaviour. Since the aim is to cause indefectible and deadly injuries, it is very important during the construction and engineering to pay attention not to go beyond the thin board between traditional deadly force and non-lethal force. Normally the intervention of one person is necessary to reach an appropriate effect (this means to operate a non-lethal weapon) but this also strongly depends on the size and weight of the non-lethal weapon. As there are non-lethal weapons built with such great size and weight (for example, the water cannon) that makes it necessary for a whole team to contribute to its operation. The issues and topics of non-lethal weapons consist of a lot of unanswered questions. Examining other areas like ergonomic, is also important besides the basic juristic, medical, economic, technical questions. The aim is not only to protect the health and life of the target person but also to protect the operator of the non-lethal weapon. The application risk of a non-lethal weapon is a question because we have to know on time how much it makes the handler's work easier and more effective. Another basic issue is how to transport the device suitable to use non-lethal force to the target area, as well as who can use it, how it can be used and against whom or what. The basic aim of this article is to examine the carrying and transportation possibilities of non-lethal weapons.

EXAMINATION OF THE POSSIBILITIES OF CARRYING NON-LETHAL WEAPONS

The transportation, moving, carrying, bearing of non-lethal weapons can be accomplished in different ways. Some non-lethal weapons are basically placed on the operator's clothes and some need the contribution of another device (for example: a vehicle). From the point of view of transportation we can divide non-lethal weapons into two main groups:

Table 1: classification of non-lethal weapons that can be moved by manual force and non-lethal weapons can not be moved or can be moved by manual force with difficulty (author's own compilation and editing)

Non-lethal weapons can be carried on clothes and can be moved by manual force	Non-lethal weapons can not be carried on clothes, only with difficulty or can not be moved by manual force
handcuff	micro wires
sticks	interceptor, blocking nets
rubber bullet grenades	water cannon
rubber bullet cartridges	taser mine
foam rubber grenades	lamps, headlights
rubber shrapnel loads	stroboscope lights
beanbag shells	speakers, megafons, sirens
muzzle launched rubber shrapnel grenades	noise makers, noise generators
brittle bullet firinig weapon	gluey foams
hanging shells (BOLO)	glues
electric shocker	slippery chemical agents
rubber bullet cramping with electrostatic discharge	active, entry prevention systems
„sticky” shocker	acoustic weapons
tactical flashlights, headlights	infrasound weapons
lasers	electromagnetic weapons
stroboscope light	HESCO bastions
flash-bang grenades	disigrentants
irritant chemical agents	rubber scrapers
malodorants	lasers
sleeping agents	
mist makers	
nerve soothers, nerve blockers	
emetics	
gluey foams	
glues	
nets	
foot thorns, star thistles	

In those cases when the non-lethal weapon is moved by manual force and carried on clothes, the operation and the carrying exercise is executed by the operator. Of course, this is a really effective solution because in this way, the operator always has the immediate possibility of making a decision to use non-lethal force or not. No other person or proper team (for example, the water cannon) is necessary. With this method the operator can get to those places more freely that are hard to reach and the immediate action possibility with non-lethal force is continuously given. It can be necessary during applications for securing events, in financial institutions, during money transportation, in parrying different types of attacks (for example crimes, terror attacks, etc.), preventing riots, securing personal protection, etc. However, not only the direct human power equipment carrying and handling can be effective. Of course, for moving non-lethal weapons we can also use carrying devices, like vehicles, animals (for example horses, dogs) or unmanned machinery which are controlled by humans. Just like in the case of traditional weapons in the area of non-lethal weapons it is important to transport them fast and effectively, too. The operator cannot be prevented in easy movements by non-lethal

weapons or in executing the actual mission in a safe way. Still, it has to be available when non-lethal force is necessary to use. The examination of carrying issues is important because problems can be illuminated by the ergonomic issues that may arise. With the solution of these issues more effective processes, equipment's and devices can be developed that can be faster, easier or more effective. The application possibility may widen and it can make the non-lethal weapons applicable in areas where they were not or just hardly suitable before. Hereby non-lethal weapons contribute to securing the operator's and the target person's (who bears the non-lethal force) life against the application of lethal force. By answering the questions that may come up in connection with the carrying, only the movement issues of non-lethal weapons can be solved. The operation has to be executed by the operating person. So the question comes up: how effective a solution can it be to use a separated "carrier" for moving a non-lethal weapon and to apply a separated operator to be carried by one person. What happens in those cases when the size or the operating mechanism of the non-lethal weapon does not provide the opportunity to carry it manually or through clothing, or is this the realization too complicated? Does this difficulty endanger the effectiveness of the non-lethal force application?

CLASSIFICATION OF NON-LETHAL WEAPONS

The non-lethal weapons can be classified in different ways. Basically two main groups are unfolded according to the application precept and the nature of the aim:

- „According to the application precept:
 - o physical:
 - kinetic/mechanical
 - electronic
 - optical
 - o chemical
 - o directed energy:
 - acoustic
 - electromagnetic
 - o biological
- According to the nature of the aim:
 - o applicable against humans
 - o applicable against (military) technical devices and infrastructure" [1]

However, one kind of classification can be according to who/what is carrying the non-lethal weapon or the location of the application. The first table contains what possibilities can come up in connection with carrying the non-lethal weapons:

Table 2: possibilities of carrying and applying locations of non-lethal weapons
(author's own compilation and editing)

Classification of according to the application precept	Non-lethal weapons applicable against humans	Carrier				Location of application	
		human	animal	vehicle	unmanned vehicle	open area	closed area
kinetic/mechanical	handcuff	x				x	x
	sticks	x	x	x		x	x
	rubber bullet grenades	x	x	x	x	x	x
	rubber bullet cartridges	x		x	x	x	x
	foam rubber grenades	x		x	x	x	x
	rubber shrapnel loads	x		x	x	x	x
	beanbag shells	x		x	x	x	x
	muzzle launched rubber shrapnel grenades	x			x	x	
	brittle bullet firing weapon	x		x	x	x	x
	hanging shells (BOLO)	x			x	x	
	nets	x				x	
electronic	water cannon			x	x	x	x
	electric shocker	x			x	x	x
	rubber bullet cramping with electrostatic discharge	x			x	x	x
	taser mine	x		x		x	x
optical	„sticky” shocker	x			x	x	
	lasers	x		x	x	x	x
	flash-bang grenades	x		x	x	x	x
	lamps, headlights	x	x	x	x	x	x
chemical	stroboscope light	x	x	x	x	x	x
	irritant chemical agents	x		x	x	x	x
	olfactory stimulation chemical agents	x		x	x	x	x
	sleeping agents	x		x	x	x	x
	mist makers	x		x	x	x	x
	nerve soothers, nerve blockers	x		x	x	x	x
	emetics	x		x	x	x	x
	gluey foams	x		x	x	x	x
	glues	x		x	x	x	x
acoustic	slippery chemical agents	x		x	x	x	x
	wet foams	x		x	x	x	x
	speakers, megafons, sirens			x	x	x	x
	noise makers, noise generators			x	x	x	x
electromagnetic	big range acoustic device			x	x	x	
	infrasound weapons		x	x	x	x	x
mechanical	active, entry prevention systems			x	x	x	x
	„X-net” vehicle blocking system			x	x	x	
	foot thorns, star thistles	x		x	x	x	
	thorny roadblock			x	x	x	
	microfiber movement restrictings			x	x	x	
	HESCO towers			x	x	x	
electronic	interceptor, blocking nets			x	x	x	
	non-lethal weapons applied against electronic systems			x	x	x	
chemical	lasers	x		x	x	x	
	disigrentants			x	x	x	
	rubber scrapers			x	x	x	

The second table shows that in most cases the carrier „device” of the non-lethal weapons is the unmanned vehicle. The human (moving by manual force, carrying on clothes) as the operator is only in the second place. This does not mean that the unmanned vehicles can substitute the human’s function but it means it is worth thinking about the wider application of unmanned vehicles.

The third table gives the details of the carriers compilation with application locations and the advantage and disadvantage of the application:

Table 3: application location of non-lethal weapons carrier devices and advantages/disadvantages of application (author’s own compilation and editing)

Carrier	Location of application		Application	
	open area	closed area	advantage	disadvantage
human being	x	x	extensive mobility (most of the terrain obstacles are surmountable), during the application faster reaction time, application is possible in open and closed area also	with some devices limited and slow movements are possible
animal	x		with completing the human force it can increase the effectiveness and gives higher level of load possibilities	mostly can be applied in open areas, the training of the animals are expensive and time-consuming
vehicle	x		fast movement possibilities with high load and carrying capacity	mostly only on open areas can be applied, movement province limited
unmanned vehicle	x	x	the operator person is in bigger safe, application in hardly approachable locations (on earth, water, air)	demands more complex personal and training and bigger cost investment

The third table shows that the humans and the unmanned vehicles are capable of moving on all types of terrains and they are capable of moving both in open and in closed spaces. The fourth table presents the applicable vehicle types:

Table 4: vehicles that can apply the non-lethal weapons as carriers (author’s own compilation and editing)

Carrier vehicle types		
ground	water	air
bicycle	jet-ski	helicopter
motorbike	motorboat	airplane
car	ship	UAV Unmanned Aerial Vehicle
jeep	USV Unmanned Surface Vehicle	
microbus		
truck		
UGV Unmanned Ground Vehicle		

The fourth table shows for us that the ground vehicles are the most widely used vehicles because most of them move on the ground. The application of the non-lethal weapons mostly happens on the ground. The fifth table summarizes those types of unmanned vehicles that could be applied as carriers:

Table 5: unmanned vehicles that can be applied as carriers of non-lethal weapons
(author's own compilation and editing)

Unmanned vehicle carriers		
ground (UGV)	water (USV)	air (UAV)
wheeled	rubber structured	fixed wing
tracked	braced structured	rotorcraft
moving on foots		

If we take into consideration the carrier as viewpoint, then the classification above can be supplemented as the following:

- According to carrier „device” of the non-lethal weapon:
 - biological „device”:
 - human
 - animal
 - technical „device”:
 - vehicle
 - unmanned vehicle
- Location of the application:
 - open area (streets, squares, parks, gardens, etc.)
 - closed areas (facilities for axample: buildings, rooms, underground places, vehicles, etc.)

CONCLUSION

Choosing the appropriate “carrying devices” of non-lethal weapons is a complex question. Depending on who is carrying these weapons has impact on the operator crew’s function too. Since the weapons (either traditional or non-lethal) are always operated by human beings, so the effect is also the result of human decisions. In most cases humans carry non-lethal weapons, since they make the decisions in connection with their application. Except in that case (only about carrying) if the size and weight of the non-lethal weapon does not allow you to carry it manually on the operator’s clothes. In these cases, the operators normally use vehicles. Sometimes it may happen that they place these devices on animals (mainly on horses). The first picture presents a case when the operators need the help of a vehicle to carry the non-lethal weapon:



Picture 1: microwave non-lethal weapon carried by Hummer [2]

The question of what is the most appropriate “device” for carrying a non-lethal weapon always changes. It is worth thinking about the wider examination of carrying possibilities. Although with regard to the animals there are non-lethal weapons (first of all acoustic weapons, optical weapons) that can give more possibilities in placing them on animals (mainly horses). These non-lethal weapons could be the different kinds of light sources (for example stroboscope light). In this way, during a riot situation, more non-lethal effects could be combined. The horse and the rubber stick can expound non-lethal mechanic effect with also non-lethal but extremely annoying and uncomfortable feelings resulting from the flashing light. The aim of the complete effect, to divert the target person from the original intention (using non-lethal force), rises. Yet, not only has the case of the animals made us think about the wider examination of the application of the non-lethal effects and combinations, carrying possibilities but also that of the unmanned vehicles’. As on those terrains where humans can move unmanned vehicles that can also do, there are more possibilities in the application as a carrying device. Of course, using unmanned vehicles has also advantages and disadvantages. Like humans, unmanned vehicles can also be sensitive to mechanical effects (attacks) to a certain extent, which can make them dysfunctional. At this time the unmanned vehicle would get injured instead of the human. Furthermore, unmanned vehicles are insensitive to different kinds of chemicals, biological effects (for example different kind of irritating chemical agents), they have no personal needs (like ergonomic clothes and other kind of equipment that befits to weather conditions, rest time/sleeping time, no hunger and thirst, discomfort feelings, etc.). Besides they can be applied in open and closed areas as well. As for traditional weapons, in many countries people use unmanned vehicles (on ground, air and water) for different kind of observation missions and also for strikes. Such as an unmanned ground vehicle presented in the second picture:



Picture 2: testing UGV battle unmanned vehicle [3]

We can draw from the conclusion that unmanned vehicles can be capable of carrying non-lethal weapons and of directing operations (before the application of non-lethal force always a human decision has to be created by a human, an unmanned vehicle cannot make its own decision), that is why their application gives wider perspective than possibilities that are made by normal vehicles, animals or, from a certain point of view, by humans, too. Similar developments are taking place nowadays in other countries (see No. 3 and No. 4 picture) too. The third picture presents a UAV (Unmanned Aerial Vehicle) unmanned vehicle that is loaded by non-lethal weapons:



Picture 3: exhibited Skunk Riot Control Copter [4]

The Skunk Riot Control Copter has been equipped by four rifles that are operated by compressed air and they are capable of firing plastic bullets that are filled with stimulating chemical agents. The bullets break up after the impact so injuries can be avoided. After the bullets are broken, the stimulating chemical agents (for example capsaicin) enter the environment exerting its effect. In the fourth picture an USV can be seen that belongs to the Israeli navy and has been equipped with water cannon.



Picture 4: Israeli USV equipped with water cannon [5]

Application of unmanned vehicles must be an alternative solution and they cannot substitute the application of humans. Unmanned vehicles can make their activity only in parallel with human activity, helping their work in this way, and making it safer and more effective. It opens up new prospects in the fields of application and also of innovation which requires further research activity.

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