CCW EXPERT MEETING
LETHAL AUTONOMOUS WEAPON SYSTEMS

Geneva, 11 – 15 April 2016

Obligations under international law prior to the use of military force:

Current developments relating to

the legal review of new weapons and methods of warfare[*]

by Stefan Sohm[**]

1. Introduction

Despite the complex and multifaceted nature of current military operations, the ability to employ military force is ultimately unique to, and the prerogative of, the armed forces. From this arises the obligation to take measures to ensure that, should such force need to be employed in a military operation, this will be done in line with our fundamental values and the relevant legal provisions, especially those dictated by international law. This is the only way to provide Bundeswehr service personnel with legal certainty and a solid basis for their actions.

2. Weapons and methods of warfare

A chief legal aspect of the use of military force relates to the types of weapons, means and methods of warfare that are to be employed. This makes them an important focus of international humanitarian law. The respective legal category is often referred to as "international humanitarian law on arms".[1]

---

[*] This article was originally published in the German language under the title "Völkerrechtliche Pflichten im Vorfeld militärischer Gewaltanwendung – Aktuelle Entwicklung bei der Prüfung neuer Waffen und Methoden der Kriegführung" in: 28:3 Humanitäres Völkerrecht – Informationsschriften | Journal of International Law of Peace and Armed Conflict 104–110 (2015).

[**] The author is Director of the Department of International Law and of Operational Law at the Federal Ministry of Defence in Berlin.

[1] Cf. with further systematization, S. Haines, The Developing Law of Weapons, in: A. Clapham/P. Gaeta, The Oxford Handbook of International Law in Armed Conflict, Oxford 2014, at pp. 273 et seqq., as

The present article aims to conduct a partial analysis of this category, from the current perspective of the Federal Ministry of Defence and the German Bundeswehr: that is, the obligation – prior to employment and independent of the respective circumstances – to legally review their weapons, means and methods of warfare, so as to determine whether or not these are compatible with the rules of international law.

Under the provisions of Article 36 of the Protocol Additional to the Geneva Conventions of 12 August 1949 relating to the Protection of Victims of International Armed Conflicts (Protocol I)[2], all contracting parties are under an obligation, when studying, developing, acquiring or adopting a new weapon, means or method of warfare, to determine whether its employment would, in some or all circumstances of employment, be prohibited by Protocol I or by any other rule of international law.

Additional Protocol I entered into force in the Federal Republic of Germany in 1991.[3] In principle, however, Germany long beforehand recognized its respective obligations. For example, legal commentaries contain the remark, in reference to the "General provisions of the law of armed conflict and of the law of war on land" – dated March 1961[4] – that, when new weapons are developed, their employment should be preceded by a study aimed at determining whether they infringe any explicit prohibition or general principles. Only if they do not may the use of these weapons be permitted. Even the United States – which, as is well known, is not a contracting party to Additional Protocol I – has for some time had formal, institutionalized procedures in place to determine whether a planned new weapon conforms to international law.[5]

Perhaps it was precisely because of the relatively high level of international consensus on this issue, at least regarding the obligation to determine the conformity of weapons, that, for many years, there were no exceptionally intensive discussions, neither at the academic nor at the political level, regarding Article 36 of Additional Protocol I, also following its entry into force.[6]

---

well as the comprehensive treatise by W. Boothby entitled "Weapons and the Law of Armed Conflict", Oxford 2009.

[2] Federal Law Gazette 1990 II, at pp. 1550, 1637.

[3] For the Federal Republic of Germany, the 1977 Additional Protocol I entered into force on 14 August 1991.

[4] See Y. Sandoz/C. Swinarski/B. Zimmermann, Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949, Geneva 1987, Article 36 § 19; M. Bothe, New Rules for Victims of Armed Conflicts, Leiden 2013 (second edition), at p. 230, footnote 1.

[5] See Department of Defense of the United States of America, Law of War Manual, June 2015, Chapter VI, at pp. 312 et seqq., http://www.dod.mil/dodgc/images/law_war_manual15.pdf (accessed on 20 March 2016).

[6] S. Weber, Neue Waffen und das Völkerrecht – Überlegungen zur Handhabung des Artikels 36 des I. Zusatzprotokolls zu den Genfer Abkommen vom 12. August 1949, in: H. Fischer/U. Froissart/W.

This may in part be due to the fact that Article 36 does not provide any specific legal guidelines for the review of weapons. It merely refers to the existing rules and provisions of international law.[7]

From a legal policy standpoint, the primary significance and aim of Article 36 is that, with this provision, international humanitarian law makes a clear statement on the relationship between law and weapons technology.[8] Law should not simply follow technological developments, but rather from the outset must exert its influence on, as well as steer, these developments. In the history of international humanitarian law, this was for a long time not the case. Rules governing air warfare[9], or the employment of submarines[10] or mines[11], were generally developed only after the respective weapons had been used, and the effects had been felt. Whether or not the converse approach will always be successful cannot be reliably determined, considering the great speed of technological innovation. Existing legislation can only perform a steering function if it succeeds in keeping abreast of future developments.[12]

Moreover, such an approach can also be problematic. How, for example, should an abstract legal review determine "superfluous injury" or "unnecessary suffering" – two key aspects of international humanitarian law – if a weapon has not been fully developed, and its actual effects are not yet known?[13] Without the context of a specific military operation, how can what is "superfluous" and "unnecessary" be defined, considering that these terms are so highly dependent on the respective situation and a

---

Heintschell von Heinegg/C. Raap (eds.), Krisensicherung und Humanitärer Schutz – Crisis Management und Humanitarian Protection – Festschrift für Dieter Fleck, Berlin 2004, at pp. 689, 691.

[7] Cf. W. Boothby, op. cit. (footnote 1), at pp. 345 et seqq.; Y. Sandoz/C. Swinarski/B. Zimmermann, op. cit. (footnote 4), Article 36, § 1472.

[8] S. Haines, op. cit. (footnote 1), at p. 275.

[9] See the 1923 Hague Rules of Aerial Warfare (which were never adopted in legally binding form), in: Federal Foreign Office/German Red Cross/Federal Ministry of Defence, Dokumente zum humanitären Völkerrecht – Documents on International Humanitarian Law, Sankt Augustin 2012 (second edition), at pp. 85 et seqq.; as a nonbinding compilation of rules see also Programme on Humanitarian Policy and Conflict Research at Havard University, Manual on International Law Applicable to Air and Missile Warfare, Bern/Cambridge 2009, http://ihlresearch. org/amw/HPCR%20Manual.pdf (accessed on 20 March 2016).

[10] Rules of Submarine Warfare of 6 November 1936, in: Federal Foreign Office/German Red Cross/Federal Ministry of Defence, op. cit. (footnote 9), at p. 115.

[11] Convention of 18 September 1997 on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, which entered into force on 1 March 1999.

[12] See D. P. Copeland, Legal Review of New Technology Weapons, in: H. Nasu/R. McLaughlin, New Technologies and the Law of Armed Conflict, Berlin/Heidelberg 2014, at p. 43.

[13] It is fully in line with the requirement of Article 36 of the 1977 Additional Protocol I to initiate the review at an early stage of developing weapons, means and methods of warfare; cf. Boothy, op. cit. (footnote 1), at p. 345; Weber, op. cit. (footnote 6), at p. 696.

careful weighing of all factors? Frequently, a framework for these considerations does not exist until the specific context of employment is known.[14]

It is undisputed, however, that international law relating to the review of new weapons has gained increasing attention in recent years, not least due to the debate over combat drones, automatic and autonomous weapon systems, as well as cyber weapons. In January 2006, the International Committee of the Red Cross published "A Guide to the Legal Review of New Weapons, Means and Methods of Warfare – Measures to Implement Article 36 of Additional Protocol I of 1977", which is designed as a handbook to assist states in meeting their obligations under Article 36. There has also been a steady rise in the number of academic publications on the subject.[15]

The increasing attention that is being paid to the legal review of new weapons in Germany has had a political impact as well, namely on the coalition agreement between the governing parties of 16 December 2013. It states that "prior to any decision to procure new weapon systems, we will carefully review all related questions of international law, constitutional law, security policy and ethics. This especially applies to new generations of unmanned aerial vehicles that have not only reconnaissance, but also combat capabilities".[16]

Admittedly, a coalition agreement is primarily of political importance. With regard to the obligation to conduct a legal review of new weapons, it merely recalls the existing obligation set out in Article 36, as well as the German Bundeswehr's long-standing practice. However, for the competent officials at the Federal Ministry of Defence, this was an opportunity to revisit the established procedures of legal review. In the end, they gave these procedures a more formal structure and better integrated them into the institution.

---

[14] S. Haines, op. cit. (footnote 1), at pp. 284 et seqq.

[15] K. Nowrot, Kampfdrohnen für die Bundeswehr? – Einsatz und Weiterentwicklung von unbemannten bewaffneten Luftfahrtsystemen im Lichte des Humanitären Völkerrechts, Beiträge zum Europa- und Völkerrecht, No. 8 (March 2013); E. von Schmeling, Rechtsprobleme des Einsatzes von unbemannten „Kriegsschiffen", Bonn Research Papers on Public International Law, Paper No. 3/2014, 4 Juni 2014, http://ssrn. com/abstract=2445956 (accessed on 20 March 2016); G. D. Brown/A. O. Metcalf, Easier Said than Done: Legal Review of Cyber Weapons, in: Journal of National Security Law and Policy 7 (2014), at p. 115; D. M. Stewart, New Technology and the Law of Armed Conflict in International Law and the Changing Character of War, in: International Law Studies 87 (2011); W. H. Parks, Conventional Weapons and Weapons Reviews, in: Yearbook of International Humanitarian Law 8 (2005), at p. 55; W. Boothby, How Will Weapons Reviews Address the Challenges Posed by New Technologies?, in: The Military Law and the Law of War Review 52 (2013), at p. 37.

[16] Prior to this agreement, the Office of Technology Assessment at the German Bundestag, upon initiative of the Defence Committee of the German Bundestag, had released a report on "The State and Prospects of the Military Use of Unmanned Systems", which expressly refers to reviews pursuant to Article 36 of the 1977 Additional Protocol I (Bundestag Document 17/6904, at p. 11).

3. Procedures

Article 36 – and there is consensus on this point[17] – does not itself set out any guidelines for how legal reviews of new weapons are to be performed. In the Bundeswehr, legal review has so far been conducted as part of the Ministry's regular staffing process, i.e. the legal division has reviewed and signed off on new weapon systems. More importantly, legal reports, assessments, and opinions have also been drawn up to determine conformity with international law. These have been prepared for the entities that were responsible for the planning, development and procurement of the corresponding weapon systems.

Experience with these procedures has shown – already prior to the written obligation in the coalition agreement – that this working method was at times cumbersome and possibly also inadequate.

This article does not aim to conduct a detailed legal analysis of various interpretations and discussions regarding Article 36. Rather, it will describe the practical conclusions that have been drawn for the procedures of legal review at the Federal Ministry of Defence. In addition, three examples are presented of specific legal reviews that highlight both the legal considerations weapon systems are given and the types of questions that may arise in the process.

4. The steering body and its standard of review

In March of this year, under the auspices of the legal division, an independent "Steering body for the legal review of new weapons and methods of warfare" was established at the Federal Ministry of Defence. It is composed of representatives of the legal division, as well as of all competent entities at the Ministry, who serve as points of contact. The competent entities are meant to provide additional expertise, as well as initiate legal reviews of new weapon systems.

Although no practical experience could yet be gained, it can be assumed that the steering body will facilitate the process of legal review of new weapons, means and methods of warfare for the Ministry's legal division, especially when non-legal expertise (e.g. medical assessments, effects analyses and operational aspects) is required.

[17] W. Boothby, op. cit. (footnote 1), S. 343; D.P. Copeland, op. cit. (footnote 12), at p. 48; S. Weber, op. cit. (footnote 6), at p. 695. This view is also held by the ICRC; see ICRC, Guide to the legal Review of New Weapons, Means and Methods of Warfare – Measures to Implement Article 36 of Additional Protocol I of 1977, 2006.

The chief standard of review is international humanitarian law as it currently applies to the Federal Republic of Germany. There is, however, a fundamental problem with abstract legal reviews. Simply because obligations under Article 36 have been met at one point in time does not mean that no legal assessments are required once a weapon is actually used. In principle, each specific employment of military force must be kept under review on a continual basis, in terms of its conformity with international humanitarian law. This automatically leads to the question of which standard must be met by the abstract, pre-employment legal review of a weapon. By contrast, the aspects that can be postponed and addressed as part of employment-related legal reviews (in the context of military operations) must also be determined.[18]

After all, every weapon can be employed in a way that violates the rules of international humanitarian law. Conversely, employment scenarios are at least theoretically conceivable for every weapon or means of warfare that would not violate international humanitarian law. Apart from weapons that are clearly banned by conventions (for example biological weapons, cluster munitions and anti-personnel mines), international humanitarian law differentiates between weapons that are by nature indiscriminate, which are banned as such, and the indiscriminate use of weapons, which is conceivable for every weapon.

This point is clearly made in Article 51 of Additional Protocol I, which addresses protection of the civilian population and the prohibition of indiscriminate attacks. In Article 51(4)(a), indiscriminate attacks are defined as those *which are not directed at a specific military objective*. The chosen method of military engagement, which is referred to here, will hardy play a role in a pre-employment legal review. By contrast, paragraph 4(b) defines indiscriminate attacks as those which employ a method or means of combat *which cannot be directed at a specific military objective*. The focus here is solely on the method and means of combat (as in paragraph 4(c), which addresses weapons that strike military objectives and civilians or civilian objects without distinction).[19] Limiting a legal review to examination of whether a weapon is a method or means of combat according to Article 51(4)(b) or (c), which are in principle prohibited, would at least be wrong in terms of the explicit wording of Article 36. The article essentially states that international law can prohibit weapons not only outright, but also specifically in certain circumstances.

[18] W. Boothby, op. cit. (footnote 1), at p. 347, concurring; see also S. Weber, op. cit. (footnote 6), at p. 701.

[19] W. Boothby, op. cit. (footnote 15), at p. 43; Y. Dinstein, The Conduct of Hostilities Under the Law of International Armed Conflict, Cambridge 2010 (second edition), §§ 313 et seqq.

It is understood that a legal review in accordance with Article 36 must not examine every feasible use of a weapon, but only its "common" or "intended" use.[20] Particularly when dealing with new technology, the actual way in which a weapon will be used may not even be known when it first undergoes a legal review. However, the legal review process is particularly well-suited for determining what forms of employment are legally permissible – and what forms are prohibited.

The steering body's standard of review is thus as follows: The question of whether or not a new weapon or method of warfare can and should be introduced is ultimately determined based on the respective legal provisions, and on whether or not a sufficient number of scenarios can be imagined for legally-permissible and useful employment of this weapon in actual military operations.

This definition shows that the legal review of a new weapon must be performed based not only on legal expertise, supported by technical and medical opinions and assessments, but that it must also take into account military and operational analyses. The large amount of information that needs to be exchanged across various areas of expertise is a compelling argument for the establishment of a formal review body.

5. Examples

Three practical examples are given below of possible legal reviews. Although these cases are not specifically linked to the newly-established steering body, they do demonstrate the need for a cross-cutting approach, and they clearly show the types of international law issues that can arise in this connection.

5.1. HIGH POWER ELECTRO MAGNETIC (HPEM) TECHNOLOGY

5.1.1. Functioning and effects

Improvised Explosive Devices (IEDs) are a significant threat to the armed forces, especially during stabilisation operations. To improve the protection of convoys and groups of vehicles, the introduction of counter-IED HPEM technology is being considered.

[20] S. Haines, op. cit. (footnote 1), at pp. 286 et seq.; . Sandoz/C. Swinarski/B. Zimmermann, op. cit. (footnote 4), § 1480; Y. Dinstein, op. cit. (footnote 19), § 216.

With this technology, a directed electromagnetic impulse is generated by the lead vehicle in a convoy. This energy affects electronic components within its focal area in such a way that IEDs are either permanently blocked or prematurely detonated. This technology goes beyond the jammers that have been employed so far, for they are effective not only against remote-controlled IEDs, but also against all explosive devices that contain electronic components (some 80% of all IEDs used in Afghanistan).

The questions in connection with international law that such a system raises are obvious: HPEM technology does not differentiate between electronic components in IEDs and those in civilian devices (e.g. mobile phones, control components, or traffic infrastructure). Civilian elements may be at least temporarily affected as well, with possibly severe consequences for civilians (e.g. pacemakers). If HPEM technology does not block an explosive device, it triggers and detonates it. However, the detonation occurs at a certain distance and a little earlier than those who placed it had planned, in order to protect the convoy.

5.1.2. Legal assessment

HPEM technology is indisputably a new method of warfare and, as such, it is subject to legal review under Article 36.

International law does not explicitly ban the employment of HPEM technology.

It can also be ruled out that HPEM would cause superfluous injury, unnecessary suffering or severe damage to the natural environment. The use of HPEM therefore does not, generally speaking, violate the basic rules set out in Article 35.

The question that must be primarily examined is that of indiscriminateness: Is HPEM an indiscriminate means or method of warfare that cannot be directed at a specific military objective? In that case, it would be banned outright pursuant to Article 51(4)(b), without the circumstances of employment needing to be considered. HPEM can in fact not be directed at a specific military objective, but only at a certain focal area. That said, we do not believe a ban on HPEM can be justified based on this provision. Situations are feasible in which the focal area comprises no civilian objectives, but only military ones (e.g. an unpopulated street without any buildings). In this situation, HPEM could in effect be directed at military objectives only.

Based on this line of reasoning, a general ban on HPEM pursuant to Article 51(4)(b) can be rejected. This does not imply that HPEM would be employed exclusively in situations like the one described above. In realistic operational scenarios (e.g. convoy protection), non-military objectives would likely also be in the focal area. However, without a general ban on HPEM, international humanitarian law merely stipulates rules

for employment of HPEM in certain situations. In this case, collateral damage involving civilians and civilian objects is not prohibited in principle, but only if the attack causing it can be deemed excessive (cf. Article 51[5][b]).

Additional consideration must, however, be given to HPEM, since prohibition pursuant to Article 51(4)(b) applies exclusively to "attacks" as defined in Article 49(1).

The question arises of whether the employment of HPEM can even be considered an attack under the respective definitions. The definition of "attack" in Article 49(1), and therefore in terms of international humanitarian law, is an offensive or defensive act of violence against the adversary.[21]

The electromagnetic impulse that is projected from a fixed point of the lead vehicle in a convoy can be more or less considered a protective shield for that convoy. Unlike armour, however, it has an external effect. If one were for that reason alone to define the use of HPEM as an attack, then every movement of a convoy with an activated HPEM effector would constitute an attack. This would at the very least be out of line with military and operational categories. In particular if a convoy were transporting urgently-needed humanitarian aid, such a definition would be illogical. Moreover, medical units and convoys would not be allowed to use HPEM, since they have no combat status and are not authorised under international law to perform acts of attack.

There is therefore good reason to argue that the rules of international humanitarian law do not provide a sufficiently strong basis for a general ban on HPEM. However, this assessment by no means implies that no legal limitations should be imposed on the employment of HPEM. This aspect must at least be part of the legal review – under application of the standard of review mentioned above – to determine conformity with Article 36 and, ultimately, whether or not the further development of an HPEM capability makes sense from an operational point of view. Regulations governing future military employment of such a system can also be developed during the legal review process, at least in a general sense. If the decisive legal standards are the ban on indiscriminate means and methods of warfare, as well as the prohibition of excessively injurious warfare, then, on an abstract level, two questions must be considered during a legal review: First, to what extent are precautionary measures pursuant to Article 57 possible and even required for the employment of HPEM, to do everything feasible to avoid harmful effects on the civilian population? Second, what shall the determining criteria be for weighing the risk of causing collateral damage against the prospective military benefits? What follows is only a brief examination of these questions.

[21] Y. Dinstein, op. cit. (footnote 19), § 4.

Regarding precautionary measures, use of situation-specific medical and technical assessments will be crucial. The place of employment must be given special consideration. In densely-populated urban areas, especially during times of day when it can be expected that large numbers of civilians may be affected, HPEM should be employed only to a limited extent. In situations in which there is a high likelihood that uninvolved persons may be affected, only jammers should be used, since these are far less dangerous.

Advance warning of the civilian population pursuant to Article 57(2)(c) may be advisable, also in terms of a general warning that civilians should keep clear of routes taken by military convoys.

We believe the protection of our own service personnel with HPEM can already be considered an expected tangible and direct military benefit, independent of any specific military order. This benefit can also play a role in the deliberation process, i.e., in determining whether or not employment of HPEM is justified, despite possible collateral damage – although some doubt has been expressed on this in academic literature.[22] Specific deliberations will also have to consider that use of HPEM significantly increases the likelihood of preventing the detonation of an IED, which in turn greatly increases the protection of civilians in the vicinity of the IED who most certainly would have been affected by its detonation.

The following general conclusions can be drawn:

Use of HPEM technology appears permissible in a range of military scenarios, in a way that would not violate the rules of international law. Restrictions imposed by international law on the employment of HPEM, as well as prescriptions regarding how it must be used, will not prevent it from being militarily useful in certain situations.

To bring HPEM more in line with the rules of international law, it would be helpful if, during actual employment, the effects and focal area could be adapted on short notice and tailored to the situation, so that certain areas could be excluded. Further technical studies could focus on the following:

Can the range of HPEM waves be temporarily shortened? Can limitation of the focal area, which would leave unaffected certain buildings and groups of persons in that area, be achieved and demonstrated?

[22] See on this aspect R. Geis, The Principle of Proportionality: Force Protection as a Military Advantage, in: Israel Law Review 45 (2012), at pp. 71 et seqq., where further references to the scientific discourse are made.

5.2. FLECHETTE MUNITIONS

5.2.1. Technical description

Flechettes are essentially arrow-shaped projectiles. They are made entirely of steel and are relatively small (a few centimetres long, with a much smaller diameter than conventional rifle bullet projectiles). Because they are projected from a warhead by an explosive substance, they can pierce and pass through wood and even thin steel. Flechettes are intended for use against soft ground targets (field camps, lightly-armoured vehicles, formations, units and groups of persons). During a regular employment scenario, up to several thousand flechettes can impact a surface area of over 100 metres in length and several hundred metres wide.

5.2.2. Legal assessment

5.2.2.1. Possibility of prohibition

There is no specific ban on flechette munitions. Flechettes do not fall under the prohibition on the use of incendiary weapons (Protocol III)[23], and they cannot be classified as cluster munitions[24] or explosive bomblets, since flechettes themselves do not explode and their effect is not based on an explosion. They also do not fall under the ban on weapons that injure through fragments that cannot be detected in the human body by an x-ray examination,[25] nor can they be described as so-called "dum-dum" bullets,[26] since they in no way change their shape, even when hitting bone. Examinations of wounds have even demonstrated that flechette injuries tend to be less severe than those of conventional 9-millimetre bullets.

5.2.2.2. Assessment of indiscriminateness

Flechettes also cannot be classified as an indiscriminate means of warfare. In view of their impact area described above, it is entirely feasible and realistic that, in certain

[23] Cf. the Protocol of 10 October 1980 on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III) to the Convention of 10 October 1980 on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects.

[24] Convention of 30 May 2008 on Cluster Munitions.

[25] Protocol of 10 October 1980on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices (Protocol II) to the Convention of 10 October 1980 on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects.

[26] Declaration (IV:3) of 29 July 1899 concerning Expanding Bullets (Dum-Dum Bullets).

combat situations, such an area would contain exclusively military targets.[27] Therefore, an abstract legal review would not entirely prohibit their employment. Restrictions on the employment of flechettes based on the consideration of indiscriminateness will primarily need to be considered at the time of their actual employment. This highlights the need to clearly distinguish between the abstract principles contained in Article 36 and a specific legal assessment of the actual employment of a weapon. Abstract legal reviews can only establish general guidelines, i.e., no employment of flechettes over inhabited areas, as well as the obligation to take all necessary precautionary measures in the potential impact area, in particular by ensuring that no civilians or civilian objects are present.

Unlike with HPEM, an examination of flechettes must answer the question of whether or not such munitions cause superfluous injury or unnecessary suffering in terms of Article 35(2). For this, flechettes must be compared with shotguns, which in the Bundeswehr Manual of International Humanitarian Law are classified as weapons prohibited by Article 35(2).[28] However, an analysis reveals this to be an unjustified comparison. As mentioned above, the immediate injuries inflicted by flechettes tend to be less severe than those of classic rifle munition. In the intended employment scenarios, persons located in the most densely-hit radius of the impact area (approx. 50 square metres) would be hit by a maximum of two flechettes. This cannot be compared to the multiple wounds caused by shotguns. A legal review can therefore conclude that flechettes may be procured, although they must not be employed in populated areas.

However, this leaves unanswered the question that must be considered from more than only a legal standpoint, namely whether the military and operational advantage of flechettes is so great that procurement makes sense economically, since they after all have only a limited effect on military targets. Moreover, flechettes are politically controversial. Their use in very densely-populated areas, which supposedly has in the past resulted in individual victims being hit by up to 70 flechettes, has generated significant political and ethical debates (the issue of "deadly metal rain" has been raised). This impact of flechettes could be ruled out by putting in place strict rules for military employment of flechettes outside of populated areas, and it would not necessarily result in a general ban on these munitions. However, this aspect must be considered as part of the procurement decision. Even though it is in principle permissible, the Bundeswehr currently does not procure any flechette munitions.

---

[27] W. H. Parks, op. cit. (footnote 15), at p. 81.

[28] Joint Service Regulation A-2141/1 "Law of Armed Conflict – Manual", § 440.

5.3. LASER WEAPONS

To conclude, the area of laser weapons will be briefly addressed. From a technical point of view, there are two basic types: anti-personnel and anti-materiel laser weapons.

Although laser rangefinders and target designators are not explicitly mentioned here, the respective legal provisions apply to these as well, when they are used for military purposes.

5.3.1. Anti-personnel laser weapons

The Protocol on Blinding Laser Weapons (Protocol IV)[29] bans the use of laser weapons that are designed to cause permanent blindness to unenhanced vision (i.e., to the naked eye, or to the eye with corrective eyesight devices). Consequently, every legal review will aim to determine whether a new system falls under this ban. According to the current preliminary assessment, so-called "dazzlers", i.e. laser weapons that are exclusively intended to create temporary blindness and do not cause permanent blindness are not prohibited. Specifically at checkpoints, such weapons can be highly effective. They also conform to the principle of proportionality. This assessment does, however, presuppose that a large number of technical issues will be clarified, so that temporary blindness can be caused without permanently damaging the eye in any way.[30]

5.3.2. Anti-materiel laser weapons

Anti-material laser weapons are more significant. In principle, such weapons will be used to attack combat vehicles, aircraft and missiles. The military advantages are these weapons' scalability, high target accuracy, and relatively low operational costs. Anti-materiel laser weapons are not prohibited by the relatively narrow scope of Protocol IV, since it explicitly does not cover blinding as an incidental or collateral effect of the legitimate military employment of laser systems (Article 3). The general provisions of international humanitarian law therefore apply.

The prohibition of indiscriminate attacks can be easily complied with, since laser beams travel at the speed of light, which allows rapidly-moving targets to be precisely

[29] Protocol of 13 October 1995 on Blinding Laser Weapons (Protocol IV) to the Convention of 10 October 1980 on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects.

[30] See also M. C. Zöckler, Laserwaffen im Völkerrecht und das Verbot unnötiger Leiden, Munich 2006, at p. 127.

designated and attacked. Because the intensity of the laser beam can be scaled, collateral damage can potentially also be avoided. However, harm to civilians and civilian objects caused by possible reflection off of the actual target is a problem. Undesired effects may also be caused by refraction. When attacking aerial targets, there is an – admittedly small – risk of the laser beam extending beyond the actual target, affecting other aircraft or satellites. Additional examinations may be required to fully understand these technical issues.

If a laser destroys enemy combat materiel and the military personnel manning this materiel is injured or killed, this would not in principle constitute a violation of international humanitarian law, even if the injury were blindness, which is absolutely feasible if optical sensors are targeted. However, depending on the situation, this could be considered to constitute unnecessary suffering (Article 35[2]) even though Protocol IV would not apply, since it covers only blindness to unenhanced vision.

At this early stage, the legal assessment can be summarised as follows: A general ban would apply only to laser systems that are exclusively or at least partially intended to be used to cause permanent blindness to unenhanced vision. Use of laser weapons against the optical devices and sensors of vehicles for the specific purpose of permanently blinding the military personnel manning these vehicles could be classified as a violation of the ban on unnecessary suffering. Use of lasers to damage materiel, in particular aircraft, missiles or vehicles, would not violate the ban on unnecessary suffering and is therefore permissible under international law. If laser weapons are used to attack other, non-vehicle-mounted optical devices and sensors, then whether or not such use is permissible under international law would be determined by the circumstances of each specific employment.

6. Conclusion

The German Bundeswehr has always fully lived up to the obligations under Article 36 of Protocol I. However, the great amount and extent of consultation this requires has resulted in legal reviews of new weapons being conducted by a steering body that was specifically established for this purpose. Fixed points of contact facilitate the legal review process, and heighten awareness of the need to ensure conformity with international law, and with the corresponding standard, in the respective divisions and entities at the Ministry of Defence. This helps launch required reviews as early as possible and also helps prevent possible misguided use of defence technology funds.

Furthermore, creation of a formal body for legal reviews under Article 36 facilitates documentation of the corresponding procedures.[31] This, in turn, raises the profile of legal reviews, both within and outside of the Ministry. At the same time, it has formally implemented a demand made in the German Government coalition agreement – or at least a significant part of this demand – which serves to underscore the agreement's security policy and ethical assessments.

[31] Notwithstanding the fact that the law as it stands knows of no duty to disclose or to make available the outcome of reviews pursued in accordance with Article 36.