

# CHAPTER XI

## REMOTELY PILOTED AIRCRAFT (ARMED DRONES) AND AUTONOMOUS WEAPONS SYSTEMS

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## A. INTRODUCTION

Much of the work of the Special Rapporteurs has focused on the implications of new technologies that were applied during the twelve year period of their successive mandates. This included attention to the use of less-lethal weapons and the use of information and communication technologies. Of particular interest, especially in the context of armed conflict and counterterrorism measures, has been the development of unmanned weapon platforms: first remotely piloted armed drones and later autonomous weapons systems. Through a series of widely cited and influential thematic reports, the Special Rapporteurs put the legal and ethical issues raised by armed drones as well as autonomous weapons squarely on the UN agenda and shaped the broader debate.

The use of armed drones to carry out targeted killings was first raised by Special Rapporteur Asma Jahangir in response to the killing of six men traveling in a car in Yemen on 3 November 2002 by what was alleged to be a missile launched by a United States-controlled predator drone aircraft. Later that month, Jahangir requested the US Government to explain how the incident was consistent with applicable international legal norms. That initial communication then led to a drawn-out correspondence between Special Rapporteur Alston and the United States, as well as a number of statements on the subject in the Rapporteur's annual reports.<sup>1</sup>

The issue of autonomous weapons systems was first raised by Special Rapporteur Alston in a report to the General Assembly in 2010 in which he called for "urgent consideration ... to be given to the legal, ethical and moral implications of the development and use of robotic technologies, especially but not limited to uses for warfare." He added that "[t]he emphasis should be not only on the challenges posed by such technological advances, but also on the ways in which proactive steps can be taken to ensure that such technologies are optimized in terms of their capacity to promote more effective compliance with international human rights and humanitarian law."<sup>2</sup>

In a report to the Human Rights Council, Special Rapporteur Heyns provided an explanation of the difference between armed drones and autonomous systems, and clarified the relevance of the mandate in relation to them:

### *Report to the Human Rights Council (A/HRC/26/36, 1 April 2014, ¶¶ 133-134)*

#### *III. Remotely piloted aircraft or armed drones and emerging autonomous weapons systems*

133. The mandate has engaged with the Human Rights Council and the General Assembly on the issues raised by remotely piloted aircraft or armed drones over a number of years,<sup>3</sup> and has recently also done so on autonomous weapons systems (or lethal autonomous robots (LARs)).<sup>4</sup> While neither system has a human physically in the aircraft, in the case of armed drones, there are at least human operators on the ground taking decisions on who to target and when to release deadly

1 See Philip Alston, 'The CIA and Targeted Killings Beyond Borders', *Harvard National Security Journal*, 2 (2011) pp. 283-446; and Philip Alston, Jason Morgan-Foster, and William Abresch, 'The Competence of the UN Human Rights Council and its Special Procedures in relation to Armed Conflicts: Extrajudicial Executions in the "War on Terror"', *European Journal of International Law*, 19 (2008) pp. 183-209.

2 Report of the Special Rapporteur, Philip Alston, A/65/321, 23 August 2010, ¶48.

3 Report of the Special Rapporteur, Philip Alston, Summary of Cases Transmitted to Governments and Responses Received, A/HRC/4/20/Add.1, 12 March 2007, pp.245-246, 359; Report of the Special Rapporteur, Philip Alston, Mission to United States, A/HRC/11/2/Add.5, 28 May 2009, p. 32; Report of the Special Rapporteur, Philip Alston, Report on Targeted Killings, A/HRC/14/24/Add.6, 28 May 2010, paras. 79-86; and Report of the Special Rapporteur, Christof Heyns, Follow-Up on Mission to United States, A/HRC/20/22/Add.3, 30 March 2012, para. 81. See also A/65/321, *supra* note 2; Report of the Special Rapporteur, Christof Heyns, A/68/382, 13 September 2013; Report of the Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism, Ben Emmerson, A/68/389, 18 September 2013.

4 Report of the Special Rapporteur, Christof Heyns, A/HRC/23/47, 9 April 2013; and A/65/321, *supra* note 2.

force. Autonomous weapons systems have not yet been deployed, but if that were to happen, these weapons platforms, once activated, will select and engage targets in an autonomous way, without further human intervention. The debates in the Human Rights Council thus far on these issues have been fruitful and productive. The Council has also recently adopted a resolution to organise an interactive panel discussion of experts on the topic.<sup>5</sup>

134. Both armed drones and autonomous weapons systems raise complicated questions and issues of international humanitarian law as well as human rights – and in particular right to life – issues. [...]

In his 2016 report to the General Assembly, Special Rapporteur Heyns emphasised the important role that human rights mechanisms should play in the consideration of technological developments in the weapons field.

*Report to the General Assembly (A/71/372, 2 September 2016, ¶¶ 65-66)*

65. Depersonalization of the use of force has been or is being introduced through the two generations of unmanned systems, armed drones and fully autonomous weapons, in armed conflict and in law enforcement.

66. It is important that the Human Rights Council continues to engage with these developments, given their clear right-to-life implications. The mandate of the Council to address the right-to-life implications of weapons and armed conflict is now well established, although the important role of other United Nations bodies should also be recognised. These other bodies do not, however, play the same role with respect to domestic law enforcement, and if the Council does not deal with these weapon systems in that context, there will be a clear protection gap.

## **B. REMOTELY PILOTED AIRCRAFT (ARMED DRONES)**

The need for greater clarity about the human rights and international humanitarian frameworks applied to the use of armed drones had become globally apparent during the so-called “War on Terror” being prosecuted during the terms of both Special Rapporteurs. Special Rapporteur Alston highlighted the need for greater transparency during his country visit to the United States of America in 2008. In a particularly influential report delivered in 2010 to the General Assembly, Alston highlighted the concern that drones, by making it easier to kill without risk to a state’s own forces, create a temptation for policy makers and commanders to interpret the legal limitations on who can be killed, and under what circumstances, too expansively. Special Rapporteur Heyns dedicated several subsequent thematic reports to these concerns, and clarified the basic principle that while drones were not *per se* unlawful, they presented the danger that states with the technology will want to lower the legal standards for their use.

### **1. Concerns about use**

Special Rapporteur Alston gave a comprehensive overview of the problems raised by the use of drones in his 2010 report to the Human Rights Council on targeted killings:

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<sup>5</sup> Human Rights Council Resolution 25/22, para. 4.

*Report on Targeted Killings (A/HRC/14/24/Add.6, 28 May 2010, ¶¶18-20, 27, 79-86)*

18. The United States has used drones and airstrikes for targeted killings in the armed conflicts in Afghanistan and Iraq, where the operations are conducted (to the extent publicly known) by the armed forces.<sup>6</sup> The US also reportedly adopted a secret policy of targeted killings soon after the attacks of 11 September 2001,<sup>7</sup> pursuant to which the Government has credibly been alleged to have engaged in targeted killings in the territory of other States.<sup>8</sup> The secret targeted killing program is reportedly conducted by the Central Intelligence Agency (CIA) using “Predator” or “Reaper” drones, although there have been reports of involvement by special operations forces, and of the assistance of civilian contractors with the implementation of the program.<sup>9</sup>

19. The first credibly reported CIA drone killing occurred on 3 November 2002, when a Predator drone fired a missile at a car in Yemen, killing Qaed Senyan al-Harithi, an al-Qaeda leader allegedly responsible for the USS Cole bombing.<sup>10</sup> Since then, there have reportedly been over 120 drone strikes, although it is not possible to verify this number.<sup>11</sup> The accuracy of drone strikes is heavily contested and also impossible for outsiders to verify. Reports of civilian casualties in Pakistan range from approximately 20 (according to anonymous US Government officials quoted in the media) to many hundreds.<sup>12</sup>

20. The CIA reportedly controls its fleet of drones from its headquarters in Langley, Virginia, in coordination with pilots near hidden airfields in Afghanistan and Pakistan who handle takeoffs and landings.<sup>13</sup> The CIA’s fleet is reportedly flown by civilians, including both intelligence officers and private contractors (often retired military personnel).<sup>14</sup>

[...]

27. Drones were originally developed to gather intelligence and conduct surveillance and reconnaissance. More than 40 countries now have such technology. Some, including Israel, Russia, Turkey, China, India, Iran, the United Kingdom and France either have or are seeking drones that also have the capability to shoot laser-guided missiles ranging in weight from 35 pounds to more than 100 pounds. The appeal of armed drones is clear: especially in hostile terrain, they permit targeted killings at little to no risk to the State personnel carrying them out, and they can be operated remotely from the home State. It is also conceivable that non-state armed groups could obtain this technology.

[...]

79. The use of drones [...] has generated significant controversy. Some have suggested that drones as such are prohibited weapons under IHL because they cause, or have the effect of

6 BBC, ‘US Drones Take Combat Role,’ 5 November 2002.

7 Council of Europe, Secret Detentions and Illegal Transfers of Detainees Involving Council of Europe Member States, report submitted by Mr. Dick Marty, Doc. 11302 Rev. (7 June 2007), paras. 58-64.

8 Greg Miller, ‘Feinstein Comment on US Drones Likely to Embarrass Pakistan,’ *LA Times*, 13 February 2009.

9 Jane Perlez, ‘Pakistan Rehearses Its Two-Step on Airstrikes,’ *New York Times*, 15 April 2009; Jane Mayer, ‘The Predator War,’ *New Yorker*, 26 October 2009; James Risen & Mark Mazzetti, ‘CIA Said to Use Outsiders to Put Bombs on Drones,’ *New York Times*, 21 August 2009.

10 Jane’s, ‘Yemen Drone Strike: Just the Start?’ 8 November 2002, available at: [http://www.janes.com/aerospace/military/news/jdw/jdw021108\\_1\\_n.shtml](http://www.janes.com/aerospace/military/news/jdw/jdw021108_1_n.shtml).

11 New America Foundation, Analysis of US Drone Strikes in Pakistan 2004-2010, available at <http://counterterrorism.newamerica.net/drones#2010chart>.

12 Ibid; US Drone Attacks in Pakistan ‘Backfiring, Congress Told,’ *LA Times*, 3 May 2009.

13 Mayer, *supra* note 9.

14 Ibid.

causing, necessarily indiscriminate killings of civilians, such as those in the vicinity of a targeted person.<sup>15</sup> It is true that IHL places limits on the weapons States may use, and weapons that are, for example, inherently indiscriminate (such as biological weapons) are prohibited. However, a missile fired from a drone is no different from any other commonly used weapon, including a gun fired by a soldier or a helicopter or gunship that fires missiles. The critical legal question is the same for each weapon: whether its specific use complies with IHL.

80. The greater concern with drones is that because they make it easier to kill without risk to a State's forces, policy makers and commanders will be tempted to interpret the legal limitations on who can be killed, and under what circumstances, too expansively. States must ensure that the criteria they apply to determine who can be targeted and killed – i.e., who is a lawful combatant, or what constitutes “direct participation in hostilities” that would subject civilians to direct attack – do not differ based on the choice of weapon.

81. Drones' proponents argue that since drones have greater surveillance capability and afford greater precision than other weapons, they can better prevent collateral civilian casualties and injuries. This may well be true to an extent, but it presents an incomplete picture. The precision, accuracy and legality of a drone strike depend on the human intelligence upon which the targeting decision is based.

82. Drones may provide the ability to conduct aerial surveillance and to gather “pattern of life” information that would allow their human operators to distinguish between peaceful civilians and those engaged in direct hostilities. Indeed, advanced surveillance capability enhances the ability of a State's forces to undertake precautions in attack.<sup>16</sup> But these optimal conditions may not exist in every case. More importantly, a drone operation team sitting thousands of miles away from the environment in which a potential target is located may well be at an even greater human intelligence gathering disadvantage than ground forces, who themselves are often unable to collect reliable intelligence.

83. It was clear during my mission to Afghanistan how hard it is even for forces on the ground to obtain accurate information. Testimony from witnesses and victims' family members, showed that international forces were often too uninformed of local practices, or too credulous in interpreting information, to be able to arrive at a reliable understanding of a situation. International forces all too often based manned airstrikes and raids that resulted in killings on faulty intelligence. Multiple other examples show that the legality of a targeted killing operation is heavily dependent upon the reliability of the intelligence on which it is based.<sup>17</sup> States must, therefore, ensure that they have in place the procedural safeguards necessary to ensure that intelligence on which targeting decisions are made is accurate and verifiable.

84. Furthermore, because operators are based thousands of miles away from the battlefield, and undertake operations entirely through computer screens and remote audiofeed, there is a risk of developing a “Playstation” mentality to killing. States must ensure that training programs for drone operators who have never been subjected to the risks and rigors of battle instil respect for IHL and adequate safeguards for compliance with it.

15 Murray Wardrop, ‘Unmanned Drones Could be Banned, Says Senior Judge,’ *The Telegraph*, 6 July 2009.

16 Michael N. Schmitt, Precision Attack and International Humanitarian Law, *International Review of the Red Cross* 87 (Sept. 2005).

17 See, e.g., Israel Ministry of Foreign Affairs Website, “Findings of the inquiry into the death of Salah Shehadeh” available at: <http://www.mfa.gov.il/MFA/Government/Communiques/2002/Findings%20of%20the%20inquiry%20into%20the%20death%20of%20Salah%20Sh.>

85. Outside the context of armed conflict, the use of drones for targeted killing is almost never likely to be legal. A targeted drone killing in a State's own territory, over which the State has control, would be very unlikely to meet human rights law limitations on the use of lethal force.

86. Outside its own territory (or in territory over which it lacked control) and where the situation on the ground did not rise to the level of armed conflict in which IHL would apply, a State could theoretically seek to justify the use of drones by invoking the right to anticipatory self-defence against a non-state actor.<sup>18</sup> It could also theoretically claim that human rights law's requirement of first employing less-than-lethal means would not be possible if the State has no means of capturing or causing the other State to capture the target. As a practical matter, there are very few situations outside the context of active hostilities in which the test for anticipatory self-defence – necessity that is “instant, overwhelming, and leaving no choice of means, and no moment of deliberation”<sup>18</sup> – would be met. This hypothetical presents the same danger as the “ticking-time bomb” scenario does in the context of the use of torture and coercion during interrogations: a thought experiment that posits a rare emergency exception to an absolute prohibition can effectively institutionalise that exception. Applying such a scenario to targeted killings threatens to eviscerate the human rights law prohibition against the arbitrary deprivation of life. In addition, drone killing of anyone other than the target (family members or others in the vicinity, for example) would be an arbitrary deprivation of life under human rights law and could result in State responsibility and individual criminal liability.

Several years later, in his 2013 report to the General Assembly, Special Rapporteur Heyns set out to revisit the Alston report, to update it, and deal with the prevailing concerns.<sup>19</sup>

*Report to the General Assembly (A/68/382, 13 September 2013, ¶¶ 12-24)*

12. New methods of employing lethal force are continuously developed. [...] Drones, assumed for the purposes of the present report to be armed drones, have moved from the horizon into the realm of the known. The appeal of drones is clear. Among other things, they provide the strategic advantage of greatly reducing the time between the identification of a potential target that could be a great distance away and the deployment of deadly force against that target. Drones, it can safely be said, are here to stay.

13. There is broad agreement that drones themselves are not illegal weapons. [...] There is, however, a notable lack of consensus on how to apply the rules of international law that regulate the use of force to drones, the fact that drones are now an established technology notwithstanding. It is the aim of the Special Rapporteur in the present report to contribute to clarifying the application of those rules and to reiterate their authority, from the perspective of protection of the right to life.

14. Drones can be expected to become more sophisticated and available in more compact form, and also to become less expensive and therefore more accessible. They are likely to form part of the arsenals of an increasing number of States that may be able to deploy such force across international borders in relatively non-intrusive and sometimes non-attributable ways, on the battlefield and to pursue targets far removed from what would traditionally be seen as zones of armed conflict. Some States may also wish to use armed drones in domestic law enforcement contexts, such as for border patrols, operations against organised crime and crowd control in demonstrations. Armed drones may fall into the hands of non-State actors and may also be hacked by enemies or other entities. In sum, the number of States with the capacity to use drones is likely to increase significantly in the near future, underscoring the need for greater consensus on the terms of their use.

18 See R.Y. Jennings, ‘The Caroline and McLeod Cases,’ *American Journal of International Law* 32 (1938) p. 92.

19 See also Christof Heyns & Tess Borden ‘“Unmanned” Weapons: Looking for the Gender Dimensions’ in F. Ni Aolain et al (eds) *Oxford Handbook on Gender and Conflict* (OUP 2017).

15. The ready availability of drones may lead to States, where they perceive their interests to be threatened, increasingly engaging in low-intensity but drawn-out applications of force that know few geographical or temporal boundaries. This would run counter to the notion that war — and the transnational use of force in general — must be of limited duration and scope, and that there should be a time of healing and recovery following conflict.

16. Peace should be the norm, yet such scenarios risk making its derogation the rule by privileging force over long-term peaceful alternatives. The expansive use of armed drones by the first States to acquire them, if not challenged, can do structural damage to the cornerstones of international security and set precedents that undermine the protection of life across the globe in the longer term. There is also uncertainty about the extent to which States are newly acquiring the technology and, because their engagement in the current debates is limited, about what their approach will be in the future.

17. On the one hand, it is often said that drones contribute towards more accurate targeting and can reduce civilian casualties. On the other, drones make it not only physically easier to dispatch long-distance and targeted armed force, but the proliferation of drones may lower social barriers in society against the deployment of lethal force and result in attempts to weaken the relevant legal standards.

18. Given that drones greatly reduce or eliminate the number of casualties on the side using them, the domestic constraints — political and otherwise — may be less restrictive than with the deployment of other types of armed force. This effect is enhanced by the relative ease with which the details about drone targeting can be withheld from the public eye and the potentially restraining influence of public concern. Such dynamics call for a heightened level of vigilance by the international community concerning the use of drones.

19. A decade or so ago, the use of armed drones was relatively novel and untested; their human impact and further technological development were hard to predict, and a full discussion of the proper application of the international legal framework had yet to emerge. A vast body of academic and advocacy literature has now developed, and civil society watchdogs are tracking the issue and pursuing transparency. Armed drones have been debated in various forums of the United Nations, intergovernmental bodies and national Governments and courts.<sup>20</sup> Recent initiatives that help to shape the international response and consensus, for example by the European Parliament and an independent advisory committee of the Government of the Netherlands, deserve attention and support.<sup>21</sup>

20. Looking backwards and forwards, and keeping in mind the advent of new weapons systems waiting in the wings, the current moment provides an opportunity to take stock. It is a chance to reflect on the outlines of the debate as it currently stands, to restate the law in some places, to identify the main disagreements and to address some of the contentious issues. This opportunity may be further facilitated by the fact that available information suggests that the present number of drone strikes may at the moment have declined.<sup>22</sup>

20 United Kingdom, High Court of Justice, *The Queen on The Application of Noor Khan v. The Secretary of State for Foreign and Commonwealth Affairs*, case No. CO/2599/2012, judgement of 21 December 2012.

21 Nils Melzer, *Human Rights Implications of the Usage of Drones and Unmanned Robots in Warfare*, European Parliament, Directorate General for External Policies, Policy Department Study (Brussels, 2013) and Advisory Committee on Issues of Public International Law, “Main conclusions of advice on armed drones” (The Hague, 2013).

22 Scott Shane, “Debate aside, number of drone strikes drops sharply”, *New York Times*, 21 May 2013. This could be due in part to pressures on Governments by the public.

21. The Special Rapporteur emphasises that the various components of international law developed over the ages create a finely balanced system to address immediate security concerns, in addition to the need to protect the right to life in the short and long terms. International security and the protection of the right to life depend on the principle that the use of force is a matter of last resort.

22. The most immediate protection for the right to life is provided by the international human rights law framework. This is the default legal regime from which deviations are permissible only when, and for as long as, those who justify the more permissive use of force under international humanitarian law can show that the requisite conditions have been fulfilled.

23. An outer layer of protection for the right to life is the prohibition on the resort to force by one State against another, again subject to a narrowly construed set of exceptions. The protection of State sovereignty and of territorial integrity, which on occasion presents a barrier to the protection of human rights, here can constitute an important component of the protection of people against deadly force, especially with the advent of armed drones.

24. A central point made by the Special Rapporteur is that a holistic approach is needed in order to protect the right to life. For a particular drone strike to be lawful under international law it must satisfy the legal requirements under all applicable international legal regimes. Although a particular drone strike may satisfy the requirements for the use of inter-State force, it may nevertheless be inconsistent with applicable rules of international humanitarian law and international human rights law, or vice versa, and thus unlawful under international law. The right to life can be adequately secured only if all the distinct requirements posed by the various constitutive parts of international law are met.

## 2. Legal frameworks

The preponderance of Special Rapporteur Heyns' 2013 General Assembly report on drones concerned the legal frameworks under which the use of drones must be considered. This report built upon the broader discussion of the legal framework for targeted killings elaborated by Special Rapporteur Alston in his 2010 report to the Human Rights Council (excerpted at length in Chapter 5).

*Report to the General Assembly (A/68/382, 13 September 2013, ¶¶ 42-76)*

### *1. International human rights law*

[...]

#### *(c) Applicability of human rights norms to extraterritorial actions by States*

42. The use of drones by one State in another State's territory raises the question whether States can be held accountable for their actions outside their own territories.

43. [The status of the right to life as a general principle of international law and a customary norm] means that, irrespective of the applicability of treaty provisions recognizing the right to life, States are bound to ensure the realization of the right to life when they use force, whether inside or outside their borders.

44. In addition, States are bound by those treaties to which they are a party and are subject to monitoring by their respective supervisory mechanisms. The applicability of such treaties is normally limited to individuals under the jurisdiction of a State party.<sup>23</sup> Jurisdiction has a

23 In the International Covenant on Civil and Political Rights, the obligation of States is further limited to "all individuals within its territory" (art. 2 (1)). However, since *López Burgos v. Uruguay* (communication No. 52/1979, views adopted on 29 July 1981, the Human Rights Committee has held that States parties can also be held

territorial and a personal dimension. All persons finding themselves within the territory of a State are presumed to be within its territorial jurisdiction.<sup>24</sup>

45. That human rights treaty obligations can apply in principle to the conduct of a State outside its territory has been confirmed by, among others, the International Court of Justice,<sup>25</sup> the Human Rights Committee,<sup>26</sup> the Inter-American Commission on Human Rights<sup>27</sup> and the European Court of Human Rights.<sup>28</sup>

46. States exercise territorial jurisdiction beyond their own borders where they exercise effective control over other territory, while personal jurisdiction is established where the State has physical power, authority or control over individuals.<sup>29</sup>

47. Drones enable a State to perform targeted killing without exercising effective control over territory and without having the individual in custody, however. Accordingly, it must be asked whether such targeting can result in violations of the right to life under the applicable treaties.

48. There is limited case law on this matter. In *Alejandro*, the Inter-American Commission on Human Rights concluded that the shooting down of two private aeroplanes registered in the United States of America by Cuban military aircraft in international airspace violated the right to life of the passengers.<sup>30</sup> At the same time, in *Banković*, the European Court of Human Rights held that persons killed during aerial bombings by the North Atlantic Treaty Organization of a radio station in Serbia did not fall within the jurisdiction of the participating States for the purposes of establishing whether they had violated the right to life.<sup>31</sup> The broad sweep of this decision has, however, increasingly been narrowed in subsequent cases in the same system,<sup>32</sup> and it is not clear that the position can be sustained.

49. It has been argued that the deliberate killing of selected individuals through extraterritorial drone strikes is likely to bring the affected persons within the jurisdiction of the operating State.<sup>33</sup> Pursuing this line of reasoning, where a State targets individuals abroad with lethal force, it can be argued that it intends to exercise ultimate control over the individuals concerned, resulting in those actions being governed by the State's human rights treaty law obligations.<sup>34</sup>

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accountable for violations outside their territory.

- 24 This presumption may be rebutted where the State is unable to exercise its authority over its territory.
- 25 International Court of Justice, *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory*, Advisory Opinion of 9 July 2004, para. 109
- 26 Human Rights Committee, General comment No. 31 on the nature of the general legal obligation imposed on States parties, (2004), para. 10.
- 27 *Coard and others v. United States*, case 10.951, Report No. 109/99, 29 September 1999, para. 37.
- 28 European Court of Human Rights (ECtHR), *Al-Skeini and others v. the United Kingdom*, application No. 55721/07, Grand Chamber judgement of 7 July 2011, paras 106-186; *Loizidou v. Turkey*, application No. 15318/89, judgement of 18 December 1996; *Ilaşcu v. Moldova and Russia*, application No. 48787/99, judgement of 8 July 2004, para. 392; *Al-Jedda v. the United Kingdom*, application No. 27021/08, Grand Chamber judgement of 7 July 2011.
- 29 *Al-Skeini v. the United Kingdom*, *supra* note 28; *Loizidou v. Turkey*, *supra* note 28; *Ilaşcu v. Moldova and Russia*, *supra* note 28; International Court of Justice, *Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Uganda)*, Judgment, I.C.J. Reports 2005, p. 168; Inter-American Commission on Human Rights, *Coard and others v. United States*, *supra* note 27; Human Rights Committee, *Burgos v. Uruguay*, *supra* note 23.
- 30 *Armando Alejandro Jr., Carlos Costa, Mario de la Pena y Pablo Morales v. Republic of Cuba*, case 11.589, Report No. 86/99, 29 September 1999, paras. 23-25
- 31 ECtHR, *Banković and others v. Belgium and 16 Other Contracting States*, application No. 52207/99, Grand Chamber decision (admissibility) of 12 December 2001, para. 82.
- 32 *Al-Skeini v. the United Kingdom*, *supra* note 28, paras. 106-186.
- 33 See Nils Melzer, *Targeted Killing in International Law* (Oxford: OUP, 2008).
- 34 Cordula Droege, "Elective affinities? Human rights and humanitarian law", *International Review of the Red Cross*, 90:871 (September 2008), p. 516; Noam Lubell, *Extraterritorial Use of Force Against Non-State Actors* (Oxford: OUP,

50. That a State has human rights obligations with regard to conduct outside its territory does not automatically mean that those obligations are the same as those that arise within its territory. In principle, while control of territory means that a State has obligations, guaranteed by international law, not only to respect but also to ensure and to fulfil the human rights of those on the territory, the exercise of authority with regard to an individual by State agents in the absence of territorial control at a minimum triggers the State's obligation to respect the rights of those individuals.<sup>35</sup>

51. It has been held that human rights treaties cannot be interpreted so as to allow a State party to perpetrate violations of the treaty on the territory of another State, which it could not perpetrate on its own territory.<sup>36</sup> The same must apply to the right to life as a part of general international law and custom. The conclusion appears to be that any positive action by a State, on its own territory or that of another State, must be carried out in compliance with its human rights obligations under all applicable rules of international law.

## 2. International humanitarian law

### (a) General

52. Drone strikes currently do not occur in the context of international armed conflict between States. Drones, where used in the context of armed conflict, are rather used where the respective parties are States and non-State armed groups, which potentially makes their use situations of non-international (or non-inter-State) armed conflict. Consequently, the Special Rapporteur focuses herein on the latter.

53. If a drone strike occurs in a situation where a non-international armed conflict exists, the protection afforded to the right to life is commonly interpreted in accordance with the rules of international humanitarian law. It is important to emphasise, however, that not all applications of violence by States against non-State actors meet the threshold requirements to be regarded as an armed conflict. Accordingly, if there is no armed conflict, there can be no non-international armed conflict, and international humanitarian law does not apply to such use of force.

54. It is worth noting the view held by some that, where a State uses force on the territory of another State against a non-State actor without the consent of the latter State, the law relating to international armed conflicts will also be applicable because the use of force is also against the territorial State.<sup>37</sup>

### (b) Criteria for the existence of a non-international armed conflict

55. For violence to amount to a non-international armed conflict, the threshold requirements are that it must be protracted armed violence between governmental authorities and organised armed groups or between such groups within a State.<sup>38</sup> Two cumulative criteria must thus be satisfied for a particular situation to be classified as a non-international armed conflict to which international humanitarian law would apply: the intensity of the conflict and the organization of the parties to the conflict.<sup>39</sup>

2010), pp. 227-231; Marko Milanovic, *Extraterritorial Application of Human Rights Treaties* (Oxford: OUP, 2011), pp. 209-221.

35 Milanovic, *supra* note 34, pp. 209-221.

36 ECtHR, *Issa and others v. Turkey*, application No. 31821/96, judgement of 16 November 2004, para. 71.

37 Dapo Akande, "Classification of conflicts: relevant legal concepts", in Elizabeth Wilmshurst (ed.) *International Law and the Classification of Conflicts* (Oxford, Oxford University Press, 2012), p. 70.

38 ICTY, *Prosecutor v. Duško Tadić*, case No. IT-94-1-T, trial judgment of 7 May 1997, para. 70.

39 *Ibid.*, para. 562.

56. An armed group will be considered to constitute a party to a non-international armed conflict only if it is sufficiently organised. International jurisprudence has determined the relevant indicative criteria, which include the existence of a command structure, of headquarters and of a group's ability to plan and carry out military operations.<sup>40</sup>

57. For a conflict to qualify as a non-international armed conflict, armed violence must also reach a certain threshold of intensity that is higher than that of internal disturbances and tensions.<sup>41</sup> The armed violence should not be sporadic or isolated but protracted.<sup>42</sup> The requirement of protracted violence, however, refers more to the intensity of the armed violence than its duration.<sup>43</sup> Just as the condition of organization, the intensity of the armed violence is an issue that is determined on a case-by-case basis.<sup>44</sup>

58. In the context of drones, these requirements mean that international humanitarian law will not apply where the threshold levels of violence or organization are not present, leaving international human rights law principles to govern the situation alone.

*(c) Various organised armed groups*

59. Expanded use of armed drones has been justified by arguments that force may be used not only against an organised armed group in a situation that meets the above requirements but also against its co-belligerents (or affiliates or associates).<sup>45</sup>

60. Co-belligerency is a concept that applies to international armed conflicts and entails a sovereign State becoming a party to a conflict, either through formal or informal processes.<sup>46</sup> A treaty of alliance may be concluded as a formal process, while an informal process could involve providing assistance to or establishing a common cause with belligerent forces.<sup>47</sup>

61. The idea that the concept of co-belligerency can be transposed into non-international armed conflicts has been met with resistance because it ignores the significant differences between the various forms of armed conflict and opens the door for an expansion of targeting without clear limits.<sup>48</sup>

62. The established legal position is that, where the individuals targeted are not part of the same command and control structures as the organised armed group or are not part of a single military

40 ICTY, *Prosecutor v. Fatmir Limaj, Haradin Bala and Isak Musliu*, case No. IT-03-66-T, judgement of 30 November 2005, paras. 94-134; International Criminal Court, *Prosecutor v. Thomas Lubanga Dyilo*, case No. ICC-01/04-01/06-2842, judgement of 14 March 2012, paras. 536-538.

41 Protocol Additional to the Geneva Conventions of 12 August 1949 relating to the Protection of Victims of Non-International Armed Conflicts (Additional Protocol II), art. 1 (2); ICTR, *Prosecutor v. Musema*, case No. ICTR-96-13-A, Judgment, 27 January 2000, para. 248.

42 *Prosecutor v. Musema*, *supra* note 41, para. 248.

43 ICTY, *Prosecutor v. Haradinaj and others*, case No. IT-04-84-T, Trial Chamber judgement of 3 April 2008, para. 49; *Prosecutor v. Limaj*, *supra* note 40, para. 90.

44 *Prosecutor v. Musema*, *supra* note 41, para. 249.

45 See [www.whitehouse.gov/the-press-office/2013/02/12/remarks-president-state-union-address](http://www.whitehouse.gov/the-press-office/2013/02/12/remarks-president-state-union-address). See also Curtis A. Bradley and Jack L. Goldsmith, "Congressional authorization and the war on terrorism", *Harvard Law Review*, 118:7 (2005), pp. 2112-2113.

46 L. Oppenheim, *International Law: A Treatise*, (ed. H. Lauterpacht), 5th ed. (London: Longmans, 1935), pp. 203, 206.

47 *Ibid.*

48 "The [United States] administration's failure to define what specific organizational features or conduct would lead a group to be classified as an associated force raises concerns that this results in an aggressive and indefinitely expansive scope of targeting authority." See [www.hrw.org/news/2013/04/11/joint-letter-president-obama-us-drone-strikes-and-targeted-killings](http://www.hrw.org/news/2013/04/11/joint-letter-president-obama-us-drone-strikes-and-targeted-killings).

hierarchical structure, they ought not to be regarded as part of the same group, even if there are close ties between the groups.<sup>49</sup>

63. Violence by various organised armed groups against the same State can amount to separate non-international armed conflicts, but only where the intensity of violence between each group and the State individually crosses the intensity threshold. Isolated drone strikes alone are unlikely to meet this threshold of violence intensity.<sup>50</sup>

*(d) Question of a “transnational” non-international armed conflict*

64. When a State uses force against non-State actors in a number of foreign States, some commentators have proposed that the entirety of the violence between the State and the non-State actors should be understood to constitute a single, transnational non-international armed conflict, occurring across multiple territories where fighters can potentially be targeted. It has been argued that this could be the case if — and only if — those targeted have a nexus to the same organised armed group.<sup>51</sup> Yet one of the risks posed by a facile acceptance of the possibility of a transnational armed conflict is subjecting unsuspecting communities to the risk of disproportionate collateral damage.

65. It is to be questioned whether the various terrorist groups that call themselves Al-Qaida or associate themselves with Al-Qaida today possess the kind of integrated command structure that would justify considering them a single party involved in a global non-international armed conflict.<sup>52</sup>

66. The view of the International Committee of the Red Cross (ICRC) is that, based on the facts, this type of non-international armed conflict is not and has not been taking place. Instead, a case-by-case approach to legally analysing and classifying the various situations of violence that have occurred in efforts to combat terrorism should be applied. Some situations may be classified as an international armed conflict, others a non-international armed conflict, while various acts of terrorism taking place in the world may be outside any armed conflict.<sup>53</sup>

*(e) Requirement of distinction*

67. Once it has been established that an armed conflict exists, and thus that the rules of international humanitarian law apply in the specific case, the next question concerns who may be targeted. Civilians may not be made the object of an attack unless, and only for such time as, they take a direct part in hostilities.<sup>54</sup> Furthermore, where there is doubt as to whether a person is a civilian or is taking a direct part in hostilities, civilian status must be presumed.<sup>55</sup>

68. In its Interpretive Guidance on Direct Participation in Hostilities, ICRC has taken the view that civilians protected from direct attack in a non-international armed conflict are all those who are neither members of a State’s armed forces nor members of organised armed groups. The

49 *Prosecutor v. Haradinaj*, *supra* note 43, p. 144.

50 Noam Lubell and Nathan Derejko, “A global battlefield? Drones and the geographical scope of armed conflict”, *Journal of International Criminal Justice*, 11:1 (2013), p. 78.

51 *Ibid.*, p. 84.

52 See Claus Kreß, “Some reflections on the international legal framework governing transnational armed conflicts”, *Journal of Conflict and Security Law*, 15: 2 (2010), p. 261.

53 ICRC, “International humanitarian law and the challenges of contemporary armed conflicts”, document 31IC/11/5.1.2 (2011), pp. 10-11.

54 Additional Protocol II, *supra* note 41, art. 13 (2) and (3) and Protocol Additional to the Geneva Conventions of 12 August 1949, relating to the Production of Victims of International Armed Conflict (Additional Protocol I), art. 51.

55 Additional Protocol II, *supra* note 41, art. 13 (2) and (3); Additional Protocol I, *supra* note 54 art. 50 (1)

latter are then defined as “individuals whose continuous function it is to take a direct part in hostilities (‘continuous combat function’)”.<sup>56</sup> Thus, a drone strike carried out against an individual with a continuous combat function in an organised armed group with which the attacking State is engaged in a non-international armed conflict will be consistent with the principle of distinction in international humanitarian law, provided that the other rules of international humanitarian law are also observed. It can never be sufficient to claim that someone targeted is a member of the opposing party; he or she must at least be a member of the armed forces of that group.

69. In addition to targeting on the basis of continuous combat function, individual civilians will lose their protection from direct attack based on conduct when, and only for such time as, they engage in specific acts of direct participation. According to ICRC, there is a three-stage test for determining when a civilian is directly participating in hostilities and thus may be targeted:<sup>57</sup> the actions of the civilian must reach a certain threshold of harm; there must be direct causation; and there must be a belligerent nexus to the conflict.<sup>58</sup>

70. The ICRC test may rightly be criticised because of its lack of an authoritative basis in treaty law, but it has the advantage that the question of who is a legitimate target is answered by reference to the performance of activity that directly causes harm to belligerents and/or civilians. This provides some objective basis for determining who may be targeted. It is noteworthy that the ICRC approach to the concepts of “members of organised armed groups” and “direct participation in hostilities” has been followed in recent State practice concerning drone attacks.<sup>59</sup>

71. International humanitarian law provides that all feasible precautions must be taken in determining whether a person has lost protection from attack as described above.<sup>60</sup> This obligation requires parties to the conflict to use all information that is reasonably available in making the determination about whether a person is a lawful target. To the extent that drones enable more precise targeting and have a greater capacity for extended surveillance than other methods of force projection, such as other aeroplanes, there is also a greater concomitant responsibility to take precautions.

72. References are sometimes made to signature strikes, whereby people may be targeted based on their location or appearance.<sup>61</sup> This is not a concept known to international humanitarian law and could lead to confusion. The legality of such strikes depends on what the signatures are. In some cases, people may be targeted without their identities being known, based on insignia or conduct. The legal test remains whether there is sufficient evidence that a person is targetable under international humanitarian law, as described above, by virtue of having a continuous combat function or directly participating in hostilities,<sup>62</sup> and if there is doubt States must refrain from targeting.<sup>63</sup> Insofar as the term “signature strikes” refers to targeting without sufficient information to make the necessary determination, it is clearly unlawful.

56 Nils Melzer, *Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law* (Geneva, ICRC, 2009), p. 27.

57 Ibid.

58 Ibid., p. 46.

59 See decision of the German Federal Prosecutor of 20 June 2013. Available from [www.generalbundesanwalt.de/docs/drohneneinsatz\\_vom\\_04oktober2010\\_mir\\_ali\\_pakistan.pdf](http://www.generalbundesanwalt.de/docs/drohneneinsatz_vom_04oktober2010_mir_ali_pakistan.pdf) (in German).

60 Melzer, *supra* note 56, p. 74.

61 Kevin Jon Heller, “‘One hell of a killing machine’: signature strikes and international law”, *Journal of International Criminal Justice*, 11:1 (2012), pp. 8-20.

62 Ibid. The author distinguishes between “legally adequate” and “legally inadequate” signatures.

63 Additional Protocol I, *supra* note 54, art. 50 (1). See also ICRC, Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949, Commentary on Additional Protocol II, para. 4789 and Interpretive Guidance, recommendation VIII.

73. Where one drone attack is followed up by another in order to target those who are wounded and hors de combat or medical personnel, it constitutes a war crime in armed conflict and a violation of the right to life, whether or not in armed conflict. Strikes on others confirmed to be civilians who are directly participating in hostilities or having a continuous combat function at the time of the follow-up strike could be lawful if the other international humanitarian law rules are respected.

74. The public statements of States that they conduct threat assessments of individuals before targeting them in armed conflict should be welcomed and implementation of these statements should be urged, because this offers a higher level of protection than is required by international humanitarian law in respect of legitimate targets.<sup>64</sup> The proviso is that the situation must be correctly classified as an armed conflict; if the requirements posed for a non-international armed conflict are not met, a threat assessment is not enough, and the more rigorous conditions of self-defence under international human rights law must be met. (f) Requirement of proportionality

*(f) Requirement of proportionality*

75. Drones come from the sky, but leave the heavy footprint of war on the communities that they target.<sup>65</sup> The claims that drones are more precise in targeting cannot be accepted uncritically, not least because terms such as “terrorist” or “militant” are sometimes used to describe people who are in truth protected civilians. The principle of proportionality protects those civilians who are not directly targeted but nevertheless may bear the brunt of the force used. According to this principle, it is prohibited to carry out an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.<sup>66</sup> By implication, where it is not excessive, such losses are regarded as incidental (“collateral”) damage and are not prohibited, provided that international humanitarian law rules have been respected. The risk to civilians may be exacerbated where drone strikes are carried out far away from areas of actual combat operations, especially in densely populated areas, and unsuspecting civilians may suddenly find themselves in the line of fire.

76. Avoiding collateral damage requires taking all feasible precautions to prevent or minimise incidental loss of civilian lives and information-gathering relating to possible civilian casualties and military gains.<sup>67</sup>

In addition to the question as to which legal frameworks govern drones use, and according to which targeting might be evaluated, Special Rapporteur Heyns also stressed various preceding questions related to *jus ad bellum*:

*Report to the General Assembly (A/68/382, 13 September 2013, ¶¶ 80- 94)*

80. In addition to the rules of international humanitarian law and international human rights law that must be strictly observed in any drone strike, the use by one State of drones to target individuals located in another State will be lawful only where it complies with the rules on the use of inter-State force. While international humanitarian law and international human rights law are aimed at protecting the individuals concerned, the law on the use of inter-State force serves

64 See [www.theguardian.com/world/2013/may/23/obama-drones-guantanamo-speech-text](http://www.theguardian.com/world/2013/may/23/obama-drones-guantanamo-speech-text).

65 International Human Rights and Conflict Resolution Clinic at Stanford Law School and Global Justice Clinic at New York University School of Law, “Living under drones: death, injury, and trauma to civilians from US drone practices in Pakistan” (2012), available from <http://livingunderdrones.org/wp-content/uploads/2012/10/Stanford-NYU-LIVING-UNDERDRONES.pdf>.

66 Additional Protocol I, *supra* note 54, art. 51 (5) (b).

67 *Ibid.*

primarily to protect the legal rights of States, including the right and interest of the State to have the lives of its citizens and inhabitants protected from aggressive acts. It can thus indirectly serve to protect life by containing the geographical spread of conflict.

81. Article 2 (4) of the Charter of the United Nations and customary international law prohibit the threat or use of inter-State force, subject to limited exceptions. A State may consent to the use of force on its territory by another State. The Charter also allows action taken in self-defence.<sup>68</sup>

### 1. Consent

82. Only the State's highest government authorities have the power to give consent to use force. It is not sufficient to obtain consent from regional authorities or from particular agencies or departments of the Government.<sup>69</sup> Where there is a difference of view between the highest authorities in the Government and lower-level officials, the view of the higher-level officials should be taken as determinative.

83. While there is no requirement that consent be made public, it must nevertheless be clear between the States concerned that consent is being given to a use of force, and the parameters of that consent should also be made clear. Consent must be given in advance.<sup>70</sup> Moreover, consent must be freely given and clearly established. It must be actually expressed by the State rather than merely presumed on the basis that the State would have consented if it had been asked. Consent may be vitiated by error, fraud, corruption or coercion.<sup>71</sup>

84. Once consent to the use of force is withdrawn, the State conducting the targeting operations is bound by international law to refrain from conducting any further operations from that moment.<sup>72</sup> States cannot consent to violations of international human rights law or international humanitarian law on their territory.

### 2. Self-defence

85. The use of drones on the territory of other States has also been justified on the basis of self-defence (including where consent was not given or is unclear). International law poses stringent requirements on the use of force in self-defence. Under Article 51 of the Charter and customary international law, a State may invoke self-defence to justify its use of force to target individuals in another State's territory when an armed attack occurs or (see below) is imminent. The International Court of Justice has confirmed that, for an attack to constitute an armed attack and thus enable the State's right to use force in self-defence, the scale and effects of the attack must reach a certain threshold of gravity.<sup>73</sup>

86. In addition, the State claiming to be acting in self-defence must satisfy the dual requirements of necessity and proportionality, grounded in customary international law. These requirements, as defined in the context of the use of inter-State force, are closely linked to the aim of a lawful act of self-defence. Thus, necessity and proportionality mean that self-defence must not be retaliatory or punitive; the aim should be to halt and repel an attack.<sup>74</sup> Action taken lawfully in self-defence,

68 The Security Council can also authorise the use of force. Humanitarian intervention without Council approval is a controversial ground for the use of inter-State force.

69 See International Law Commission, Draft articles on responsibility of States for internationally wrongful acts, commentary to article 20.

70 Ibid.

71 Ibid.

72 Ibid., para. 6.

73 See *Armed Activities on the Territory of the Congo*, *supra* note 29.

74 *Nicaragua v. United States of America*, Judgment, I.C.J. Reports 1986, p. 14, para. 191, *Oil Platforms (Islamic Republic*

such as the use of drones to target individuals in another State's territory, must serve the purpose of halting and repelling an armed attack and must be both necessary and proportionate to that end.

[...]

90. The right to self-defence persists only for so long as it is necessary to halt or repel an armed attack and must be proportionate to that aim. In determining what is necessary to bring an attack to an end and what is a legitimate objective for self-defence, however, States are not entitled to continue to act in self-defence until the absolute destruction of the enemy is achieved, such that the enemy poses no long-term threats.

91. It has been argued that self-defence against an armed group on the territory of another State is permissible only if the host State is unable or unwilling to act against that group.<sup>75</sup> This follows from the requirement that action taken in self-defence must be necessary. The test of unwillingness or inability can therefore not refer to an independent justification for the use of force on foreign soil, but at best constitute part and parcel of a claim to self-defence. Moreover, in determining whether a State is unable or unwilling to take action, the State acting in self-defence might be required to request such action before the commencement of acts taken in self-defence, to establish that it is necessary.

92. Importantly, the imminence requirement in international human rights law that stipulates that life may be taken only to protect life is not to be conflated with the requirement of imminence in the law governing the use of force on foreign territory under Article 51 of the Charter. The former is a condition required for all uses of lethal force to be lawful under international human rights law. The latter applies under the doctrine of anticipatory self-defence and would allow the use of self-defence where an attack is imminent.<sup>76</sup>

93. Article 51 makes it clear that measures adopted by States in exercise of self-defence must be reported to the Security Council.<sup>77</sup> This can be seen as posing an obligation of transparency and justification to the international community, placing the issue formally on the agenda of the Council and recognizing its role. All States Members of the United Nations have an obligation under its founding treaty to submit such reports. While failure to report will not render unlawful an otherwise lawful action taken in self-defence, the absence of a report may be one of the factors indicating whether the State in question was itself convinced that it was acting in self-defence.<sup>78</sup> According to Article 51, the right to exercise self-defence shall continue until the Council has taken measures necessary to maintain international peace and security.

94. In addition to its transparency function, it could be argued that the rationale for this reporting requirement is to contribute towards the protection of the legal rights of sovereignty by the international community, given that the State using force is required to offer its justification for that use of force. By extension, it may be concluded that a State must report afresh when the material facts have changed, for example, where self-defence is used as a basis for the use of force on the territory of a new State, or new parties are added to the conflict.

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*of Iran v. United States of America*), Judgment, I.C.J. Reports 2003, p. 161, paras. 51 and 62.

75 Daniel Bethlehem, "Self-defence against an actual or imminent armed attack by non-State actors", *American Journal of International Law*, 106:4 (2012), pp. 770 and 776.

76 Contrast United States, Department of Justice, White Paper, "Lawfulness of a lethal operation directed against a U.S. citizen".

77 *Nicaragua v. United States*, *supra* note 74, para. 235; *Armed Activities in the Territory of the Congo*, *supra* note 29, para. 145.

78 *Nicaragua v. United States*, *supra* note 74, para. 200.

Special Rapporteur Heyns concluded his 2013 report on the legal framework with the claim that drones should follow the law, not the other way around:

*Report to the General Assembly (A/68/382, 13 September 2013, ¶¶ 102-103)*

*Conclusions*

102. The legal framework for maintaining international peace and the protection of human rights is a coherent and well-established system, reflecting norms that have been developed over the centuries and have withstood the test of time. Even though drones are not illegal weapons, they can easily be abused. The central norms of international law need not, and should not, be abandoned to meet the new challenges posed by terrorism. On the contrary, that drones make targeted killing so much easier should serve as a prompt to ensure a diligent application of these standards, especially in view of the likely expansion in the number of States with access to this technology in the future.

103. The use of drones by States to exercise essentially a global policing function to counter potential threats presents a danger to the protection of life, because the tools of domestic policing (such as capture) are not available, and the more permissive targeting framework of the laws of war is often used instead.

In his report to the General Assembly of 2014, Special Rapporteur Heyns again commented on the subject:

*Report to the Human Rights Council (A/HRC/26/36, 1 April 2014, ¶¶ 135-140)*

*A. Remotely piloted aircraft (or armed drones)*

135. It has been more than 10 years since the first reported armed drone strike in Yemen outside the scope of a traditional armed conflict, took place, on 3 November 2002.<sup>79</sup> Since then, and as at February 2014, according to some sources, a minimum estimate of 2,835 individuals have been killed in drone attacks in Pakistan, Yemen and Somalia alone.<sup>80</sup>

136. In some cases, such armed drone attacks may have been subject to and conformed with the rules of international humanitarian law (IHL), while in others there are serious concerns that they may not have met the IHL requirements. Some attacks also may not have occurred within the confines of an armed conflict, and as such should be measured by the more stringent requirements of international human rights law, which they almost certainly did not meet. There are also cases where there is genuine uncertainty. While there is agreement on most aspects of the international legal framework that is applicable to armed drones, there are some areas where its interpretation is still being debated.

137. Legal uncertainty in relation to the interpretation of important rules on the international use of force presents a clear danger to the international community. To leave such important rules open to interpretation by different sides may lead to the creation of unfavourable precedents where States have wide discretion to take life and there are few prospects of accountability. Such a situation undermines the protection of the right to life. It also undermines the rule of law, and the ability of the international community to maintain a solid foundation for international security.

138. To contribute towards a stronger global consensus on the regulation of armed drone strikes (by international law), it is proposed that the Council, among other relevant bodies, consider

79 Report of the Special Rapporteur, Asma Jahangir, E/CN.4/2003/3, 13 January 2003, para. 39.

80 See <http://www.thebureauinvestigates.com/category/projects/drones/>.

expressing its views on the applicable legal framework on drones, as has to some extent already been done by the General Assembly.<sup>81</sup>

139. The intervention by the European Union (EU),<sup>82</sup> with which the United Kingdom aligned itself,<sup>83</sup> during the debate in the Third Committee of the General Assembly, in October 2013, on the report by the Special Rapporteur, provides an important point of reference. The EU expressed its view that: (a) The current international legal framework is adequate to govern drone strikes; (b) The right to life can only be adequately protected if all constraints on the use of force set out by international law are complied with; (c) International central norms on the use of force must not be abandoned to suit the current use of drones; (d) There should be transparency surrounding all drone operations to enhance accountability.

140. The above is a minimalist position. An intervention by the Council in similar terms, to which the following point may be added, will help to narrow down at least the outer limits of the debate: (e) Outside of the narrow confines of armed conflict, any killing must meet the requirements of human rights law, and be strictly necessary and proportionate.

In his 2016 report to the General Assembly, Special Rapporteur Heyns summarised the position taken by the mandate with respect to armed drones, both regarding their use in armed conflict and in conventional law enforcement (addressed above in Chapter 3):

*Report to the General Assembly (A/71/372, 2 September 2016, ¶¶ 67-74)*

67. There is broad agreement that armed drones themselves are not illegal weapons. In many cases, however, they make it easier for States and other actors to use force and may thus present a real risk to the right to life. Legal standards should not be watered down to accommodate drones. Drones should follow the law, not the other way round.

68. It is of particular importance to maintain the distinction between situations of armed conflict and situations of law enforcement. The legal regime applicable to the latter (international human rights law) is more restrictive than that for the former (international human rights law and international humanitarian law). Whether force is used in the context of an armed conflict is a question of fact, and international humanitarian law applies only where the use of force relates to an armed conflict. Where that is not the case, the legality of the use of force against an individual is assessed by human rights law exclusively. International law does not provide that the law of self-defence in inter-State use of force can be a “stand-alone” basis for the use of force against an individual.

69. Deploying a missile from a drone against someone is invariably lethal if it hits the target. As a result, drones should be used in a context where international human rights law is the applicable legal regime (to the exclusion of international humanitarian law) only if it is necessary in order to save lives against a threat that is truly imminent, as required by the last sentence of principle 9 of the Basic Principles [...].

81 On 18 December 2013 the General Assembly adopted by consensus resolution 68/178, which in para. 6 (s) urges States “to ensure that any measures taken or means employed to counter terrorism, including the use of remotely piloted aircraft, comply with their obligations under international law, including the Charter of the United Nations, human rights law and international humanitarian law, in particular the principles of distinction and proportionality”.

82 See <http://webtv.un.org/watch/third-committee-27th-meeting-68th-general-assembly/2777317047001/#full-text>, at 1:30:10; and European Parliament Resolution on the use of armed drones (2014/2567(RSP)).

83 See <http://webtv.un.org/watch/third-committee-27th-meeting-68th-general-assembly/2777317047001/#full-text> at 1:48:36.

70. The central norms of international law need not, and should not, be abandoned to meet the challenges posed by terrorism. Indeed, the fact that drones make targeted killing so much easier should serve as a prompt to ensure diligent application of existing legal standards.

71. One of the most important ways to guard against the risks posed by drones is transparency about the factual as well as the legal situation pertaining to their use.

Transparency is a necessary step for legal accountability, mitigating abuse and democratic debate and oversight, by the population themselves as well as their representatives. The discrepancies between the figures for drone strikes recently released by the Government of the United States and civil society monitors provides a clear illustration of the uncertainty that exists regarding core facts about the drones programme, rendering proper public and other oversight of and accountability for a singularly intrusive method of using force in many cases impossible.

72. It is widely accepted that, during armed conflict, the meaning of the term “arbitrary” in human rights law is determined with reference to the requirements of international humanitarian law.<sup>84</sup> This approach has recently been called into question, however, with respect to a State which commits an act of aggression. The critical position does not challenge the fact that, in order to enhance the respect for international humanitarian law on all sides of an armed conflict, the privilege of belligerency, which shields a combatant from individual criminal responsibility whenever he or she takes the life of his or her adversary in conformity with the requirements of international humanitarian law, extends to those combatants who fight on the side of an aggressor State. However, it questions the notion that such an aggressor State itself deserves a corresponding privilege with respect to the international human right to life. Instead, it argues that the taking of enemy life by combatants of an aggressor State in the course of an act of aggression should be considered as a violation by that State of the right to life.<sup>85</sup>

73. The use of remote-controlled force in domestic policing, as raised by the Special Rapporteur in 2014 (see A/69/265) — has become a stark reality in recent years, for example when a sniper in Dallas was killed when a bomb was delivered and detonated by radio control.<sup>86</sup>

74. The use of military-style weapons in law enforcement in general should be questioned. Using such weapons implies that the citizens and the population at large are being treated as a threat. Using, for example, automatic firing mode in law enforcement operations does not comply with the requirement that every shot has to be separately justified. Using remote-controlled force during domestic policing, for example during the management of demonstrations, raises particular problems. The police have a duty to protect the public, and by using remote control they distance themselves from the public, and may not be able to fulfil this function.

### 3. Accountability and transparency

One potential safeguard against the lowering of the thresholds for the use of force, against which both Special Rapporteurs warned, is clear transparency and accountability for the manner in which drones are used. Special Rapporteur Heyns elaborated as follows in his 2013 General Assembly report:

84 See International Court of Justice, *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion of 8 July 1996, paras. 24-25.

85 The Rapporteur discussed the law dealing with the inter-State use of force as a secondary level of protection of the right to life in 2013 with reference to armed drones (see A/68/382, *supra* note 3). See, more recently, Frédéric Mégret, “What is the specific evil of aggression?”, in: Claus Kreß and Stefan Barriga (eds.) *The Crime of Aggression: A Commentary* (Cambridge: CUP, 2017).

86 See “Use of police robot to kill Dallas shooting suspect believed to be first in US history” *Guardian*, 8 July 2016, available at: [www.theguardian.com/technology/2016/jul/08/police-bomb-robot-explosive-killed-suspect-dallas?CMP=Share\\_iOSApp\\_Other](http://www.theguardian.com/technology/2016/jul/08/police-bomb-robot-explosive-killed-suspect-dallas?CMP=Share_iOSApp_Other).

*Report to the General Assembly (A/68/382, 13 September 2013, ¶¶ 95-101)*

*1. International human rights law*

95. The modern concept of human rights is based on the fundamental principle that those responsible for violations must be held to account. A failure to investigate and, where applicable, punish those responsible for violations of the right to life in itself constitutes a violation of that right.<sup>87</sup>

96. Legal and political accountability are dependent on public access to the relevant information.<sup>88</sup> Only on the basis of such information can effective oversight and enforcement take place. The first step towards securing human rights in this context is transparency about the use of drones.

97. A lack of appropriate transparency and accountability concerning the deployment of drones undermines the rule of law and may threaten international security.<sup>89</sup> Accountability for violations of international human rights law (or international humanitarian law) is not a matter of choice or policy; it is a duty under domestic and international law.<sup>90</sup>

98. The various components of transparency<sup>91</sup> require that the criteria for targeting and the authority that approves killings be known and that drone operations be placed in institutions that are able to disclose to the public the methods and findings of their intelligence, criteria used in selection of targets and precautions incorporated in such criteria.

99. One of the criticisms levelled against the current drone programmes has been the absence of an official record regarding the persons killed. States must also give guarantees of non-repetition and give effect to the right to reparations of victims of drone strikes.

100. Drone victims, just as any other human rights victims, and society at large have a right to have access to information relating to allegations of human rights violations and their investigation.<sup>92</sup> The Human Rights Council has emphasised the need under international human rights law for transparency, highlighting victims' right to know the truth about the perpetrators, their accomplices and their motives there.<sup>93</sup> Likewise, during an armed conflict, relatives of persons killed or missing have the right to know the fate of their relatives.<sup>94</sup>

87 ECtHR, *Kaya v. Turkey*, application No. 22729/93, judgement of 19 February 1998, paras. 86-92; *McCann and others v. United Kingdom*, Appl. No. 18984/91, 27 September 1995, para. 169; Human Rights Committee, General comment No. 31, *supra* note 26, para. 15.

88 Principles on the Effective Prevention and Investigation of Extra-legal, Arbitrary and Summary Executions, para. 16.

89 Melzer, *supra* note 21, p. 4.

90 Report of the Secretary-General's Panel of Experts on Accountability in Sri Lanka (12 April 2011). Available from [www.un.org/News/dh/infocus/Sri\\_Lanka/POE\\_Report\\_Full.pdf](http://www.un.org/News/dh/infocus/Sri_Lanka/POE_Report_Full.pdf).

91 See Philip Alston, "The CIA and targeted killings beyond borders", *Harvard National Security Journal*, vol. 2, No. 2 (2011), p. 287.

92 See Inter-American Court of Human Rights, "*Mapiripán Massacre*" v. *Colombia*, judgement of 15 September 2005, para. 238.

93 Human Rights Council resolution 9/11, preamble and para. 1; International Convention for the Protection of All Persons from Enforced Disappearance, art. 24 (2); Commission on Human Rights resolution 2005/66.

94 Additional Protocol I, art. 32 and ICRC, Commentary on article 32 of Additional Protocol I, para. 1197; Additional Protocol I, art. 33 and ICRC, Commentary on article 33 of Additional Protocol I, para. 1222; Geneva Convention relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), art. 138.

### *International humanitarian law*

101. A parallel obligation to investigate and, where appropriate, punish those responsible in respect of cases of alleged war crimes exists under international humanitarian law.<sup>95</sup> Whenever there are reasons to query whether violations of international humanitarian law may have occurred in armed conflict as a result of a drone strike, such as the incorrect designation of persons as targetable or disproportionate civilian harm, accountability demands at least a preliminary investigation.<sup>96</sup> Civilian casualties must be determined and should be disclosed.

The practical need for this transparency had already been made clear by Special Rapporteur Alston in his country report on the United States of America, and by Special Rapporteur Heyns in his follow-up:

*Report on Mission to the United States of America (A/HRC/11/2/Add.5, 28 May 2009, ¶¶ 71-73)*

*E. Targeted killings: lack of transparency regarding the legal framework and targeting choices*

71. The Government has credibly been alleged to have engaged in targeted killings on the territory of other States.<sup>97</sup> Senior Government officials have confirmed the existence of a program through which drones are used to target particular individuals, but have also caused civilian casualties.<sup>98</sup> On several occasions I have asked the Government to explain the legal basis on which a particular individual was targeted.<sup>99</sup> While I have welcomed the Government's willingness to engage in dialogue on targeted killings, it has been evasive about its grounds for targeting, and I am disturbed by the broader implications of its positions. Briefly, those positions are that: (a) the Government's actions against al-Qaeda constitute a world-wide armed conflict to which international humanitarian law applies; (b) international humanitarian law operates to the exclusion of human rights law; (c) international humanitarian law falls outside the mandate of the Special Rapporteur and of the Human Rights Council; and (d) States may determine for themselves whether an individual incident is governed by humanitarian law or human rights law.

95 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (First Geneva Convention), art. 49; Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (Second Geneva Convention), art. 50; Geneva Convention relative to the Treatment of Prisoners of War (Third Geneva Convention), art. 129; Fourth Geneva Convention, art. 146; Additional Protocol I, art. 85; Security Council resolution 827 (1993) establishing the International Criminal Tribunal for the Former Yugoslavia and Statute of the Tribunal, art. 2; Security Council resolution 955 (1994) establishing the International Criminal Tribunal for Rwanda and Statute of the Tribunal, art. 4; Rome Statute of the International Criminal Court, art. 8 (2) (a).

96 The Public Commission to Examine the Maritime Incident of 31 May 2010, Second Report — Turkel Commission, "Israel's mechanisms for examining and investigating complaints and claims of violations of the laws of armed conflict according to international law" (February 2013), p. 256.

97 On 17 September 2001, the President signed a "presidential finding" pursuant to the authority of which the CIA developed the concept of "high-value targets" for whom "kill, capture or detain" orders could be issued in consultation with lawyers in DOJ, CIA, and the administration. Council of Europe, *Secret Detentions and Illegal Transfers of Detainees Involving Council of Europe Member States*, report submitted by Mr. Dick Marty, Doc. 11302 Rev. (7 June 2007), paragraphs 58-64. I asked the Inspector General of the CIA about this program, but he refused to confirm or deny any aspect of this account.

98 Eric Schmitt and Christopher Drew, *More Drone Attacks in Pakistan Planned*, The New York Times, April 7, 2009; Jane Perlez, *Pakistan Rehearses Its Two-Step on Airstrikes*, The New York Times, April 15, 2009.

99 A/HRC/4/20/Add.1, *supra* note 3, pp. 342-58 (one targeted killing in Pakistan) and pp. 358-61 (three targeted killings in Pakistan); *see also* Report of the Special Rapporteur, Philip Alston, Summary of Cases Transmitted to Governments and Responses Received, E/CN.4/2006/53/Add.1, 27 March 2006, pp. 264-65.

72. I responded to these positions in detail both directly to the Government and in my 2007 report to the Council.<sup>100</sup> I have discussed the extent to which these positions constitute a radical departure from past practice, and the highly negative consequences that would flow from them.<sup>101</sup> Under the Government's reinterpretation of the law and the Council's and my mandate, the United States would function in a public accountability void - as could other States - to the detriment of the advances made by the international human rights and humanitarian law regimes over the past sixty years.

73. The new administration should reconsider these positions and move to ensure the necessary transparency and accountability. Withholding such information replaces public accountability with unverifiable Government assertions of legality, inverting the very idea of due process.

***Follow up country report to the United States of America (A/HRC/20/22/Add.3, 29 March 2012, ¶¶ 79-82)***

79. The Special Rapporteur again requests the Government to clarify the rules that it considers to cover targeted killings, as mere reference to a statement made by a senior State official is insufficient. The Special Rapporteur reiterates his predecessor's recommendation that the Government specify the bases for decisions to kill rather than capture "human targets" and whether the State in which the killing takes place has given consent. It should also specify procedural safeguards in place to ensure in advance that targeted killings comply with international law, as well as the measures taken after such killing to ensure that its legal and factual analysis is accurate.

80. In the absence of Government transparency, civil society has conducted considerable research on drone strikes. Although figures vary widely with regard to drone attack estimates, all studies concur on one important point: there has been a dramatic increase in their use over the past three years.<sup>102</sup> While these attacks are directed at individuals believed to be leaders or active members of al-Qaeda or the Taliban, in the context of armed conflict (e.g. in Afghanistan), in other instances, civilians have allegedly also perished in the attacks<sup>103</sup> in regions where it is unclear whether there was an armed conflict or not (e.g. in Pakistan).

81. Since June 2004, some 300 drone strikes have been carried out in Pakistan<sup>104</sup> and the number of resulting deaths has allegedly reached quadruple figures according to unconfirmed reports,<sup>105</sup> of which about 20 per cent are believed to be civilians.<sup>106</sup> According to the non-governmental Pakistan Human Rights Commission, United States drones strikes were responsible for at least 957

100 Report of the Special Rapporteur, Philip Alston, A/HRC/4/20, 29 January 2007; A/HRC/4/20/Add.1, *supra* note 3, pp. 342-58.

101 These consequences include: (a) many of the worst human rights and humanitarian law violations in the world today would be removed from the purview of the Special Rapporteur and the Human Rights Council; (b) a State could target and kill any individual, anywhere in the world, whom it deemed to be an "enemy combatant" and it would not be accountable to the international community; (c) a State could unilaterally decide that a particular incident complied with international law - as interpreted solely by the State - and would not therefore be covered by the mandate; (d) it is widely agreed that international human rights and humanitarian law are complementary, not mutually exclusive.

102 New American Foundation database on drone strikes 2004-2011, available from <http://counterterrorism.newamerica.net/drones>; also Peter Bergen and Katherine Tiedemann, *The Year of the Drone - An Analysis of U.S. Drone Strikes in Pakistan, 2004-2010*, New America Foundation, 24 February 2010.

103 Amnesty International, *As if Hell Fell on Me: The Human Rights Crisis in Northwest Pakistan*, June 2010, p. 87

104 Chris Woods, "Number of CIA drone strikes in Pakistan hit 300," 14 October 2011, All Stories, Covert Drone War, Human Rights, Bureau of Investigative Journalism.

105 See New American Foundation database on drone strikes, *supra* note 102.

106 *Ibid.*

deaths in Pakistan in 2010.<sup>107</sup> Information also indicates that the attacks increasingly fuel protests among the population.<sup>108</sup> In the mission report, the Special Rapporteur recommended that the Government publish the number of civilians collaterally killed as a result of drone attacks, and the measures in place to prevent such casualties. The DoD formally confirmed that such estimates of civilian casualties are not compiled separately from estimates related to other weapons systems.<sup>109</sup> The Special Rapporteur reiterates the recommendation that the Government track civilian casualties in disaggregated data so as to identify the number of casualties resulting from the use of drone attacks.

82. Disclosure of these killings is critical to ensure accountability, justice and reparation for victims or their families. No system of compensation and reparation such as those put in place in Iraq and Afghanistan exist in Pakistan, Yemen, Somalia or other States where such strikes have allegedly taken place. The Government should clarify the procedures in place to ensure that any targeted killing complies with international humanitarian law and human rights, and indicate the measures or strategies applied to prevent casualties, as well as the measures in place to provide prompt, thorough, effective and independent public investigation of alleged violations.<sup>110</sup>

## C. AUTONOMOUS WEAPONS SYSTEMS (AWS)

The Special Rapporteur's research into drones led to further detailed research into the development of other potential unmanned weapon platforms. Special Rapporteur Alston included a section in his report to the General Assembly in 2010 on autonomous weapons systems, or lethal autonomous robotics (LARs), as they were known at the time.

Special Rapporteur Heyns presented a full report on such weapons systems in July 2013 to the Human Rights Council. This report, together with the advocacy of civil society groups, prompted a meeting on the topic of the state parties to the Convention on Conventional Weapons (CCW) on how to respond to this new technology in November of that year.<sup>111</sup> Heyns served as advisor to the CCW on the topic until the end of his mandate in 2016. The process at the CCW is still ongoing at the time of publication.

### 1. Definitions

Both Special Rapporteurs found it important to define at the outset of their respective reports what was included within the terms in question (and what was not):

#### *Report to the General Assembly, (A/65/321, 23 August 2010, ¶32)*

32. An initial hurdle in addressing the legal and ethical ramifications of these technologies concerns the lack of a uniform set of definitions of key terms such as “autonomous”, “autonomy” or “robots”.

107 Human Rights Commission in Pakistan, State of Human Rights in 2010, April 2011, p. 6. Figures however vary.

108 Chris Woods, “Number of CIA drone strikes in Pakistan hit 300,” The Bureau of Investigative Journalism, 14 October 2011; also Center for Constitutional Rights, “Pakistani Drone Victims and Families Seek Arrest Warrant for Former CIA Counsel John Rizzo,” 19 July 2011.

109 *American Civil Liberties Union, et al. v. Department of Justice*, No. 1:10-cv-00436-RMC (D.D.C.).

110 A/HRC/14/24/Add.6, *supra* note 3, pp. 27-28.

111 See Sarah Knuckey, “Major New Step Forward For International Debate on Autonomous Weapons Systems,” *Just Security* (Nov. 15, 2013), available at: <https://www.justsecurity.org/3255/major-step-autonomous-weapons/>; Sarah Knuckey, “Governments Conclude First (Ever) Debate on Autonomous Weapons: What Happened and What's Next,” *Just Security* (May 16, 2014), available at: <https://www.justsecurity.org/10518/autonomous-weapons-intergovernmental-meeting/>. Knuckey also presented expert testimony to the CCW in 2015. See also Sarah Knuckey, Autonomous weapons systems and transparency: toward an international dialogue, in Nehal C. Bhuta, Susanne Beck, Robin Geiß, Hin-Yan Liu, and Clauss Kreß, (eds.) *Autonomous Weapons Systems: Law, Ethics, Policy* (Cambridge, Cambridge University Press, 2016).

Uses of these terms vary significantly among the militaries of different States, as well as among defence industry personnel, academics and civilians.<sup>112</sup> Confusion can result, for example, from differences over whether “autonomous” describes the ability of a machine to act in accordance with moral and ethical reasoning ability, or whether it might simply refer to the ability to take action independent of human control (e.g. a programmed drone that can take off and land without human direction; a thermometer that registers temperatures).<sup>113</sup> As the international community begins to debate robotic technologies, it will need to at least seek a shared understanding of the systems and their characteristics.

*Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶37-43)*

37. While definitions of the key terms may differ, the following exposition provides a starting point.<sup>114</sup>

38. According to a widely used definition (endorsed *inter alia* by both the United States Department of Defense and Human Rights Watch<sup>115</sup>), the term LARs refers to robotic weapon systems that, once activated, can select and engage targets without further intervention by a human operator. The important element is that the robot has an autonomous “choice” regarding selection of a target and the use of lethal force.

39. Robots are often described as machines that are built upon the sense-think-act paradigm: they have sensors that give them a degree of situational awareness; processors or artificial intelligence that “decides” how to respond to a given stimulus; and effectors that carry out those “decisions”.<sup>116</sup> The measure of autonomy that processors give to robots should be seen as a continuum with significant human involvement on one side, as with UCAVs where there is “a human in the loop”, and full autonomy on the other, as with LARs where human beings are “out of the loop”.

40. Under the currently envisaged scenario, humans will at least remain part of what may be called the “wider loop”: they will programme the ultimate goals into the robotic systems and decide to

112 The rapid, at times almost chaotic, development of unmanned aircraft systems over the past 10 years has led to a range of terminology appearing in both military and civilian environments. All of these areas have the potential to cause confusion or misunderstanding when unmanned aircraft issues are discussed between military, industrial and academic audiences. (UK Ministry of Defence, Joint Doctrine Note 3/10, *Unmanned Aircraft Systems: Terminology, Definitions and Classification*, March 2010, available at <http://www.mod.uk/NR/rdonlyres/FBC33DD1-C111-4ABD-9518-A255FE8FCC5B/0/JDN310Amendedweb28May10.pdf>. See also Patrick Lin, George Bekey, & Keith Abney, *Autonomous Military Robotics: Risk, Ethics, and Design* (2008), available at: [http://ethics.calpoly.edu/ONR\\_report.pdf](http://ethics.calpoly.edu/ONR_report.pdf) [a report prepared for the United States Department of the Navy]; Peter Singer, *Wired for War: The Robotics Revolution and Conflict in the 21st Century* (Penguin, 2009) p. 67 (defining “robot”).

113 Compare, for example, definitions of “autonomous”, “semi-autonomous” and “automation” at United States Department of Defense, *Out Front in Harm’s Way, Joint Robotic Program, Master Plan, FY 2005*, available at <http://www.jointrobotics.com/documents/masterplan/2005%20JRP%20Master%20Plan.pdf> and UK Ministry of Defence, Joint Doctrine Note 3/10, *Unmanned Aircraft Systems: Terminology, Definitions and Classification, March 2010* available at <http://www.mod.uk/NR/rdonlyres/FBC33DD1C1114ABD9518A255FE8FCC5B/0/JDN310Amendedweb28May10.pdf>.

114 Ronald Arkin, *Governing Lethal Behaviour in Autonomous Robots* (2009), p. 7; Noel Sharkey Automating Warfare: lessons learned from the drones, p. 2, available from <http://www.alfredroma.it/wp-content/uploads/2012/05/Automated-warfareNoel-Sharkey.pdf>; Lin et al, *supra* note 112, p. 4.

115 US Department of Defense Directive, “Autonomy in Weapons Systems”, Number 3000.09 of 21 November 2012, Glossary Part II. See also United Kingdom Ministry of Defence “The UK Approach to Unmanned Aircraft Systems” paras. 202-203, available from <https://www.gov.uk/government/publications/jdn-2-11-the-uk-approach-to-unmanned-aircraftsystems>; see also, Human Rights Watch *Losing Humanity: The Case Against Killer Robots* (2012), p. 2, available at: <http://www.hrw.org/reports/2012/11/19/losing-humanity-0>.

116 Singer, *supra* note 112, p. 67.

activate and, if necessary, deactivate them, while autonomous weapons will translate those goals into tasks and execute them without requiring further human intervention.

41. Supervised autonomy means that there is a “human on the loop” (as opposed to “in” or “out”), who monitors and can override the robot’s decisions. However, the power to override may in reality be limited because the decision-making processes of robots are often measured in nanoseconds and the informational basis of those decisions may not be practically accessible to the supervisor. In such circumstances humans are *de facto* out of the loop and the machines thus effectively constitute LARs.

42. “Autonomous” needs to be distinguished from “automatic” or “automated.” Automatic systems, such as household appliances, operate within a structured and predictable environment. Autonomous systems can function in an open environment, under unstructured and dynamic circumstances. As such their actions (like those of humans) may ultimately be unpredictable, especially in situations as chaotic as armed conflict, and even more so when they interact with other autonomous systems.

43. The terms “autonomy” or “autonomous”, as used in the context of robots, can be misleading. They do not mean anything akin to “free will” or “moral agency” as used to describe human decision-making. Moreover, while the relevant technology is developing at an exponential rate, and full autonomy is bound to mean less human involvement in 10 years’ time compared to today, sentient robots, or strong artificial intelligence are not currently in the picture.<sup>117</sup>

## 2. Emergence of autonomous weapons systems

Having defined their terms, the Special Rapporteurs both described the state of the rapidly moving field:

### *2010 Report to the General Assembly, (A/65/321, 23 August 2010, ¶¶17-28)*

17. Over the past decade, the number and type of unmanned or robotic systems developed for, and deployed in, armed conflict and law-enforcement contexts has grown at an astonishing pace. The speed, reach, capabilities and automation of robotic systems are all rapidly increasing. Unmanned technologies already in use or in later stages of development — including unmanned airplanes, helicopters, aquatic and ground vehicles — can be controlled remotely to carry out a wide array of tasks: surveillance, reconnaissance, checkpoint security, neutralization of an improvised explosive device, biological or chemical weapon sensing, removal of debris, search and rescue, street patrols, and more. They can also be equipped with weapons to be used against targets or in self-defence. Some of these technologies are semi-automated, and can, for example, land, take off, fly, or patrol without human control. Robotic sentries, including towers equipped with surveillance capacity and machine guns, are in use at the borders of some countries. In the foreseeable future, the technology will exist to create robots capable of targeting and killing with minimal human involvement or without the need for direct human control or authorization.

18. Some of this technology is either unambiguously beneficial or can be used to clearly positive effect, including, most importantly, saving the lives of civilians and limiting military personnel casualties. However, the rapid growth of these technologies, especially those with lethal capacities and those with decreased levels of human control, raise serious concerns that have been almost entirely unexamined by human rights or humanitarian actors, although some military lawyers, philosophers, ethicists and roboticists have begun to do so.<sup>118</sup> The general lack of international

117 The same applies to “the Singularity”, see Singer, *supra* note 112, p. 101.

118 See, for example, Summary of Harvard Executive Session of June 2008, *Unmanned and Robotic Warfare: Issues, Options And Futures*, at 14; <http://www.lnwprogram.org/publicfiles/download/Future+of+Unmanned+>

attention to this issue is understandable. Other humanitarian or human rights issues — disastrous floods in Pakistan, killing and sexual violence in the Democratic Republic of the Congo, or gang killings in Mexico — seem far more immediately pressing, and resources, time, and staffing capacities in the United Nations, non-governmental organizations and think tanks are always stretched. In addition, anything that smacks of science fiction seems more at home in an Asimov novel or Terminator film rather than in a human rights report.

19. Various factors explain why the human rights community continues to see advances in robotics as an exotic topic that does not need to be addressed until the relevant technologies are actually in use. First, much of the information about these developments remains confined to military research establishments and specialist scientific literature. Second, understanding the technologies requires expertise beyond that of most human rights experts. Third, the attractions of greater use of robotic technologies greatly overshadow, in the public mind, the potential disadvantages. And finally, there is a North-South dimension, in that the North has the money and the technical know-how to develop the technologies, while many of the negative consequences of their use will fall much more heavily on poorer countries in the South.

20. The analysis that follows is predicated on two principal assumptions. The first is that the new robotic technologies have very important ramifications in terms of the right to life and the fight against extrajudicial executions, and that they raise issues that need to be addressed now, rather than later. The second is that, although a large part of the research and technological innovation currently being undertaken is driven by military and related concerns, there is no inherent reason why human rights and humanitarian law considerations cannot be proactively factored into the design and operationalization of the new technologies. But this will not happen unless and until the human rights community presses the key public and private actors to make sure it does; and because the human rights dimensions cannot be addressed in isolation, the international community urgently needs to address the legal, political, ethical and moral implications of the development of lethal robotic technologies.

#### *Trends in the development of lethal robotic technology*

21. While the use of lethal robots in the context of war is not unprecedented,<sup>119</sup> their development and use has dramatically increased since the attacks of 11 September 2001, the Afghanistan and Iraq conflicts, and the enormous growth in military research and development that the conflicts precipitated. Military experts have noted that the two conflicts are serving as real-time laboratories of “extraordinary development” for “robotic warfare”.<sup>120</sup>

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and+Robotic+Warfare?file\_id=505283 (“2008 Harvard Session”); Arkin, *supra* note 114; Peter Asaro, “How Just Could a Robot War Be?”, in Philip Brey, Adam Briggie & Katinka Waelbers (eds.), *Current Issues in Computing And Philosophy* (2009); William H. Boothby, *Weapons and the Law of Armed Conflict* (2009); Jason Borenstein, “The Ethics of Autonomous Military Robots”, 2 *Studies in Ethics, Law and Technology* (2008) available at <http://www.bepress.com/selt/vol2/iss1/art2>; Charles J. Dunlap, Jr., “Technology: Recomplicating Moral Life for the Nation’s Defenders”, 24 *Parameters: US Army War College Quarterly* (2009); Noel Sharkey, “Automated Killers and the Computing Profession”, *Computer Journal* (2007); Noel Sharkey, “Death Strikes from the Sky: The Calculus of Proportionality”, 28 *IEEE Technology and Society* 16-19 (2009); Robert Sparrow, “Robotic Weapons and the Future of War”, in Jessica Wolfendale and Paolo Tripodi (eds.), *New Wars and New Soldiers: Military Ethics in the Contemporary World*, (forthcoming); Robert Sparrow, “Predators or Plowshares? Arms Control of Robotic Weapons” 28 *IEEE Technology and Society* 25 (2009); Lin et al, *supra* note 112.

119 As long ago as the Second World War, for example, Germany used bombs attached to tank treads which were detonated by remote control, while the United States used radio-piloted bomber aircraft packed with explosives. See Steve Featherstone, “The Coming Robot Army”, *Harpers*, February 2007; Singer, *supra* note 112, (discussing historical development of unmanned or robotics technology).

120 2008 Harvard Session, *supra* note 118, at p. 2.

22. The primary user of this technology is the United States. Between 2000 and 2008, the number of United States unmanned aircraft systems increased from less than 50 to over 6,000.<sup>121</sup> Similarly, the number of unmanned ground vehicles deployed by the United States Department of Defense increased from less than 100 in 2001 to nearly 4,400 by 2007.<sup>122</sup> Other States, including Australia, Canada, France, Germany, Israel, the Republic of Korea and the United Kingdom of Great Britain and Northern Ireland have also developed or are developing unmanned systems.<sup>123</sup>

23. At present, the robotic weapons technologies most in use are systems that are remotely, but directly, operated by a human being. A well-known example is the “BomBot”, a vehicle which can be driven by remote control to an improvised explosive device, drop an explosive charge on the device, and then be driven away before the charge is detonated.<sup>124</sup> Another example is the Special Weapons Observation Reconnaissance Detection System (SWORDS) and its successor, the Modular Advanced Armed Robotic System (MAARS). SWORDS is a small robot that can be mounted with almost any weapon that weighs less than 300 pounds, including machine guns, rifles, grenade launchers and rocket launchers, and can travel in a variety of terrains.<sup>125</sup> It can be operated by remote control and video cameras from up to two miles away, and be used for street patrols and checkpoint security as well as to guard posts. MAARS is similar, but can carry more powerful weapons and can also be mounted with less-than-lethal weapons, such as tear gas.<sup>126</sup>

24. The level of automation that generally exists in currently deployed systems is limited to the ability of, for example, an unmanned combat aerial vehicle or a laser-guided bomb to be programmed to take off, navigate or de-ice by itself, or with only human monitoring (as opposed to control). In June 2010, trials were held in which helicopters had carried out fully autonomous flights.<sup>127</sup> Sentry systems also exist which can patrol automatically around a sensitive storage facility or a base. The Mobile Detection Assessment and Response System (MDARS), for example, is a small robotic patrol force on wheels designed to relieve personnel of the repetitive and sometimes dangerous task of patrolling exterior areas and which can autonomously perform random patrols.<sup>128</sup> For currently existing systems that have lethal capability, the choice of target and the decision to fire the weapon is made by human beings, and it is a human being who actually fires the weapon, albeit by remote control. With such weapons systems, there is, in military terminology, a “man in the

121 See Government Accountability Office, Report to the Subcommittee on Air and Land Forces, Committee on Armed Services, House of Representatives, *Unmanned Aircraft Systems: Additional Actions Needed to Improve Management and Integration of DOD Efforts to Support Warfighter Needs*, November 2008, available at: <http://www.gao.gov/new.items/d09175.pdf>.

122 Department of Defense, Report to Congress: *Development and Utilization of Robotics and Unmanned Ground Vehicles* 11 (October 2006), available at: <http://www.jointrobotics.com/Activities/congressdocs/UGV%20Congressional%20Report%20-%20Final%20%28October%202006%29.pdf>. U.S. law requires that, by 2015, one third of US operational ground combat vehicles be unmanned. *Ibid.*; at p. 45. Office of the Secretary of Defense, *Unmanned Systems Roadmap 2007-2032* (2007), available at [http://auvac.org/research/publications/files/2007/unmanned\\_systems\\_roadmap\\_2007-2032.pdf](http://auvac.org/research/publications/files/2007/unmanned_systems_roadmap_2007-2032.pdf). For fiscal year 2010, the US Department of Defense sought a budget of \$5.4 billion for unmanned systems (including systems for use on land, in the air, and at sea), an increase of 37.5 per cent over the past two years. “Pentagon’s Unmanned Systems Spending Tops \$5.4 billion in FY2010”, *Defense Update*, 14 June 2009, available at [http://defense-update.com/newscast/0609/news/pentagon\\_uas\\_140609.html](http://defense-update.com/newscast/0609/news/pentagon_uas_140609.html).

123 See *Development and Utilization of Robotics and Unmanned Ground Vehicles*, *supra* note 122, p. 47 (describing research and development activities directed towards developing military capabilities for robotics and unmanned ground vehicles of United States allies).

124 *Ibid.*, at p. 12.

125 Singer, *supra* note 112, pp. 29-32.

126 *Ibid.* See also Seth Porges, “Real Life Transformer Could Be First Robot to Fire in Combat”, *Popular Mechanics*, 1 Oct. 2009, available at: <http://www.popularmechanics.com/technology/military/4230309>.

127 Olivia Koski, “In a First, Full-Sized Robo-Copter Flies With No Human Help”, *Wired* (14 July 2010).

128 “MDARS — 21st Century Robotic Sentry System”, General Dynamics Robotics Systems, at <http://www.gdrs.com/about/profile/pdfs/0206MDARSBrochure.pdf>.

loop”, so that the determination to use lethal force, as with any other kind of weapon, lies with the operator and the chain of command. Examples of such semi-automated weapons systems currently in use include Predator and Reaper drones<sup>129</sup> deployed in the conflicts in Iraq and Afghanistan by the United States and the United Kingdom, and Israeli Harpy drones. Systems that would replace this generation of technology include the Sky Warrior, an unmanned aircraft system capable of taking off and landing automatically, with the capacity to carry and fire four Hellfire missiles.<sup>130</sup>

25. “Swarm” technologies are also being developed to enable a small number of military personnel to control a large number of machines remotely. One system under development envisions that a single operator will monitor a group of semi-autonomous aerial robotic weapons systems through a wireless network that connects each robot to others and to the operator. Each robot within a “swarm” would fly autonomously to a designated area, and “detect” threats and targets through the use of artificial intelligence, sensory information and image processing.<sup>131</sup>

26. Robotic technology is also becoming faster and more capable of increasingly rapid response. Military strategic documents predict the development of technology that speeds up the time needed for machines to respond to a perceived threat with lethal force to micro or nanoseconds. Increasingly humans will no longer be “in the loop” but rather “on the loop” — monitoring the execution of certain decisions.<sup>132</sup> The speed of the envisioned technology would be enhanced by networking among unmanned machines which would be able to “perceive and act” faster than humans can.

27. To date, armed robotic systems operating on any more than a semi-automated basis have not been used against targets. The military representatives of some States indicate that humans will, for the foreseeable future, remain in the loop on any decisions to use lethal force.<sup>133</sup> The United States Department of Defense, for example, has stated that for a significant period into the future, the decision to pull the trigger or launch a missile from an unmanned system will not be fully automated, but notes that many aspects of the firing sequence will, even if the final decision to fire will not likely be fully automated until legal, rules of engagement, and safety concerns have all been thoroughly examined and resolved.<sup>134</sup> However, some roboticists note that the advent of autonomous lethal robotic systems is well under way and that it is a simple matter of time before autonomous engagements of targets are present on the battlefield.<sup>135</sup> A number of countries are already reportedly deploying or developing systems with the capacity to take humans out of the lethal decision-making loop. For example:

129 United States Air Force, *Unmanned Aircraft Systems Flight Plan 2009-2047* (20019) p. 26, available at: [http://www.fas.org/irp/program/collect/uas\\_2009.pdf](http://www.fas.org/irp/program/collect/uas_2009.pdf).

130 See descriptions at General Atomics Aeronautical, <http://www.ga-asi.com/products/aircraft/ermp-uas.php>; Defense Update, Sky Warrior Goes into Production to Equip U.S. Army ER/MP Program, 9 July 2010, [http://www.defence-update.net/wordpress/20100709\\_sky\\_warrior\\_lrip.html](http://www.defence-update.net/wordpress/20100709_sky_warrior_lrip.html).

131 *Unmanned Aircraft Systems Flight Plan 2009-2047*, *supra* note 129, pp. 33-34. A group of European firms, lead by Dassault, is developing similar technology for the European market. Erik Sofge, “Top 5 Bomb-Packing, Gun-Toting War Bots the U.S. Doesn’t Have”, *Popular Mechanics*, 1 October 2009, available at: <http://www.popularmechanics.com/technology/military/4249209>.

132 *Unmanned Aircraft Systems Flight Plan 2009-2047*, *supra* note 129, p. 41.

133 British Air Marshal Steve Hillier sees an enduring requirement for a human in the loop for decision-making. When you get to attack, you need someone to exercise judgement. <http://www.flightglobal.com/articles/2010/07/13/344077/farnborough-uk-unmanned-air-vehicles.html>.

134 United States Department of Defense, *FY 2009–2034 Unmanned Systems Integrated Roadmap*, 6 April 2009, available at <http://jointrobotics.com/documents/library/UMS%20Integrated%20Roadmap%202009.pdf>.

135 Ronald C. Arkin, Alan R. Wager and Brittany Duncan, “Responsibility and Lethality for Unmanned Systems: Ethical Pre-mission Responsibility Advisement”, GVU Technical Report GIT-GVU-09-01, GVU Center, Georgia Institute of Technology, 2009.

- Since approximately 2007, Israel has deployed remote-controlled 7.62 mm machine-guns mounted on watchtowers every few hundred yards along its border with Gaza as part of its “Sentry Tech” weapons system, also known as “Spot and Shoot” or in Hebrew, “Roeh-Yoreh” (Sees-Fires).<sup>136</sup> This “robotic sniper” system locates potential targets through sensors, transmits information to an operations command centre where a soldier can locate and track the target and shoot to kill.<sup>137</sup> Dozens of alleged “terrorists” have been shot with the Sentry Tech system.<sup>138</sup> The first reported killing of an individual with Sentry Tech appears to have taken place during Operation Cast Lead in December 2008.<sup>139</sup> Two alleged “terrorists” were killed using the system in December 2009,<sup>140</sup> and another person was killed and four injured by Sentry Tech in March 2010; according to media accounts it is unclear whether the dead and injured were farmers or gunmen.<sup>141</sup> Future plans envision a “closed loop” system, in which no human intervention would be required in the identification, targeting and kill process.<sup>142</sup>
- The Republic of Korea has developed the SGR-1, an unmanned gun tower that, beginning in July 2010, is performing sentry duty on an experimental basis in the demilitarised zone between the Democratic People’s Republic of Korea and the Republic of Korea.<sup>143</sup> The SGR-1 uses heat and motion detectors and pattern recognition algorithms to sense possible intruders; it can alert remotely located command centre operators who can use the SGR-1’s audio and video communications system to assess the threat and make the decision to fire the robot’s 5.5 millimetre machine gun.<sup>144</sup> Media accounts indicate that, although the decision to use lethal force is made now by human commanders, the robot has been equipped with the capacity to fire on its own.<sup>145</sup>

28. Such automated technologies are becoming increasingly sophisticated, and artificial intelligence reasoning and decision-making abilities are actively being researched and receive significant funding. States’ militaries and defence industry developers are working to develop “fully autonomous capability”, such that technological advances in artificial intelligence will enable unmanned aerial vehicles to make and execute complex decisions, including the identification of human targets and the ability to kill them.<sup>146</sup> A 2003 study commissioned by the United States Joint Forces Command reportedly predicted the development of artificial intelligence and

136 Robin Hughes and Alon Ben-David, “IDF Deploys Sentry Tech on Gaza Border”, *Jane’s Defence Weekly*, 6 June 2007.

137 Noah Schachtman, Robo-Snipers, “Auto Kill Zones” to Protect Israeli Borders, *Wired*, 4 June 2007, [http://www.wired.com/dangerroom/2007/06/for\\_years\\_and\\_y/](http://www.wired.com/dangerroom/2007/06/for_years_and_y/).

138 Anshell Pfeffer, “IDF’s Newest Heroes: Women Spotters on Gaza’s Borders”, *Haaretz*, 3 March 2010, available at <http://www.haaretz.com/print-edition/news/idf-s-newest-heroes-women-spotters-on-gaza-border-1.264024>.

139 Israeli War-Room “Look-Out” Girls Use New “See-Shoot” Remote Control, *BBC Monitoring Middle East*, 9 January 2009.

140 Yaakov Katz, “IDF Unveils Upgrades to Gaza Fence”, *Jerusalem Post*, 3 March 2010, available at <http://www.jpost.com/Israel/Article.aspx?id=170041>.

141 Ali Waked, “Palestinians: 1 Dead, 4 Injured From IDF Fire in Gaza”, 1 March 2010, available at <http://www.ynetnews.com/articles/0,7340,L-3856218,00.html>.

142 “Remotely Controlled Mechanical Watchtowers Guard Hostile Borders”, *Homeland Security Newswire*, 19 July 2010, at <http://homelandsecuritynewswire.com/remotely-controlled-mechanical-watch-towers-guard-hostile-borders>; Noah Schachtman, “Robo-Snipers, ‘Auto Kill Zones’ to Protect Israeli Borders”, *Wired*, 4 June 2007, [http://www.wired.com/dangerroom/2007/06/for\\_years\\_and\\_y/](http://www.wired.com/dangerroom/2007/06/for_years_and_y/); Jonathan Cook, “Israel Paves the Way for Killing by Remote Control”, *The National*, 13 July 2010.

143 “Army Tests Machine-gun Sentry Robots in DMZ”, Yonhap News Agency, 13 July 2010, available at <http://english.yonhapnews.co.kr/national/2010/07/13/14/0301000000AEN20100713007800315F.HTML>.

144 Ibid.; “Machine gun-toting robots deployed on DMZ”, *Stars and Stripes* 12 July 2010, available at <http://www.stripes.com/news/pacific/korea/machine-gun-toting-robots-deployed-on-dmz-1.110809>.

145 “Top 5 Bomb-Packing”, *supra* note 131.

146 *Unmanned Aircraft Systems Flight Plan 2009-2047*, *supra* note 129, p. 50.

automatic target recognition that will give robots the ability to hunt down and kill the enemy with limited human supervision by 2015.<sup>147</sup> Among the envisioned uses for fully automated weapons systems are: non-lethal through lethal crowd control; dismounted offensive operations; and armed reconnaissance and assault operations.<sup>148</sup> One already developed ground robot, the Guardium UGV, is a high-speed vehicle that can be weaponised and used for combat support as well as border patrols and other security missions, such as perimeter security at airports and power plants.<sup>149</sup>

*Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶44-49)*

*2. Current technology*

44. Technology may in some respects be less advanced than is suggested by popular culture, which often assigns human-like attributes to robots and could lure the international community into misplaced trust in its abilities. However, it should also be recalled that in certain respects technology far exceeds human ability. Technology is developing exponentially, and it is impossible to predict the future confidently. As a result, it is almost impossible to determine how close we are to fully autonomous robots that are ready for use.

45. While much of their development is shrouded in secrecy, robots with full lethal autonomy have not yet been deployed. However, robotic systems with various degrees of autonomy and lethality are currently in use, including the following:

- The US Phalanx system for Aegis-class cruisers automatically detects, tracks and engages anti-air warfare threats such as anti-ship missiles and aircraft.<sup>150</sup>
- The US Counter Rocket, Artillery and Mortar (C-RAM) system can automatically destroy incoming artillery, rockets and mortar rounds.<sup>151</sup>
- Israel's Harpy is a "Fire-and-Forget" autonomous weapon system designed to detect, attack and destroy radar emitters.<sup>152</sup>
- The United Kingdom Taranis jet-propelled combat drone prototype can autonomously search, identify and locate enemies but can only engage with a target when authorised by mission command. It can also defend itself against enemy aircraft.<sup>153</sup>
- The Northrop Grumman X-47B is a fighter-size drone prototype commissioned by the US Navy to demonstrate autonomous launch and landing capability on aircraft carriers and navigate autonomously.<sup>154</sup>
- The Samsung Techwin surveillance and security guard robots, deployed in the demilitarised zone between North and South Korea, detect targets through infrared sensors. They are currently operated by humans but have an "automatic mode".<sup>155</sup>

147 Steve Featherstone, "The Coming Robot Army", *Harpers*, February 2007, available at <http://www.wesjones.com/robot.htm>.

148 *FY 2009-2034 Unmanned Systems Integrated Roadmap*, *supra* note 134, p. 10.

149 GNIUS Unmanned Ground Systems, Guardian UGV, described at <http://www.gnius.co.il/unmanned-ground-systems/guardium-ugv.html> and <http://www.defenseupdate.com/products/g/guardium.htm>.

150 See <http://usmilitary.about.com/library/milinfo/navyfacts/blphalanx.htm>.

151 See <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA557876>.

152 *Ibid.*

153 See [http://www.baesystems.com/product/BAES\\_020273/taranis](http://www.baesystems.com/product/BAES_020273/taranis).

154 See [http://www.as.northropgrumman.com/products/nucasx47b/assets/X-47B\\_Navy\\_UCAS\\_FactSheet.pdf](http://www.as.northropgrumman.com/products/nucasx47b/assets/X-47B_Navy_UCAS_FactSheet.pdf).

155 *Ibid.*

46. Military documents of a number of States describe air, ground and marine robotic weapons development programmes at various stages of autonomy. Large amounts of money are allocated for their development.<sup>156</sup>

47. It seems clear that if introduced, LARs will not, at least initially, entirely replace human soldiers, but that they will have discretely assigned tasks suitable to their specific capabilities. Their most likely use during armed conflict is in some form of collaboration with humans,<sup>157</sup> although they would still be autonomous in their own functions. The question should therefore be asked to what extent the existing legal framework is sufficient to regulate this scenario, as well as the scenario whereby LARs are deployed without any human counterpart. Based on current experiences of UCAVs, there is reason to believe that States will inter alia seek to use LARs for targeting killing.

48. The nature of robotic development generally makes it a difficult subject of regulation, especially in the area of weapons control. Bright lines are difficult to find. Robotic development is incremental in nature. Furthermore, there is significant continuity between military and non-military technologies.<sup>158</sup> The same robotic platforms can have civilian as well as military applications, and can be deployed for non-lethal purposes (e.g. to defuse improvised explosive devices) or be equipped with lethal capability (i.e. LARs). Moreover, LARs typically have a composite nature and are combinations of underlying technologies with multiple purposes.

49. The importance of the free pursuit of scientific study is a powerful disincentive to regulate research and development in this area. Yet “technology creep” in this area may over time and almost unnoticeably result in a situation which presents grave dangers to core human values and to the international security system. It is thus essential for the international community to take stock of the current state of affairs, and to establish a responsible process to address the situation and where necessary regulate the technology as it develops.

Special Rapporteur Heyns further described what he saw as the drivers of technological innovation in this space, and what the potential impediments might be in his 2013 report:

*2013 Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶50-56)*

*3. Drivers of and impediments to the development of LARs*

50. Some of the reasons to expect continuous pressures to develop LARs, as well as the impediments to this momentum, also apply to the development of other unmanned systems more generally. They offer huge military and other advantages to those using them and are part of the broader automisation of warfare and of the world in general.

51. Unmanned systems offer higher force projection (preserving the lives of one’s own soldiers) and force multiplication (allowing fewer personnel to do more). They are capable of enlarging the battlefield, penetrating more easily behind enemy lines, and saving on human and financial resources. Unmanned systems can stay on station much longer than individuals and withstand other impediments such as G-forces. They can enhance the quality of life of soldiers of the user party: unmanned systems, especially robots, are increasingly developed to do the so-called dirty, dull and dangerous work.<sup>159</sup>

156 *Unmanned Aircraft Systems Flight Plan 2009-2047*, *supra* note 129, p. 41.

157 *Ibid.*

158 Kenneth Anderson and Matthew Waxman, “Law and ethics for robot soldiers”, *Policy Review*, No. 176 (2012), pp. 2, 13, available from <http://www.hoover.org/publications/policy-review/article/135336>; Singer, *supra* note 112, p. 379.

159 Gary Marchant et al, “International governance of autonomous military robots”, *Columbia Science and Technology Law Review*, 12 (2011) p. 275.

52. Robots may in some respects serve humanitarian purposes. While the current emergence of unmanned systems may be related to the desire on the part of States not to become entangled in the complexities of capture, future generations of robots may be able to employ less lethal force, and thus cause fewer unnecessary deaths. Technology can offer creative alternatives to lethality, for instance by immobilizing or disarming the target.<sup>160</sup> Robots can be programmed to leave a digital trail, which potentially allows better scrutiny of their actions than is often the case with soldiers and could therefore in that sense enhance accountability.

53. The progression from remote controlled systems to LARs, for its part, is driven by a number of other considerations.<sup>161</sup> Perhaps foremost is the fact that, given the increased pace of warfare, humans have in some respects become the weakest link in the military arsenal and are thus being taken out of the decision-making loop. The reaction time of autonomous systems far exceeds that of human beings, especially if the speed of remote-controlled systems is further slowed down through the inevitable time-lag of global communications. States also have incentives to develop LARs to enable them to continue with operations even if communication links have been broken off behind enemy lines.

54. LARs will not be susceptible to some of the human shortcomings that may undermine the protection of life. Typically they would not act out of revenge, panic, anger, spite, prejudice or fear. Moreover, unless specifically programmed to do so, robots would not cause intentional suffering on civilian populations, for example through torture. Robots also do not rape.

55. Yet robots have limitations in other respects as compared to humans. Armed conflict and IHL often require human judgement, common sense, appreciation of the larger picture, understanding of the intentions behind people's actions, and understanding of values and anticipation of the direction in which events are unfolding. Decisions over life and death in armed conflict may require compassion and intuition. Humans – while they are fallible – at least might possess these qualities, whereas robots definitely do not. While robots are especially effective at dealing with quantitative issues, they have limited abilities to make the qualitative assessments that are often called for when dealing with human life. Machine calculations are rendered difficult by some of the contradictions often underlying battlefield choices. A further concern relates to the ability of robots to distinguish legal from illegal orders.

56. While LARs may thus in some ways be able to make certain assessments more accurately and faster than humans, they are in other ways more limited, often because they have restricted abilities to interpret context and to make value-based calculations.

### 3. Concerns

Special Rapporteur Alston, when first introducing the subject in the General Assembly, highlighted that while there may be technological and military advantages of autonomy, there were concerning implications that had not yet been fully considered at the international level.

#### *Report to the General Assembly, (A/65/321, 23 August 2010, ¶¶29-31)*

29. Although robotic or unmanned weapons technology has developed at astonishing rates, the public debate over the legal, ethical and moral issues arising from its use is at a very early stage, and very little consideration has been given to the international legal framework necessary for dealing with the resulting issues.

160 Singer, *supra* note 112, p. 83.

161 Arkin, *supra* note 114, xii.

30. There are many possible advantages flowing from the use of existing and developing technologies.<sup>162</sup> They may be able to act as “force multipliers”, greatly expanding the capacity or reach of a military, and robots may be sacrificed or sent into hazardous situations that are too risky for human soldiers. They may be less economically costly than deploying humans, and, indeed, their destruction does not result in the ending of irreplaceable human life. As stated in a United States Government report, more and more robots are being destroyed or damaged in combat instead of Servicemen and women being killed or wounded, and this is the preferred outcome.<sup>163</sup> Robots may be able to use lethal force more conservatively than humans (because they do not need to have self-preservation as a foremost drive<sup>164</sup>), and their actions and responses may be faster, based on information processed from more sources, and more accurate, enabling them to reduce collateral damage and other mistakes made by humans. They may also be able to avoid mistakes or harm resulting from human emotions or states, such as fear, tiredness, and the desire for revenge, and, to the extent that machines are equipped with the ability to record operations and monitor compliance with legal requirements, they may increase military transparency and accountability.

31. But these hypothetical advantages may not necessarily be reflected in the design or programming of actual technologies. And the reality, to date, is that technological developments have far outpaced even discussions of the humanitarian and human rights implications of the deployment of lethal robotic technologies. [...]

*i. Thresholds for the use of force*

As with the case of remotely piloted vehicles, both Special Rapporteurs were concerned about the potential implication of the emerging technology for the thresholds at which states would contemplate or indeed pursue the use of force as a means to achieve their ends:

*Report to the General Assembly, (A/65/321, 23 August 2010, ¶44)*

44. **Use of force threshold and jus ad bellum considerations.** To the extent that decisions about whether to go to war are limited by the prospect of the loss of the lives of military personnel, and the high economic cost of warfare, robotic armies may make it easier for policymakers to choose to enter into an armed conflict, increasing the potential for violating jus ad bellum requirements. This may be particularly the case where the other side lacks the same level of technology. Similarly, within the context of armed conflict, insofar as robots are remotely controlled by humans who are themselves in no physical danger, there is the concern that an operator’s location far from the battlefield will encourage a PlayStation mentality to fighting and killing, and the threshold at which, for example, drone operators would be willing to use force could potentially decrease. Thus, the international community should consider whether and when reduced risk to a States’ armed forces resulting from the extensive use of robotic technologies might unacceptably increase the risk to civilian populations on the opposing side.

*Report to the Human Rights Council, (A/HRC/23/47, 9 April 2013, ¶¶57-62, 82-85)*

*LARs and the decision to go to war or otherwise use force*

57. During the larger part of the last two centuries, international law was developed to constrain armed conflict and the use of force during law enforcement operations, to make it an option of last resort. However, there are also built-in constraints that humans have against going to war

162 For more discussion of these arguments, see Arkin *supra* note 114; Lin et al, *supra* note 112.

163 *Development and Utilization of Robotics and Unmanned Ground Vehicles*, *supra* note 122, p. 9. See also FY 2009-2034 *Unmanned Systems Integrated Roadmap*, *supra* note 134.

164 Ronald C. Arkin, “Ethical Robots in Warfare”, *IEEE Technology & Society*, 2009, p. 2.

or otherwise using force which continue to play an important (if often not decisive) role in safeguarding lives and international security. Chief among these are unique human traits such as our aversion to getting killed, losing loved ones, or having to kill other people.<sup>165</sup> The physical and psychological distance from the actual use of force potentially introduced by LARs can lessen all three concerns and even render them unnoticeable to those on the side of the State deploying LARs.<sup>166</sup> Military commanders for example may therefore more readily deploy LARs than real human soldiers.

58. This ease could potentially affect political decisions. Due to the low or lowered human costs of armed conflict to States with LARs in their arsenals, the national public may over time become increasingly disengaged and leave the decision to use force as a largely financial or diplomatic question for the State, leading to the “normalization” of armed conflict.<sup>167</sup> LARs may thus lower the threshold for States for going to war or otherwise using lethal force, resulting in armed conflict no longer being a measure of last resort.<sup>168</sup> According to the report of the Secretary-General on the role of science and technology in the context of international security and disarmament, “... the increased capability of autonomous vehicles opens up the potential for acts of warfare to be conducted by nations without the constraint of their people’s response to loss of human life.”<sup>169</sup> Presenting the use of unmanned systems as a less costly alternative to deploying “boots on the ground” may thus in many cases be a false dichotomy. If there is not sufficient support for a ground invasion, the true alternative to using unmanned systems may be not to use force at all.

59. Some have argued that if the above reasoning is taken to its logical conclusion, States should not attempt to develop any military technology that reduces the brutality of armed conflict or lowers overall deaths through greater accuracy.<sup>170</sup> Drones and high-altitude airstrikes using smart bombs should then equally be viewed as problematic because they also lower casualty rates for the side that uses them (and in some cases also for the other side), thereby removing political constraints on States to resort to military action.<sup>171</sup>

60. This argument does not withstand closer scrutiny. While it is desirable for States to reduce casualties in armed conflict, it becomes a question whether one can still talk about “war” – as opposed to one-sided killing – where one party carries no existential risk, and bears no cost beyond the economic. There is a qualitative difference between reducing the risk that armed conflict poses to those who participate in it, and the situation where one side is no longer a “participant” in armed conflict inasmuch as its combatants are not exposed to any danger.<sup>36</sup> LARs seem to take problems that are present with drones and high-altitude airstrikes to their factual and legal extreme.

61. Even if it were correct to assume that if LARs were used there would sometimes be fewer casualties per armed conflict, the total number of casualties in aggregate could still be higher.

62. Most pertinently, the increased precision and ability to strike anywhere in the world, even where no communication lines exist, suggests that LARs will be very attractive to those wishing to perform targeted killing. The breaches of State sovereignty – in addition to possible breaches of

165 A/65/321, *supra* note 2, para. 44; John Mueller “The Iraq Syndrome”, *Foreign Affairs* 84:6 (2005) p. 44.

166 According to military experts, it generally becomes easier to take life as the distance between the actor and the target increases. See David Grossman *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Back Bay Books, 1996).

167 Armin Krishnan *Killer robots: Legality and Ethicality of Autonomous Weapons* (Ashgate, 2009) p. 150.

168 Singer, *supra* note 112, p. 323; Asaro, *supra* note 118, p. 7.

169 Report of the Secretary-General on the Role of science and technology in the context of international security and disarmament, A/53/202, 28 July 1998, para. 98.

170 Asaro, *supra* note 118, pp. 7-9. Discussed by Patrick Lin et al. “Robots in War: Issues of Risk and Ethics” in R. Capurro & M. Nagenborg (eds.) *Ethics and Robotics* (2009) p. 57.

171 Anderson and Waxman, *supra* note 158, p. 12.

IHL and IHRL – often associated with targeted killing programmes risk making the world and the protection of life less secure.

[...]

*The use of LARs by States outside armed conflict*

82. The experience with UCAVs has shown that this type of military technology finds its way with ease into situations outside recognised battlefields.

83. One manifestation of this, whereby ideas of the battlefield are expanded beyond IHL contexts, is the situation in which perceived terrorists are targeted wherever they happen to be found in the world, including in territories where an armed conflict may not exist and IHRL is the applicable legal framework. The danger here is that the world is seen as a single, large and perpetual battlefield and force is used without meeting the threshold requirements. LARs could aggravate these problems.

84. On the domestic front, LARs could be used by States to suppress domestic enemies and to terrorise the population at large, suppress demonstrations and fight “wars” against drugs. It has been said that robots do not question their commanders or stage *coups d'état*.<sup>172</sup>

85. The possibility of LAR usage in a domestic law enforcement situation creates particular risks of arbitrary deprivation of life, because of the difficulty LARs are bound to have in meeting the stricter requirements posed by IHRL.

**ii. Accountability and responsibility**

One of the most serious concerns expressed by both Special Rapporteurs centred on the question of accountability or criminal responsibility for (the use of) the weapons.

*Report to the General Assembly, (A/65/321, 23 August 2010, ¶¶33-36)*

33. **International and criminal responsibility.** One of the most important issues flowing from increased automation is the question of responsibility for civilian casualties or other harm or violations of the laws of war. As analysed at length in various prior reports by the Special Rapporteur,<sup>173</sup> international human rights and humanitarian law, as applied in the context of armed conflict or law enforcement, set standards that are designed to protect or minimise harm to civilians, and set limits on the use of force by States’ militaries, police or other armed forces. When these limits are violated, States may be internationally responsible for the wrongs committed, and officials or others may bear individual criminal responsibility. Both the international human rights and humanitarian law frameworks are predicated on the fundamental premise that they bind States and individuals, and seek to hold them to account. Where robots are operated by remote control and the ultimate decision to use lethal force is made by humans, individual and command responsibility for any resulting harm is generally readily determinable.

34. However, as automation increases, the frameworks of State and individual responsibility become increasingly difficult to apply. Who is responsible if a robot kills civilians in violation of applicable international law? The programmer who designed the program governing the robot’s actions, any military officials who may have approved the programming, a human commander assigned responsibility for that robot, a soldier who might have exercised oversight but opted not

172 Krishnan, *supra* note 167, p. 113.

173 See, for example, Report of the Special Rapporteur, Philip Alston, E/CN.4/2005/7, 22 December 2004; Report of the Special Rapporteur, Philip Alston, A/61/311, 5 September 2006; and A/HRC/14/24/Add.6 *supra* note 3.

to do so? What if the killing is attributed to a malfunction of some sort? Is the Government which deployed the robot responsible, or the principal engineer or manufacturer, or the individual who bore ultimate responsibility for programming, or someone else? What level of supervision does a human need to exercise over a robot in order to be responsible for its actions? Are circumstances conceivable in which robots could legitimately be programmed to act in violation of the relevant international law, or conversely, could they be programmed to automatically override instructions that they consider, under the circumstances, to be a violation of that law? Are there situations in which it would be appropriate to conclude that no individual should be held accountable, despite the clear fact that unlawful actions have led to civilian or other deaths?

35. Some argue that robots should never be fully autonomous — that it would be unethical to permit robots to autonomously kill, because no human would clearly be responsible, and the entire framework of accountability would break down. Others, such as Ronald Arkin, argue that it will be possible to design ethical systems of responsibility.<sup>174</sup> In his view, robots could be better ethical decision-makers than humans because they lack emotion and fear, and could be programmed to ensure compliance with humanitarian law standards and applicable rules of engagement. Still others respond that such thinking is predicated on unproven assumptions about the nature of rules and how robots may be programmed to understand them, and that it underestimates the extent to which value systems and ethics inform the application of the rules in ways that robots cannot replicate.<sup>175</sup> In order to understand how to apportion responsibility for violations of the law, say some ethicists, more research needs to be done both to understand how and why humans themselves decide to follow the law and ethical rules, as well as the extent to which robotic programming mimics or differs from human decision-making.

36. To the extent that unmanned systems are not being designed to support investigation, they raise additional transparency and accountability concerns. Perhaps most troublingly from an international law perspective, some have indicated that unmanned systems are not designed to support investigation. They do not archive information. They leave open the possibility of soldiers pointing to the machine, declaring, “I’m not responsible — the machine is”.<sup>176</sup> In order to comport with States’ international law obligation to provide accountability for the use of lethal force, any unmanned weapons system, regardless of the degree of automation, must not hinder — and indeed should facilitate — States’ ability to investigate wrongful conduct.

### *2013 Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶75-81)*

#### *D. Legal responsibility for LARs*

75. Individual and State responsibility is fundamental to ensure accountability for violations of international human rights and international humanitarian law. Without the promise of accountability, deterrence and prevention are reduced, resulting in lower protection of civilians and potential victims of war crimes.<sup>177</sup>

76. Robots have no moral agency and as a result cannot be held responsible in any recognizable way if they cause deprivation of life that would normally require accountability if humans had made the decisions. Who, then, is to bear the responsibility?

174 Arkin et al. *supra* note 135; Ronald C. Arkin, Patrick Ulam and Brittany Duncan, “An Ethical Governor for Constraining Lethal Action in an Autonomous System”, GVU Technical Report GIT-GVU-09-02, GVU Center, Georgia Institute of Technology, 2009.

175 For example, Peter Asaro, “Modeling the Moral User”, 28 *IEEE Technology and Society* 20-24 (2009); Sharkey, “Death Strikes from the Sky”, *supra* note 118; Sparrow, “Robotic Weapons and the Future of War”, *supra* note 118.

176 2008 Harvard Session, *supra* note 118, p. 8.

177 Human Rights Watch, *supra* note 115, pp. 42-45.

77. The composite nature of LAR technology and the many levels likely to be involved in decisions about deployment result in a potential accountability gap or vacuum. Candidates for legal responsibility include the software programmers, those who build or sell hardware, military commanders, subordinates who deploy these systems and political leaders.

78. Traditionally, criminal responsibility would first be assigned within military ranks. Command responsibility should be considered as a possible solution for accountability for LAR violations.<sup>178</sup> Since a commander can be held accountable for an autonomous human subordinate, holding a commander accountable for an autonomous robot subordinate may appear analogous. Yet traditional command responsibility is only implicated when the commander “knew or should have known that the individual planned to commit a crime yet he or she failed to take action to prevent it or did not punish the perpetrator after the fact.”<sup>179</sup> It will be important to establish, inter alia, whether military commanders will be in a position to understand the complex programming of LARs sufficiently well to warrant criminal liability.

79. It has been proposed that responsibility for civil damages at least should be assigned to the programmer and the manufacturers, by utilizing a scheme similar to strict product liability. Yet national product liability laws remain largely untested in regard to robotics.<sup>180</sup> The manufacturing of a LAR will invariably involve a vast number of people, and no single person will be likely to understand the complex interactions between the constituent components of LARs.<sup>181</sup> It is also questionable whether putting the onus of bringing civil suits on victims is equitable, as they would have to bring suit while based in a foreign country, and would often lack the resources.

80. The question of legal responsibility could be an overriding issue. If each of the possible candidates for responsibility identified above is ultimately inappropriate or impractical, a responsibility vacuum will emerge, granting impunity for all LAR use. If the nature of a weapon renders responsibility for its consequences impossible, its use should be considered unethical and unlawful as an abhorrent weapon.<sup>182</sup>

81. A number of novel ways to establish legal accountability could be considered. One of the conditions that could be imposed for the use of LARs is that responsibility is assigned in advance.<sup>183</sup> Due to the fact that technology potentially enables more precise monitoring and reconstruction of what occurs during lethal operations, a further condition for their use could be the installation of such recording devices, and the mandatory *ex post facto* review of all footage in cases of lethal use, regardless of the status of the individual killed.<sup>184</sup> A system of “splitting” responsibility between the potential candidates could also be considered.<sup>185</sup> In addition, amendments to the rules regarding command responsibility may be needed to cover the use of LARs. In general, a stronger emphasis on State as opposed to individual responsibility may be called for, except in respect of its use by nonstate actors.

178 Rome Statute of the ICC, art. 28; Heather Roff “Killing in War: Responsibility, Liability and Lethal Autonomous Robots” p. 14, available at: [http://www.academia.edu/2606840/Killing\\_in\\_War\\_Responsibility\\_Liability\\_and\\_Lethal\\_Autonomous\\_Robots](http://www.academia.edu/2606840/Killing_in_War_Responsibility_Liability_and_Lethal_Autonomous_Robots).

179 Additional Protocol I, *supra* note 54, arts. 86 (2) and 87.

180 Patrick Lin “Introduction to Robot Ethics” in Patrick Lin et al (eds.) *Robot Ethics: The ethical and Social Implications of Robotics* (MIT Press, 2012), p. 8.

181 Wendell Wallach “From Robots to Techno Sapiens: Ethics, Law and Public Policy in the Development of Robotics and Neurotechnologies” *Law, Innovation and Technology* 3 (2011) p. 194.

182 Gianmarco Verugio and Keith Abney “Roboethics: The Applied Ethics for a New Science” in Lin et al., *supra* note 180, p. 114; Robert Sparrow “Killer Robots” *Journal of Applied Philosophy* 24:1 (2007).

183 See Ronald Arkin “The Robot didn’t do it” Position Paper for the Workshop on Anticipatory Ethics, Responsibility and Artificial Agents p. 1, available at: <http://www.cc.gatech.edu/ai/robot-lab/publications.html>.

184 Marchant et al, *supra* note 159, p. 7.

185 Krishnan, *supra* note 167, p. 105.

### iii. *Safeguards and control*

In addition to these normative issues, the Special Rapporteurs also raised a number of more practical concerns:

*Report to the General Assembly, (A/65/321, 23 August 2010, ¶¶37-42)*

37. **Safeguards and standards for deployment.** Another significant problem concerns the ability of robots to comply with human rights and humanitarian law, and the standards relevant to programming and the development of technology for deployment. What standards or testing must be conducted before armed machines are able to conduct crowd control, patrol in civilian populated areas, or be enabled to decide to target an alleged combatant? While any kind of technology has the potential to malfunction and result in lethal error, the particular concern with the rapid development of robotic weapons is whether — and the extent to which — technical safeguards are built into the systems to prevent the inadvertent or otherwise wrongful or mistaken use of lethal force. What programming or other technical safeguards have been and should be put in place to ensure that the precautions required by international humanitarian law are taken? What programming safeguards would international humanitarian law require?

38. Troublingly, military and civilian experts acknowledge that robotic development in general is being driven by the defence industry, and that few systems in the field have been subjected to rigorous or standardised testing or experimentation.<sup>186</sup> The United States military, for example, admits that in the interests of saving military lives in the conflicts in Iraq and Afghanistan, robotic systems may be deployed without the requisite testing for whether those systems are, in fact, reliable.<sup>187</sup>

39. In the context of armed conflict generally, and especially in urban areas, military personnel often have difficulty discriminating between those who may be lawfully targeted — combatants or those directly participating in hostilities — and civilians, who may not. Such decision-making requires the exercise of judgement, sometimes in rapidly changing circumstances and in a context which is not readily susceptible of categorization, as to whether the applicable legal requirements of necessity and proportionality are met, and whether all appropriate precautions have been taken. It is not clear what criteria would be used to determine whether a robot is ever capable of making such decisions in the manner required, or how to evaluate the programs that might purport to have integrated all such considerations into a given set of instructions to guide a robotic technology.

40. In addition, there is the concern that the development of lethal capacity has outpaced the development both of safeguards against technical or communications error. For example, military strategic planning documents caution that it “may be technically feasible” for unmanned aerial systems to have nuclear strike capability before safeguards are developed for the systems, and that ethical discussions and policy decisions must take place in the near term in order to guide the development of future unmanned aerial systems capabilities, rather than allowing the development to take its own path.<sup>188</sup>

41. There are also questions about how and when the benefits of speedy processing of intelligence and other data is outweighed by the risks posed by hasty decision-making. Man-on-the-loop

186 2008 Harvard Session, *supra* note 118, p. 2.

187 *FY 2009-2034 Unmanned Systems Integrated Roadmap*, *supra* note 134, pp. 39-40 (“The current commitment of combat forces has seen a number of unmanned systems fielded quickly without the establishment of the required reliability and maintainability infrastructure that normally would be established prior to and during the fielding of a system. This was justifiably done as a conscious decision to save Warfighter’s lives at the risk of reliability and maintainability issues with the equipment fielded”).

188 *Unmanned Aircraft Systems Flight Plan 2009-2047*, *supra* note 129, p. 41.

systems, for instance, raise the concern that technology is being developed that is beyond humans' capacity to supervise effectively and in accordance with applicable law. With respect to swarm technologies, some research has found that human operators' performance levels are reduced by an average of 50 per cent when they control even two unmanned aircraft systems at a time.<sup>189</sup> The research suggests that the possibility of lethal error rises as humans play a "supervisory" role over a larger number of machines. Unless adequate precautions are taken and built into systems, the likelihood increases that mistakes will be made which will amount to clear violations of the applicable laws.

42. A related concern is what safeguards should or must be put in place to prevent ultimate human control of robots from being circumvented, and what safeguards can be implemented to prevent lethal robots from being hacked or used by, for example, insurgent or terrorist groups.

*Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶63-74, 89-97)*

63. A further question is whether LARs will be capable of complying with the requirements of IHL. To the extent that the answer is negative, they should be prohibited weapons. However, according to proponents of LARs this does not mean that LARs are required never to make a mistake – the yardstick should be the conduct of human beings who would otherwise be taking the decisions, which is not always a very high standard.<sup>190</sup>

64. Some experts have argued that robots can in some respects be made to comply even better with IHL requirements than human beings.<sup>191</sup> Roboticist Ronald Arkin has for example proposed ways of building an "ethical governor" into military robots to ensure that they satisfy those requirements.<sup>192</sup>

65. A consideration of a different kind is that if it is technically possible to programme LARs to comply better with IHL than the human alternatives, there could in fact be an obligation to use them<sup>193</sup> – in the same way that some human rights groups have argued that where available, "smart" bombs, rather than less discriminating ones, should be deployed.

66. Of specific importance in this context are the IHL rules of distinction and proportionality. The rule of distinction seeks to minimise the impact of armed conflict on civilians, by prohibiting targeting of civilians and indiscriminate attacks.<sup>194</sup> In situations where LARs cannot reliably distinguish between combatants or other belligerents and civilians, their use will be unlawful.

67. There are several factors that will likely impede the ability of LARs to operate according to these rules in this regard, including the technological inadequacy of existing sensors,<sup>195</sup> a robot's inability to understand context, and the difficulty of applying of IHL language in defining non-combatant

189 P. W. Singer, "Robots at War: The New Battlefield", *Wilson Quarterly*, Winter 2009; see also Jessie Y. C. Chen, et al., Human-Robot Interface: Issues in Operator Performance, Interface Design, and Technologies, United States Army Research Laboratory, ARL-TR-3834, July 2006, available at: <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA451379> (discussing research findings on benefits and drawbacks of automation).

190 Lin et al., *supra* note 170, p. 50.

191 Marchant et al, *supra* note 159, p. 280; Singer, *supra* note 112, p. 398.

192 Arkin, *supra* note 114, p. 127.

193 Jonathan Herbach "Into the Caves of Steel: Precaution, Cognition and Robotic Weapons Systems Under the International Law of Armed Conflict" *Amsterdam Law Forum* 4 (2012), p. 14.

194 Additional Protocol I, *supra* note 54, arts. 51 and 57.

195 Noel Sharkey "Grounds for Discrimination: Autonomous Robot Weapons" RUSI Defence Systems (Oct 2008) pp. 88-89, available from <http://rusi.org/downloads/assets/23sharkey.pdf>.

status in practice, which must be translated into a computer programme.<sup>196</sup> It would be difficult for robots to establish, for example, whether someone is wounded and hors de combat, and also whether soldiers are in the process of surrendering.

68. The current proliferation of asymmetric warfare and non-international armed conflicts, also in urban environments, presents a significant barrier to the capabilities of LARs to distinguish civilians from otherwise lawful targets. This is especially so where complicated assessments such as “direct participation in hostilities” have to be made. Experts have noted that for counter-insurgency and unconventional warfare, in which combatants are often only identifiable through the interpretation of conduct, the inability of LARs to interpret intentions and emotions will be a significant obstacle to compliance with the rule of distinction.<sup>197</sup>

69. Yet humans are not necessarily superior to machines in their ability to distinguish. In some contexts technology can offer increased precision. For example, a soldier who is confronted with a situation where it is not clear whether an unknown person is a combatant or a civilian may out of the instinct of survival shoot immediately, whereas a robot may utilise different tactics to go closer and, only when fired upon, return fire. Robots can thus act “conservatively”<sup>198</sup> and “can shoot second.”<sup>199</sup> Moreover, in some cases the powerful sensors and processing powers of LARs can potentially lift the “fog of war” for human soldiers and prevent the kinds of mistakes that often lead to atrocities during armed conflict, and thus save lives.<sup>200</sup>

70. The rule of proportionality requires that the expected harm to civilians be measured, prior to the attack, against the anticipated military advantage to be gained from the operation.<sup>201</sup> This rule, described as “one of the most complex rules of international humanitarian law,”<sup>202</sup> is largely dependent on subjective estimates of value and context specificity.

71. Whether an attack complies with the rule of proportionality needs to be assessed on a case-by-case basis, depending on the specific context and considering the totality of the circumstances.<sup>203</sup> The value of a target, which determines the level of permissible collateral damage, is constantly changing and depends on the moment in the conflict. Concerns have been expressed that the open-endedness of the rule of proportionality combined with the complexity of circumstances may result in undesired and unexpected behaviour by LARs, with deadly consequences.<sup>204</sup> The inability to “frame” and contextualise the environment may result in a LAR deciding to launch an attack based not merely on incomplete but also on flawed understandings of the circumstances.<sup>205</sup> It should be recognised, however, that this happens to humans as well.

72. Proportionality is widely understood to involve distinctively human judgement. The prevailing legal interpretations of the rule explicitly rely on notions such as “common sense”, “good faith” and the “reasonable military commander standard.”<sup>206</sup> It remains to be seen to what extent these concepts can be translated into computer programmes, now or in the future.

196 Peter Asaro “On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanisation of Lethal Decision-making”, *International Review of the Red Cross* 94 (2012) p. 11.

197 Human Rights Watch, *supra* note 115, p. 31.

198 Marchant et al, *supra* note 159, p. 280.

199 Singer, *supra* note 112, p. 398.

200 Ibid.

201 Protocol I additional to the Geneva Conventions, 1977, art. 51 (5) (b).

202 Human Rights Watch, *supra* note 115, p. 32.

203 Lin et al., *supra* note 170, p. 57.

204 Noel Sharkey, “Automated Killers and the Computing Profession” *Computer*, Vol. 40 (2007), p. 122.

205 Krishnan, *supra* note 167, pp. 98-99.

206 Tonya Hagmaier et al, “Air force operations and the law: A guide for air, space and cyber forces” p. 21, available at: <http://www.afjag.af.mil/shared/media/document/AFD-100510-059.pdf>; Andru Wall “Legal and Ethical Lessons of

73. Additionally, proportionality assessments often involve qualitative rather than quantitative judgements.<sup>207</sup>

74. In view of the above, the question arises as to whether LARs are in all cases likely (on the one hand) or never (on the other) to meet this set of cumulative standard. The answer is probably less absolute, in that they may in some cases meet them (e.g. in the case of a weapons system that is set to only return fire and that is used on a traditional battlefield) but in other cases not (e.g. where a civilian with a large piece of metal in his hands must be distinguished from a combatant in plain clothes). Would it then be possible to categorise the different situations, to allow some to be prohibited and others to be permitted? Some experts argue that certain analyses such as proportionality would at least initially have to be made by commanders, while other aspects could be left to LARs.<sup>208</sup>

[...]

### *G. Taking human decision-making out of the loop*

89. It is an underlying assumption of most legal, moral and other codes that when the decision to take life or to subject people to other grave consequences is at stake, the decision-making power should be exercised by humans. The Hague Convention (IV) requires any combatant “to be commanded by a person”. The Martens Clause, a longstanding and binding rule of IHL, specifically demands the application of “the principle of humanity” in armed conflict.<sup>209</sup> Taking humans out of the loop also risks taking humanity out of the loop.

90. According to philosopher Peter Asaro, an implicit requirement can thus be found in IHL for a human decision to use lethal force, which cannot be delegated to an automated process. Non-human decision-making regarding the use of lethal force is, by this argument, inherently arbitrary, and all resulting deaths are arbitrary deprivations of life.<sup>210</sup>

91. The contemplation of LARs is inextricably linked to the role of technology in the world today. While machines help to make many decisions in modern life, they are mostly so used only where mechanical observation is needed (e.g. as a line umpire in sporting events) and not in situations requiring value judgements with far-reaching consequences (e.g. in the process of adjudication during court cases). As a more general manifestation of the importance of person-to-person contact when important decisions are taken, legal systems around the world shy away from trials in absentia. Of course, robots already affect our lives extensively, including through their impact on life and death issues. Robotic surgery is for example a growing industry and robots are increasingly used in rescue missions after disasters.<sup>211</sup> Yet in none of these cases do robots make the decision to kill and in this way LARs represent an entirely new prospect.

92. Even if it is assumed that LARs – especially when they work alongside human beings – could comply with the requirements of IHL, and it can be proven that on average and in the aggregate they

NATO’s Kosovo Campaign” p. xxiii, available at: [http://www.au.af.mil/au/awc/awcgate/navy/kosovo\\_legal.pdf](http://www.au.af.mil/au/awc/awcgate/navy/kosovo_legal.pdf).

207 Markus Wagner “The Dehumanization of International Humanitarian Law: Legal, Ethical, and Political Implications of Autonomous Weapon Systems” (2012), available at: [http://robots.law.miami.edu/wp-content/uploads/2012/01/Wagner\\_Dehumanization\\_of\\_international\\_humanitarian\\_law.pdf](http://robots.law.miami.edu/wp-content/uploads/2012/01/Wagner_Dehumanization_of_international_humanitarian_law.pdf) note 96 and accompanying text.

208 Benjamin Kastan “Autonomous Weapons Systems: A Coming Legal ‘Singularity?’” *University of Illinois Journal of Law, Technology and Policy* (forthcoming 2013), p. 18 and further, available at: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2037808](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2037808).

209 Geneva Convention Protocol I, art. 1(2). See also the preambles to the 1899 and 1907 Hague Conventions. Hague Convention with Respect to the Laws and Customs of War on Land and its Annex: Regulation Concerning the Laws and Customs of War on Land (Hague Convention II).

210 Asaro, *supra* note 196, p. 13.

211 See <http://www.springer.com/medicine/surgery/journal/11701>.

will save lives, the question has to be asked whether it is not inherently wrong to let autonomous machines decide who and when to kill. The IHL concerns raised in the above paragraphs relate primarily to the protection of civilians. The question here is whether the deployment of LARs against anyone, including enemy fighters, is in principle acceptable, because it entails non-human entities making the determination to use lethal force.

93. This is an overriding consideration: if the answer is negative, no other consideration can justify the deployment of LARs, no matter the level of technical competence at which they operate. While the argument was made earlier that the deployment of LARs could lead to a vacuum of legal responsibility, the point here is that they could likewise imply a vacuum of moral responsibility.

94. This approach stems from the belief that a human being somewhere has to take the decision to initiate lethal force and as a result internalise (or assume responsibility for) the cost of each life lost in hostilities, as part of a deliberative process of human interaction. This applies even in armed conflict. Delegating this process dehumanises armed conflict even further and precludes a moment of deliberation in those cases where it may be feasible. Machines lack morality and mortality, and should as a result not have life and death powers over humans. This is among the reasons landmines were banned.<sup>212</sup>

95. The use of emotive terms such as “killer robots” may well be criticised. However, the strength of the intuitive reactions that the use of LARs is likely to elicit cannot be ignored. Deploying LARs has been depicted as treating people like “vermin”, who are “exterminated.”<sup>213</sup> These descriptions conjure up the image of LARs as some kind of mechanised pesticide.

96. The experience of the two World Wars of the last century may provide insight into the rationale of requiring humans to internalise the costs of armed conflict, and thereby hold themselves and their societies accountable for these costs. After these wars, during which the devastation that could be caused by modern technology became apparent, those who had personally taken the central military decisions resolved, “in order to save succeeding generations from the scourge of war”, to establish the United Nations to pursue world peace and to found it on the principles of human rights. While armed conflict is by no means a thing of the past today, nearly 70 years have passed without a global war. The commitment to achieve such an objective can be understood as a consequence of the long-term and indeed inter-generational effects of insisting on human responsibility for killing decisions.

97. This historical recollection highlights the danger of measuring the performance of LARs against minimum standards set for humans during armed conflict. Human soldiers do bring a capacity for depravity to armed conflict, but they also hold the potential to adhere to higher values and in some cases to show some measure of grace and compassion. If humans are replaced on the battlefield by entities calibrated not to go below what is expected of humans, but which lack the capacity to rise above those minimum standards, we may risk giving up on hope for a better world. The ability to eliminate perceived “troublemakers” anywhere in the world at the press of a button could risk focusing attention only on the symptoms of unwanted situations. It would distract from, or even preclude, engagement with the causes instead, through longer term, often non-military efforts which, although more painstaking, might ultimately be more enduring. LARs could thus create a false sense of security for their users.

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212 Asaro, *supra* note 196, p. 14.

213 Sparrow, “Robotic Weapons and the Future of War”, *supra* note 118, p. 11.

*iv. Other implications*

*Report to the General Assembly, (A/65/321, 23 August 2010, ¶43)*

43. **Civilian support.** An important political consideration is whether the widespread use of robots in civilian settings, such as for law enforcement in cities, or in counter-insurgency operations, would alienate the very populations they were meant to assist. Over-reliance on technology increases the risk that policymakers and commanders will focus on the relatively easy use of armed or lethal tactics to the detriment of all the other elements necessary to end a conflict, including winning hearts and minds, and that policymakers will overestimate the ability of new technologies to achieve sustainable peace. In addition, while robots may have the benefit of not acting based on emotion, they also do not have the kind of sympathy, remorse or empathy that often appropriately tempers and informs the conduct of fighters and their commanders.

*Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶98-99)*

*Other concerns*

98. The possible deployment of LARs raises additional concerns that include but are not limited to the following:

- LARs are vulnerable to appropriation, as well as hacking and spoofing.<sup>214</sup> States no longer hold a monopoly on the use of force. LARs could be intercepted and used by non-State actors, such as criminal cartels or private individuals, against the State or other non-State actors, including civilians.<sup>215</sup>
- Malfunctions could occur. Autonomous systems can be “brittle.”<sup>216</sup> Unlikely errors can still be catastrophic.
- Future developments in the area of technology cannot be foreseen. Allowing LARs could open an even larger Pandora’s box.
- The regulation of the use of UCAVs is currently in a state of contestation, as is the legal regime pertaining to targeted killing in general, and the emergence of LARs is likely to make this situation even more uncertain.
- The prospect of being killed by robots could lead to high levels of anxiety among at least the civilian population

99. The implications for military culture are unknown, and LARs may thus undermine the systems of State and international security.

In his final report to the General Assembly in 2016, Special Rapporteur Heyns summarised his concerns regarding the development of autonomous weapons:

*Report to the General Assembly (A/71/372, 2 September 2016, ¶¶ 75-80)*

75. Some of the same concerns that apply to armed drones apply to autonomous weapons — weapon platforms that, once activated, can select and engage targets without further human intervention. However, they also raise additional concerns about the protection of life during war and peace. Because machine learning takes place and not all situations in armed conflict can be

214 Jutta Weber “Robotic warfare, human rights and the rhetorics of ethical machines”, pp. 8 and 10, available from [http://www.gender.uu.se/digitalAssets/44/44133\\_Weber\\_Robotic\\_Warfare.pdf](http://www.gender.uu.se/digitalAssets/44/44133_Weber_Robotic_Warfare.pdf).

215 Singer, *supra* note 112, p. 261-263.

216 Kastan, *supra* note 208, p. 8.

foreseen, there is an element of unpredictability in the selection of a target and the use of lethal force by autonomous weapons. They raise the question of to what extent such weapon platforms are still tools in the hands of human beings, or, conversely, allow robots to make life and death determinations over human beings.<sup>217</sup>

76. Autonomous weapons raise two distinct questions: can they carry out lawful targeting, and should they be permitted to carry out targeting of human beings?

77. The first question focuses on the interests of those who are protected from targeting — such as uninvolved civilians and those hors de combat. Will autonomous weapons be equipped to make the necessary distinctions, as well as the proportionality judgements required to ensure the protection of the right to life? In the case of advanced autonomy this may be seriously questioned. Moreover, reference was made above to the procedural component of the right to life, namely accountability. If there is a low level of human control, there may be a lack of legal accountability where targeting goes wrong, because accountability is premised on control.

78. There is also the question of whether autonomous weapons should make life-and-death determinations about humans. Here the primary concern is with the rights of those who may otherwise be targeted and are in that sense not protected. In order not to be “arbitrary”, a deprivation of life may require a deliberative human decision. Killing by a machine may thus inherently be a violation of the right to life. It may furthermore also be a violation of human dignity, or of the right to a dignified life, if the determination that a human being will be killed is made by a robot, because it reduces the person to being a target (literally to the binary code of computing: the figures of 0s and 1s) and nothing more. Here the question is not legal but moral accountability: on whose conscience does the death of the person targeted lie when the killing is done by an algorithm?

79. In armed conflict there is often not an objectively right or wrong answer about targeting. Moreover, even if that were the case, the individual taking the decision is at most expected to act reasonably under the circumstances, given the available information. Where that turns out to be wrong there is no legal responsibility, but a certain moral responsibility remains, at least to make sure such an error does not occur again in the future. This will be lost if computers make targeting determinations.

80. In many of the discussions on the topic in which the Special Rapporteur has participated, the focus was on the use of autonomous targeting in single, isolated cases. However, what is at stake are rather the potential consequences of the deployment of such weapons over time, and the exponential effect of machine learning and of decreased control by human beings as a collective over decisions over life and death. Deciding to cross the threshold into a world in which this is accepted as standard practice is a momentous and probably irreversible decision.

#### **4. Weapons control and engagement with the Convention on Certain Conventional Weapons**

In his 2013 report, Special Rapporteur Heyns highlighted some potential avenues for control of the new technology, including highlighting the decision of at least one manufacturer to put in place a moratorium:

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217 See, generally, Bhuta et al., *supra* note 111.

*Report to the Human Rights Council (A/HRC/23/47, 9 April 2013, ¶¶100-108)*

*LARs and restrictive regimes on weapons*

100. The treaty restrictions<sup>218</sup> placed on certain weapons stem from the IHL norm that the means and methods of warfare are not unlimited, and as such there must be restrictions on the rules that determine what weapons are permissible.<sup>219</sup> The Martens Clause prohibits weapons that run counter to the “dictates of public conscience.” The obligation not to use weapons that have indiscriminate effects and thus cause unnecessary harm to civilians underlies the prohibition of certain weapons,<sup>220</sup> and some weapons have been banned because they “cause superfluous injury or unnecessary suffering”<sup>221</sup> to soldiers as well as civilians.<sup>222</sup> The use of still others is restricted for similar reasons.<sup>223</sup>

101. In considering whether restrictions as opposed to an outright ban on LARs would be more appropriate, it should be kept in mind that it may be more difficult to restrict LARs as opposed to other weapons because they are combinations of multiple and often multipurpose technologies. Experts have made strong arguments that a regulatory approach that focuses on technology – namely, the weapons themselves – may be misplaced in the case of LARs and that the focus should rather be on intent or use.<sup>224</sup>

102. Disarmament law and its associated treaties, however, provide extensive examples of the types of arms control instruments that establish bans or restrictions on use and other activities. These instruments can be broadly characterised as some combination of type of restriction and type of activity restricted. The types of restrictions include a ban or other limitations short of a ban.

103. The type of activity that is typically restricted includes: (i) acquisition, retention or stockpiling, (ii) research (basic or applied) and development, (iii) testing, (iv) deployment, (v) transfer or proliferation, and (vi) use.<sup>225</sup>

104. Another positive development in the context of disarmament is the inclusion of victim assistance in weapons treaties.<sup>226</sup> This concern for victims coincides with other efforts to address the harm weapons and warfare cause to civilians, including the practice of casualty counting<sup>227</sup> and the good faith provision of amends – implemented for example by some International Security Assistance Force States – in the case of civilian deaths in the absence of recognised IHL violations.<sup>228</sup> These practices serve to reaffirm the value of life.

105. There are also meaningful soft law instruments that may regulate the emergence of LARs. Examples of relevant soft law instruments in the field of disarmament include codes of conduct, trans-governmental dialogue, information sharing and confidence-building measures and

218 Through the Hague Convention of 1907 and the 1977 Additional Protocols to the Geneva Conventions.

219 See <http://www.icrc.org/eng/war-and-law/conduct-hostilities/methods-means-warfare/index.jsp>.

220 Mine Ban Treaty (1997); and Convention on Cluster Munitions (2008).

221 Protocol I additional to the Geneva Conventions, 1977. art. 35 (2); ICRC, Customary Humanitarian Law, Rule 70.

222 Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare. Geneva, 17 June 1925.

223 Convention on Certain Conventional Weapons, Protocol III on incendiary weapons.

224 Marchant et al, *supra* note 159, p. 287, Asaro, *supra* note 196, p. 10.

225 Marchant et al, *supra* note 159, p. 300. See also Bonnie Docherty “The Time is Now: A Historical Argument for a Cluster Munitions Convention” 20 *Harvard Human Rights Law Journal* (2007), p. 53 for an overview.

226 Mine Ban Treaty (1997), art. 6, and Convention on Certain Conventional Weapons, Protocol V on Explosive Remnants of War (2003), art. 8. The Convention on Cluster Munitions (2008), art. 5 was groundbreaking in placing responsibility on the affected State.

227 S/2012/376, para. 28 (commending inter alia the commitment by the African Union Mission in Somalia).

228 *Ibid.*, para. 29 (the Secretary General “welcomed the practice of making amends”).

framework conventions.<sup>229</sup> In addition, non-governmental organization (NGO) activity and public opinion can serve to induce restrictions on weapons.

106. Article 36 of the First Protocol Additional to the Geneva Conventions is especially relevant, providing that, “in the study, development, acquisition or adoption of a new weapon, means or methods of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.”

107. This process is one of internal introspection, not external inspection, and is based on the good faith of the parties.<sup>230</sup> The United States, although not a State party, established formal weapons mechanisms review as early as 1947. While States cannot be obliged to disclose the outcomes of their reviews, one way of ensuring greater control over the emergence of new weapons such as LARs will be to encourage them to be more open about the procedure that they follow in Article 36 reviews generally.

108. In 2012 in a Department of Defense Directive, the United States embarked on an important process of self-regulation regarding LARs, recognizing the need for domestic control of their production and deployment, and imposing a form of moratorium.<sup>231</sup> The Directive provides that autonomous weapons “shall be designed to allow commanders and operators to exercise appropriate levels of human judgement over the use of force.”<sup>232</sup> Specific levels of official approval for the development and fielding of different forms of robots are identified.<sup>233</sup> In particular, the Directive bans the development and fielding of LARs unless certain procedures are followed.<sup>234</sup> This important initiative by a major potential LARs producer should be commended and may open up opportunities for mobilizing international support for national moratoria.

Special Rapporteur Heyns made three interventions before increasingly formal panels convened at the CCW:

*Presentation made at the informal expert meeting organised by the state parties to the Convention on Certain Conventional Weapons (13 – 16 May 2014, Geneva, Switzerland)*

*Autonomous weapons systems and human rights law*

It is indicative of the welcome recognition of the need for a holistic approach to this issue by the international community that the Human Rights Council has heard me in May of last year speaking on the international humanitarian law (IHL) implications of LAWS,<sup>235</sup> and that the CCW, which normally deals with IHL, is willing today to consider the human rights aspects.

You may have noticed that I have not used the word “lethal” in the heading of my paper for today. Instead of addressing the specialised case of lethal autonomous weapons systems I will be addressing the use of autonomous weapons systems to project force in general; lethal and non-lethal force; AWS and not LAWS. The reason is as follows:

As I understand it, our common concern is with the autonomous use of force against human beings. IHL – and by extension the CCW – deals with situations of armed conflict where the kind

229 Marchant et al, *supra* note 159, pp. 306-314.

230 Discussed in International Review of the Red Cross vol. 88, December 2006.

231 US DoD Directive, *supra* note 115.

232 *Ibid.*, para. 4 (a).

233 *Ibid.*, paras. 4 (c) and (d).

234 *Ibid.*, Enclosure 3.

235 A/HRC/23/47 *supra* note 4.

of force that is used against people is usually lethal force. The intentional use of non-lethal force is the exception. As a result, this conference deals with Lethal Autonomous Weapons Systems or LAWS. However, in the human rights context the expectation is that if force is used against humans it will normally not be lethal. Lethal force is the exception under international law enforcement standards.

Since AWS are weapon platforms, they can be used in such a context to deploy various types lethal or less lethal weapons. As a result, in considering the possible application of force by autonomous weapon platforms in the human rights context, the discussion cannot be confined to the use of lethal force, but all forms of the use of force must be considered, lethal as well as less lethal. In this context the use of force even if it does not constitute a violation of the right to life, can still violate some other rights concerning bodily security.

It is an open question exactly when a system should be described as autonomous. A definition of AWS that is widely used is “systems that, once activated, can select and engage targets without further human intervention”. Autonomy should however best be seen as a continuum of increased machine decision-making. Some of the problems that arise with fully autonomous systems, however defined, will also present themselves with lower forms of autonomy. It may thus be helpful at this stage – before clear definitions have been formulated – to see AWS as systems at the higher end of the scale of increasing machine autonomy. It should be clear, however, that the autonomy at stake relates to the so-called critical functions – the release of force.

I will consider the human rights implications of AWS under seven main headings.

### *1) Situations where human rights law may potentially apply to AWS*

The legal debate about AWS that has emerged during the past few years has largely left human rights out of the picture, and focused primarily on IHL. Yet, it would be a mistake not to consider the implications of use of force through AWS from a human rights perspective. Given the rapid development of technology, there is certain to be increased pressure for systems for the release of force to become more autonomous.

Human rights law applies to the use of force at all times; it is complementary to IHL during armed conflict, and where there is no armed conflict it applies to the exclusion of IHL. To get the full picture of how to deal with the possible introduction of these weapons, the human rights angle should thus be a central consideration. Is the use of AWS to apply force permissible under human rights law, and if so under what circumstances?

There are three situations where human rights law can potentially apply to AWS:

#### *a) Armed conflict*

Human rights law complements IHL rules on the use of force during armed conflict, subject to a number of qualifications, including the proviso that during armed conflict the rules of human rights law are determined with reference to the provisions of the more specialised – and in many ways more permissive – legal rules of international humanitarian law. The important point, however, is that people on both sides of the conflict retain their human rights such as the right to life and the right to dignity during armed conflict, even if the contents of the rights may differ according to the context. For its part, the rules of IHL should be interpreted with reference to these rights.

#### *b) Anti-terrorism and other actions in situations that do not constitute armed conflict*

Moreover, in situations where the threshold requirements of armed conflict are not met (e.g. in a geographical area that is removed from established battlefields, without a nexus to an armed

conflict), the requirements on the use of AWS would be regulated by human rights law only. It has been argued that armed drones have in a number of cases during the last decade and more been used in such contexts, and the same may happen with AWS. This should be treated as a law enforcement situation subject to IHRL and international law enforcement standards, not subject to IHL.

### *c) Domestic law enforcement*

Human rights law, of course, is the relevant legal regime as far as domestic law enforcement – for example by police officers – is concerned. It is conceivable as a practical matter that if AWS were developed and made available to the military forces of a State, those military forces could be deployed in law enforcement operations using AWS. The same State's law enforcement officials could at some point also decide to use AWS, fitted with lethal or less lethal weapons. In such contexts, the use of force is clearly subject to international human rights law.

There is a burgeoning industry poised to produce AWS manufactured specifically with domestic law enforcement in mind. Possible scenarios gleaned from the marketing literature of some of these companies include the use of AWS in the context of crowd control (for example armored robotic platforms and launchers to disperse demonstrators with teargas or rubber bullets, to inflict powerful electrical shocks from the air, and to mark perceived troublemakers with paint). Such weapon platforms may also be equipped with firearms or light weapons.

Other potential applications of AWS in the domestic law enforcement context include the apprehension of specific classes of perpetrators, such as prison escapees, or rhino or other big-game poachers; or providing perimeter protection around specific buildings, such as high security prisons or in border areas, where stationary systems that spray tear gas may for example be installed. Such systems may also be used to patrol pipelines.

The recently released “riobot” (not currently autonomous as far as the release of force is concerned) is marketed as being particularly suitable to deal with strikes in the mining industry throughout Africa.

Hostage situations present popular (if not sometimes fanciful) hypotheticals – e.g. an AWS can conceivably be programmed to release deadly force against a hostage-taker who exposes himself or herself for a split second based on facial recognition, in a situation where a human sniper will be too slow to react.

States and private manufacturers are bound to make such technology available to buyers around the world, in the same way that private security firms have become a global industry. In some cases this will mean that States or other actors that do not necessarily have advanced capacity in technology, or experience in dealing with such weapons, may acquire such weapons and place it in the hands of ill-equipped or unaccountable police officers, security guards or other law enforcement officials.

## *2) Weapons law and human rights law*

While international human rights law places stringent restrictions on the use of force and firearms, it poses relatively few limitations of its own on the kinds of weapons that may be manufactured and used. However, in most cases where weapons are illegal under IHL, they may also not be used in a law enforcement context.

IHL has a special branch, weapons law, which deals with the question when weapons should be regarded as unlawful in the context of armed conflict. One of the IHL mechanisms which have a link with human rights law is article 36 of Additional Protocol I to the Geneva Conventions. Article 36 provides that all State parties are required to subject new weapons to a review “to determine

whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party". The words "or by any other rule of international law" in the quotation may be interpreted to imply that in order to pass article 36 review, the potential use of such weapons under the applicable human rights law – including the right to dignity – must also be considered.

Another prong of IHL that impacts on the legality of weapons is the so-called Martens Clause, which provides that "in cases not covered by the law in force, the human person remains under the protection of the principles of humanity and the dictates of the public conscience." Clearly, in the human rights era, the values underlying human rights law will also influence the interpretation given to Martens Clause. It has been argued that weapons beyond a certain level of autonomy may be considered to violate the principles of humanity and the dictates of the public conscience. Human rights values form an important part of the "public conscience" today, and some of the states that are known best for their research into autonomy in weapons systems pride themselves on their vibrant human rights cultures.

The Martens Clause establishes among other things that the absence of an explicit prohibition does not imply that conduct or weapons are permitted. Does this mean that the burden of proof is on a State that uses such technology to prove that it will be lawful? It is worth making reference here to the approach that is followed in international environmental law. The precautionary principle determines that, and in the absence of scientific consensus on whether harm will be caused by an action or policy, the burden of proof is on the one wishing to introduce the action or policy.

Given the potential that weapons with high levels of autonomy may end up being used in law enforcement, as well as the increased levels of sophistication and in some case lethality of so-called less-lethal weapons – and without detracting from the applicability of existing standards - it may be necessary at some point to develop a system that is analogous to the article 36 procedure for weapons to be used in law enforcement.

### *3) The human rights that are potentially at stake*

The human rights that may potentially be infringed by the introduction and use of AWS to dispense force (lethal or less lethal) most noticeably include the right to life and the right to human dignity. While the focus will primarily be on these two rights, reference will also be made to the right to liberty and security of the person; the right against inhuman treatment; the right to just administrative action; and the right to a remedy.

These rights are widely recognised in the main human rights treaties and in most cases also form part of customary international law. In what follows, I will look at the potential impact of AWS in respect of each one of these rights. For ease of reference I will refer to the articulation of these rights in the International Covenant on Civil and Political Rights (ICCPR) (except in the case of dignity, which is not recognised in the ICCPR as a separate right).

I will also refer to the United Nations Code of Conduct for Law Enforcement Officials (Code of Conduct) and the Basic Principles on the use of Force and Firearms by Law Enforcement Officials ("Basic Principles"). The Basic Principles as well as the Code of Conduct set out principles for the use of force by law enforcement officials and require them, in doing so, to uphold human rights as well as ethical considerations.

The cumulative effect of these international standards for law enforcement demonstrates the fundamental incompatibility that exists in many ways between the constitutive values of the human rights regime and the use of AWS. In general it can be said that there is considerably less space for the use of AWS under human rights law than under IHL. The lower the level of control that remains in the hands of humans over the use of AWS (that is, the more the autonomy of

humans in this regard is compromised), the more there will be concern that the rights listed under consideration are violated.

*a) The right to life*

According to article 6 (1) of the ICCPR “[e]very human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life.” The term “arbitrary” has a legal as well as an ethical meaning. The primary soft law sources for the interpretation of this right where State agents resort to force are the Code of Conduct and the Basic Principles, mentioned above.

International human rights law poses a number of rules for the use of force which have titles similar to those used in IHL, but which differ greatly in their content. This includes the rules of necessity and proportionality, which have specific meanings under human rights law. Human rights law does not know concepts such as “combatant’s privilege” or “collateral damage”.

“Necessity”, in the context of human rights law, means that force should only be used as a last resort, and if that is the case, a graduated approach should be followed. Non-violent or less violent means must be used under human rights law if possible. To capture someone who poses a threat and subject that person to a trial is the norm.

Force may be used only against a person if that person is posing an imminent threat of violence – normally implying a matter of seconds or even split-seconds. While the hostile intention of the target is irrelevant in the context of IHL, where the focus is on status or conduct, it often plays a decisive role in the human rights context.

“Proportionality” also has a distinct meaning in the human rights context. Proportionality in this context sets a maximum on the force that may be used to achieve a specific legitimate purpose: the interest harmed may not exceed the interest protected. The fact that force may be “necessary” does not imply that it is proportionate. Thus, for example, a fleeing thief who poses no immediate danger may not be killed, even if it means the thief will escape, because the protection of property does not justify the intentional taking of life.

Basic Principle 9 deals specifically with firearms:

Law enforcement officials shall not use firearms against persons except in self-defence or defence of others against the imminent threat of death or serious injury, to prevent the perpetration of a particularly serious crime involving grave threat to life, to arrest a person presenting such a danger and resisting their authority, or to prevent his or her escape, and only when less extreme means are insufficient to achieve these objectives. In any event, intentional lethal use of firearms may only be made when strictly unavoidable in order to protect life.

In sum: intentional use of lethal force is only permissible where it is strictly necessary in response to a truly imminent threat to life.

The argument that a deadly return of fire is justified as self-defence, which is often used where police officers employ deadly force, is not available insofar as AWS (or other unmanned systems) are concerned. Intentional deadly force may be used only to protect human life, and not objects such as a machine.

The requirements for the use of force under human rights law are clearly much stricter than under IHL. A case-by-case assessment is needed, not only of each attack, as under IHL, but of each use of force against a particular individual. The same problems that are encountered in the context of armed conflict – whether machines have, or will ever have, the ability to make the qualitative assessments required for the use of force in IHL – exists all the more in the case of the use of force

during law enforcement and additional considerations also apply. It is, for example, very difficult to conceive that machines will be able to ascertain whether a particular person has the intention to attack with sufficient certainty to warrant the release of deadly force. Allowing machines to determine whether to act in defence of others poses grave risks that the right to life will be violated.

It could also be argued that a determination of life and death by a machine is inherently arbitrary, based on the premise that it is an unspoken assumption of international human rights law that the final decision to use lethal force must be reasonable and taken by a human. Machines cannot “reason” in the way that humans do and can thus not take “reasonable” decisions on their own. Article 1 of the Universal Declaration of Human Rights moreover provides that “All human beings ... are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.” The language may be outdated, but it is clear that human rights law places a strong emphasis on human reasoning and interaction.

*b) The right to human dignity*

The right to dignity is widely perceived to be at the heart of the entire human rights enterprise. Article 1 of the Universal Declaration of Human Rights provides as follows: “All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.”

While dignity is not recognised as a separate right in the ICCPR, it is a constitutive part of a number of the rights contained in that treaty. It is also recognised in several treaties as a separate right and it is a concept that influences the way in which other rights are interpreted. I would, for example, argue that the notion of the right to life cannot be understood in isolation from the concept of dignity, because it is the value of life that makes it worth protecting.

In the context of the use of force the right to dignity serves primarily to protect those targeted, rather than those who are incidental casualties. This is the case in armed conflict as well as law enforcement situations. It is worth keeping in mind that IHL was established in the first place to protect the dignity of combatants.

As a result of the above the strong and at times exclusive emphasis in much of civil society activism about “killer robots” on civilian casualties and their right to life in the context of armed conflict could be seen as one-sided. A significant but under-emphasised part of the problem with AWS is its potential impact on the dignity of those targeted. The potential effect of AWS on the dignity of the person targeted comes to the fore even more strongly in the case of law enforcement, where the combatant/civilian distinction does not exist.

One hears too often – and the first few days of this meeting is no exception – that considerations such as the right to dignity may be important ethical concepts, but they have nothing to do with law and as such do not place legal constraints on the actions of states. This is wrong for a number of reasons.

In the first place, as was set out above, the right to dignity is a legal right, and a central component of the international human rights canon that is enforceable through its mechanisms. This right also plays an important role on the domestic front in the context of the protection of the right to life, in some cases trumping it and in others supporting it. For example, in the well-known German air security case the German Constitutional Court has ruled that legislation allowing the Minister of Defence to authorise the shooting down of a civilian aircraft involved in a 9/11 style terrorist attack was unconstitutional, despite the lives that would be saved, inter alia because that would constitute a violation of the right to dignity of those in the airplane.

In other cases courts have ruled, or law makers have argued, that the death penalty (or at least aspects of its implementation) violates the right to dignity. The same applies to life imprisonment without the possibility of parole.

Moreover, as has been stated, the complementarity of IHL and human rights means that human rights rules such as the right to dignity need to be taken into account when IHL rules are interpreted. The Martens Clause, for example, is clearly open-ended and invites such interpretation.

Lastly, it presents a very bleak picture of the international order if ethical norms are explicitly excluded from consideration. An approach that ignores ethical norms presents the spectre of an order that will find itself increasingly unsupported by the fundamental values of the people whose interests it is supposed to serve. Human rights norms such as the right to life and dignity have to be given contents in terms of ethical standards.

Coupled to this is the tendency for people to take the law into their own hands beyond a certain point if their dignity is at stake. As indicated above, the “Riobot” is being developed specifically to control unrest on the mines in Africa. It is not autonomous in its release of force at the moment, but the addition of such a function is technologically not a major step. One can imagine the likely reaction of miners to the indignity if they are being herded like cattle by autonomous robots; adding insult to injury.

It has been argued that having a machine deciding whether you live or die is the ultimate indignity. This could potentially be extended to the decision by machines to use force in general. Human rights and human dignity are premised on the idea of equal concern and respect for each individual. While AWS may arguably be used to attack property under certain circumstances, humans should not be treated like mere objects.

Death by algorithm means people are treated as interchangeable entities, like pests or objects; as a nuisance rather than as someone with inherent dignity. A decision as far-reaching as the one to deploy force – and in particular deadly force – should only be taken after due consideration by a human being, who has asked the question, in real time, whether there is really no other alternative in the specific case at hand, and who assumes responsibility for the outcome. A machine, bloodless and without morality or mortality, cannot fathom the significance of the killing or maiming of a human being. The use of force against a human being is so far-reaching that each use of force – in IHL language, every attack – requires that a human being should decide afresh whether to cross that threshold.

I am not a psychologist, and do not want to go into this in any detail, but it is difficult not to think about the implications of the claims by psychologists that the proper functioning of the human psyche depends amongst other things on the possibility of hope. The harshness of reality is often bearable only because we believe – often against the odds – that the worst will not happen. This is why life-long incarceration without the possibility of parole is seen in many legal systems as unacceptably cruel and inhuman. Knowing that one may be confronted at any moment by a robot which will bring your life to an end with all the certainty that science can offer leaves no room for the possibility of an exception; for a rare occurrence of compassion or just a last-minute change of mind. Dignity in many instances depends on hope, and high levels of lethal machine autonomy can do deep damage to our collective sense of worth.

The issue of time seems to play a central role in this context. One of the problems presented by laws that try to regulate such future situations if they arise (such as the German air security law) or computer algorithms that determine when AWS will be allowed to release potentially deadly force, is that they do so in advance, on the basis of hypotheticals, while there is no true and pressing emergency rendering such a far-reaching decision unavoidable. Decision-making about the life and limb of people of flesh and blood by law makers or scientists based on theoretical possibilities

contemplated in the halls of the legislature or laboratories risks trivialising the issues at stake; it makes crossing the threshold of using force against another human being easy and routine.

This is not to say that decision-makers who may have to use force in real-life situations should be left with an unfettered discretion on whether to use such force and if so how much force may be used; the law should pose certain parameters, such as necessity and proportionality. However, these are general principles, not a priori determinations of how such principles should be applied in concrete cases. That should be left to humans on the ground, with situational awareness; humans who know that they will have to live with the consequences of their actions. Neither laws nor algorithms should make the use of force against people inevitable; it is a responsibility humans cannot shirk.

In addition to the right to life and the right to dignity, several other human rights can be brought into play by the release of force by AWS. They will be discussed in a cursory way below.

*c) The right to security of the person*

Article 9(1) of the ICCPR provides that:

Everyone has the right to liberty and security of person. No one shall be subjected to arbitrary arrest or detention. No one shall be deprived of his liberty except on such grounds and in accordance with such procedures as are established by law.

The right to security in this article covers the infliction of life-threatening as well as non-life-threatening injuries, for example during arrest. Using AWS to apply lethal or less-lethal force can thus potentially constitute a violation of article 9.

The Human Rights Committee is in the process of adopting a General Comment (number 35) on article 9, stating (in paragraph 12) that: „The notion of “arbitrariness” is not to be equated with “against the law”, but must be interpreted more broadly to include elements of inappropriateness, injustice, lack of predictability, and due process of law, as well as elements of reasonableness, necessity, and proportionality.” This understanding of the prohibition on “arbitrary” deprivation of liberty is similar to the one that applies to deprivations of the right to life. There seems to be little reason not to extend it also to bodily security as protected in article 9.

*d) The right against inhuman treatment*

Article 7 of the ICCPR provides that:

No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment. In particular, no one shall be subjected without his free consent to medical or scientific experimentation.

Since machines are not humans, it can be argued that the application of force by a machine to a human being without direct human involvement and appropriate levels of control is inherently, or by definition, “inhuman” treatment. The same argument can be made about a system that allows animals – such as trained dogs – to be used against people where there is not strict control by humans.

*e) Just administrative action*

Legal systems around the world recognise everyone’s right to just administrative action. It requires, at a minimum, that those affected by executive decisions will be “heard” and that someone will apply his or her mind to the situation at hand.

As is the case of other areas of law, it has rarely been stated explicitly that a human and not a machine must take these decisions, but there has so far not been a need to make this clear. This appears to be a hidden assumption of administrative law. Such an approach would provide support for the notion that there should be a deliberative process when force is used by the authorities, as part of the continuous exercise of discretion by a human, as opposed to machine decision-making. Since the use of force by a law enforcement official is often irreversible, and ordinary appeal procedures do not provide protection, the person affected must at least be able to appeal to the humanity of the person exercising the executive power.

There is an emerging school of thought that the use of force in an armed conflict is an administrative act, which requires the exercise of human discretion; it is much easier to make the case in a situation of law enforcement, where the right to just administrative action is well established.

It should be noted that in response to the emergence of technology, some states are limiting the computerization of executive power. For example, article 15 of EU Directive 95/46/EC provides that every person has a right “not to be subject to a decision which produces legal effects concerning him ... which is based solely on automated processing of data.”

#### *f) The right to a remedy*

The ICCPR in article 2 (3) provides that State Parties must “ensure that any person whose right or freedoms ... are violated shall have an effective remedy.” Not having a remedy for the violation of a particular right is in many cases in itself a violation of that right.

In line with this approach, the lack of accountability for a death where there is reason to believe that it was unlawful, is in itself a violation of the right to life. As will be discussed below, an accountability vacuum in the case of AWS is a real possibility.

#### *4) Limitations on rights and the burden of proof*

Most human rights may in principle be limited. Any infringement should, however, present as small an intrusion as possible. Those who infringe rights have to show that the infringement was for a legitimate reason and was as proportionate to that goal. If a State uses weapons systems that *prima facie* limits rights such as those listed above, the burden of proof to show that it is justified under human rights law is thus clearly on the State. In particular, if the level of autonomy of the weapon release system infringes the rights in question, the burden falls on the State in question to show why a human being – or perhaps a remote controlled system – is not employed instead.

#### *5) Accountability and transparency*

In the context of the use of armed drones, accountability and transparency have emerged as central issues under IHL. Human rights law likewise requires states to “ensure that any person whose rights or freedoms ... are violated shall have an effective remedy ...”. I will not repeat those requirements here, but merely say that the same considerations that apply to weaponised drones will apply to the use of AWS, for example outside the scope of armed conflict. Given the currently high levels of secrecy and impunity concerning armed drones, developing AWS in this context is particularly concerning.

However, it should be noted that accountability in the case of AWS also raises hurdles additional to those presented by weaponised drones. As many commentators have pointed out in the context of armed conflict, it is uncertain who will be held accountable if the use of an autonomous system has results that would have constituted a crime if a human being was directly involved. The same consideration applies, probably with increased force, in the law enforcement context.

Transparency is also of major concern. One of the problems with AWS is that little is known about the extent to which States are developing these weapons, though they stand ready to change the nature of war and law enforcement and many other aspects of the world we live in. I want to use this opportunity to commend the States present here today on their willingness to engage in a debate about the issue. However, more is required. States should disclose to the world – without necessarily going into technical details – to what extent they plan to develop autonomous systems and for what purposes. At the very least, they should disclose their views on what they see as the limits on such developments.

#### *6) Possible conflicts between the rights to life and dignity*

The main concerns expressed earlier were that AWS could violate the rights to life and dignity. What happens if there is a conflict between the right to life and the right to dignity – if the use of AWS protects the one but violates the other?

The argument has been made in the context of discussions of armed conflict, for example by Ron Arkin, that AWS may in specific cases or in the aggregate save lives, for example by allowing the more precise application of force against legitimate targets. Clearly, this is a consideration of significant weight. One can anticipate such arguments also being made in the law enforcement context.

However, even if it can be proven that machines can in this manner save lives, it is not necessarily the end of the debate. The right to life may be one of the supreme rights, but so is the right to human dignity, and saving lives for example of civilians by using AWS may come at the cost of the dignity of those targeted.

The human rights ethos militates against sacrificing the individual for the good of the many; the life or dignity of one for the lives of others. If that were not so, there would be no defence against the crude utilitarian argument that it may be acceptable to kill one person if that person's body (for example his or her organs) could save the lives of many others. As a result, there should be great caution about following a "numbers game" approach to AWS – there is an important difference between facing, or dying, a dignified and an undignified death. What, it may well be asked, is the point of preserving the physical continuation of specific lives, if life itself is devalued in the process?

Yet, an emphasis on dignity also cannot end the debate. Given the irreversibility of death, and the foundational nature of the right to life, when real decisions have to be taken, no one will deny the importance of saving life.

Which right should prevail in the event of a conflict between the right to life and the right to dignity? It may be that the choice is as stark as asking what is preferable: that fewer lives are lost but those who die do so in an undignified way, or that more people die but their deaths are more dignified?

I cannot see a quick and easy answer to this question, and trying to find a formulaic answer in terms of which one right is placed higher up on the hierarchy of rights is more likely to do harm than good. There can be no automatic (to use the term in this context) preference for the one right above the other. Both the right to life and the right to dignity are irreducible values; prioritizing the one over the other is bound to lead to losses that will be unacceptable in the long run.

The closest one can get to a solution, it seems to me, is to seek some kind of compromise between the protection of life as well as dignity. That is, it should be accepted that humans cannot and should not exercise complete control over every targeting decision. In some cases our decisions need to be enhanced by technology in order to save lives. However, if delegating such powers goes beyond a certain point, the threat to human dignity becomes too high.

Several speakers so far have advanced the idea that what is required is an obligation on the State to ensure that “meaningful human control” or “an appropriate level of human control” is retained over the use of force. This idea, which will be taken up again below, could present a possible compromise position between these two rights, retaining the essence of each.

### 7) *Conclusion*

IHL as it currently reads, in its black letter form, presents significant problems for the development and use of AWS. I have elaborated elsewhere on some of the problems that I think AWS will face to reliably meet the requirements of distinction, proportionality and precaution. These problems increase when the unarticulated premise of IHL – that humans will be the main decision-makers as far as decisions over life and death during armed conflict are concerned – is brought to the fore.

The use of AWS under human rights law raises further reasons for concern. As was argued above, in many ways AWS are antithetical to human rights law, even more so than is the case with IHL.

Much of the debate so far has centred on examples. Those who oppose the use of AWS provide clear examples of the unacceptable use of some forms of AWS, while those who are in favor of it likewise point to examples where there can be little reason not to permit such use.

Most people would for example agree that the whole-sale delegation to machines of decisions on the use of force, and especially lethal or “less lethal” force, during rapidly changing crowd control operations would not be compatible with human rights law. At the same time, the possibility that advanced technology combined with human control could save lives and cannot be discounted. The mere fact that a computer decides to pull the trigger, even where deadly force is at stake, does not necessarily mean that human rights norms are violated.

To illustrate this point, let us develop the hostage-taking scenario provided earlier a bit further: A large group hostages have been taken in a situation such as the one presented when the Nigerian school girls were abducted by Boko Haram. After all other avenues had proven fruitless a group of snipers were deployed to target the hostage takers. Because multiple, moving targets are concerned, it is difficult to get the snipers to fire at the same time, and it is dangerous if they don't. A central computer coordinates the simultaneous release of force at a time when all of them have a clear shot. I would argue that there is a sufficiently high level of human control over the targeting decisions to make the release of force potentially lawful.

Using examples are useful, since it makes the issue real. However, it is also clear that confining the debate to such exchanges is not on its own going to take us much further. The question has to be asked how does one distinguish such cases on a principled basis. As has been clear from the discussions at this meeting, “meaningful human control” provides a popular standard to be used to distinguish acceptable from unacceptable uses of increasingly autonomous systems, and it is worth exploring the contents and implications of using this standard further.

If highly autonomous systems were to be used for crowd control there would be little human control over each release of fire, while in the case of the snipers each individual targeting decision is taken by a human. Some level of machine autonomy may allow the snipers not to harm the hostage. Machine autonomy, up to a point, can thus complement and enhance human autonomy, but beyond a certain point (sometimes referred to as “full autonomy”) the scale tips and it undermines functions that should be performed only by humans.

Without some form of meaningful human control over every release of force, it is difficult to see how AWS can be lawfully used under human rights law. In order to take the debate on the appropriate response by the international community to AWS to the next level, we urgently need

to develop a clearer picture of what “meaningful” or “appropriate levels of” human control would entail.

In the last place, I would like to make a comment about the appropriate forum to discuss the elaboration of this concept and the other challenges posed by AWS. AWS clearly has far-reaching consequences as far as IHL is concerned, and processes such as the one currently undertaken by the CCW are of great importance. It will, however, be important to keep the human rights dimension in mind as well in these processes. It is equally important to address AWS in human rights fora and I will ask the Human Rights Council in June to stay engaged with this issue, alongside the other relevant UN and international bodies.<sup>236</sup> At the same time the great significance and importance of this issue being taken up by the CCW must be emphasised.

Technology will keep on developing and will keep on pushing up against the boundaries of human control. Those wishing to retain human control over life and death decisions will have to be equally relentless in their protection of this value which, once lost, cannot be regained.

*Presentation made at the Informal Meeting of Experts on Lethal Autonomous Weapons: Convention on Conventional Weapons (16 April 2015, Geneva) Panel on Human Rights and Lethal Autonomous Weapons Systems (LAWS)*

[...]

I would like to address four issues:

1. It may in the first place be appropriate to take a step back, and to ask ourselves how we should articulate the underlying issue on the table today. A popular approach may be to say it is concern about machines taking decisions about the use of lethal force against human beings during armed conflict. However, in my view autonomous weapons raise a larger concern. I think the broader concern is about machines taking decisions about the use of force against human beings, whether it is in armed conflict or not, and whether the force is lethal or not.

While the question of machines determining whether people will live or die during war is for current purposes the main issue to be addressed, it is not the only one. Increasingly law enforcement officials use unmanned systems, for example in riot control, and in some of these systems force may be released autonomously. Existing systems can for example deploy teargas without human intervention – and in future they may well be able to activate rubber bullets, TASERS etc. These weapons are in the ordinary course of events not lethal, but the issues raised by such expansion of autonomous force release are in many respects the same as those raised by its use on the battlefield: essentially the concern is about robots having physical control over our lives.

We will be doing ourselves a disservice by dealing with one aspect of this problem in isolation from the other aspects, or if the disarmament and human rights communities go in different directions about the underlying issue. We may find that we end up with an incoherent set of terms and norms that try to address different parts of the same issue.

Several consequences follow if one is to take this more holistic approach:

- In the first place it seems that the better general term to be used is probably Autonomous Weapons Systems (AWS). LAWS is a sub-category of AWS, just as Fully Autonomous Weapons (where there is no meaningful human control over the critical functions) is also a specific form of AWS. There is a role and a place for these more specialised terms (and as a

236 Report of the Special Rapporteur, Christof Heyns, A/HRC/26/36, 1 April 2014.

lawyer I am partial to the acronym LAWS), but in the end we need to find a solution for the problems presented by AWS, not just LAWS.

- The importance of dealing with this issue of increased autonomy in weapons release in disarmament as well as human rights fora become apparent – clearly the lethal, military versions should be dealt with in the CCW, but the CCW does not have a mandate over law enforcement, and unless the Human Rights Council and other such for a deals with it, an important aspect part of the problem will remain unaddressed, and is going to fall through the cracks. The Human Rights Council has a clear mandate in its founding document and thus an obligation to deal with human rights issues, wherever they occur, also in a pre-emptory way.
- From the start of the debate the importance of the right to life in this context have been emphasised. This is no doubt correct, and also explains the close engagement of my mandate with this issue. However, I have used my interventions at the meetings over the last two years to draw attention to the importance of the role of human dignity as well, and I am happy to see that the issue is squarely on the agenda, also in today's discussion.
- The rights to life and to dignity are the two main rights, but following the human rights paradigm serves as a reminder that the following rights – unless they are legitimately derogated from - also come into the picture: This includes the right against torture and cruel, inhuman or degrading treatment or punishment. (Can a robot ever administer the “human” treatment that the law requires? The use of dogs by the police for example requires proper human supervision – meaningful human control). It also includes the right to bodily security; and the right to just administrative action (can a robot ‘apply its mind’?). These are all considerations that should be taken into account in deliberations on the implications of ethical as well as legal standards (such as the Martens Clause).
- The human rights approach places a strong emphasis on the need for accountability. In fact, and very important in the context of autonomous weapons, is that a lack of proper accountability where there is a violation of a right such as the right to life in itself constitutes a further violation of that right. This highlights the importance of the concern that AWS might create an accountability vacuum – that if human control is absent we may end up in a situation where no human being may be held responsible if things go wrong with robots, because meaningful responsibility depends on meaningful control.

2. It is well-established that human rights [law] continues to apply during armed conflict, though the exact requirements of a right such as the right to life may be determined with reference to the *lex specialis* of international humanitarian law. I would like to discuss the implications of autonomous weapons for the right to life and the right to dignity in the context of two questions that I think have to be asked in deciding how to deal with such weapons:

The first question is can they do it? By this I mean to what extent can they be relied upon to do accurate targeting? As a technical matter, how good are or will they be at ensuring that only legitimate targets are being hit? Can they comply with the requirements of distinction and proportionality at least as well or better than humans? Much has been said about this, so let me just say that to the extent that they cannot, it becomes a right to life issue.

The people whose right to life are at stake here are those who are not legitimate targets – those who are protected by IHL, such as uninvolved civilians. As others have much more eloquently put it than I can, it is far from certain that at least fully autonomous weapons – where there is no meaningful human control – can be relied upon to do good targeting.

But even assuming that autonomous weapons ‘can do it’ – that one day they can make targeting decisions that are at least as good as those taken by human beings – there is a second question that needs to be asked. That is the question ‘Should they do it?’ or, to put it differently, ‘Is it right?’ The main issue here is not the plight of those who are protected under IHL, such as uninvolved

civilians, as was the case with the first question, but rather the implications of these weapons for legitimate targets. Is it right that humans, even if it is in other respects lawful, will be selected for targeting by machines?

This is in part a right to life question: some would say it is inherently arbitrary for machines to take life and death decisions, even where legitimate targets are concerned. This issue needs to be explored further. But for our current purposes let me just say that it is very much also a question of human dignity.

When we are dealing with fully autonomous weapons, the question arises whether the dignity of those targeted is not affected in a fundamental way, in the same way that it is a well-established rule of international law that even those who are sentenced to death in full compliance with the law may not be executed in an inhumane way, e.g. through beheading. It seems to me that such actions potentially affect the dignity of all of us, because the very value of human life is compromised. The flipside of a living a dignified life is dying a dignified death. And the manner in which one dies – or in which we can all potentially die – including how decisions are taken about life plays an important role in this regard.

A human being in the sights of a fully autonomous machine is reduced to being an object – being merely a target. This is death by algorithm; it has also been called ethics by numbers. In fact the human is reduced to the two numbers of the digital word – zeros and ones. While war is at best already an undignified business, it traditionally at least involve some kind of deliberative process, some kind of decision-making whether a particular attack is really necessary, in which human consideration may – even if often in practice not – play a role.

IHL of course sets the tone – the first question is whether it is lawful. But IHL developed in the context and in my view relies on the assumption that there will be a second-order determination as well. A human will decide whether to go ahead and actually initiate the attack. The hypothesis that machines may one day comply better with IHL standards – doubtful as it is on its own terms – does not serve as an argument why the human can effectively be taken out of the decision-making loop. As is often said, something may be lawful but be awful, and a human is needed in the loop to prevent that from happening..

A world where the function of pulling the trigger is delegated to machines is a world without hope: hope in some measure of mercy; perhaps hope in benefitting from some measure of human error or shortcoming during the targeting. Machines cannot fathom the importance of life, and the significance of the threshold that is crossed when a life is taken.

Ron Arkin has said we should think about LAWS as a specialised kind of smart bomb, which up to a point may be true. However, the concern is that beyond a certain point – where humans are not in effective control - they may be simply too smart and perhaps in that sense also too predictable. It is no longer a case of humans using them as tools to achieve our purposes; the true picture is more akin to them using us for their purposes.

The above refers to the dignity of those who are targeted. However, another form of dignity is also at stake. If the decision whether to use deadly force is taken out of the hands in whose name it is being done, they cease to be moral agents: people who take a decision and assume responsibility for it. It is no wonder that so many military officers are reluctant about the introduction of AWS. Their dignity is on the line.

So far we have dealt with the use of AWS in armed conflict. There are further considerations why the use of AWS is even more problematic in law enforcement. The use of unmanned systems such as drones in law enforcement in general is already problematic, because police officers have a duty to protect the public, and in order to do so they generally need to be on the spot; they have to be

hands on. But if policing becomes so depersonalised that the police officers are not only physically but also psychologically absent from decisions to use force, the very nature of policing and its basic assumptions are challenged.

Moreover, law enforcement requires a much higher level of personalised decision-making on the use of force than armed conflict: in many cases it is necessary to establish whether a person who seems to pose a threat actually intends to execute that threat. This is in essence a decision requiring human judgement.

3. So, what is the test to determine whether AWS are acceptable, in armed conflict or in law enforcement? Some AWS have a very low level of autonomy as regards the critical functions of force release; in other cases humans exercise little control. We saw above that the problems concerning the right to life and the right to dignity emerge when humans no longer exercise meaningful control.

Another way of putting it, is to ask the question whether the weapons in question are tools in the hands of humans, or the other way around. To use them as a tool is to exercise meaningful human control.

In my view the test is that AWS may be accepted only to the extent that they are good tools. Both of these words carry significance.

They must be tools in the sense that humans use them to pursue their own objectives. Posing the requirement of meaningful human control is just another way of saying that AWS are acceptable only insofar as they are tools in the hands of humans.

But there is also a qualification in the case of those AWS that are used by humans as tools. They must be good tools. Where humans exercise meaningful control over machines in taking targeting decision, the expected outcome in terms of accuracy of targeting should clearly not be worse than if they were not used. But does the outcome have to be better? Or is it sufficient if the machines are as good at doing this as human beings?

I would argue that the machines have to do at least as good as humans in targeting, but the argument can be made that they should do even better than humans. Heightened technology gives increased control, and with greater control comes greater responsibility. We generally require specialists, medical and otherwise, to meet higher standards of proficiency.

So, for example, if a drone has a computer function to help its operator to select a target, such targeting should be more accurate than would otherwise be the case. Merely being as accurate as when humans act on their own means it is not a good tool and there is no reason why it should replace humans.

Cases where a level of autonomy short of full machine autonomy can help save lives in a manner which preserves human dignity can readily be imagined, and in such instances AWS can and should in my view, if available, be used. Let me give an example from a law enforcement perspective, which may resonate with the fact that this week it is one year after the 276 Nigerian girls disappeared. Assume that during a hostage situation the lives of the hostages depend on whether snipers who have been deployed release fire simultaneously. If their rifles are connected by a computer which releases force only once all of them have a clear shot at armed hostage takers, this may allow them to get the hostages out unharmed. While the computer releases the force, this seems to me a clear case of meaningful human control being exercised, and thus a legitimate use of AWS.

It is likewise easy to imagine scenarios during armed conflict where technology is used in the targeting process, which can save lives. As long as meaningful human control is retained, this should be welcomed.

The use of technology in such a case does not undermine the dignity of those targeted, because humans take the decision, and for the same reason the dignity of those by whom it is used is also not affected. In fact their dignity can be enhanced to the extent that they are able to function better as moral agents who want to save lives – in the above case the lives of the hostages. Moreover, should something go wrong human responsibility can be assigned. Such uses of AWS as good tools should be encouraged.

4. The above implies, however, that if there is no meaningful human control, and the AWS are thus fully autonomous, they may not be used. In the last place, it may be useful to unpack the following question further, which I think is the central and most difficult question posed by AWS: If a fully autonomous weapon can save lives on the battlefield by being more accurate in targeting than a human being, should it still be rejected?

As was alluded to earlier, whether targeting by fully autonomous weapons will ever be superior to that of human beings given the kind of values judgements that are involved, is in dispute. However, let us assume for the moment that it can be done. In the terms used above, in such a case autonomous weapons will no longer be “tools”, but their targeting is “good”. Does the latter not cancel out the former?

Does the right to life not mandate and in fact require the use of such technology if it is available? The right to life is often described as the “supreme right”, and should surely trump softer considerations such as those about dignity outlined above?

This scenario clearly represents a dilemma. The right to life and the right to dignity appear to be in conflict. Which one should prevail? Given my role as mandate holder on the right to life, my first inclination is to say that the right to life should always prevail, and anything that can save lives should be supported.

I have given this question a great deal of thought. As you may know in my 2013 report I did not propose and outright ban, but a moratorium, to allow time for the international debate to develop, and frankly for people like yourselves and myself to make up our minds. It seems that debate has indeed developed, and has yielded some significant results. Of particular importance is the emerging consensus around the notion of meaningful human control: At least in the context of armed conflict autonomous weapons may be permitted if humans retain meaningful control, but should be banned where that is not the case.

Against the above background it seems that we have to admit to ourselves that even if such weapons can save lives, if they are fully autonomous that is a benefit we have to do without.

The idea of the indivisibility and inter-connectedness of rights means that one right cannot automatically trump all other rights. The right to life and the right to dignity, for example, are both fundamental rights, and the question which right should prevail must be determined on a case by case basis in the light of the circumstances. I would argue that where autonomous weapons are concerned, the case for the right to dignity is so strong in that at some point it prevails over the right to life. Saving the lives of some people by allowing others to be killed by machines that are not under human control involves using the latter as a means to an end and is an unacceptable affront to human dignity.

It may be more accurate not to talk about the right to life being trumped in such a case by the right to dignity, but rather to say that the right to life should be interpreted in terms of the right to dignity, because the right to life properly understood is the right to a dignified life.

It is not merely a question of protecting the right to dignity. On closer inspection, even if fully autonomous weapons can in specific cases lead to more accurate targeting, that may also

compromise the right to life as traditionally understood. As was pointed out earlier, a lack of accountability for violations of the right to life is in itself also an independent violation of that right. And as we saw earlier, there are serious concerns about the extent to which there will be accountability when things go wrong with AWS. Without human control it is difficult to imagine human responsibility. As a result, fully autonomous weapons may also threaten the right to life.

What about the use of LAWS in carefully defined spaces, for example where there are no civilians? Even assuming that the problem of those who may surrender or be wounded or otherwise hors de combat can be solved (which is not an inconsiderable problem), what could be wrong with allowing the targeting in such cases to be autonomous? Some would argue that meaningful human control is not in fact being exercised in such a case, by the operator selecting such a circumscribed area of deployment: that in effect the necessity and proportionality decision can be said to have been taken by a human.

This may be part of the answer, but it emphasises why it is so important to develop the concept of meaningful human control further. Clearly considerations such as how much time elapses after the machine is activated and before force is released will also play a role.

To conclude: it seems to me that we are getting closer to an answer to the question how to deal with AWS: As long as they are good tools, in the sense that humans exercise meaningful control over them, they can and should be used in an armed conflict situation. There is significantly less room for their use in law enforcement, where it will be difficult to outperform human beings. If they are no longer tools in the hands of humans, they should not be used. Considerations of IHL, human rights, IHL and ethics call for fully autonomous weapons to be banned.

*Presentation made by Special Rapporteur Heyns at the Meeting of High Contracting Parties to the Convention on Certain Conventional Weapons (14 April 2016, Geneva)*

*Autonomous Weapon Systems: Human rights and ethical issues*

*1) First, what to call them?*

Autonomy in force delivery can potentially be found in the conduct of hostilities, where it will typically be aimed at lethal results. It is increasingly clear that they may also be used during law enforcement (for example to disperse teargas or Tasers), where the intention will normally be to avoid death. In the former case it makes sense to talk about Lethal Autonomous Weapons Systems; in the latter case, the word ‘lethal’ is out of place, and may muddle the conversation.

In my view it will thus make sense to use ‘Autonomous Weapons Systems’ as the generic term, and to talk about Lethal Autonomous Weapons Systems (LAWS) when the discussion is confined to its use in armed conflict.

*2) What are the main concerns about AWS from a human rights perspective?*

Human rights ethics and law apply during law enforcement but also during armed conflict.

AWS with meaningful human control over the release of force – the so-called ‘critical functions’ – do not raise unique human rights concerns. In fact they may help those who use them to better meet human rights standards. However, AWS where humans do not exercise meaningful control – fully autonomous machines – raise a number of concerns.

The first concern is can they do it?: Can such AWS conduct proper targeting, and ensure a) that the force is properly directed (aimed at appropriate targets) and b) that the force is properly calibrated (it does not overstep the boundaries of what is necessary to neutralise an immediate threat during

law enforcement, or to cause disproportionate death or injury among those who may not be targeted such as uninvolved civilians).

This is a largely a technical question, related to the protection of the right to life of those who are protected by law against the use of force. Some argue that machines will over time become better at targeting than humans; others say this is unlikely. Clearly if machines are not going to be better at targeting than humans, using them is a non-starter.

But what if they will over time become better than humans at the deployment of force?

That still raises the question should they do it? Should machines have the power to take human life, or to inflict severe injury?

One way of articulating the concern here is in terms of the right to dignity of those at the receiving end of the use of autonomous force: also and, in particular, those who may legitimately be targeted and subjected to force. I have argued elsewhere that to allow machines to determine when and where to use force against humans is to reduce those humans to objects; they are treated as mere targets. They become zeros and ones in the digital scopes of weapons which are programmed in advance to release force without the ability to consider whether there is no other way out, without a sufficient level of deliberate human choice about the matter

Moreover, if dignity entails the ability to take autonomous decisions, AWS without meaningful human control could also imply that the dignity of those on whose behalf these machines is impinged.

In addition to the above, fully autonomous weapon delivery undermines the rights against inhumane treatment and just administrative action of those in their line of fire.

### *3) The role of accountability*

Control and accountability are two sides of the same coin: if humans do not have control over force release they cannot be held accountable, which is why AWS with full autonomy present the danger of the often-discussed 'accountability vacuum'.

Rights such as the right to life have two components: the prohibition on arbitrary deprivations of life, as well as the requirement that where such deprivation occurs, there must be accountability. A lack of accountability in itself constitutes a violation of the right to life. Even if AWS can produce better targeting results than human beings, there will still be mistakes, and if the possibility of accountability is lacking, it means that the right to life is violated in such cases.

But AWS also raise questions about broader political accountability: to the extent that a system is entrenched whereby the exercise of the critical functions of force delivery are out of the hands of human beings, including their political leaders, it may become easier for such entities to take the decision to use force – and when things go wrong for those in power to relay on the defence – explicitly or implicitly - that 'the machine did it'.

### *4) Conclusion*

Some level of autonomy in force delivery is inevitable and may indeed be desirable. Beyond a certain point, however, the very values which give human existence its meaning may be undermined by autonomous weapons. I have called earlier, in 2013, for a moratorium on AWS in general, until such time as the international community has had the opportunity to work out an appropriate response. The high level of engagement with this issue that has occurred on so many levels – including in the CCW – has to my mind been helpful in bringing clarity to the matter. Today, after three years, it is clear to me that the notion of 'meaningful human control' provides a workable and

well-founded basis on which a distinction can be drawn between those forms of autonomy that are acceptable, and those that are not.

AWS without meaningful human control in the context of armed conflict as well as law enforcement should be banned.

In his final report to the General Assembly, Special Rapporteur Heyns briefly noted the processes that had been undertaken at the CCW since his initial report on autonomous weapons to the Council, and encouraged it and other human rights bodies to remain engaged with the issue:

*Report to the General Assembly (A/71/372, 2 September 2016, ¶¶ 81-83)*

81. In his report to the Human Rights Council at its twenty-third session (A/HRC/23/47), the Special Rapporteur called for a moratorium on the development of autonomous weapons, until a principled basis could be found to distinguish acceptable and autonomous weapons.

82. The concept of “meaningful human control” over critical functions (most saliently, the release of force) has subsequently been elaborated in the context, inter alia, of the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects to fill this void. The Rapporteur supports the approach that weapons with full autonomy — those without meaningful human control — should be banned. They are unlikely to cross the first hurdle outlined above — the ability to make proper targeting decisions. They should moreover not make life-and-death determinations over human beings, because it would violate the right to a dignified life. The same constraints do not apply to autonomous weapons for which humans retain meaningful control.

83. In December 2016, the decision on how to take forward international work concerning autonomous weapons will again be on the agenda of the States parties to the Convention on the Use of Certain Conventional Weapons. The Rapporteur urges the Human Rights Council (and other human rights bodies) to follow the outcome of the decision closely. In addition, the Council should remain seized of the possible introduction of autonomous weapons in domestic law enforcement operations (see A/69/265, paras. 77-87).