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Futureproofing Is Never Complete: Ensuring the Arms Trade Treaty Keeps Pace with New Weapons Technology

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Note: *This is an updated version of an earlier policy brief we authored during the Arms Trade Treaty negotiations in March 2013.*[3] *It has been revised to comment on the final text of the treaty, which was opened for signature in June 2013. The paper draws on technical advice from members of the International Committee for Robot Arms Control, but any opinions (and/or errors) are the authors' alone.*

The preamble of the United Nations Charter states that the purpose of the Organization is to "save succeeding generations from the scourge of war."[4] The United Nations Arms Trade Treaty, opened for signature this year, contributes to this goal by establishing a potentially transformative new global norm.[5] For the first time, it puts in place international prohibitions on the sale and transfer of conventional weapons to armed groups that abuse human rights and humanitarian law, engage in organized crime or commit acts of terrorism and piracy. The Arms Trade Treaty has the potential to save lives.[6]

But the Arms Trade Treaty will only be as watertight as states' interpretation of it, especially as digital and robotics technology transforms the arms industry. We are in the midst of a far-reaching and potentially destabilizing transformation of the arms industry driven by the growing capabilities of information and communications technology. The most talked-about expression of this is the increasing use of armed Unmanned Aerial Vehicles (UAVs) or drones. However, weapons manufacturers are also developing a wide range of robotic, "unmanned" and autonomous weapons. This includes military land and maritime robots, as well as related parts, components and technologies. Examples include:

- **'Unarmed' versions of the General Atomics Predator XP Drone**. General Atomics, manufacturer of the well-known armed Predator drone, has exported "unarmed" versions to several states.[7] UAVs are often sold as unarmed civilian aircraft but can be used for military purposes such as target acquisition for artillery or aerial attacks, or observing and scouting of military targets. Moreover, some unarmed UAVs may be armed with modular attachments or through adaptation.[8]

- **The iRobot 710 Warrior**: This remote-control ground robotic system has the capacity to be fitted with a variety of modular attachments, ranging from a camera, robotic 'hand', a shotgun or a grenade launcher. The weapons attachments can be sold separately from the main system and reassembled later.[9]

- **The UAS Advanced Development Switchblade:** A miniature aerial drone and explosive "loitering munition" (the manufacturers' phrase), launched from a mortar tube, that can be remotely piloted to seek a target and then be flown 'kamikaze-style' into a target.[10] Lockheed Martin makes a similar system, called the Fire Shadow.[11]

- **Unmanned Surface Vehicle Precision Engagement Module (USV PEM).** This remote control unmanned surface vessel can be armed with missiles and a .50 calibre machine gun.[12] It is one of many military marine systems under development by weapons manufacturers. Several navies have also been developing robotic sea mines and torpedoes that would navigate either autonomously or through remote control, detect the presence of a ship or aircraft and even autonomously fire on it.[13]

- **The Liberator 3D-printable pistol**: Designed by a university student, the plans for this plastic handgun can be downloaded from the internet and manufactured cheaply on a 3D printer.[14]

With an increasing global market for unmanned technology, distinctions between civilian and military applications are easily blurred. Some new robotic systems can be sold separately from the guns that attach to them and thus might not fall into the definition of a weapon (until armed), despite their deadly potential. Future conflicts will likely see increasing use of these weapon systems, providing both states and non-state actors with new capabilities to use lethal force. These capabilities stretch the boundaries of the international laws of war and redefine the interpretations of what constitutes a battlefield.[15] This is already posing new humanitarian, human rights and arms control challenges.[16]

The Problem: The Arms Trade Treaty Relies on an Outdated Categorization of Weapons

Article 2 of the Arms Trade Treaty – the Scope – states that the treaty "shall apply to all conventional arms within the following categories:

(a) Battle tanks;
(b) Armored combat vehicles;
(c) Large-calibre artillery systems;
(d) Combat aircraft;
(e) Attack helicopters;
(f) Warships;
(g) Missiles and missile launchers; and
(h) Small arms and light weapons."

Except for the addition of small arms and light weapons, this list is derived from the categories covered by the UN Register of Conventional Arms, a voluntary international arms trade reporting system. The Register's website clearly states that "Not all arms are covered" by this list, just those "deemed the most lethal."[17]

Later in the Arms Trade Treaty, there are less stringent provisions for states to "establish and maintain a national control system" in order to "regulate the export of ammunition/munitions" (Article 3) and "parts and components" (Article 4). However, there are no provisions for regulating transfers of technologies.

It is clear from reading the Arms Trade Treaty text that its intention is to regulate the broad range of conventional weapons, including the examples of robotic systems listed in the previous section. However, it is incumbent on civil society and concerned states to remain vigilant since some states or manufacturers acting in bad faith may try to claim the presence of loopholes.

For example, the iRobot Warrior falls outside the UN Register's technical specifications of both "Battle tanks" and "Armored combat vehicles." It does not have the "high cross-country mobility", or the weight nor 75mm gun of a tank. Unlike an armored combat vehicle, it is not "designed and equipped to transport a squad of four or more infantrymen" and may not have a high-calibre weapon.[18] As Unmanned Ground Vehicles (UGVs) become more popular, state will need to consider redefining the UN Register categories to include them.

Arming an unarmed UAV or downloading and 3D printing a gun would, under the current text, be considered a transfer regulated by the Arms Trade Treaty. The US State Department recently acted against servers hosting the Liberator's plans.[19] However, in practical application, there are challenges in the monitoring of these kinds of circumvention, particularly as many new weapons technologies are modular by design.

There is a danger that weapons like the Switchblade (or the Fire Shadow) could fall into a gray area between a "munition" (under the less tightly controlled Article 3 of the treaty) and a "Combat aircraft." It is a fixed-wing aircraft, but given its small size, some manufacturers may try to claim that such miniature UAVs are more like a munition than an airplane.

Finally, the UN Register category of "warship" does not state that it only applies to manned ships. Therefore, unmanned ships and submarines are clearly covered by it. However, it is notable that the USV PEM is not called a "ship" by its manufacturer. Indeed, there is evidence that some military actors are trying to claim that an unmanned robotic vessel is an "adjunct" to another military ship, not a warship itself. [20] Indeed, if a vessel displaces less 750 metric tonnes, the UN Register does not apply unless it "equipped for launching missiles with a range of at least 25 kilometres or torpedoes with similar range." [21] The .50 calibre machine mounted on such a USV itself would be controlled by the category of small arms and light weapons. But there may be practical problems in controlling those who would attempt to circumvent the Article 4 "Parts and Components" controls by selling such a USV disassembled into modular parts separately from its weapons attachment.

These definitional gray areas pose potential problems in interpreting how the emerging class of robotic weapons will fit into the Arms Trade Treaty categories. Given these complexities, a report from the Stockholm International Peace Research Institute (SIPRI) worried that the Arms Trade Treaty text lacks some clarity in regulating new weapons technology.[22]

Back in March, while states were still negotiating the draft Arms Trade Treaty, we recommended several key language changes – drawn from proposals already on the floor – that would help "futureproof" the treaty, allowing it to cover emerging technologies.[23] Unfortunately, most of the concerns raised in our paper, as well as by Amnesty International, the International Committee for Robot Arms Control and several states' delegations (including France, Peru and the Holy See), were not addressed in the final text.[24] Amending the treaty (though not impossible[25]) may at this time be both politically infeasible and possibly undesirable while the treaty is being established as a universalized international norm.

The Solution: Ensure the Arms Trade Treaty Is a Living Document

Can the Arms Trade Treaty still be futureproofed? We believe it can, even though the treaty is now final and 113 states have signed it. If used well, the Arms Trade Treaty can become an effective instrument in stemming unchecked proliferation of robotic weapons to criminals, human rights abusers, terrorists, pirates and rogue states. But this will require a recognition that futureproofing is an ongoing task of vigilance that will never completed. Civil society has succeeded in persuading states to negotiate a strong Arms Trade Treaty, but our job now is to win the more complex discursive struggle –

that of interpretation and implementation. As expressed by Norway in the UN General Assembly First Committee in October, "The Arms Trade Treaty should, when it enters into force, be a dynamic and living instrument, open for improvements and changes in the future."[26]

The following is a list of options for concerned states, international organizations and civil society to ensure that the Arms Trade Treaty remains a living document, able to adapt to new challenges:

1. **Unequivocally Assert that the Arms Trade Treaty Scope Includes both Manned and Unmanned Conventional Arms**: The UN Register's definitions, even with the potential problems noted above, include unmanned weapons, because there is no provision stating that they do not.[27] Civil society and concerned states must make this clear in their public statements and call out those who attempt to suggest otherwise.

2. **Build on the Recent Definitional Clarifications of the UN Register's Group of Governmental Experts**: On July 15, a report written by a UN General Assembly-mandated Group of Governmental Experts and endorsed by Secretary-General Ban Ki-moon, recommended that "Member States report armed unmanned aerial vehicles" – i.e. weaponized drones – to the UN Register of Conventional Arms under that categories of "combat aircraft" and "attack helicopters."[28] The new definitions of these categories now include:

    a. "Unmanned fixed-wing or variable-geometry wing aircraft, designed, equipped or modified to engage targets by employing guided missiles, unguided rockets, bombs, guns, cannons or other weapons of destruction", and

    b. "Unmanned rotary-wing aircraft, designed, equipped or modified to engage targets by employing guided or unguided anti-armour, air-to-surface, air-to-subsurface, or air-to-air weapons and equipped with an integrated fire control and aiming system for these weapons." [29]

    The Group is made up of officials of 15 diverse countries, including the all major arms exporters (the USA, Russia, China, UK, France and Germany). The Group's report represents the authoritative statement on the categories that the Arms Trade Treaty borrows. The Group's definitions should thus be considered binding on the Arms Trade Treaty's states parties. Civil society and concerned states should urge the Group to make similar definitional clarifications of the "Battle tanks", "Armored combat vehicles" and "Warships" categories to spell out explicitly the inclusion of new types of unmanned ground vehicles, surface vessels and submarine/underwater vessels.

3. **Develop and Promote Comprehensive National Control Lists**: Implementation of the Arms Trade Treaty will largely be decentralized to the national level. Each State Party will be required to draw up National Control Lists (see Article 5, paragraph 2) of the conventional weapons they control, produce and transfer. Article 5, paragraph 3 says that states are "encouraged to apply the provisions" of the Arms Trade Treaty to "the broadest range of conventional arms." In consulting with diplomats negotiating the treaty, many assured us that their governments would interpret the spirit of the Scope broadly in evaluating transfers (and the behavior of other states). But this means it is up to us in civil society to hold states to that broad interpretation. Civil society, international organizations and concerned states should monitor what weapons States Parties are including on the Lists and call out systems that are missing. "Early adopter" states, the first ones to ratify the treaty, should draw up comprehensive Lists and promote them as best practices, perhaps through regional organizations such as the EU, NATO, ECOWAS, CARICOM, African Union and Organization of American States. Indeed, Article 5, paragraph 4 of the Arms Trade Treaty encourages States Party to "make their control lists publicly available." Civil society could use this to foster a "race to the top" among states – persuading them to make Lists as broad as possible – and shame those which fail to include new technologies.

4. **Influence the Interpretation of the Treaty through Careful Monitoring**: Ultimately, the strength of the Arms Trade Treaty will derive not from the literal meanings of its text, but from how it is put into practice, which civil society and concerned states have the capacity to shape through monitoring how it is put into practice. This means any monitoring mechanisms should anticipate potential circumvention strategies and hold accountable states, manufacturers and armed groups that try to claim the existence of loopholes.

5. **Build Connections to Related Campaigns and Control Regimes**. It will never be possible to develop a single, universal control system able to anticipate all the potential threats posed by new weapons to international peace and security. In his most recent report to the UN General Assembly, Special Rapporteur on extrajudicial, summary or arbitrary executions Christof Heyns expressed the need to interpret the interlocking "regimes of international law" relevant to military robotics as constituting "an interconnected and holistic system", each with a "distinctive role…in protecting the right to life."[30] Therefore, the coalition that built the Arms Trade Treaty will need to build links to related efforts like the UN Register, Missile Technology Control Regime, the Wassenaar Arrangement and dual-use equipment control programs. The Control Arms coalition should also collaborate with the Campaign to Stop Killer Robots, the International Committee for Robot Arms Control and those advocating for a convention on cyberweapons to share information, expertise and political support.

Endnotes

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[3] Matthew Bolton & Wim Zwijnenburg. (22 March 2013) "Futureproofing the draft Arms Trade Treaty: a policy brief." *ATT Monitor*. 6.5. pp. 3-4. <http://reachingcriticalwill.org/images/documents/Disarmament-fora/att/monitor/ATTMonitor6.5.pdf>. Accessed 11 October 2013.
[4] United Nations. (26 June 1945) "Preamble." *Charter of the United Nations*. <http://www.un.org/en/documents/charter/preamble.shtml>. Accessed 17 October 2013.
[5] UNODA. (2013) "The Arms Trade Treaty." <http://www.un.org/disarmament/ATT/>. Accessed 17 October 2013; Denise Garcia. (2011) *Disarmament Diplomacy and Human Security - Norms, Regimes, and Moral Progress in International Relations*. New York, Routledge. pp. 13-35, 37-57.
[6] Matthew Bolton. (11 April 2013) "Arms Trade Treaty: Keeping weapons from terrorists and human rights abusers." *The Hill*. <http://thehill.com/blogs/congress-blog/foreign-policy/293325-arms-trade-treaty-keeping-weapons-from-terrorists-and-human-rights-abusers>. Accessed 17 October 2013.
[7] Brendan McGarry. (17 June 2013) "General Atomics Sells Predator XP Abroad." *DefenseTech*. <http://defensetech.org/2013/06/17/general-atomics-sells-predator-xp-abroad/>. Accessed 17 October 2013.
[8] Wim Zwijnenburg is currently working on a more detailed policy paper regarding arms control of UAVs that will be forthcoming shortly.
[9] iRobot Corporation. (2013) "iRobot 710 Warrior: Specifications." <http://www.irobot.com/en/us/learn/defense/warrior/Specifications.aspx>. Accessed 13 October 2013.
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[12] US Naval Sea Systems Command. (5 April 2012) "Navy Developing Precision Engagement Round for USVs." <http://www.navsea.navy.mil/NewsView.aspx?nw=NewsWires&id=34>. Accessed 17 October 2013.
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[17] UNODA. (2013) "UN Register of Conventional Arms." <http://www.un.org/disarmament/convarms/Register/>. Accessed 17 October 2013.

[18] UNODA. (n.d.) "Categories of equipment and their definitions." <http://www.un.org/depts/ddar/Register/Categories.html>.

[19] Andy Greenberg. (9 May 2013) "State Department Demands Takedown Of 3D-Printable Gun Files For Possible Export Control Violations." *Forbes*. <http://www.forbes.com/sites/andygreenberg/2013/05/09/state-department-demands-takedown-of-3d-printable-gun-for-possible-export-control-violation/>. Accessed 18 October 2013.

[20] See the following for the debate within the US Navy about whether unmanned military vessels are warships: Captain Andrew Norris. (2013) "The Legal Status of Unmanned Maritime Systems (UMSs)." *Legal Issues Relating to Unmanned Maritime Systems*. Chap. 2. <http://www.usnwc.edu/getattachment/771216f5-d78b-4765-9b8c-b4ecaf169254/Legal_Issues_Relating_to_Unmanned_Maritime_Systems.aspx>. Accessed 17 October 2013.

[21] UNODA. (n.d.) "Categories of equipment and their definitions." <http://www.un.org/depts/ddar/Register/Categories.html>.

[22] Tilman Brück and Paul Holtom. (13 March 2013) "Will the arms trade treaty be stuck in the past?" *SIPRI*. <http://www.sipri.org/media/newsletter/essay/brueck_holtom_March13>. Accessed 11 October 2013.

[23] Bolton & Zwijnenburg, *Op. cit.*

[24] Matthew Bolton. (9 April 2013) "The Role of ICRAC in the Arms Trade Treaty Negotiations." *ICRAC*. <http://icrac.net/2013/04/the-role-of-icrac-in-the-arms-trade-treaty-negotiations/>. Accessed 11 October 2013.

[25] Though perhaps a far-fetched possibility, the final Arms Trade Treaty text allows the possibility of changes. Article 17 allows future conferences of States Party to review "developments in the field of conventional arms"; Article 20 allows them to adopt amendments by three-quarters vote instead of consensus. Changes that would tighten the regulation of new technologies include: a) expanding the Scope (Article 2) to cover "all conventional weapons" (as suggested by the EU in the March 2013 negotiations) and clarify that it includes "systems or platforms…both manned and unmanned" (as proposed in the 13 July 2012 committee draft of the Scope); and b) Including "Technologies" along with "Parts and Components" in Article 4 (as called for by the Peru statement at the March 2013 negotiating conference, signed by 11 states and supported by numerous others.

[26] Knut Langeland. (14 October 2013) "Agenda Items 89 to 107: General debate on all disarmament and international security agenda items." <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com13/statements/14Oct_Norway.pdf>. Accessed 17 October 2013.

[27] See, for example: Juergen Altmann. (June 2013) "Arms control for armed uninhabited vehicles: an ethical issue." *Ethics and Information Technology*. 15(2). pp. 137-152.

[28] United Nations Register of Conventional Arms Group of Governmental Experts. (15 July 2013). "Continuing operation of the United Nations Register of Conventional Arms and its further development." A/68/140. <http://www.un.org/ga/search/view_doc.asp?symbol=A/68/140>. Accessed 11 October 2013.

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[30] United Nations Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions. (13 September 2013) Report to the General Assembly. A/68/382. <http://justsecurity.org/wp-content/uploads/2013/10/UN-Special-Rapporteur-Extrajudicial-Christof-Heyns-Report-Drones.pdf?utm_source=Press+mailing+list&utm_campaign=6de0426c90-2013_10_17_Heyns_drones_report_UN&utm_medium=email&utm_term=0_022da08134-6de0426c90-286021377>.