
BEYOND THE HORIZON: "WIDE AREA" RIOT CONTROL AGENT MEANS OF DELIVERY AND THEIR RELEVANCE TO THE CWC, BWC AND UNSCR 1540

POLICY PAPER 4
BIOCHEMICAL SECURITY 2030 PROJECT
UNIVERSITY OF BATH

FEBRUARY 2014

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ACKNOWLEDGEMENTS

The authors, as well as the project organisers, would like to thank those who have reviewed drafts of this paper. In particular this includes Prof. Malcolm Dando, and Dr. Ralf Trapp. In addition, we are grateful to those who commented upon an "advance" version of this paper circulated at the Biological Weapons Convention Meeting of States Parties in December 2013. We are also grateful to the Economic and Social Research Council as well as the Defence Science and Technology Laboratory Futures and Innovation Domain for funding this project. Dr Michael Crowley would like to express his gratitude to the Joseph Rowntree Charitable Trust for their financial support for aspects of this research. He would also like to recognise and thank colleagues from the Omega Research Foundation for their contribution to elements of the primary research.

The views expressed in this publication are those of the authors alone and institutional affiliations are provided for the purposes of identification only and do not imply endorsement of the content herein.

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EXECUTIVE SUMMARY

This paper highlights the development and promotion of a range of large calibre munitions and delivery systems that can be utilized for dispersing significant amounts of riot control agent (RCA) over wide areas and/or extended distances. Such “wide area” RCA means of delivery have included: large irritant sprayers; automatic grenade launchers; multiple munition launchers; rocket propelled grenades; mortar munitions; large calibre projectiles; heliborne munition dispensers; and cluster munitions. In addition, certain “wide area” RCA dispersal mechanisms have been developed or adapted for use on unmanned aerial and ground vehicles.

The paper explores the applicability of the Chemical Weapons Convention (CWC), the Biological and Toxin Weapons Convention (BWC) and United Nations Security Council resolution (UNSCR) 1540 to such delivery systems. In particular, the paper examines the lack of definitional clarity and continuing ambiguity concerning the range of “wide area” RCA means of delivery prohibited under the CWC and the BWC. In addition to the implications for effective implementation of these two Conventions, such ambiguities may also trigger a similar ambiguity with regard to the effective implementation of resolution 1540 (2004) which obliged all UN Member States to take and enforce effective measures against the proliferation of nuclear, chemical and biological weapons, their means of delivery and implement domestic control measures over related materials.

Despite evidence of the development of a range of “wide area” RCA means of delivery apparently in conflict with the CWC (and some potentially with the BWC), the international community has so far failed to effectively address this issue to date. Continuing inaction with regard to the regulation of “wide area” RCA means of delivery risks: their potential employment in armed conflict; their proliferation to, and misuse by, non-State actors; the employment of inherently inappropriate munitions in law enforcement; and the potential misuse of such devices to facilitate “large scale” human rights abuses. In addition, continued development of certain such delivery systems could undermine confidence in the existing control regimes, be seen as attempts to conceal illegal chemical or biological weapons programmes, or in fact create the material basis for future attempts to “break out” of the prohibitions of the CWC and the BWC, potentially resulting in the employment of such delivery systems for the dispersal of a range of chemical or biological warfare agents.

RECOMMENDATIONS FOR CWC STATES PARTIES

In the light of these concerns, the CWC States Parties acting through the relevant policy making organs of the Organisation for the Prohibition of Chemical Weapons (OPCW) in consultation with the Technical Secretariat should:

- develop a process for determining which means of RCA delivery are prohibited under the Convention;
- develop a regularly updated clarificatory document detailing such prohibited RCA means of delivery;
- strengthen existing RCA declaration and reporting measures, and explore the feasibility and utility of introducing appropriate monitoring and verification measures.

Furthermore, all CWC States Parties should utilise existing CWC consultation, investigation and fact-finding mechanisms where activities of potential concern come to their attention.

RECOMMENDATIONS FOR BWC STATES PARTIES

BWC States Parties should examine the implications of the development, promotion and potential employment of “wide area” RCA means of delivery for implementation of the Convention. These discussions, which should take place as part of the current inter-sessional process, should explore the potential of misuse of such “wide area” RCA means of delivery for purposes prohibited under Articles I and III of the BWC.

Furthermore, as part of the inter-sessional process review of advances in science and technology, BWC States Parties should highlight existing research and development (and likely future trajectories) of potential concern including those relating to the manufacture, adaptation or utilisation of applicable “wide area” RCA means of delivery.

1. "WIDE AREA" RIOT CONTROL AGENT MEANS OF DELIVERY: DEFINITION AND CONCERNS

The Chemical Weapons Convention (CWC) ¹ entered into force on 29th April 1997 and, at 21st January 2014, there were 190² States Parties that had ratified, acceded or succeeded to it³ - the highest number of any comparable arms control or disarmament treaty. The use of riot control agents (RCAs), such as 2-chlorobenzalmalononitrile (CS), dibenzoxazepine (CR) and 1-chloroacetophenone (CN) as a method of warfare is prohibited under the CWC. The Convention, however, permits the use of such chemicals for law enforcement including domestic riot control purposes, provided they are used in "types and quantities" consistent with such purposes.

Consequently, whilst States Parties to the CWC are prohibited from developing RCA munitions for use in armed conflict, they may manufacture, acquire and utilise delivery systems to disseminate appropriate types and quantities of RCAs for law enforcement purposes. However, there is continuing ambiguity as to the type and specifications of those means of delivery that are prohibited under the Convention. This ambiguity has potentially dangerous consequences, allowing divergent interpretations, policy and practice amongst States Parties to emerge.

Of particular concern are those large calibre munitions and delivery systems that can be utilised for delivering significant amounts of RCA over wide areas and/or over extended distances. The implications for the proliferation and misuse of "wide area" means of delivery are potentially grave and include:

(1) Employment of inherently inappropriate means of delivery in law enforcement:

Certain forms of "wide area" RCAs means of delivery are inherently inappropriate and could never legitimately be used for law enforcement due to the dangers of serious injury or fatality to the targets and/or to uninvolved bystanders. Of particular concern are delivery mechanisms that: disperse RCAs in quantities that entail a serious risk of asphyxiating or poisoning the targets; conflict with the principle of proportionality with regard to the use of force in law enforcement; or that risk causing casualties or fatalities due to their design or physical characteristics not directly related to RCA toxicity e.g. consequences of the impact of high velocity munitions, sub-munitions, components or shrapnel.

(2) Proliferation to and misuse by non-State actors:

Although, to date, there have been few confirmed cases of the use of RCA means of delivery by non-State actors in armed conflict⁴, the current commercial availability of

¹ Organisation for the prohibition of chemical weapons (OPCW), Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention), 1993, <http://www.opcw.org/chemical-weapons-convention/articles> (accessed 21st January 2014).

² For details of States Parties see: OPCW website <http://www.opcw.org/about-opcw/member-states/> (accessed 21st January 2014).

³ An additional two Signatory States (Israel and Myanmar) have signed the CWC, thus rendering political support to the objectives and principles of the Convention and committing themselves to not undermining the Convention's objectives. Only four Non-Signatory States (Angola, DPRK, Egypt and South Sudan) have not taken relevant action on the Convention.

⁴ See for example: Cameron, G., Pate, J., McCauley, D. & DeFazio, L. 1999 WMD Terrorism Chronology: Incidents Involving Sub-National Actors and Chemical, Biological, Radiological, and

a wide range of such means of delivery raises the danger of their acquisition and employment by a range of non-State actors including opposition armed forces, unregulated private military companies and terrorist organisations.

(3) Misuse to facilitate “large scale” human rights abuses:

Whilst “limited area” RCA means of delivery, such as hand held irritant sprayers, could be misused by law enforcement officials or non-State actors for human rights abuses against individuals, the inappropriate employment of “wide area” RCA means of delivery potentially facilitates human rights abuses on a far greater scale. This could include the blanket application of RCAs against large peaceful gatherings or demonstrations resulting in *en masse* infliction of cruel, inhuman or degrading treatment or punishment. Alternatively, such means of delivery could be employed as a “force multiplier” in conjunction with firearms, leading to potential violations of the principle of proportionality in the use of force in law enforcement.

(4) Employment in armed conflict:

There is a long history⁵, dating back to the First World War, of the use of “wide area” RCA means of delivery by State military forces in large scale armed conflict.⁶ In previous conflicts “wide area” RCA means of delivery were employed to drive enemy combatants from entrenched, underground, enclosed or fortified positions; for subsequent area denial; to disable and incapacitate large numbers of combatants; or in conjunction with conventional arms as a “force multiplier”. More recently, a range of contemporary “wide area” RCA means of delivery have been promoted for use in counter-insurgency operations or urban warfare.

(5) Potential use in, or to conceal, chemical weapons programmes:

A range of “wide area” delivery mechanisms such as cluster munitions, mortar shells or large calibre projectiles that are ostensibly designated as RCA munitions could instead be filled with other toxic chemicals and employed to disperse agents such as the incapacitant BZ or “classic” chemical warfare agents. Given the limited declaration and transparency mechanisms applicable to RCA munitions under the CWC⁷, there is a danger that certain States might seek to hide illicit chemical weapons production under the guise of law enforcement programmes.

Nuclear Materials, *The Non-proliferation Review*, Summer 2000, volume 7, number 2, available from: <http://cns.miis.edu/npr/72toc.htm> (accessed 21st January 2014); Pate, J., Ackerman, G., and McCloud, K., *2000 WMD Terrorism Chronology: Incidents Involving Sub-National Actors and Chemical, Biological, Radiological, and Nuclear Materials*, April 2001, available from the website of the Monterey Institute’s Center for Non-proliferation Studies, <http://cns.miis.edu/reports/cbrn2k.htm> (accessed 21st January 2014).

⁵ See for example: Stockholm International Peace Research Institute/Perry Robinson, J. and Leitenberg, M., *The problem of chemical and biological warfare, Volume 1: The rise of CB weapons*, Stockholm, Sweden, 1971

⁶ Under the Chemical Weapons Convention, the use in armed conflict of the toxic properties of any chemical is prohibited, as is their development, production, acquisition, stockpiling, retention or transfer when intended for such purposes. See: OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article I and Article II(1).

⁷ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article III.1 (e).

2. LESSONS FROM HISTORY: DEVELOPMENT AND USE OF RCA MEANS OF DELIVERY IN ARMED CONFLICT

Prior to the CWC coming into force in 1997, certain States including Iraq, South Africa, the United States, the USSR and Yugoslavia undertook research and development of a range of large calibre munitions or other means of delivering RCAs over long distances and/or wide areas.⁸ A number of such large calibre RCA munitions and “wide area” means of RCA delivery were reportedly utilised in armed conflicts, most notably by the U.S. in the Vietnam War, and by Iraq in its conflict with Iran.

2.1 UNITED STATES AND TACTICAL CS MUNITIONS

During the 1960s, the U.S. developed and/or held a range of Tactical CS (TAC CS) munitions which included devices dispersing significant quantities of RCAs over wide areas and/or extended ranges; and Riot Control CS munitions normally dispersing smaller quantities over shorter distances or narrower areas. TAC CS munitions developed by the U.S. reportedly included: M54 grenades, M651 40mm cartridges, 66mm shoulder-fired rockets, M8 16 tube 35mm cartridge launchers, M4 and M5 bulk (helicopter) agent dispersers, XM99 2.75 inch folding-fin aircraft rockets, M630 4.2 inch mortar cartridges, XM629 105mm howitzer cartridges, XM-631 155mm projectiles, XM15 50lb cluster canisters, CBU-30/A 500lb dispenser munition systems, CBU-19/A, BLU-52A/B 750lb bombs, XM28 1000lb dispensers and bagged agent.⁹

The United States reportedly employed a variety of RCA munitions and means of delivery in its conflict with Vietnam¹⁰. In its 1971 report, SIPRI stated:

“Almost every type of weapons delivery system in Viet-Nam had a CS capability, so that CS could swiftly be spread over almost any size of target area, at any range and, if necessary, in close coordination with other forms of firepower.”¹¹

In their 2003 analysis, Meselson and Perry Robinson reported that:

“25 different types of weapon disseminating the irritant agent CS, including heavy munitions ranging up to 155mm artillery shell and 750-pound aircraft bombs, were

⁸ See for example: Stockholm International Peace Research Institute/Perry Robinson, J. and Leitenberg, M., *The problem of chemical and biological warfare, Volume I: The rise of CB weapons*, Stockholm, Sweden, 1971; Stockholm International Peace Research Institute/Perry Robinson, J., Hedén, C. and von Schreeb, H. *The Problem of Chemical and Biological Warfare Volume II, The problem of chemical and biological warfare, CB Weapons Today*, Stockholm, Sweden: SIPRI, 1973; Pearson, A., Chevrier, M. and Wheelis, M. (eds), *Incapacitating Biochemical Weapons*, Lanham, United States: Lexington Books, 2007.

⁹ Stockholm International Peace Research Institute/Perry Robinson, J. and Leitenberg, M. (1971) *op.cit.*, pp.192-193; Howard, P.L. Operational Aspects of Agent CS, USATECOM Desert Test Center technical report DTC-FR-S700M, April 1973 [columns 1,2,3 and 5]. As cited in Perry Robinson, J. *Disabling Chemical Weapons, A Documented Chronology of Events, 1945-2011*, Harvard Sussex Program, DRAFT of 20th November 2012 (copy provided by the author).

¹⁰ Stockholm International Peace Research Institute/Perry Robinson, J. and Leitenberg, M. (1971) *op.cit.*; Meselson, M. and Perry Robinson, J. 'Non Lethal' weapons and implementation of the Chemical and Biological Weapons Conventions, 20th Pugwash Workshop Study Group on the implementation of the CBW Conventions, Geneva, Switzerland, 8th-9th November 2003.

¹¹ Stockholm International Peace Research Institute/Perry Robinson, J. and Leitenberg, M. (1971) *op.cit.*, p.190.

used in Viet Nam. Ultimately more than 15 million pounds of CS were dispensed in these munitions."¹²

2.2 IRAQ AND WEAPONISED RCAs

During the 1980s, Iraq developed a range of chemical weapons that it subsequently employed in its conflict with Iran, this included weaponised RCAs. In its *Compendium* of documents detailing Iraq's chemical weapons programme¹³, the United Nations Monitoring and Verification Committee (UNMOVIC) stated that *"Despite the classification of CS as riot control agent it was widely used by Iraq for military purposes."*¹⁴

Describing Iraq's CS programme, UNMOVIC reported that:

*"The second phase (after 1981 until the end of Gulf War) included the production of CS, its use in combination with other agents and filling CS into munitions such as mortal[sic] shells, rocket warheads and aerial bombs. The use in bombs and mortars suggests that Iraq considered CS as a chemical warfare agent. Given its ability to hinder unprotected personnel for short periods of time (several minutes) when exposed to the requisite concentration, CS according to Iraq's declarations was used in conjunction with other chemical agents and conventional ammunition to cause confusion among enemy ground troops during [the] Iran-Iraq war."*¹⁵

With regard to the range of RCA means of delivery developed by Iraq, UNMOVIC stated that *"From 1984 until 1985, an unknown number of "RPG-7" [rocket propelled] grenades, and over 1,000, 82mm, and 20,000 120mm mortars were filled with CS."*¹⁶ In addition, a *"few hundred"* BR-250 and AALD-250 bombs which had a capacity of 60 litres of agent, and a *"few hundred"* BR-500 and AALD-500 bombs which had a capacity of 120 litres of agent, *"were filled with CS"*.¹⁷

One of the clear lessons UNMOVIC highlighted in its report analysing its activities in Iraq, was *"do not downplay riot agents"*¹⁸. The report explained that because of the nature of CS¹⁹, its widespread use as a riot control agent and the uncertainty as to whether it could be considered as a chemical weapons agent and therefore part of Iraq's weapons of mass

¹² Meselson, M. and Perry Robinson, J. (2003) *op.cit.*

¹³ United Nations Monitoring and Verification Committee [UNMOVIC], *Compendium, The Chemical Weapons Programme*, undated, www.un.org/depts/unmovic/new/pages/compendium.asp (accessed 21st January 2014).

¹⁴ United Nations, UNMOVIC, *Compendium, Observations And Lessons Learned*, (undated) *op.cit.*, p.1110.

¹⁵ United Nations, UNMOVIC, *Compendium, The Chemical Weapons Programme*, (undated) *op.cit.*, p.95.

¹⁶ United Nations, UNMOVIC, *Compendium, The Chemical Weapons Programme*, (undated) *op.cit.*, p.176.

¹⁷ United Nations, UNMOVIC, *Compendium, The Chemical Weapons Programme*, (undated) *op.cit.*, p.158.

¹⁸ United Nations, UNMOVIC, *Compendium, Observations And Lessons Learned*, (undated) *op.cit.*, p.1110.

¹⁹ The report described CS as a *"commonly used, non-lethal, riot control agent that is intended to temporarily disorient and subdue"*. United Nations, UNMOVIC, *Compendium, Observations And Lessons Learned*, (undated) *op.cit.*, p.1109.

destruction programme, “Iraq’s CS was not given sufficient attention by U.N. verification and monitoring activities in the period 1991 to 2003.”²⁰

3. CONTEMPORARY DEVELOPMENT OF “WIDE AREA” RCA MEANS OF DELIVERY

Research undertaken by the Bradford Non-Lethal Weapons Research Project (BNLWRP) and Omega Research Foundation (ORF)²¹ has detailed the development, testing, production, possession or promotion by State or commercial entities in 15 countries of some 40 “wide area” RCA means of delivery since the coming into force of the Chemical Weapons Convention (CWC) in 1997. These “wide area” RCA means of delivery have included: large irritant sprayers; automatic grenade launchers; multiple munition launchers; rocket propelled grenades; mortar munitions; large calibre projectiles; heliborne munition dispensers; and cluster bombs. In addition, certain “wide area” RCA dispersal mechanisms have been developed or adapted for use on unmanned aerial and ground vehicles. The following case studies, adapted from the report, illustrate some of the types of delivery systems of potential concern.²²

3.1 UNITED STATES: AFTERBURNER 2000 MULTI MISSION AEROSOL DELIVERY SYSTEM

Marketing material produced by U.S. manufacturer MSI Delivery Systems Inc, has described the Afterburner 2000 (AB2K) as a

*“robust multi-mission, multi-purpose smoke generator capable of rapidly blanketing large areas with dense smoke. The smoke solution can be mixed with specific chemicals to upgrade the mission requirements...”*²³

Company information detailing mission specific formulations stated that the Afterburner 2000 is capable of “dispensing many less-than-lethal formulations in a high density aerosol form”. This included:

“Standard non-toxic training smoke mixed with irritants such as OC, CS, or Pepper upgrades the capabilities to include: Crowd Control and Civil Unrest, SWAT Teams and Tactical Incursions, Corrections Dept. (Riots / Prisoner Extraction), Less-lethal Terrorist Suppression, Urban Warfare (MOUT / COIN) ...”²⁴ [Emphasis added].

²⁰ United Nations, UNMOVIC, *Compendium, Observations And Lessons Learned*, (undated) *op.cit.*, p.1109.

²¹ Crowley, M. Drawing the line: Regulation of “wide area” riot control agent delivery mechanisms under the Chemical Weapons Convention, Bradford Non-Lethal Weapons Project & Omega Research Foundation, April 2013
<http://www.omegaresearchfoundation.org/assets/downloads/publications/BNLWRP%20ORF%20RCA%20Munitions%20Report%20April%202013.pdf> (accessed 21st January 2014).

²² It should be noted that in the case of the Turkish 120mm RCA mortar projectile documented in Section 3.4, all existing munitions have reportedly been destroyed.

²³ MSI Delivery Systems, Inc, The AB2K, Multi-Mission Aerosol Delivery System, <http://www.msi-deliverysystems.com/Products/page9/page9.html> (accessed 21st January 2014).

²⁴ MSI Delivery Systems, Inc., MSI Delivery Systems, Inc, Mission Specs, <http://ab2kmmads.com/mission-specs> (accessed 21st January 2014). The company further stated that it “only provides the non-toxic training smoke. Additives for “Irritants” are provided by the customer through their local suppliers.” MSI Delivery Systems, Inc, Mission Specs (undated) *op.cit.*

According to the company, a one second trigger burst of the Afterburner 2000 can release over 1,500 cubic feet of smoke with a range greater than 100 feet (30 meters).²⁵ The marketing material stated that

*“[the]standalone version of the Afterburner 2000™ expels 50,000 cubic feet (1,416 cubic meters) of smoke on a single charge. The dependent version with high-capacity backpack expels 320,000 cubic feet (9,061 cubic meters) of smoke on a single charger.”*²⁶

According to the manufacturer’s website, the Afterburner 2000 can:

*“[be]mounted on walls, buildings and fixed on stationary structures on vehicles including small craft, military style boats, US military, law enforcement and Homeland Security vehicles, Humvees, riot control and other armor piercing vehicles.”*²⁷

In addition, the manufacturer has stated that the Afterburner 2000 can also be “*incorporated onto unmanned ground vehicles and aircraft, drones for deployment dependent upon size*” and that the Afterburner 2000 “*has been tested for compatibility with military small craft boats.*”²⁸ A variation of the Afterburner 2000 called the AB2K-Robot Smoke Generator (AB2K-RSG) has also been:

*“specifically designed by request for use with the Andros™ F6B Robot by Remotec a subsidiary of Northrop Grumman. The unit can be operated remotely from up to 4 miles distance. The unit is also tested and compatible with Black-I Robotics products.”*²⁹

Although there is no information publicly available concerning which (if any) law enforcement and military entities in the U.S. or elsewhere have purchased this product, the manufacturer has stated that “*MSI Delivery Systems Inc...has commenced volume production and sales*”³⁰

3.2 SERBIA: 60MM, 81/82MM AND 120MM CARGO MORTAR MUNITION

According to Yugoimport-SDPR’s promotional materials, the Serbian company developed a range of “*Second generation mortar shells...using modern technical and technological solutions*” which included a number of mortar munitions containing riot control agents.³¹ A marketing brochure produced by the company and distributed during 2005 (entitled *Mortars and Mortar Shells*)³² included information on 60mm, 81/82mm and 120mm M93 cargo mortar shell families.

²⁵ MSI Delivery Systems.Inc, The AB2K, Multi-Mission Aerosol Delivery System, <http://www.msi-deliverysystems.com/Products/page9/page9.html> (accessed 21st January 2014).

²⁶ *Ibid.*

²⁷ MSI Delivery Systems.Inc, AB2K Capabilities, <http://ab2kmmads.com/ab2k-mmads-variants> (accessed 21st January 2014)

²⁸ *Ibid*

²⁹ *Ibid.*

³⁰ MSI Delivery Systems.Inc, Afterburner 2000 press release, 10th January 2010, <http://www.msi-deliverysystems.com/Products/Downloads/files/Press%20Release%20Intro.pdf> (accessed 21st January 2014).

³¹ Yugoimport-SDPR, *Mortars and Mortar Shells*, undated catalogue, distributed at Latin America Aero and Defence (LAAD) 2005, 26th – 29th April 2005, Rio de Janeiro, Brazil, p.8.

³² Yugoimport-SDPR, *Mortars and Mortar Shells* (undated) *op.cit.*

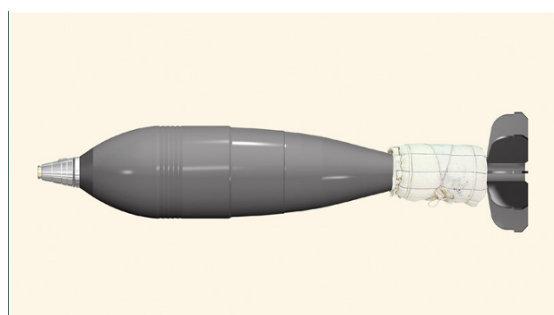
According to the Yugoimport-SDPR brochure, each M93 cargo mortar shell family:

**“...consists of one standard cargo shell and three types of submunition:
HC-smoke composition-based submunition,
CS-composition – disabling effect submunition,
Incendiary effect submunition.”**³³ [Emphasis added].

No information is publicly available regarding the amount or concentration of the CS-composition held in each munition. Similarly, no details are available regarding the weight, area coverage or maximum range of these munitions; nor concerning their manufacture, stockpiling, transfer or utilisation.

3.3 RUSSIAN FEDERATION: 120MM MORTAR PROJECTILE

According to the 2009 English language version of the 2006 “*Ordnance and munitions*” volume of “*Russia’s Arms and Technologies*, a Russian company developed a 120-mm mortar shell filled with irritant-action pyrotechnic composition for Model 1938 and 2B11 mortars, and for 2S9, 2S23 and 2B16 artillery pieces (shown in the images below). The mortar shell weighs 16 kilograms and has a maximum range of fire of 5.2 kilometres (from 1938 model mortar), 6.8 kilometres (from 2b11 mortar) and 6.6 kilometres (from 2B16, 2S9 and 2S23 guns).³⁴ No further information concerning the manufacture, stockpiles, transfer or utilisation of the 120 mm mortar projectile has been made publicly available.



Images of 120mm chemical irritant mortar shell (top left), 120mm self-propelled gun (bottom left) and 120mm mortar (bottom right). All images from, and used with the permission of www.arsenalrus.com



³³ Yugoimport-SDPR, *Mortars and Mortar Shells* (undated) *op.cit.*, pp.9-11.

³⁴ Non-lethal munitions section, Volume 12 “*Ordnance and Munitions*” (English language version), “*Russia’s Arms and Technologies. The XXI Century Encyclopedia*”, version 2006.1eng, Arms and Technologies Publishing House, 5th May 2009.

3.4 TURKEY: 120MM MORTAR PROJECTILE

In November 2003, *Jane's Defence Weekly* reported that the Turkish (State-owned) arms manufacturer, Makina ve Kimya Endustrisi Kurumu (MKEK) had developed a 120 mm mortar round - the CS MKE MOD 251 - filled with CS (shown in the image on the next page).³⁵ The CS MKE MOD 251 mortar round weighed 17.34 kg and had a maximum range of 8,132 metres.³⁶ It was promoted by MKEK on their website³⁷ and at international security exhibitions including: the 7th International Defense Industry Fair (IDEF) held in Ankara, Turkey in September 2005³⁸; and at the Africa Aerospace and Defence (AAD) exhibition held in Cape Town, South Africa in September 2010.³⁹

In correspondence with BNLWRP, ORF and the Institute for Security Studies (ISS)⁴⁰, the Turkish Government stated that 1,000 CS MKE MOD 251 munitions had been produced in 1996, prior to Turkey's ratification of the Chemical Weapons Convention, with roughly 150 used for testing purposes during the initial R&D phase in 1997. The facility for their production was subsequently discontinued after 1997. At the time of ratification, there remained 850 pieces of CS MKE MOD 251 type munitions in the inventory of the Turkish Armed Forces. Turkey stated that from that time and until 2011, none of the remaining 850 munitions were used, but were stored at the Turkish Armed Forces ammunition destruction facility awaiting disposal. In July 2011 Turkey reported that such destruction had been completed.

In correspondence, dated 29th March 2013, the Turkish Ambassador confirmed Turkey's wide-ranging actions in this area:

*"Turkey has implemented a series of measures ranging from completion of destruction of its remaining [large calibre] RCA munitions to destroying all promotional materials and conducting outreach to brokers and intermediaries to inform them that promoting or trading in such items is not permissible under Turkey's CWC obligations."*⁴¹

³⁵ Foss, C. Turkey details 120mm Automatic Mortar, *Janes Defence Weekly*, 12th November 2003.

³⁶ Turkish Defence Industry Catalogue, 2007, <http://www2.ssm.gov.tr/katalog2007/data/24509/9/uruning/uruning34.html> (accessed 30th September 2010).

³⁷ MKEK was promoting the CS 120mm mortar round till at least mid-November 2009 on its website, see <http://mkekexport.com/ammunition.htm> (accessed 16th November 2009).

³⁸ The 7th International Defense Industry Fair was held by The Turkish Armed Forces Foundation under the auspices of the Turkish Ministry of Defense at the Ankara Hippodrome between 27th - 30th September 2005. Over 400 companies from 49 countries exhibited their goods and services at IDEF, of which 108 were from Turkey.

³⁹ AAD 2010 was held at Air Force Base Ysterplaat, Cape Town, South Africa from 21st to 25th September 2010. For further information see AAD 2010 website, <http://www.aadexpo.co.za/> (accessed 28th September 2010).

⁴⁰ Correspondence from Ambassador Dogan, Permanent Representative of Turkey to the OPCW, to BNWLRP, ORF and ISS, 25th February 2011 (copy on file with the authors). Correspondence from Mr Utkan, Counsellor, Permanent Representation of Turkey to the OPCW, to BNLWRP, ORF and ISS, 8th July 2011 (copy on file with the authors).

⁴¹ Correspondence from Ambassador Dogan, Permanent Representative of Turkey to the OPCW, to BNLWRP and ORF, 29th March 2013. (Copy held by the researchers). See also: Ambassador Dogan (25th February 2011) *op.cit.*; Counsellor Utkan (8th July 2011) *op.cit.*

Images of MKEK Tactical CS 120 mm mortar round, photographed on display at AAD 2010, in Cape Town, South Africa, 21st-25th September 2010 (Photo: © Robin Ballantyne/Omega Research Foundation).



3.5 UNITED STATES: XM1063 155MM PROJECTILE

According to information previously released by the U.S. Government, General Dynamics Ordnance and Tactical Systems worked under the direction of the U.S. Army's Armament Research, Development and Engineering Center (ARDEC) to develop a 155mm artillery projectile called the XM1063.⁴² According to General Dynamics, the XM1063 (also called the Non-Lethal Personnel Suppression Projectile) was designed to carry out three interrelated functions, to: *"separate combatants from non-combatants; suppress, disperse or engage personnel [and] deny personnel access to, use of, or movement through a particular area, point or facility."*⁴³ The munition was intended to *"Address...[the] need for Non-Lethal Options that is highlighted by current conflicts in Iraq and Afghanistan...[the munition would] minimize...collateral damage, fatalities and permanent injury."*⁴⁴

The XM1063 was based upon the M864 artillery projectile⁴⁵, and was intended to have a range of at least 20 kilometres, and potentially up to 28 kilometres.⁴⁶ The multiple sub-

⁴² US Army, Picatinny Centre, Non-Lethal Artillery Structural Firing (FY04) Purchase Order Contract in Support of the FY04 155mm Non-Lethal Artillery Projectile Program, Contract Number W15QKN-04-M-0328, 14th September 2004, www.sunshine-project.org/incapacitants/jnlwdpdf/XM1063.pdf (accessed 14th February 2013). Document also available at: <http://procnet.pica.army.mil/dbi/download/GoGetContract.cfm?AwardNum=W15QKN-04-M-0328> (accessed 21st January 2014).

⁴³ McCormick, J., Presentation on 155mm XM1063 Non-Lethal Personnel Suppression Projectile, General Dynamics OTS, National Defense Industrial Association, 42nd Annual Armament Systems: Gun and Missile Systems Conference and Exhibition, 23rd-26th April 2007, Charlotte, North Carolina, USA, http://www.dtic.mil/ndia/2007gun_missile/GMTuePM2/McCormickPresentation.pdf, (accessed 21st January 2014), p.4.

⁴⁴ McCormick, J. (2007) *op.cit.* p.4.

⁴⁵ For information on the M864 projectile see: [Globalsecurity.org, M864 Base Burn DPICM, http://www.globalsecurity.org/military/systems/munitions/m864.htm](http://www.globalsecurity.org/military/systems/munitions/m864.htm) (accessed 21st January 2014).

munitions would be released above the target area and then fall to the ground and disperse their payloads.⁴⁷ Estimates of the area covered vary between a minimum of 5,000 square metres⁴⁸ to a reported maximum of 10,000 square metres.⁴⁹ Only limited details of the proposed payload have been made public but the available documentation described it as a “liquid payload”⁵⁰ and a “non-lethal personnel suppression agent.”⁵¹ Payload agent effectiveness was apparently tested at Army Edgewood Chemical Biological Center,⁵² indicating a chemical agent. Furthermore, a Joint Non-Lethal Weapons Directorate (JNLWD) reference book on “non-lethal” weapons, published in 2011, included a reference to a legal review conducted in 2007 of the “XM1063 Malodorant 155mm Artillery Round”,⁵³ that indicated that such malodorant agents were considered for this munition.

According to a July 2008 article in the U.K. newspaper, *The Guardian*, testing of the XM1063 was completed successfully in 2007 and it was due for low-rate production from 2009.⁵⁴ According to *The Guardian*, ARDEC stated “that the production decision is on hold awaiting further direction from the program manager.”⁵⁵ Information currently available from the General Dynamics website stated that “XM-1063 Non-Lethal Artillery has achieved TRL Level 6.1 through gun test firings as payload in 155mm M483 rounds” and was “Prepared for Milestone B decision.”⁵⁶ In his June 2012 *New Scientist* article, Hambling noted that although “the project is on hold, [it] has been developed by General Dynamics...to the stage of test firings and could be reactivated.”⁵⁷ No further information regarding the current status of the XM1063 research and development programme has been made public by the U.S. Government.

⁴⁶ McCormick, J., 155mm XM1063 Non-Lethal Personnel Suppression Projectile. Presentation to the 41st Annual Armament Systems: Guns and Missile Systems, Conference & Exhibition, National Defense Industrial Association (NDIA), Sacramento, US, 27th -30th March 2006, <http://www.dtic.mil/ndia/2006garm/tuesday/mccormick.pdf>, (accessed 21st January 2014) .p.12.

⁴⁷ McCormick, J. (2006) *op.cit.*

⁴⁸ NLOS-C Non-Lethal Personnel Suppression, US Army ARDEC brochure, 2005, as cited in Davison, N. (2007) *op.cit.*, p.34.

⁴⁹ Hambling, D., *The Guardian*, US weapons research is raising a stink, 10th July 2008, <http://www.guardian.co.uk/science/2008/jul/10/weaponstechnology.research> (accessed 21st January 2014).

⁵⁰ US Army ARDEC, Solicitation, R -- 155mm XM1063 Non-lethal Artillery Engineering Support Contract, Solicitation number: W15QKN-04-X-0819, 30th September 2004, <http://www.fbodaily.com/archive/2004/10-October/02-Oct-2004/FBO-00687159.htm> (accessed 21st January 2014).

⁵¹ McCormick, J. (2006) *op.cit.*, p.7.

⁵² US Army ARDEC (2004) Solicitation (Modification) R -155mm XM1063 Non-lethal Artillery Engineering Support Contract (Ref: W15QKN-04-X-0819). *FBO Daily*, 30th September 2004, as cited in Davison, N. (2007) *op.cit.*, p.34.

⁵³ Joint Non-Lethal Weapons Directorate, Non-Lethal Weapons (NLW) Reference Book, 30th June 2011, copy of report available at <http://publicintelligence.net/dod-non-lethal-weapons-2011/> (accessed 21st January 2014), p.viii.

⁵⁴ Hambling, D. (2008) *op.cit.*

⁵⁵ Hambling, D. (2008) *op.cit.*

⁵⁶ General Dynamics website, http://www.gd-ots.com/agent_dispersing.html (accessed 21st January 2014).

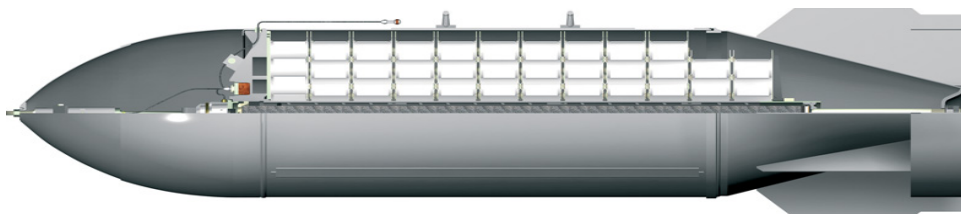
⁵⁷ Hambling, D. US military malodorant missiles kick up a stink, *New Scientist*, issue 2867, 4th June 2012, <http://www.newscientist.com/article/mg21428676.800-us-military-malodorant-missiles-kick-up-a-stink.html> (accessed 21st January 2014).

3.6 RUSSIAN FEDERATION: 500KG CLUSTER MUNITION

According to the 2009 English language version of the 2006 “*Ordnance and munitions*” volume of “*Russia’s Arms and Technologies*,”⁵⁸ a Russian company developed a 500-kilogram cluster bomb packed with sub-munitions charged with irritant-action pyrotechnic composition. The publication stated that:

*“This cluster bomb has been developed from the standard 500kg cluster bomb packed with smoke sub-munitions. It is dropped from a fixed-wing or rotary-wing aircraft in an altitude span of 100 to 12,000m at a speed of up to 1,200 km/h...The bomb permits high concentrations of an irritant agent to be attained within a short time.”*⁵⁹

No further information concerning the manufacture, stockpiles, transfer or utilisation of the cluster munition is currently publicly available.



Images of 500kg cluster munitions loaded onto fixed wing aircraft (top) and of a single cluster munition (bottom). All images from and used with permission of: www.arsenalrus.com.

⁵⁸ Arms and Technologies Publishing House (2009) *op.cit.*

⁵⁹ Arms and Technologies Publishing House (2009) *op.cit.*

4. REGULATION OF RCA MEANS OF DELIVERY UNDER THE CHEMICAL WEAPONS CONVENTION

Under Article I of the CWC:

“Each State Party to this Convention undertakes never under any circumstances:
(a) To develop, produce, otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly, chemical weapons to anyone;
(b) To use chemical weapons;
(c) To engage in any military preparations to use chemical weapons;
*(d) To assist, encourage or induce, in any way, anyone to engage in any activity prohibited to a State Party under this Convention.”*⁶⁰

Article II.1 of the CWC, defines a chemical weapon as:

*“(a) **toxic chemicals or their precursors**, except where intended for purposes not prohibited by the Convention, as long as the types and quantities are consistent with such purposes;*
*(b) **munitions and devices specifically designed to cause death or other harm through the toxic properties of those toxic chemicals specified in subparagraph (a), which would be released as a result of the employment of such munitions and devices;***
*(c) **any equipment specifically designed for use directly in connection with the employment of the munitions and devices referred to in (b).**”*⁶¹ [Emphasis added].

Amongst the “*purposes not prohibited*” defined under Article II.9 of the Convention are:

“(c) Military purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare;
*(d) Law enforcement including domestic riot control purposes.”*⁶²

In addition, the Convention specifically defines riot control agents (RCAs) as: “*Any chemical not listed in a Schedule, which can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure.*”⁶³ Whilst the Convention expressly prohibits the use of “*riot control agents as a method of warfare*”⁶⁴, States Parties are permitted to possess and employ RCAs for “*purposes not prohibited*” including “*law enforcement including domestic riot control purposes.*” However, such use would be acceptable only “*as long as the types and quantities [of toxic chemicals] are consistent with such purposes.*”⁶⁵

Certain forms of “wide area” RCA means of delivery may have utility in large scale law enforcement situations provided they meet the CWC “types and quantities” restrictions and are employed in conformity with the CWC and human rights standards; however some of these could also be readily misused in armed conflict. Such RCA means of delivery should be stringently regulated to prevent misuse.

⁶⁰ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article I.

⁶¹ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article II.1.

⁶² OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article II.9.

⁶³ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article II.7

⁶⁴ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article I.5.

⁶⁵ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article II.1.a.

Other forms of “wide area” RCA means of delivery are completely inappropriate for any form of law enforcement, having possible utility only in armed conflict or for large scale human rights violations. Such means of delivery inherently breach the CWC “types and quantities” provision and/or the prohibition on the use of RCAs as a “method of warfare”. In addition, they may potentially be retrofitted for delivery of “classic” chemical and biological weapons. They should be considered to be chemical weapons and verifiably destroyed.

“Wide area” RCA munitions have recently begun to receive some attention in the OPCW. For example in its report to States Parties in preparation for the Third CWC Review Conference, the Scientific Advisory Board (SAB) highlighted the issue and *“note[d] with concern isolated reports of the commercial availability of munitions apparently designed to deliver large amounts of riot control agents over long distances.”*⁶⁶ In addition, certain States Parties, notably Turkey, have set out their position on this issue.

However, despite the requirement under Article VII of the CWC for all States Parties to *“adopt the necessary measures to implement [their] obligations under this Convention”* and to *“not permit in any place under [their] control any activity prohibited to a State Party under this Convention”*⁶⁷, it is clear that the development and promotion of a range of “wide area” RCA means of delivery potentially in conflict with the Convention has taken place. Despite such activities none of the OPCW policy making organs (i.e. the Executive Council or the Conference of States Parties) have addressed this situation to date.

5. “WIDE AREA” RCA DELIVERY SYSTEMS: RELEVANCE TO THE BIOLOGICAL AND TOXIN WEAPONS CONVENTION

The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction - commonly known as the Biological Weapons Convention (BWC) - entered into force on 26th March 1975.⁶⁸ As of 21st January 2014, 170 States were party to the Convention⁶⁹ with a further 10

⁶⁶ OPCW, Conference of the States Parties, Report of the Scientific Advisory Board on Developments in Science and Technology for the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, RC-3/DG.1, Third Review Conference, 8th – 19th April 2013, 29th October 2012 Paragraph 56, http://www.opcw.org/index.php?eID=dam_frontend_push&docID=15865 (accessed 21st January 2014).

⁶⁷ OPCW, Chemical Weapons Convention (1993) *op.cit.*, Article VII. The importance of ensuring effective and comprehensive national implementation has been repeatedly recognised by States Parties, and reflected in the Final Documents of the First, Second and Third Review Conferences. See for example: OPCW, Third Review Conference RC-3/3, 8th – 19th April 2013, 19th April 2013, Report of the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Conference, National Implementation Measures, paragraphs 9.96 -9.103.

⁶⁸ Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (BTWC), 1972, text available at: Biological and Toxin Weapons Convention Website, <http://www.opbw.org/convention/documents/btwctext.pdf>, (accessed 21st January 2014).

⁶⁹ For details of BWC States Parties see United Nations Office at Geneva website: http://www.unog.ch/_80256ee600585943.nsf/%28httpPages%29/7be6cbb52c12571860035fd5c?OpenDocument&ExpandSection=2#_Section2 (accessed 21st January 2014).

signatory States⁷⁰. There are 16 States which have neither signed nor ratified the Convention.⁷¹

Article I which establishes the principal obligations and prohibitions of the Convention declares:

*“Each State Party to this Convention undertakes never in any circumstance to develop, produce, stockpile or otherwise acquire or retain...weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict” for “microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes”.*⁷²

Moreover, Article III of BCW states that:

*“each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire [the] ... means of delivery specified in article I of the Convention”.*⁷³

In accordance with Article IV, States Parties should take:

*“any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition or retention of the ... means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere”.*⁷⁴

The majority of commonly used riot control agents are pharmaceutical chemicals not of biological origin. They could not, therefore, be classified as *“microbial, or other biological agents, or toxins”* and consequently do not appear to fall within the scope of the BWC. However, oleoresin capsicum (OC) which is derived from the pepper plant and its relatives is clearly of biological origin and could be considered to be a toxin. It therefore does appear to be covered by the BWC (as well as the CWC). Similarly, since BWC Article I included *“toxins, whatever their origin or method of production”* a case can also be made that pelargonic acid vanillylamide (PAVA), a synthetic capsaicinoid, is also covered under the BWC (as well as the CWC). Both OC and PAVA are employed in a variety of chemical irritant sprays used widely by police and other security agencies for law enforcement activities.

Certain forms of “wide area” RCA means of delivery have been developed and promoted as being able to disseminate PAVA or OC/pepper spray; such means of delivery would appear to fall within the scope of the BWC. Such means of delivery would appear to be in breach of the Convention if they were employed for *“for hostile purposes or in armed conflict”* or were developed or held for use in such purposes. In addition, certain other “wide area” RCA means of delivery that have been developed and promoted for the dispersal of CS, CN or CR, could

⁷⁰ The ten signatory States are: Central African Republic, Côte d'Ivoire, Egypt; Haiti, Liberia, Myanmar, Nepal, Somalia, Syrian Arab Republic, and the United Republic of Tanzania.

⁷¹ Andorra, Angola, Chad, Comoros, Djibouti, Eritrea, Guinea, Israel, Kiribati, Mauritania, Micronesia (Federated States of), Namibia, Niue, Samoa, South Sudan and Tuvalu have neither signed nor ratified the Convention.

⁷² Biological and Toxin Weapons Convention (1972) *op.cit.*, Article I.

⁷³ Biological and Toxin Weapons Convention (1972) *op.cit.*, Article III.

⁷⁴ Biological and Toxin Weapons Convention (1972) *op.cit.*, Article IV.

also potentially be utilised or adapted for the dispersal of OC and PAVA, and possibly other toxins or certain biological agents, thereby bringing them within the ambit of the BWC.

The Seventh Review Conference of the BWC noted the value of national implementation measures, as appropriate, in accordance with the constitutional process of each State Party, to...

“prevent anyone from developing, producing, stockpiling, or otherwise acquiring or retaining, transporting or transferring and using under any circumstances, biological agents and toxins, equipment, or their means of delivery for non-peaceful purposes.”⁷⁵

The Review Conference consequently called upon States Parties:

“to adopt, in accordance with their constitutional processes, legislative, administrative, judicial and other measures, including penal legislation, designed to... enhance domestic implementation of the Convention and ensure the prohibition and prevention of the development, production, stockpiling, acquisition or retention of... means of delivery as specified in Article I of the Convention.”⁷⁶

In addition, the Seventh BTWC Review Conference agreed to include in the 2012-2015 inter-sessional programme a standing agenda item to review developments in the field of science and technology related to the Convention.⁷⁷ Such a review is intended to explore developments that have “*potential for uses contrary to the provisions of the Convention*”⁷⁸ as well as those that have “*potential benefits for the Convention*.”⁷⁹ The range of specific topical scientific subjects that will be considered over the five year period includes: “*advances in production, dispersal and delivery technologies of biological agents and toxins*” which will be considered in 2015.⁸⁰

However, despite the formal acknowledgement given to “*means of delivery*” considerations by BWC States Parties at the Review Conference, there has to date been no serious discussion in these fora of the current development and promotion of “wide area” RCA munitions and means of delivery, and the potential implications for implementation of the BWC.

⁷⁵ United Nations, Final Document of the Seventh BTWC Review Conference As adopted by the Conference on 22nd December 2011, <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G12/600/60/PDF/G1260060.pdf?OpenElement> (accessed 21st January 2014), Article IV, paragraph 13.g

⁷⁶ United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit*, Article IV, paragraphs 11 and 11.a.

⁷⁷ United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit*, Final Document, Article 1, paragraph 2.

⁷⁸ United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 22. (a).

⁷⁹ United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 22. (b).

⁸⁰ See United Nations, Final Document of the Seventh BTWC Review Conference (2011) *op.cit*, Decisions and recommendations, Review of developments in the field of science and technology related to the Convention, paragraph 23.

6. "WIDE AREA" RCA DELIVERY SYSTEMS: RELEVANCE TO THE UNITED NATIONS SECURITY COUNCIL RESOLUTION 1540 (UNSCR 1540)

On 28th April 2004, the United Nations Security Council unanimously adopted Resolution 1540 (2004)⁸¹ under Chapter VII of the United Nations Charter (*Action with respect to threats to peace, breaches of peace, and acts of aggression*),⁸² obliging *all* UN Member States to take and enforce effective measures against the proliferation of nuclear, chemical and biological weapons, their means of delivery and related materials.

Security Council resolution 1540 (2004) reinforces and complements existing non-proliferation regimes and through it, the Security Council called upon all States:

*"to renew and fulfil their commitment to multilateral cooperation, in particular within the framework of the International Atomic Energy Agency, the Organization for the Prohibition of Chemical Weapons and the Biological and Toxin Weapons Convention, as important means of pursuing and achieving their common objectives in the area of non-proliferation and of promoting international cooperation for peaceful purposes... [and] promote the universal adoption and full implementation, and, where necessary, strengthening of multilateral treaties to which they are parties, whose aim is to prevent the proliferation of nuclear, biological or chemical weapons".*⁸³

Affirming that the proliferation of nuclear, chemical and biological weapons and their means of delivery constitutes a threat to international peace and security, the Security Council obliged States, *inter alia*, to:

(i) *Refrain from supporting by any means non-State actors from developing, acquiring, manufacturing, possessing, transporting, transferring or using nuclear, chemical or biological weapons and their "means of delivery";*⁸⁴

(ii) *adopt and enforce appropriate effective laws prohibiting activities involving the proliferation of such weapons and their "means of delivery" to non-State actors, in particular for terrorist purposes, as well any attempts to engage in such activities, assist or finance them;*⁸⁵ and

(iii) *implement and enforce appropriate controls over "related materials" in order to account for and secure items in production, use, storage or transport; physically protect; detect, deter, prevent and combat the illicit trafficking and brokering through*

⁸¹ United Nations Security Council, Resolution 1540 (2004). Adopted by the Security Council at its 4956th Meeting, on 28th April 2004, [http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20\(2004\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20(2004)) (accessed 21st January 2014).

⁸² UNSCR 1540 (2004) was adopted by the United Nations Security Council under Chapter VII of the United Nations Charter (*Action with respect to threats to peace, breaches of peace, and acts of aggression*). As the UN Charter gives the Security Council "*primary responsibility for international peace and security*", under Article 41 of the Chapter VII of the UN Charter "*the Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions..*", while Article 42 specifies that "*should the Security Council consider that measures provided for in Article 41 would be inadequate or have proved to be inadequate, it may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such action may include demonstrations, blockade, and other operations by air, sea, or land forces of Members of the United Nations*".

⁸³ United Nations Security Council, Resolution 1540 (2004) *op.cit.*, Articles 8 (a) and (c).

⁸⁴ United Nations Security Council, Resolution 1540 (2004) *op.cit.*, Article 1.

⁸⁵ United Nations Security Council, Resolution 1540 (2004) *op.cit.*, Article 2.

*effective border controls and law enforcement efforts; control the export, transit, trans-shipment and re-export and the provision of funds and services related to such export and trans-shipment that would contribute to proliferation; penalize violations.*⁸⁶

For the purpose of resolution 1540 (2004), the Security Council defined “means of delivery” as:

*“missiles, rockets and other unmanned systems capable of delivering nuclear, chemical or biological weapons, that are specially designed for such use” and “related materials” as “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery”.*⁸⁷

From a combined reading of the definition of “means of delivery” and “related materials”, it is clear that a range of “wide area” RCA means of delivery may potentially fall under the scope of resolution 1540. Firstly, certain “wide area” RCA means of delivery may inherently breach the CWC “types and quantities” provision or the prohibition on use of RCAs as a “method of warfare”. Secondly, certain “wide area” RCA means of delivery which utilize OC or PAVA may also breach the BWC, and consequently UNSCR 1540. Finally, certain “wide area” RCA means of delivery may be utilized or adapted to disperse “classic” chemical or biological weapons thereby breaching either the CWC or BWC, as well as UNSCR 1540.

On 20th April 2011, the UN Security Council adopted UNSCR 1977⁸⁸ which substantially reinforced the mechanisms in place to facilitate and build capacity to implement UNSCR 1540. Firstly, the Security Council agreed to extend the mandate of the Committee tasked to monitor and foster implementation of the resolution, for a full ten years until 25th April 2021.⁸⁹ The Committee will be aided by a “*Group of Experts*” to assist it with more technical matters.⁹⁰ The Resolution also encouraged the Committee to form partnerships with regional and intergovernmental organizations to promote universal implementation of UNSCR 1540.⁹¹ UNSCR 1977 decided that the 1540 Committee should continue to “*intensify its efforts to promote the full implementation by all States of resolution 1540 (2004)*” through the compilation of information on the status of States’ implementation, outreach, dialogue, assistance and cooperation.⁹² The 1540 Committee has been mandated to conduct two “*comprehensive*” reviews of the status of implementation of UNSCR 1540 (2004) submitting its reports to the Security Council and that “*the first review should be held before December 2016*”.⁹³

A further important development has been the adoption, following the use of chemical weapons in Syria and the subsequent UN investigative report, by the United Nations Security

⁸⁶ United Nations Security Council, Resolution 1540 (2004) *op.cit.*, Article 3.

⁸⁷ United Nations Security Council, Resolution 1540 (2004) *op.cit.*

⁸⁸ United Nations Security Council, Resolution 1977 (2011) <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/306/79/PDF/N1130679.pdf?OpenElement> (accessed 21st January 2014).

⁸⁹ United Nations Security Council, Resolution 1977 (2011), Paragraph 2.

⁹⁰ United Nations Security Council, Resolution 1977 (2011), Paragraph 5.a.

⁹¹ United Nations Security Council, Resolution 1977 (2011), Paragraph 10.

⁹² United Nations Security Council, Resolution 1977 (2011), Paragraph 9.

⁹³ United Nations Security Council, Resolution 1977 (2011), Paragraph 3.

Council of Resolution 2118 (2013).⁹⁴ In addition to instituting mechanisms to facilitate and verify the “*expeditious destruction of Syria’s chemical weapons programme*”, the Security Council also decided that:

*“Member States shall inform immediately the Security Council of any violation of resolution 1540 (2004), including acquisition by non-State actors of chemical weapons, their means of delivery and related materials in order to take necessary measures therefore”.*⁹⁵

The potential importance of UNSCR1540 as a regulatory mechanism to combat the proliferation and misuse of “wide area” RCA means of delivery by both State and non-State actors is reinforced by its application to all UN Member States regardless of whether they are States Parties to the CWC or BWC. Furthermore, its potential utility has been further strengthened by the international community’s efforts to improve the implementation and monitoring of the Resolution. To date, however, the application of UNSCR1540 to “wide area” RCA means of delivery has not been formally raised by any UN Member State nor considered by the UN Committee 1540.

7. CONCLUSION AND RECOMMENDATIONS

Research has uncovered the development and promotion of a range of large calibre munitions and delivery systems that can be utilised for dispersing significant amounts of RCA over wide areas and/or over extended distances. Such “wide area” RCA means of delivery have included: large irritant sprayers; automatic grenade launchers; multiple munition launchers; rocket propelled grenades; mortar munitions; large calibre projectiles; heliborne munition dispensers; and cluster munitions. In addition, certain “wide area” RCA dispersal mechanisms have been developed or adapted for use on unmanned aerial and ground vehicles.

However, there is currently a lack of definitional clarity and continuing ambiguity concerning which forms of “wide area” RCA means of delivery are prohibited under the CWC and BWC. In addition to the implications for effective implementation of these two Conventions, such ambiguities have potentially dangerous consequences for the implementation of resolution 1540 (2004) obligations which are applicable to all UN Member States, thereby increasing the risk of proliferation and misuse of such “wide area” RCA means of delivery by non-State actors.

Despite evidence of the development of a range of “wide area” RCA means of delivery apparently in conflict with the CWC (and some potentially with the BWC), the international community has so far failed to effectively address this issue to date. Continuing inaction with regard to the regulation of “wide area” RCA means of delivery risks: their potential employment in armed conflict; their proliferation to, and misuse by, non-State actors; the employment of inherently inappropriate munitions in law enforcement; and the potential misuse of such devices to facilitate “large scale” human rights abuses. In addition, continued development of certain such delivery systems could undermine confidence in the existing control regimes, be seen as attempts to conceal illegal chemical or biological weapons programmes, or in fact create the material basis for future attempts to “break out” of the

⁹⁴ United Nations Security Council Resolution 2118 (2013). 27th September 2013, <http://unscr.com/en/resolutions/doc/2118> (accessed 21st January 2014).

⁹⁵ United Nations Security Council Resolution 2118 (2013) *op.cit.*, Article 14.

prohibitions of the CWC and the BWC, potentially resulting in the employment of such delivery systems for the dispersal of a range of chemical or biological warfare agents.

Recommendations for CWC States Parties

In the light of the concerns raised in this paper, we recommend that the CWC States Parties acting through the relevant policy making organs of the Organisation for the Prohibition of Chemical Weapons (OPCW) in consultation with the Technical Secretariat should:

1. Develop a process for determining which means of RCA delivery are prohibited under the Convention:

The OPCW should develop criteria and a suitable process for determining which means of RCA delivery are inappropriate for law enforcement purposes and would breach Article II.1 and/or Article I.5 of the CWC. If agreed by the Organisation, proposals for appropriate criteria and a determination mechanism could be developed by the Technical Secretariat. These proposals could then be submitted for the consideration of an appropriate forum of the OPCW, such as the Executive Council or Conference of States Parties.

2. Develop a regularly updated clarificatory document detailing such prohibited RCA means of delivery:

The OPCW should develop a clarificatory document for States Parties detailing those means of RCA delivery that are considered inherently inappropriate for law enforcement purposes and breach Article II.1 and/or Article I.5 of the CWC. All States Parties would be prohibited, under Article I.1, from developing, producing, stockpiling, marketing, transferring or using such means of delivery. Subsequently, all States Parties currently possessing such prohibited means of RCA delivery should declare such items to the Technical Secretariat as required under Article III.1 and verifiably destroy such means of delivery as required under Article I.2 of the Convention.

If agreed by the Organisation, a clarificatory document containing a proposed list of prohibited means of RCA delivery should be developed by the Technical Secretariat, potentially with the assistance of the Scientific Advisory Board (SAB). This document could then be submitted for the consideration, review and approval of an appropriate forum of the OPCW, such as the Executive Council (EC) or Conference of States Parties (CSP). The clarificatory document should be reviewed regularly in an appropriate forum such as the EC or CSP to determine whether additional items should be added in the light of developments in science and technology.

3. Strengthen existing RCA declaration and reporting measures, and explore the feasibility and utility of introducing appropriate monitoring and verification measures:

The OPCW should expand the range of information provided by States Parties in their RCA declarations in fulfilment of Article III.1(e). To facilitate this process, the Technical Secretariat should be tasked with developing recommendations for relevant information categories for consideration by States Parties at the appropriate OPCW forums i.e. Executive Council or Conference of State Parties. Such information should include details of:

- Name, structural formula and CAS number of each type of RCA and quantities held;
- Nature and quantities of the associated “wide area” RCA munitions, means of delivery and dispersal;
- Locations of, and authorities responsible for holding, stockpiles of RCAs and associated “wide area” RCA munitions, means of delivery or dispersal;

- Entities permitted to use RCAs and associated “wide area” RCA munitions, means of delivery or dispersal;
- Nature of intended use.

In line with existing obligations, States Parties should be required to provide an update of the initial declaration 30 days after any change has become effective. These expanded reporting obligations could be introduced as voluntary confidence building measures (CBMs) – similar to the CBMs utilised by States Parties to the Biological and Toxin Weapons Convention. As a means of promoting confidence and best practice in this area, all States Parties should now consider unilaterally providing the Technical Secretariat with the additional information regarding holdings of RCAs and related “wide area” means of delivery outlined above.

The OPCW should also study the potential feasibility and utility of introducing appropriate monitoring and verification measures undertaken by the Technical Secretariat to ensure that declarations submitted by States Parties concerning possession of RCAs and associated “wide area” means of delivery are full and accurate.

In addition, all CWC States Parties should utilise existing CWC consultation, investigation and fact -finding mechanisms where activities of potential concern come to their attention such as the reported development, production, marketing, transfer, stockpiling or use of prohibited RCA means of delivery or the emergence of militarily significant stockpiles of other “wide area” RCA means of delivery. If bilateral consultations with the relevant States Parties are not fruitful, concerned States Parties could consider a formal request under Article IX of the CWC.

Recommendations for BWC States Parties

In addition, we recommend that BWC States Parties should examine the implications of the development, promotion and potential employment of “wide area” RCA means of delivery for implementation of the BWC. These discussions, which should take place as part of the current inter-sessional process, should explore the potential of misuse of such “wide area” RCA means of delivery for purposes prohibited under Articles I and III of the Convention.

Furthermore, as part of the current inter-sessional process review of advances in science and technology, as well as future science and technology review processes, BWC States Parties should highlight existing research and development (and likely future trajectories) of potential concern including those relating to the manufacture, adaptation or utilisation of applicable “wide area” RCA means of delivery.