

III. Chemical arms control and disarmament

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The 1993 Chemical Weapons Convention (CWC) is the principal international legal basis for the prohibition of chemical warfare.¹ No state acceded to the convention in 2017, although South Sudan indicated that it intended to do so shortly. As of December 2017, there were 192 states parties to the convention, which is implemented by the Organisation for the Prohibition of Chemical Weapons (OPCW).²

OPCW developments

The OPCW focused much of its attention and resources on investigating continued allegations of chemical weapon (CW) use in Iraq and Syria, and confirming the completeness and correctness of Syria's declarations (see sections I and II).

Since 1 January 2017, the 2017 edition of the Harmonized Commodity Description and Coding System (HS) nomenclature has allocated a unique international code to 33 of the most traded CWC-scheduled chemicals.³ In conjunction with this development, a revised edition of the OPCW Handbook on Chemicals was issued.⁴

In January 2017 the OPCW Technical Secretariat hosted a tabletop exercise under the auspices of the United Nations Counter-Terrorism Implementation Task Force (UNCTITF) to test interagency cooperation in response to a chemical or biological weapon attack. The exercise utilized the Rapid Response Assistance Mission (RRAM), which was established in 2016.⁵

In 2017 the Technical Secretariat issued the results of a survey on the extent of employment of biomediated processes.⁶ Of the 32 states parties that responded to the survey, at least 12 maintain a policy of declaring relevant discrete organic chemicals (DOCs) produced through chemical, biochemical

¹ For a summary and other details of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention, CWC) see annex A, section I, in this volume.

² The remaining non-member states are Egypt, Israel and North Korea. Israel is a signatory.

³ OPCW, 'Opening statement by the Director-General to the Executive Council at its eighty-fourth session', EC-84/DG.26, 7 Mar. 2017, para. 49, p. 7. The HS nomenclature is established by the International Convention on the Harmonized Commodity Description and Coding System, opened for signature 14 June 1983, entered into force 1 Jan. 1988.

⁴ OPCW, *Handbook on Chemicals, 2017*, rev. 1 (OPCW: The Hague, Jan. 2017).

⁵ OPCW (note 3), para. 19, p. 3. On the responsibilities and capabilities of the RRAM see OPCW, Technical Secretariat, 'Establishment of a rapid response assistance team', S/1381/2016, 10 May 2016.

⁶ OPCW, Technical Secretariat, 'Results of the survey on biomediated processes', S/1534/2017, 14 Sep. 2017. See also OPCW, Scientific Advisory Board, 'Report of the Scientific Advisory Board's workshop on trends in chemical production', SAB-26/WP.2, 19 Oct. 2017.

or biological processes to the OPCW.⁷ China, Germany and India were among the parties with substantial chemical industries that did not participate. The survey (a) provides insight into the OPCW's routine verification procedures; (b) suggests possible implications of modifying the cost, scope and level of intrusiveness of the CWC; and (c) illustrates potential overlaps between chemical and biological arms control verification. An important component of the CWC's routine declaration and verification regime for the chemical industry is focused on chemical plants that produce 'by synthesis' certain DOCs. The parties have long considered whether the definition of such production should include biological and biologically mediated processes, mainly in order to include certain types of enzyme catalysis processes. The OPCW has adjusted DOC-selection methodologies to reduce, for example, the number of urea-production plants that receive routine inspections.⁸ It is possible that similar adjustments will be made in relation to biomediated processes. This issue remains under review within the OPCW's Industry Cluster and elsewhere. The methodology for collecting and analysing such information could be further developed and harmonized.

The OPCW Scientific Advisory Board (SAB) considered the possible integration of existing verification practices with a capability for chemical forensics and evidence management, partly through the use of unmanned aerial vehicles. Such an approach would strengthen the response to chemical emergencies, including by enhancing the organization's detection, identification and monitoring capacities.⁹ If used to support investigations of alleged use or to conduct challenge inspections, the Conference of the States Parties (CSP) and Executive Council would first have to evaluate and approve the underlying work instructions and standard operating procedures in order to ensure that the principles and procedures for CWC 'managed access' verification are observed. Finally, the Chemical Forensics International Technical Working Group (CFITWG) was established in April 2017 with a mandate to address gaps between theoretical science and practical capabilities in the performance of chemical forensics on weaponized chemicals. The work of the CFITWG will be further considered by a newly established SAB temporary working group on investigative science and technology starting in 2018.

⁷ OPCW (note 6), para. 5(a), p. 3. The 32 states were Andorra, Argentina, Australia, Austria, Bangladesh, Belarus, Brazil, Burkina Faso, Canada, Chile, Costa Rica, Croatia, Cuba, the Czech Republic, France, Greece, Iran, Ireland, Italy, Japan, the Netherlands, New Zealand, Portugal, Russia, Slovakia, Slovenia, Switzerland, Thailand, Turkey, the UK, the USA and Uzbekistan.

⁸ DOC and phosphorus, sulphur or fluorine (PSF) producing plant sites are of relevance to CWC verification due to the potential to reconfigure them at short notice for prohibited purposes. Urea is an organic compound with wide application, including for explosives. However, it poses a low risk to the object and purpose of the CWC.

⁹ OPCW, Scientific Advisory Board, 'Report of the Scientific Advisory Board's workshop on emerging technologies', SAB-26/WP.1, 21 July 2017.

The Conference of the States Parties

The CSP met on 27 November–1 December 2017. It agreed a programme of work and a budget of €67 248 655 (c. \$82 million) for 2018, of which €28 984 106 (c. \$35.5 million) is related to verification costs and €37 830 816 (c. \$46 million) to administrative and other costs.¹⁰ The remaining balance was essentially earmarked for the Fourth CWC Review Conference. The CSP elected by consensus Ambassador Fernando Arias of Spain as the fourth Director-General of the OPCW.¹¹ Arias will begin work on 25 July 2018.

There was general agreement among the parties that the treaty regime has now entered its ‘post-CW destruction phase’.

In its opening plenary statement, Russia stated that criticisms of the completeness and correctness of Syria’s declarations at the OPCW and the conclusions of the OPCW–United Nations Joint Investigative Mechanism (JIM) holding Syria responsible for CW use were politically motivated.¹² Syria reiterated its continued willingness to work with the OPCW on questions concerning the completeness and correctness of its declarations. It also underlined its commitment to the object and purpose of the CWC and called for the establishment of a zone free of weapons of mass destruction in the Middle East.¹³

The United States stated that ‘Chemical weapons use by the Syrian Arab Republic remains the most serious violation of the Chemical Weapons Convention in the Convention’s twenty year history, and the greatest modern challenge to the global norm against chemical weapons use’.¹⁴

Essentially, only the states in the Western European and Other States Group sought to hold the Syrian Government responsible for CW use in their plenary statements.¹⁵ China, India, Jordan and Pakistan, as well as the Africa Group and the Latin America and the Caribbean Group, refrained from taking a public position on Syrian Government responsibility for chemical weapon use. The reasons are not clear and somewhat speculative. Most governments are informally willing to accept that the Syrian Government is

¹⁰ OPCW, ‘Decision, programme and budget of the OPCW for 2018’, C-22/DEC.5, 30 Nov. 2017, para. 9(c), p. 3.

¹¹ Dr John Gee of Australia, the organization’s first Deputy Director-General, briefly served as an acting Director-General.

¹² Russia, [Statement by G. V. Kalamonov, Deputy Minister of Industry and Trade of the Russian Federation, Head of the Russian Delegation at the 22nd Session of the Conference of the States Parties to the Convention on the Prohibition of Chemical Weapons], [no number], 27 Nov. 2017, The Hague (in Russian).

¹³ Syrian plenary statement [simultaneous translation to English].

¹⁴ OPCW, Conference of the States Parties, ‘United States of America: Statement by Andrea Hall, Senior Director for Weapons of Mass Destruction and Counterproliferation, National Security Council Delegation of the United States of America to the Twenty-Second Session of the Conference of the States Parties’, C-22/NAT.7, 27 Nov. 2017, p. 2.

¹⁵ In addition to West European states, the group includes Australia, Canada, New Zealand, Turkey and the USA.

responsible for some CW attacks. Some governments do not wish to become entangled in a Russian–US dispute. Many governments take the view that if others reflect their position, they need not take a public stance. The intelligence and security analytical capabilities among governments are variable. Some governments do not necessarily have the capacity (or the will) to draw their own analytical conclusions and act on them.

Drawing on the efforts of Australia and Switzerland in recent years, 39 states issued a joint paper drawing attention to the potential risks posed by chemicals that affect the central nervous system (CNS) to the object and purpose of the CWC.¹⁶ These states called for a further clarification of positions on this matter among the member states. In support of this initiative, the USA stated that ‘If our first responders are at risk when they encounter illicit fentanyl, how can our unsuspecting populations be safe when fentanyl is aerosolised and used as a law enforcement tool? Despite these dangers, countries continue to pursue these chemicals. . . . CNS-acting chemicals pose to the Chemical Weapons Convention—a threat that will increase, not decrease, over time.’¹⁷

Among the side events were (a) an update on the upgrading or construction of a new OPCW Central Laboratory; (b) presentations on and discussion of CNS-acting chemicals and their relation to CWC provisions, to avoid the re-emergence of chemical warfare and misuse of ‘law enforcement’ provisions; (c) presentations on and discussion of the potential applicability of CWC provisions to sea-dumped chemical weapons and an update on environmental assessments and munitions remediation activity; (d) an introduction to the OPCW’s secure information exchange (SIX) for the digital transmission of data between the parties and the Technical Secretariat; (e) a presentation on ‘science for diplomats’ in the context of recent SAB activity and reports; (f) presentations by France on preventing the misuse of chemical facilities and chemical products; (g) an update on the activities of the OPCW Staff Council; (h) an exhibit by the delegation of Japan updating the status of operations to destroy abandoned chemical weapons (ACWs) in China; (i) an exhibit by the Gesellschaft zur Entsorgung von chemischen Kampfstoffen und Rüstungsaltslasten mbH (GEKA mbH) on the destruction of chemicals shipped to the facility from Libya in 2016; (j) presentations on

¹⁶ The states are Albania, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, Colombia, Croatia, Cyprus, the Czech Republic, Ecuador, Estonia, Finland, Germany, Greece, Ireland, Japan, Latvia, Lithuania, Luxembourg, Malta, New Zealand, Norway, the Philippines, Poland, Portugal, Romania, Senegal, Slovenia, South Korea, Spain, Switzerland, Turkey, the UK, the USA and Uruguay. OPCW, Conference of the States Parties, ‘Joint paper: Aerosolisation of central nervous system-acting chemicals for law enforcement purposes’, C-22/NAT.5, 28 Nov. 2017. See also OPCW (note 9); and OPCW, Scientific Advisory Board, ‘Response to the Director-General’s request to the Scientific Advisory Board to provide consideration on which riot control agents are subject to declaration under the Chemical Weapons Convention’, SAB-25/WP.1, 27 Mar. 2017.

¹⁷ OPCW, C-22/NAT.7 (note 14), pp. 2–3.

the long-term health effects of CW exposure, such as cohort studies of those exposed during the 1980–88 Iran–Iraq War; (k) an update on the work of the OPCW Fact-finding Mission (FFM) in Syria; and (l) a presentation on a newly published book on the history of CWs.¹⁸

Destruction of chemical weapons

As of December 2017 approximately 96 per cent of declared CW stockpiles had been destroyed. Eight parties have declared CW stockpiles since the convention's entry into force: Albania, India, Iraq, the Republic of Korea (South Korea), Libya, Russia, Syria and the USA. In 2017 the OPCW conducted six inspections of old chemical weapons (OCWs) in Belgium, France, Germany, Italy, Panama and the United Kingdom. China and Japan continued to cooperate on the destruction of World War II-era ACWs left behind by the latter. At the end of 2016 there were 10 CW destruction facilities (see table 8.2), which are distinct from the destruction facilities and technologies used for the destruction of ACWs and OCWs.

China

As of 31 October 2017, 62 416 ACWs had been declared and 48 851 destroyed.¹⁹ As of October 2017 Japan had spent approximately €1.3 billion (c. \$1.6 billion) on ACW-related activities in China.²⁰

Japan expressed its hope that the destruction of all currently identified ACWs in China would be completed by 2022.²¹ Japan intends to complete destruction operations at Haerbaling by 2022 of all ACW declared on or before 31 December 2016.²² In 2017, 81 ACW were recovered from Hunchun on 13–27 June and 62 ACW from Shangzhi on 3–16 July (see table 8.3).²³

¹⁸ Friedrish, B. et al. (eds), *One Hundred Years of Chemical Warfare: Research, Deployment, Consequences* (Springer: Cham, 2017); 'Translating ambitions: Upgrading the OPCW Chemical Laboratory to a Centre for Chemistry and Technology', Presentation slides by private contractor, The Hague; and OPCW, Technical Secretariat, 'Request from the Director-General to states parties for voluntary contributions to a new trust fund for upgrading the OPCW Chemical Laboratory to a Centre for Chemistry and Technology', S/1561/2017, 8 Dec. 2017.

¹⁹ Japan, '5. Achievements and PLAN', poster no. 5, Poster exhibit at 22nd CSP, The Hague, 27 Nov.–1 Dec. 2017.

²⁰ Japan, 'Statement by HE Mr Hiroshi Inomata, Ambassador of Japan and Permanent Representative to the OPCW at the Eighty-Sixth Session of the Executive Council of the OPCW', 10–13 Oct. 2017, The Hague, p. 3.

²¹ OPCW, Executive Council, 'Japan: Statement by H.E. Ambassador Hiroshi Inomata, Permanent Representative of Japan to the OPCW at the Eighty-Sixth Session of the Executive Council', EC-86/NAT.14, 10 Oct. 2017, p. 3.

²² Japan, '2. characteristics of ACW destruction project', poster no. 2, Poster exhibit at 22nd CSP, The Hague, 27 Nov.–1 Dec. 2017.

²³ Japan, '4. Haerbaling area', poster no. 4, Poster exhibit at 22nd CSP, The Hague, 27 Nov.–1 Dec. 2017.

Table 8.2. Chemical weapon destruction facilities in service or under construction as of 31 Dec. 2016

Facility	Location
Rabta Toxic Chemicals Destruction Facility	Libya
Gesellschaft zur Entsorgung von chemischen Kampfstoffen und Rüstungsaltslasten mbH (GEKA mbH)	Lower Saxony, Germany ^a
Kizner ^b	Udmurtia, Russia
Pueblo Chemical Agent-Destruction Pilot Plant (PCAPP)	Colorado, United States
Pueblo Chemical Agent-Destruction Pilot Plant Explosive Destruction System (PCAPP-EDS)	Colorado, United States
Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)	Kentucky, United States
Blue Grass Chemical Agent-Destruction Pilot Plant Static Detonation Chamber (BGCAPP-SDC)	Kentucky, United States
Prototype Detonation Test and Destruction Facility (PDTDF)	Maryland, United States
Aberdeen Proving Ground Chemical Transfer Facility (APG/CTF)	Maryland, United States
Recovered Chemical Weapons Destruction Facility (RCWDF)	United States

^a This facility destroys old chemical weapons, as well as chemical weapons removed from Libya.

^b Destruction operations at this facility were completed in 2017.

Source: OPCW, Technical Secretariat, 'Summary of verification activities in 2016', Note by the Director-General, S/1537/2017, 19 Sep. 2017, table 4, p. 11.

Iraq

Iraq announced that two CW bunkers at the Al Muthanna Complex in Saladin Governorate left over from the time of President Saddam Hussein had been encapsulated in concrete.²⁴

Libya

A number of the CWC parties, including European Union (EU) member states, continued to allocate funds and to provide other support to remediate 350 tonnes of sulphur mustard hydrolysate at the Ruwagha Tank Farm, south-eastern Libya.²⁵ The EU funded an environmental scoping study of the site in 2017, which was carried out by the Hotzone Solutions Group. The

²⁴ OPCW, Conference of the States Parties, 'Opening statement by the Director-General to the Conference of the States Parties at its Twenty-Second Session', C-22/DG.20, 27 Nov. 2017, para. 17, p. 3.

²⁵ OPCW, Executive Council, 'Status of the implementation of the plan for the destruction of Libya's remaining Category 2 chemical weapons outside the territory of Libya', Report by the Director-General, EC-87/DG.1, 23 Oct. 2017, para. 15, p. 3.

Table 8.3. Status of abandoned chemical weapon destruction operations in China

Site	Destruction approach	Status
Guangzhou MDF	..	Site selection under way
Haerbaling TDF	CDC and SDC	Operational since 2014; 7112 ACW destroyed as of Nov. 2017
Harbin MDF	CDC	Under construction
Nanjing MDF	CDC	Operations completed in 2012; 35 861 ACW destroyed
Shijiazhuang MDF	CDC	Operations completed in Dec. 2016; 2567 ACW destroyed
Taiyuan MDF	..	Site selection under way
Wuhan MDF	CDC	Operations completed in 2015; 264 ACW destroyed

ACW = abandoned chemical weapon; CDC = cold detonation chamber/controlled detonation chamber; MDF = mobile destruction facility; SDC = static detonation chamber; TDF = temporary destruction facility.

Source: Japan, '3. Overview: Destruction operations', poster no. 3, Poster session at 22nd CSP, The Hague, 27 Nov.–1 Dec. 2017.

destruction of chemicals shipped to GEKA in Germany from Ruwagha in 2017 was completed in January 2018.²⁶

Panama

During World War II the USA operated a CW testing facility on San José Island, off the Pacific coast of Panama.²⁷ Panama declared the possession of ACWs on its territory in 2002. However, it has since redesignated the weapons as OCWs.

In 2017 Panama declared eight OCWs, all located on the island. They comprise: six M79 1000-pound (454-kilogram) air bombs believed to have originally been filled with phosgene (CG), one M78 500-lb (227-kg) air bombs believed to have originally been filled with cyanogen chloride (CK) and one M1A1 cylinder that is rusted through and empty. Later in the year

²⁶ NDRI, '500 Tonnen Chemiewaffen in Munster Vernichtet' [500 tonnes of chemical weapons destroyed in Munster], NDR.de, 11 Jan. 2018; and German Federal Foreign Office, 'Vernichtung von restbeständen des libyschen chemiewaffenprogramms in Deutschland erfolgreich beendet' [Successful completion of the destruction in Germany of the remnants of Libya's chemical weapon programme], Press release, 5 Jan. 2018.

²⁷ Brophy, L. P. and Fisher, G. J. B., *The Chemical Warfare Service: Organizing for War*, United States in World War II, the Technical Services (US Army Center of Military History: Washington, DC, 1959, reprinted 1989), p. 106. See also Lindsay-Poland, J., *Emperors in the Jungle: The Hidden History of the US in Panama* (Duke University Press: Durham, NC, 2003); and Johnston, H., *A Bridge Not Attacked: Chemical Warfare Civilian Research during World War II* (World Scientific: London, 2003).

Panama destroyed the munitions *in situ* through explosive venting during the rainy season. The solids were rinsed with caustic solution and the rinsate collected in containers that meet international standards for disposal by a licensed off-site treatment, storage and disposal facility. The explosive components of the munitions were detonated using donor charges and the metal fragments were collected and checked for contamination, after which they were to be recycled.²⁸

Russia

Russia completed the destruction of its CW stockpile on 27 September 2017.²⁹ Russia thanked those states that had assisted it in this effort. Their combined contributions over 20 years comprised approximately 10 per cent of the total destruction cost.³⁰

The United States

As of 31 October 2017 the USA had completed the destruction of 91 per cent of its Category 1 CWs.³¹ Construction of its final chemical weapon destruction facility, at Blue Grass, Kentucky, was almost complete and it is scheduled to commence full-scale operations in 2020.³²

²⁸ OPCW, Executive Council, 'Panama: Concept plan for the destruction of eight old chemical weapons', EC-85/NAT.2, 16 June 2017.

²⁹ OPCW, 'OPCW marks completion of destruction of Russian chemical weapons stockpile', Press release, 11 Oct. 2017.

³⁰ These states were Belgium, Canada, the Czech Republic, Finland, France, Germany, Ireland, Italy, the Netherlands, New Zealand, Norway, Poland, Switzerland, Sweden, the UK and the USA. On Russian CW destruction assistance see Hart, J., 'Assistance for the destruction of chemical weapons in the Russian Federation: Political and technical aspects', Paper presented at the Conference on Strengthening European Action on WMD Non-Proliferation and Disarmament: How Can Community Instruments Contribute?, 7–8 Dec. 2005, Brussels.

³¹ OPCW, C-22/DG.20 (note 24), para. 9, p. 2. Category 1 CWs are those weapons based on chemicals appearing in Schedule 1 of the CWC's Annex on Chemicals and their parts and components. For 'order of destruction' of Category 1 CW see CWC (note 1), Verification Annex, Part IV(A), paras 15–17.

³² OPCW, C-22/DG.20 (note 24), para. 9, p. 2.