

The global abolition of chemical weapons

Paul F. Walker

In November 2012 the Organisation for the Prohibition of Chemical Weapons (OPCW) will host its 17th annual Conference of the States Parties in The Hague to review recent progress in the global elimination of chemical weapons. As the international implementing agency for the Chemical Weapons Convention (CWC), the OPCW has overseen the safe and verified demilitarization of more than 50,000t of chemical agents and almost four million weapons and containers in six countries since the CWC's entry into force in April 1997.

This represents about 71% of the declared chemical weapons stockpiles—72,669t—in seven possessor countries. The great bulk, 95%, of these stockpiles resided in the United States and the Russian Federation, which had declared 28,577t and 40,000t respectively. The remaining 4,052t were declared primarily by India and the Republic of Korea, with Albania declaring 16t and Libya 24t.¹

United States

Both the Soviet Union and the United States had agreed bilaterally in the late 1980s to destroy their existing chemical weapons stockpiles, recognizing that the munitions were expensive to secure and maintain, that they were risky with occasional leakage of agent from the aging weapons, were mostly obsolete without modern launch systems, and were subject to terrorist attack and possible proliferation. The United States declared it had nine stockpiles with the largest, at Tooele, Utah, holding 44% (12,353t) of the munitions. The Soviet Union declared seven stockpiles, all holding 14–18% (5,400–7,500t) except the smallest site, Gornyy in Saratov Oblast, with 1,143t.²

The United States opened its first prototype incinerator on Johnston Atoll in 1990 and 1,202t of agent were burned there prior to CWC entry into force in April 1997. The United States had also begun construction of several follow-on incinerators in the continental United States, with the second one at Tooele, Utah, beginning operations in 1996 and destroying 232t before CWC entry into force. It also had begun construction of three more incinerators in Alabama, Oregon and Arkansas, all to open in the early 2000s.

The US Army had initially planned to construct three centralized destruction facilities, one on Johnston Atoll and two in the continental United States, and to ship chemical weapons from the other six stockpiles to these plants for destruction. The target date for finishing full destruction was 1994, well ahead of even the CWC entry into force. The US Congress,

Paul F. Walker is program director of the Green Cross Environmental Security and Sustainability Program and manages the Washington DC office for Green Cross International and its US national affiliate, Global Green USA.

upon hearing of the shipment options, became concerned over the potential risks to local communities along the shipment routes and quickly banned movement of the stockpiles off-site and across state borders, necessitating a change in plans for on-site destruction. This was the first major obstacle to a much quicker process and lower budget for the chemical weapons destruction process in the United States. After the congressional ban, the US Army agreed to construct nine incinerators, one at each stockpile, thereby precluding the need for any major shipment off-site, but increasing both schedule and budget for the programme.

The other major mistake early in the US chemical weapons destruction programme was the assumption that one major technology—incineration—would be widely accepted. The US Army had judged high-temperature incineration as the “most mature” and “most cost-effective” of all options for safely destroying dangerous chemical agents, rocket propellants, explosives, metal parts, and dunnage (everything else, including wood, fibreglass, and plastic). The National Academy of Sciences special committee on munitions demilitarization, consisting mostly of thermal engineers, supported this decision. However, this early judgment completely overlooked the fact that incineration was quickly becoming a “red flag” for public health and environmental regulators, along with the public at large, given growing questions about toxic atmospheric emissions.

Public opposition arose in the mid-1990s to the US Army plan for nine incinerators, and by the late 1990s almost every stockpile state was involved in public hearings focused on potential toxic emissions from the planned incinerators. At the same time, the US Congress passed a bill which mandated a Department of Defense programme to test and evaluate “non-baseline incineration technologies” for chemical weapons destruction. Dubbed the Assembled Chemical Weapons Assessment Program (ACWA), under auspices of the Secretary of Defense’s office rather than the Army, this effort garnered a \$40 million appropriation in its first year and began searching for destruction technologies that could be more acceptable to the states and local communities. The US Army actively opposed this effort but could not overcome the mandate of Congress and the wishes of many of the states and local citizens.³

An interesting part of the ACWA was the congressional mandate that a “National ACWA Dialogue” be established as an integral part of this process; this dialogue would meet four to six times annually and would include representatives from the US Army, from technology providers, from governors’ offices and state regulators, and local citizens including public health and environmental experts. Also indicative of this growing battle over technologies and toxic emissions was the fact that the White House under President Bill Clinton agreed to an amendment to the articles of ratification of the CWC in 1997 that required that a priority be placed on protection of public health and the environment in the chemical weapons destruction programme, and that alternative, non-incineration technologies be fully investigated for implementation.

In the end, after many contentious ACWA Dialogue meetings and site visits, and after many congressional initiatives and conditions, the US effort was implemented with incinerators at five sites (Alabama, Arkansas, Johnston Atoll, Utah and Oregon), while four stockpile sites (Colorado, Indiana, Kentucky and Maryland) decided to use chemical neutralization and varied secondary treatments for their chemical munitions.

With the establishment of ACWA in the mid-1990s, the US chemical weapons destruction programme was split in two—the Program Manager for Chemical Demilitarization (PMCD), under the US Army, managed seven sites, while ACWA, under the Secretary of Defense, managed two sites, Colorado and Kentucky. These were the two sites with weaponized agents (chemical agents in weapons systems, including explosives and propellants) that decided to use neutralization rather than incineration, while two other sites (Indiana and Maryland), which also decided on neutralization, would be managed under PMCD because their agents were stored in bulk.

One of the factors in driving the decision to use neutralization, that is, mixing the drained agent with another liquid reagent to chemically neutralize it, was the realization early in the programme that mustard agent would neutralize well with hot water. This was reportedly learned in the 1990s from French colleagues who had been using steam to treat on-site old weapons found buried and unexploded in Europe.

Seven of the nine US stockpiles have now finished their destruction programmes, totalling about 90% of the original US stockpile. The largest US stockpile, over 12,000t at Tooele, Utah, was the last to complete its mission, on 21 January 2012. Three other stockpiles completed their destruction programs in 2011—Alabama, Arkansas and Oregon. While Tooele had operated over 15 years, the other three had operated 6 to 8 years. Their average annual tonnage destroyed varied widely, from 250t to over 800t per year; this was dependent on the type of weapon and agent being burned. But the important point is that all the stockpiles were successfully destroyed without any major injuries or deaths recorded due to agent release.

The other two stockpiles in Maryland and Indiana, both neutralized rather than burned, operated 2003 to 2005 and 2005 to 2008, respectively. Destruction at the Maryland site was rushed into operation in 2003 due to public and military concerns about its vulnerability to terrorist attack after the 11 September 2001 attacks. The simple drainage and neutralization of this stockpile with hot water was a demonstration of the excellent applicability of neutralization to mustard agent. The resultant toxic mix was shipped to a private industrial waste treatment facility. This went very smoothly, likely due to public concern that any terrorist risk be dealt with quickly rather than delayed.

The neutralization of the Indiana nerve agent stockpile was more controversial. The stockpile held 1,152t of VX nerve agent which had been produced for decades on-site. A caustic neutralization process destroyed the VX but produced a liquid product. The agreement with the US Army and the local Citizens' Advisory Commission was that the second-stage treatment

process would be by super-critical water oxidation (SCWO), a high-tech, high-temperature and high-pressure treatment, on-site. However, the US Army, in an effort to save funds and to meet an interim CWC deadline for 45% stockpile destruction by 29 April 2007, decided to ship this toxic liquid in 2006 to an industrial waste incinerator in Texas. This catalyzed much local and national debate, alleging violation by the US Army of past agreements for on-site treatment and of congressional restrictions on off-site and cross-border shipments of live agent (it was alleged that miniscule amounts of live VX agent remained in the neutralized liquid). After months of legal wrangling and court injunctions, the incineration in Texas went forward.

But the United States has made very good progress over its 20-plus years of operations to date—90% of its declared chemical weapons stockpiles safely and permanently destroyed, seven of its nine stockpiles closed and undergoing remediation, and the last two sites in Colorado and Kentucky under construction. These will begin operating in the next 5 to 7 years, after thorough systemization and testing. The Colorado stockpile of 2,369t of mustard agent is most recently projected to finish in 2019, while the Kentucky stockpile of 475t of nerve and mustard agents may take until 2023. Thus the United States will be a decade or more behind the CWC legal deadline for completion of its stockpile destruction programme.⁴

Russian Federation

The Russian Federation is the largest possessor state, having declared 40,000t at seven stockpile sites. When the Russian Federation signed the CWC in 1993 (ratified in 1997), it stated to the CWC states parties that it would need financial and technical support to undertake its chemical weapons destruction programme in a safe and timely way. The United States was the first to offer support and began with an on-site inspection of the stockpile near Shchuch'ye in Kurgan Oblast. The US delegation for this 1994 visit included congressional representatives (including the author who was a congressional staffer at the time) and an Assistant Secretary of Defense, Harold Smith, who offered during the visit to build the Russian Federation an incinerator based on the Johnston Atoll and Tooele models. The Russian Federation refused the offer, declaring incineration too costly, complex and contentious, and opted instead to investigate other options for destruction.

A joint research and evaluation effort by the United States and the Russian Federation was established and over 30 technologies were evaluated. Several years later the Russian Federation agreed to pursue chemical neutralization for its stockpiles, not dissimilar to what ACWA was pursuing, and planning began for constructing a joint facility at Shchuch'ye, to be replicated later at a similar stockpile at Kizner. The United States proposed that Shchuch'ye be the first to construct because it and Kizner were the only weaponized stockpiles of small calibre weapons—artillery shells—which might be subject to theft and diversion. The Shchuch'ye stockpile was also the closest to foreign borders in Central Asia where much concern was building over possible terrorist operations in the mid-1990s.

The 1994 inspection by the United States of the Shchuch'ye stockpile had revealed several things: that the Russian stockpile was battlefield-ready with two million artillery shells and several hundred short-range missile warheads with mini-munitions inside; that both good storage inventories and stockpile security were lacking; and that the Russian Federation was ready for a joint effort with the United States to address its stockpile programme. The United States was concerned over the proliferation risk at these stockpiles, and anxious to move forward with improved perimeter security and destruction facility planning.

Although planning began in the mid-1990s, it took until 2002 for the first chemical weapons destruction facility to open, not at Shchuch'ye, but rather at Gorny in Saratov Oblast. This was a much smaller lewisite stockpile stored in drums, and Germany had agreed in the late 1990s to design and construct the neutralization facility, in partnership with the Russian Federation.

Construction would begin the following year at Shchuch'ye, but there was constant disagreement between the American and Russian partners over schedule, procurement and costs. The Russian Federation was anxious to have the facility up and running by 2005; the United States was convinced that 2008 was the earliest it could operate. Construction costs, originally estimated at almost \$800 million, escalated to \$1.5 billion (US facility costs were escalating to over \$3 billion per facility).

In the meantime, the Gorny facility finished its first-stage process in December 2005, and the larger facility constructed by Germany at Kambarka in Udmurtia began operating the same month. The next year the Russian Federation's third facility opened in Maradikovskiy in Kirov Oblast for nerve agent neutralization, and in 2008 a fourth facility in Leonidovka in the Penza Oblast.

The fifth Russian chemical weapons destruction facility to open was at Shchuch'ye in March 2009, when Russian authorities started up the first of two main destruction lines at the plant. However, the second main destruction line has yet to open, although the Russian Federation has recently said that it is likely to open by the end of 2012. The sixth Russian facility to open was at Pochep in Bryansk Oblast in November 2010, while the seventh and last at Kizner in Udmurtia is scheduled to begin operations in 2013, about four years behind its original projected opening in 2009.

To date, the Russian Federation has neutralized about 60% of its stockpile, some 24,000t, very close to the same tonnage as the United States.⁵ The Russian Federation has accomplished this in less than eight years, over 3,000t per year; the United States has taken 22 years, averaging over 1,000t per year. The major differences here have been the fact that the Russian stockpile, a third larger than the US stockpile, has not included explosives or propellant and has therefore been much safer to handle; it has held a higher percentage in bulk storage rather than individual munitions, thereby making processing much quicker; and that it has been given credit for destruction by the OPCW after its first-stage neutralization process, whereas the United States has requested credit only after a two-stage process at its neutralization sites.

India and the Republic of Korea

India and the Republic of Korea have been very secretive about their chemical weapons stockpiles, including location, weapons types, chemical agents, tonnage and destruction technologies. The Republic of Korea has even invoked its confidentiality privileges under the CWC and refused its name to be used by the OPCW when listing possessor states.⁶ The OPCW has resorted to listing all possessor states parties by name, and then adds “and another State Party”.

Estimates place about 2,000t of mustard agent in India’s stockpile, and 2,000t of binary nerve agent weapons in the Republic of Korea’s stockpile. The Republic of Korea completed its destruction programme in 2008 and India in 2009, the second and third possessor states to complete elimination of their chemical weapons stockpiles under OPCW verification. It is alleged that India used incineration, and some observers believe that the Republic of Korea did likewise. Indian officials have stated privately that they did not want any publicity given to their programme due to possible civil law suits and public opposition. Officials of the Republic of Korea refuse to talk at all about their programme, but observers speculate that the official silence may be due to the high degree of political sensitivity on the Korean peninsula, with the Democratic People’s Republic of Korea an acknowledged possessor state but non-member of the CWC. Some observers also speculate that the Republic of Korea’s binary weapons were almost identical to the most modern in the US arsenal, and sensitivity over this alliance and trade in chemical weapons was very high.

Albania

Albania joined the CWC in 1994 yet did not declare itself as a possessor state. A decade later it acknowledged that it held a relatively small stockpile (nearly 17t) of bulk mustard, lewisite, mustard–lewisite mixture, adamsite, and chloroacetophenone agents in an insecure location. Albania’s ambassador to the OPCW explained that this discovery only arose during an inventory of military assets left behind by the prior regime.⁷

With the financial help of the United States and the technical support of Germany, as well as several other states, Albania began its destruction process with a small incinerator in 2007, expecting to meet the 29 April 2007 CWC deadline for full destruction. However, the facility engineers underestimated the temperatures in the process and burned a hole in the furnace with the very first barrel of agent. It took several weeks to repair the equipment, and Albania finished operations in July, 10 weeks after the CWC deadline.

This was therefore the first case before the OPCW Executive Council where a state party and possessor state had violated the treaty. The Executive Council acknowledged the technical difficulty in the process and did not reprimand Albania for any intentional violation. Rather, the OPCW Director-General Rogelio Pflirter commended Albania for being the first state party to

complete its destruction programme, albeit with the help of several other states parties and by far the smallest stockpile declared at that time.

Libya

Libya joined the OPCW, as well as the other multilateral arms control and disarmament regimes, in 2004 and subsequently declared a chemical weapons stockpile estimated initially at 24.7t, subsequently more precisely estimated at 23.69t. It also declared 1,390t of precursor chemicals, 3,563 unfilled aerial bombs, and 3 chemical weapon production facilities.⁸

In March 2004, OPCW inspectors verified Libya's declared weapons inventory on-site and witnessed the complete destruction of its unfilled aerial bombs.⁹ Discussions soon began about how best to destroy its mustard agents and precursor chemicals, with both the United States and Italy offering their support. After a few false starts, including the construction of an incinerator by the United States but the failure to transfer it to Libya, Libya began to neutralize its mustard agents stored in bulk containers in late 2010. Unfortunately, after about 13t had been neutralized, a major part failed in February 2011, just prior to the outbreak of the civil war. OPCW inspectors on-site were pulled out of the country, and an attempt to ship a replacement part from Italy was stopped by the NATO blockade. This left some 10t of chemical agents, and over 800t of precursor chemicals, in a potentially insecure stockpile in Libya, with much concern about potential use in the conflict.

On 28 November 2011, the new Libyan government, the National Transitional Council, surprised everyone by declaring a second stockpile of chemical agents.¹⁰ The OPCW inspected this stockpile, reportedly of weaponized mustard agent, in January 2012, and demanded a full plan and schedule for destruction by April 2012. Not only did this mean that Libya would be the third possessor states (along with the United States and Russia) to miss the final CWC destruction deadline, but it would be the first state party to admit to intentionally violating its legal obligations under the treaty by retaining a secret weapons stockpile.

The OPCW stated that "[t]he new government in Tripoli, which has been recognized by the United Nations, inherits Libya's obligations as a State Party to the CWC to destroy the remaining stockpiles in their entirety under international verification by OPCW inspectors."¹¹ The secret, undeclared chemical weapons stockpile shocked many states parties who pointed to the need to strongly reprimand Libya; other OPCW members perceived this situation as the fault of the prior Libyan leader, not the transitional government, and emphasized the transparency and full cooperation that the new government was seeking to implement. Reportedly a final statement has now been crafted and mediated by the OPCW Executive Council Chairman, Ambassador Peter Goosen from South Africa, and was to be considered at the May 2012 Executive Council meeting. However, the important point will be to emphasize that no state party can harbour a secret chemical weapons stockpile or other related facility without

some degree of punishment from the OPCW and states parties responsible for effective implementation of the Convention.¹²

Iraq

In January 2009 Iraq became the 186th state to join the CWC. Iraq declared two large bunkers filled with old and unknown quantities of chemical weapons and agents. These bunkers, which reportedly stand three stories high and are the size of a football field, were sealed by United Nations inspectors in the 1990s.

OPCW experts had visited Iraq as early as 1999 when they helped close the United Nations chemical laboratory, part of the Baghdad Monitoring and Verification Center, and helped to destroy mustard agent samples.¹³ The first OPCW Director-General Jose Bustani had also discussed Iraq's accession to the CWC in the following years, but these discussions stopped in 2002.

At the 16th OPCW Conference of the States Parties in 2011, the director of the Iraq Foreign Ministry's International Organization Department quoted from the new Iraqi constitution to emphasize Iraq's commitment to disarmament: "The Iraqi Government shall respect and implement Iraq's international obligations regarding the non-proliferation, non-development, non-production, and non-use of nuclear, chemical, and biological weapons, and shall prohibit associated equipment, materiel, technologies, and delivery systems for use in the development, manufacture, production, and use of such weapons."¹⁴

But the question remains about how best to deal with a potentially costly and dangerous demilitarization effort. One solution discussed has been to further encase the two bunkers into a more permanent burial site, with environmental monitoring for soil and ground water seepage. Other observers have noted that the CWC, under the Verification Annex, prohibits dumping and burial of chemical agents.¹⁵

Iraq was not bound by the 29 April 2012 destruction deadline, and the OPCW has asked for a full plan and schedule this year for its destruction process.

Conclusions: continued focus on CW destruction

Great headway has been made globally in abolishing chemical weapons since the Chemical Weapons Convention entered into force 15 years ago. The fact that over 50,000t and millions of munitions, representing over 70% of declared stockpiles, have been safely destroyed is alone an extraordinary step forward in improving international security. Likewise, over 1,100 chemical industrial facilities have been inspected in 81 states parties, lending much more confidence as to the non-proliferation and non-diversion of dual-use chemicals.

But much remains to be done to fully achieve a world free of chemical weapons—the main goal of the CWC: some 20,000t of Category 1 chemical weapons remain to be destroyed in four states parties—the Russian Federation (16,000t), the United States (2,844t), Libya (amount unknown), and Iraq (amount unknown). We know now that this will take at least another decade, perhaps longer, so the OPCW’s and States Parties’ focus must remain on its primary goal. This needs to include strict reporting requirements, transparency, and accountability by the possessor states, as agreed to at the 16th Conference of the States Parties.¹⁶

Also related to stockpile destruction is the elimination or conversion of former chemical weapons production facilities. Of the 70 facilities declared by 13 States Parties, 43 have been destroyed and 21 have been converted to commercial purposes. However, the remaining six must be addressed in two States Parties, and all of these converted facilities must remain on the list of commercial facilities that face ongoing inspections.

A secondary goal in support of CW disarmament is related to the CWC’s number of States Parties (currently 188). As OPCW Director-General Ahmet Üzümcü stated in his report to the 16th Conference of the States Parties in November 2011, “Without universality, we face a paradoxical situation in which there is the complete elimination of chemical weapons by those that have chosen to join the Convention, without the assurance that chemical weapons have been eliminated from the world. Attaining the universality of the Convention must therefore remain a high priority.”¹⁷

As the OPCW gradually shifts from on-site inspection of chemical weapons stockpile destruction over the next decade, it will become all the more important that its industry verification and challenge inspection regimes maintain excellent capability to inspect all chemical industry facilities capable of dual-use chemical research, development and production. The inspectorate must also be capable of responding in a timely way to any request by a state party for a challenge inspection of suspicious activities in a state party.

Last, but not least, the hundreds of thousands of tons of chemical agents and weapons dumped or buried before international and national environmental, public health and arms control regimes prohibited these practices require continued attention. The CWC explicitly prohibits the dumping or burial of chemical weapons, but has sections on “old” (produced before 1925) and “abandoned” (left in foreign territory after 1 January 1925) chemical weapons. Essentially, a state party is not responsible for these weapons unless they are unearthed or raised; if so, the OPCW must then verify them and oversee their timely destruction.

The largest project under OPCW auspices is the Japanese agreement with China to unearth and destroy hundreds of thousands of abandoned Japanese chemical weapons left in China during the last century. This will be a long, expensive and dangerous process, likely to last decades. However, chemical weapons seem to emerge almost weekly throughout the globe, largely in Europe, and several states—Belgium, France, Germany, Italy and others—remain actively engaged in the verified destruction of these old weapons. The United States has

identified over 200 suspected sites nationally with buried chemical weapons and has spent almost two decades remediating a burial site, Spring Valley, in northwest Washington DC.

Over 300,000t of chemical weapons have been dumped into all oceans of the world except the Antarctic. These munitions have become a larger concern over the last two decades as some have begun washing up on shore from shallower dump sites, and many have endangered and injured fishermen in Europe, the United States and Japan. While the CWC does not directly address sea-dumped munitions, it will clearly have to discuss this growing problem and determine next steps in better understanding the public health, environmental and proliferation impacts of this legacy.¹⁸

The Chemical Weapons Convention remains the best international model to date for verified abolition of a whole class of weapons in a non-discriminatory way. Other arms control agreements such as the Nuclear Non-Proliferation Treaty have been accused of a double standard for those states with and without nuclear weapons capability, while the Biological Weapons Convention lacks staffing for full implementation and any verification regime. As the world begins to recognize that weapons of mass destruction—nuclear, chemical and biological—and some conventional munitions, such as anti-personnel landmines and cluster bombs, are inhumane, the CWC serves as a very important, essential regime for both verified abolition and non-proliferation. The world is already a much safer and secure place after 15 years of CWC implementation, and will be even more safe and secure as the treaty is fully implemented.

Notes

1. Note that these figures have varied a bit over time, sometimes due to confusion about metric versus US tons, sometimes due to more accurate measurements as stockpiles are destroyed, and sometimes due to assumptions about original stockpile size—either at CWC entry into force in 1997 or original stockpile figures from 1990.
2. The United States and Soviet Union met at Jackson Hole, Wyoming, in 1989 and signed a Memorandum of Understanding to undertake bilateral data exchanges and on-site inspections of chemical weapons stockpiles and facilities. This MoU was signed by US Secretary of State James Baker and USSR Foreign Minister Edward Shevardnadze on 23 September 1989. Interestingly, the MoU states that neither state shall have an “aggregate quantity of chemical weapons” larger than “5,000 agent tons” by the end of 2002, and shall have destroyed at least 50% by 1999; see <www.acq.osd.mil/tc/treaties/bda/text.htm>.
3. The initial proposal to Congress was for a \$60 million appropriation; US Army opposition to the ACWA legislation caused the House of Representatives to reduce this to \$20 million, but the US Senate stuck with the \$60 million request from the Clinton Administration. The House–Senate compromise was \$40 million.
4. For the most recent US Department of Defense press release on the ACWA schedule, see <www.pmacwa.army.mil/>; see also Chris Schneidmiller, “U.S. Chemical Weapons Disposal Schedule ‘No Surprise,’ Expert Says”, *Global Security Newswire*, 18 April 2012.
5. See “Russia destroys over 60 percent of chemical weapons”, *Itar-Tass*, 21 March 2012. This article, however, mistakenly alleged that the Russian Federation would complete its destruction process by 29 April 2012, five weeks after the article was published, while it also acknowledged that most facilities were still operating or under construction.

6. The Confidentiality Annex to the Chemical Weapons Convention states: "Information shall be considered confidential if it is so designated by the State Party from which the information was obtained and to which the information refers".
7. See "Albania the First Country to Destroy All of its Chemical Weapons", *Chemical Disarmament Quarterly*, November 2007, p. 9. See also Conference of the States Parties, *Request by Albania for Extensions of the Intermediate Deadlines for the Destruction of its Category I Chemical Weapons Stockpiles*, OPCW document C-9/DEC. 8, 30 November 2004.
8. See OPCW, "Libya: Facts and Figures", <www.opcw.org/the-opcw-and-libya/libya-fact-and-figures/>.
9. See OPCW, "Initial Inspection in Libya Completed", 22 March 2004, <www.opcw.org/news/article/initial-inspection-in-libya-completed>.
10. See OPCW, "OPCW Inspectors Verify Newly Declared Chemical Weapons Materials in Libya", 20 January 2012, <www.opcw.org/news/article/opcw-inspectors-verify-newly-declared-chemical-weapons-materials-in-libya/>.
11. See OPCW, "Captured Chemical Weapons in Libya were Declared to the OPCW by Former Government", 28 September 2011, <www.opcw.org/news/article/captured-chemical-weapons-in-libya-were-declared-to-the-opcw-by-former-government/>.
12. For a recent update, see Chris Schneidmiller, "Libya Moves to Resume Chemical Weapons Disposal", *Global Security Newswire*, 24 April 2012.
13. See OPCW, "OPCW Experts Mission to Iraq," 20 July 1999, <www.opcw.org/news/article/opcw-experts-mission-to-iraq-an-update/>.
14. Conference of the States Parties, *Statement by H.E. Ahmed Bamerni*, OPCW document C-16/NAT. 26, 28 November 2011, pp. 1–2.
15. Part IV(A), § C, para. 13, of the CWC Verification Annex states: "Each State Party shall determine how it shall destroy chemical weapons, except that the following processes may not be used: dumping in any body of water, land burial or open pit burning. It shall destroy chemical weapons only at specifically designated and appropriately designed and equipped facilities".
16. See sub-item 9(d), "Issues related to meeting the final extended deadline and other destruction-related issues", in Conference of the States Parties, *Report of the Sixteenth Session of the Conference of the States Parties 28 November – 2 December 2011*, OPCW document C-16/5, 2 December 2011, p. 5; and Conference of the States Parties, *Decision: Final Extended Deadline of 29 April 2012*, OPCW document C-16/DEC.11, 1 December 2011.
17. Conference of the States Parties, *Opening Statement by the Director-General to the Conference of the States Parties at its Sixteenth Session*, OPCW document C-16/DG.18, 28 November 2011, p. 4.
18. Lithuania has established an International Scientific Advisory Board on sea-dumped munitions (of which this author is a member), and the United Nations General Assembly passed a resolution in December 2010 on "Cooperative measures to assess and increase awareness of environmental effects related to waste originating from chemical munitions dumped at sea"; see A/C.2/65/L.32/Rev.1.

