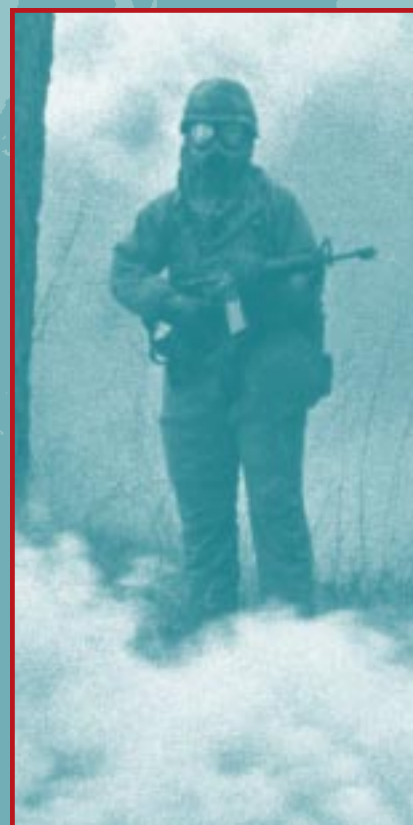


The Chemical Weapons Convention

Implementation Challenges and Solutions

JONATHAN B. TUCKER, EDITOR



MONTEREY
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OF INTERNATIONAL STUDIES

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Introduction

JONATHAN B. TUCKER

ON THE WORLD WAR I battlefield of Ypres, in Belgium, Germany launched the first large-scale use of poison gas in a surprise attack on April 22, 1915. At the predetermined moment, German troops simultaneously opened 6,000 cylinders that had been buried along the front lines, releasing 168 metric tons of chlorine gas. Heavier than air, the greenish-gray vapor settled close to the ground, forming a dense cloud five miles wide that was carried by the wind over the opposing French and Canadian trenches. As the green fog washed over them, the startled troops experienced violent nausea, asphyxiation, blindness, and agonizing pain. Within 30 minutes, the toxic gas had caused 15,000 casualties and 5,000 deaths, leading to the collapse of two entire French divisions.¹

Germany's use of chemical warfare provoked Allied retaliation in kind. As the war ground on, both sides developed new offensive agents of ever-greater potency, including phosgene and mustard gas. By the armistice, chemical warfare had inflicted over 1 million casualties, of which more than 90,000 were fatal, and many of the survivors had been blinded or scarred for life.² On several occasions, the winds had carried clouds of poison gas as far as 30 kilometers behind the front-line trenches, injuring and killing scores of noncombatants.³

The horror inspired by the indiscriminate and ghastly nature of chemical warfare inspired the international community to negotiate the Geneva Protocol of 1925, which banned the use in war of asphyxiating and poisonous gases but did not restrict their possession. Over the next decade, some 40 countries ratified the Geneva Protocol, including all of the great powers except Japan and the United States. Although the White House and the Senate Foreign Relations Committee endorsed the Geneva Protocol in 1926, the chemical industry and the U.S. Army Chemical Warfare Service lobbied against it, and the treaty never came to a vote on the Senate floor. (The United States finally ratified the Geneva Protocol in 1975.) Several other

countries joined the treaty but reserved the right to retaliate in kind if their enemies resorted to chemical warfare.

Because of the gaping loopholes in the Geneva Protocol, all of the major combatants in World War II stockpiled large quantities of chemical weapons, which fortunately remained unused. Throughout the Cold War, the sophistication of the chemical arsenals on both sides of the East-West divide continued to grow with the development of more lethal nerve agents, improved delivery systems, and finally "binary" chemical weapons, in which two relatively nontoxic components react to form a lethal agent while the bomb or shell is in flight to the target.

In view of the continuing threat of chemical warfare, in 1980 a multilateral negotiating forum in Geneva began work on a Chemical Weapons Convention (CWC) that would close the loopholes in the Geneva Protocol by banning the development, production, stockpiling, and transfer of chemical weapons, as well as their use. The talks dragged on for several years because all decisions had to be made by consensus at a time when the Soviet Union and its Warsaw Pact allies faced off against the industrial democracies of Western Europe, Australia, Japan, and North America. The other main negotiating bloc, the Group of 21 neutral and non-aligned developing countries, sparred with the industrialized West over chemical export controls.

Despite these formidable obstacles, two major events in the early 1990s helped to move the CWC negotiations into the endgame phase. The collapse of the Soviet Union dissipated East-West tensions, while Iraq's threatened use of chemical weapons during the 1991 Persian Gulf War strengthened the determination of Western nations to conclude the treaty. A chairman's text of the draft Convention incorporating numerous compromises was put forward in early 1992, and a final flurry of negotiations produced a revised version that met with general approval.

The CWC was opened for signature at a ceremony in Paris in January 1993 and, after the required 65 ratifications, entered into force on April 29, 1997. During the four years that preceded entry into force, extensive negotiations by a Preparatory Commission (PrepCom) sought to translate the many vague or ambiguous provisions in the treaty into detailed inspection procedures and formats. The PrepCom also established the administrative and financial structures of the Organization for the Prohibition of Chemical Weapons (OPCW), the new international body that would oversee CWC implementation.

Serving both as a disarmament and a nonproliferation measure, the Convention requires member-states to destroy all chemical weapons stockpiles and dedicated production facilities and to renounce their reacquisition in the future. The legal obligations enshrined in the treaty keep states under pressure to comply, even when they might be tempted to cut corners or to ignore violations by other states for reasons of political expediency. As membership in the CWC gradually approaches universality, it is expected that its prohibitions will enter into customary international law, making them binding on countries that do not ratify the treaty. When that happens, the small number of holdout states will become more isolated and vulnerable to political and economic sanctions.

The case of Iraq demonstrates that a determined proliferator may be willing to pay an extraordinarily high price to acquire prohibited weapons in defiance of global norms. As defense analyst Brad Roberts has argued, however, “norms matter in international politics—not because they constrain the choices of the most malevolent of men but because they create the basis for consensus about responses to actions inconsistent with those norms.”

Basic Elements of the CWC

As the last of three treaties banning the various categories of weapons of mass destruction, the CWC complements the 1968 nuclear Non-Proliferation Treaty (NPT) and the 1972 Biological Weapons Convention (BWC). Compared with these earlier

As membership in the CWC gradually approaches universality, it is expected that its prohibitions will enter into customary international law.

efforts, the CWC offers a number of advantages. In contrast to the NPT, which grants a small group of nuclear powers the right to possess the same weapon denied to other states, the CWC imposes equal rights and obligations on all members, whether or not they possess chemical weapons at the time of joining. Compared with the BWC, whose lack of formal monitoring provisions has made it easy prey for violators such as the

Soviet Union and Iraq, the CWC breaks new ground in the extent and intrusiveness of its verification regime.

States Parties to the Convention that possess chemical weapons must declare their stockpiles and destroy them within ten years of entry into force, with the possibility of a one-time, five-year extension in exceptional cases. Destruction is broadly defined as a process (such as high-temperature incineration or chemical neutralization) that converts chemical warfare agents and munitions irreversibly into a form in which they are no longer usable as weapons. Although the choice of destruction method is left to the discretion of each State Party, it must be approved by the treaty organization. Declared chemical weapons stockpiles and former production facilities must be secured and subject to routine inspection until they are completely destroyed, and the destruction process is monitored on a continuous basis by international inspectors.

Even after stockpiles have been destroyed, it is not a simple matter to verify that countries are not reacquiring a chemical warfare capability, as much of the equipment and materials used in chemical weapons production have commercial as well as military applications. Several key ingredients (“precursors”) for chemical weapons are used in the manufacture of legitimate products such as ballpoint pen ink, pesticides, and fire retardants. As a result, any state with a moderately advanced chemical industry is potentially capable of manufacturing chemical warfare agents such as mustard gas and sarin.

The CWC addresses this “dual-use dilemma” by focusing its basic prohibitions on purposes rather than on specific chemicals or technologies. Article I states that each State Party “undertakes never

under any circumstances to develop, produce, otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly, chemical weapons to anyone.” Article II defines chemical weapons as “toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes.” A toxic chemical is defined as “any chemical, which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals.”

The combination of these provisions and definitions, known as the General Purpose Criterion, allows the CWC to prohibit the application of all toxic chemicals for offensive military purposes while permitting their peaceful uses in commercial industry, agriculture, medical therapeutics, scientific research, and the development of defenses. Because of the inclusiveness of the General Purpose Criterion, a State Party could not legally circumvent the Convention by inventing new types of chemical weapons. The CWC also bans the acquisition and use for prohibited purposes of toxins: poisonous compounds produced by living organisms (or synthetic analogues thereof).⁴ Two toxins—ricin, a toxic protein present in castor beans, and saxitoxin, the causative agent of paralytic shellfish poisoning—are listed as examples in the Convention to ensure that all toxins are covered by the basic prohibitions in Article I.

The Treaty Organization

The Organization for the Prohibition of Chemical Weapons (OPCW), headquartered in The Hague, the Netherlands, is responsible for implementing the CWC. It consists of three bodies: the Conference of the States Parties, a policymaking organ of all CWC member-states that meets once a year and can be called into special session; the 41-country Executive Council, which oversees treaty implementation; and the Technical Secretariat, the professional staff responsible for analyzing data declarations and conducting on-site inspections. Member-states are also required to pass domestic legislation making the provisions of the treaty binding on their citizens and companies; to implement national export controls on treaty-controlled

chemicals; and to establish a “National Authority” that serves as the point of contact with the OPCW and coordinates the submission of declarations and the hosting of inspections.

Declarations

Implementation of the CWC is challenging because of the large number of facilities worldwide where chemical weapons might be manufactured covertly. Industrial plants that produce more than specified amounts of certain dual-use chemicals relevant to chemical weapons must be declared annually and opened to routine inspection. The CWC verification regime does not attempt to monitor all toxic chemicals, which would be prohibitively costly. Instead, declarations and inspections focus on the subset of treaty-relevant chemicals and activities that have been assessed to pose the greatest threat.

To this end, the CWC includes an Annex on Chemicals that groups chemical warfare agents and their most important precursors into three “schedules” based on their military potential and the extent of their legitimate civilian use. Schedule 1 comprises known chemical warfare agents (e.g., sarin, VX, mustard gas) and their immediate precursors, which have few if any legitimate applications; Schedule 2 includes toxic chemicals and precursors that are utilized in small quantities for commercial purposes; and Schedule 3 covers toxic chemicals such as phosgene and hydrogen cyanide, which were employed as weapons in World War I yet are currently produced and consumed by industry in large quantities. To prevent the verification regime from being overtaken by technological developments, the CWC has an expedited mechanism for amending the Schedules as new toxic agents and precursors are identified.

States Parties to the CWC are required to declare all chemical weapons production, storage, and destruction facilities and a subset of chemical industry plants, and to host routine inspections at these sites. The CWC determines whether a chemical industry facility is declarable on the basis of two criteria: (1) whether it produces, processes, or consumes one or more of the chemicals listed on the Schedules; and (2) whether the annual amount of “scheduled” chemicals produced, processed, or consumed exceeds specified quantitative thresholds.⁵ Chemical plants

that produce more than 200 tons per year of “un-scheduled discrete organic chemicals” must also be declared because they could potentially be converted to the production of scheduled chemicals.

Routine Inspections

To ensure that dual-capable chemical facilities and equipment are not diverted for chemical weapons production, OPCW inspection teams conduct routine inspections: periodic, pre-announced visits to declared sites, both government- and industry-owned. The purpose of these inspections is to check the accuracy of declarations and to verify the absence of illicit production of chemical warfare agents (Schedule 1 chemicals) or the diversion of dual-use industrial chemicals (Schedule 2 and 3 chemicals) for prohibited purposes. The frequency and intrusiveness of routine inspections are determined by the types of chemicals declared at each facility, with the most in-depth inspections conducted at Schedule 1 facilities and the least comprehensive at Schedule 3 facilities. Routine inspections do not assume that a facility is violating the CWC and hence are politically low profile and non-confrontational. By keeping declared facilities at risk of inspection, however, the verification regime seeks to increase the economic and political costs of non-compliance and thereby deter violations.

In some cases, compliance judgments involve an assessment of intent. For example, a large holding of phosgene would be legitimate if it were being used to produce polyurethane plastics, but it would be a violation of the CWC in the absence of such a legitimate application. Another category of permitted activity where intent can be hard to discern is the development of defenses against chemical weapons. The CWC guarantees the right of participating states to produce and retain a limited quantity of Schedule 1 chemicals (up to one metric ton) for the purpose of developing and testing gas masks, protective clothing, detectors, alarms, decontaminating solutions, and medical antidotes. Chemical defenses are considered desirable because they reduce the military utility of chemical weapons, creating a disincentive to their acquisition and use. At the same time, however, protective research could provide a cover for offensive activities. To increase transparency and build confidence in compliance, participating states are

required to submit annual reports on their chemical defense activities.

Challenge Inspections

The CWC supplements routine inspections with the right of any member-state to request the international inspectorate to conduct a “challenge” inspection of a facility, declared or undeclared, on the territory of another member-state that is suspected of violating the basic prohibitions of the treaty. Challenge inspections provide a “safety net” to detect—and thereby deter—clandestine production of chemical warfare agents.

To discourage the abuse of challenge inspections for harassment or espionage, the country issuing the challenge must provide preliminary evidence of an “unresolved concern.” The 41-member Executive Council of the OPCW must then vote by a three-quarters majority within 12 hours to block the inspection if it considers the request to be “frivolous, abusive or clearly beyond the scope of the Convention.” Some consider the requirement for a three-quarters majority to block an inspection to be tantamount to a veto-proof approval mechanism. In any event, it seems likely that all but the most blatantly frivolous challenge requests will be allowed to proceed.

A challenged facility is obligated to provide some access to the OPCW inspection team not later than 108 hours after its arrival in the host country. This timeline is designed to allow the challenged facility to protect commercial proprietary and national security information unrelated to CWC compliance, but without enabling cheaters to conduct a thorough clean-up that could remove all traces of illicit activity. Most analysts consider the timeline adequate to assess treaty compliance with a reasonable degree of confidence.

The CWC specifies additional procedures for conducting challenge inspections that are designed to protect legitimate secrets and to avoid abuse. Once the inspection team is on-site, the inspected party may invoke its right to “managed access,” a negotiating process that is designed to satisfy the inspectors’ compliance concerns while protecting legitimate national security and trade secrets. Examples of managed-access techniques include placing cloth shrouds over proprietary equipment,

turning off computers, locking up documents, specifying locations where samples may be taken, and allowing inspectors to visit rooms selected at random. Although officials from the challenged country have the right to deny access to certain sensitive areas, they must make “every reasonable effort” to satisfy the inspectors’ compliance concerns by suggesting alternative approaches, such as record audits.

Whether a challenge inspection uncovers clear-cut evidence of a violation will depend on the nature and scale of the prohibited activity, the quality of the intelligence supporting the challenge request, and the sophistication of the violator’s efforts to conceal its illicit behavior. Although it is unlikely that CWC inspectors will find a “smoking gun” such as filled chemical munitions, a challenge inspection may reveal a pattern of anomalies or discrepancies strongly indicative of a treaty violation.

The CWC also sets out detailed procedures for investigating cases of alleged use of chemical weapons. In the event of an alleged chemical attack, any CWC member-state may request an investigation by providing the inspectorate with information about the time and location of the incident, the types of chemical agent(s) employed, the extent of use, and the reported effects on humans, animals, and vegetation. The OPCW will then dispatch a team of experts to investigate at the earliest safe opportunity. Once the investigative team arrives at the site, it has the right to gain access to “any and all areas which could be affected by the alleged use of chemical weapons . . . [and] to hospitals, refugee camps and other locations it deems relevant to the effective investigation of the alleged use of chemical weapons.” Inspectors are also entitled to interview and examine persons who were allegedly affected by chemical weapons and to collect environmental and biomedical samples. On completion of the field investigation, the team must submit a final report within 30 days.

The Importance of CWC Implementation

The CWC is unique among multilateral arms control agreements in the complexity and scope of its implementation provisions. Whereas some arms control treaties simply prohibit the possession or use of certain weapons, the CWC contains a large num-

ber of affirmative obligations that are key to its effective operation. Moreover, parallel sets of obligations must be implemented synchronously at the international, governmental, and domestic levels.

At the international level, the CWC is the only treaty that mandates the creation of its own independent implementing body, the OPCW, which is responsible for overseeing every article of the Convention. In contrast, the Biological Weapons Convention lacks an implementing body, whereas the nuclear Non-Proliferation Treaty adopted an existing organization, the International Atomic Energy Agency (IAEA), whose authority covers only some of the obligations of NPT States Parties. As the first international agency devoted to eliminating an entire category of weaponry, the OPCW will set important precedents for the Comprehensive Test Ban Treaty Organization (CTBTO) and a future Organization for the Prohibition of Biological Weapons.

At the national government level, States Parties to the CWC must engage in multiple activities: setting up a National Authority to communicate with the OPCW, enacting implementing legislation and chemical export controls, preparing and submitting declarations and annual reports, hosting inspections, building destruction facilities for any stockpiled chemical weapons, and destroying or converting any former chemical weapons production facilities.

Within States Parties, the CWC is unique with respect to the depth and breadth with which it intrudes on the private sector. The active engagement of the chemical industry in the implementation of the treaty will provide an important test of the ability of the international community to control the military applications of dual-use technologies.

Overview of This Report

This collection of essays seeks to review the key elements of CWC implementation over the past four years, noting important achievements and pointing out urgent problems that need to be addressed. Alexander Kelle of the Frankfurt Peace Research Institute reports some significant accomplishments. Four states have declared stockpiles of chemical weapons (including India and South Korea, which had previously denied possessing an offensive capability) and all but Russia have begun to destroy them. At the same time, Kelle notes with concern

the failure of many States Parties to pay their annual assessments or to reimburse the organization for verification costs on their territories, resulting in a financial shortfall that threatens to cripple OPCW operations. Several states have also failed to pass the required implementing legislation or to meet a number of other treaty obligations.

Amy Sands and Jason Pate of the Monterey Institute discuss the festering suspicions that some States Parties may be violating the CWC, and urge other member-governments to find the political will to address these concerns through challenge inspections and other treaty-based measures before the unresolved allegations seriously undermine the credibility of the regime.

Amy Smithson of the Henry L. Stimson Center chronicles the transformation of the United States from the moral leader of the CWC negotiations to an international scofflaw that granted itself unilateral exemptions from key provisions of the treaty and was three years late in submitting its industry declarations. As a result, Washington has set a bad example that other countries have been only too willing to emulate.

Aleksander Pikayev of the Carnegie Moscow Center portrays the travails of Russia, possessor of the world's largest stockpile of chemical weapons, which faces formidable obstacles to destroying this deadly legacy according to the timetable specified in the CWC. He concludes that even with increased international assistance, Moscow may be unable to meet the deadlines in the treaty.

Richard Burgess, a private consultant, describes the role of the chemical industry in CWC implementation. Although the record thus far has been generally good, the decision of States Parties to rely on national discretion with respect to several aspects of industry declarations has resulted in major inconsistencies in the way the Convention is being implemented by different countries. The OPCW has also come into conflict with the United States over its interpretation of the CWC provisions with respect to inspections of industry sites.

Daniel Feakes of the University of Sussex examines the role of export controls and chemical trade in CWC implementation and the troubled relation-

The CWC is unique among multilateral arms control agreements in the complexity and scope of its implementation provisions.

ship between the treaty and the Australia Group, an informal association of like-minded countries that harmonize their national export controls on chemical weapons materials and production equipment.

George Parshall, formerly with the DuPont Company, addresses the implications of emerging scientific and technological developments for the future viability of the CWC. Finally,

Michael Moodie of the Chemical and Biological Arms Control Institute discusses the diverse array of policy issues that are likely to be addressed during the First CWC Review Conference, scheduled for May 2003. He argues that the conference will provide a valuable opportunity to revitalize the political commitments that undergird the treaty.

The contributors to this report document a number of disturbing trends, including a budgetary crisis at the OPCW that could force a severe cutback in verification activities; a reinterpretation of treaty provisions that is reducing the intrusiveness of inspections and hence their ability to build confidence in compliance; a lack of political will on the part of member-countries to confront states suspected of noncompliance by launching challenge inspections; and the refusal of a number of known and suspected chemical proliferators to join the treaty. Unless these negative trends are reversed, they could fatally undermine the ability of the CWC to achieve its goal of eliminating chemical weapons from the planet.

Another serious problem with CWC implementation has been a lack of transparency—and hence accountability—on the part of the OPCW. Not only have most State Parties classified their declarations to the Organization, but documents from the Executive Council and the Scientific Advisory Committee are unavailable to the public. As a result of this information black-out, non-governmental organizations and the international media have had great difficulty playing their customary “watchdog” role. In addition to making it difficult for outsiders to follow the actions of the OPCW, the low profile of the Organization has deprived it of a public constituency that supports what it is trying to accomplish. It is to be hoped that the States Parties to the CWC will move to increase

the transparency of the regime in the near future.

At a time when multilateral treaties are under siege on several fronts, the effective implementation of the CWC is increasingly critical to the entire enterprise of arms control and nonproliferation. Beyond the ability of the Convention to contain and reverse the spread of chemical weapons, its successful implementation will pave the way for future efforts to combat the spread of weapons of mass destruction.

NOTES

¹ For a detailed history of chemical arms control, see Jonathan B. Tucker, "From Arms Race to Abolition: The Evolving Norm Against Biological and Chemical Warfare," in Sidney D. Drell, Abraham D. Sofaer, and George D. Wilson, *The New Terror:*

Facing the Threat of Biological and Chemical Weapons (Stanford, Calif.: Hoover Institution Press, 1999), pp. 159–226.

² Organization for the Prohibition of Chemical Weapons, "A Brief History of Chemical Disarmament" [www.opcw.nl/basic/briefup.htm].

³ Charles E. Heller, "Chemical Warfare in World War I: The American Experience, 1917-1918," *Leavenworth Papers* No. 10 (Fort Leavenworth, KS: Combat Studies Institute, 1984), p. 17.

⁴ Toxins are also banned under the Biological Weapons Convention (BWC).

⁵ The quantitative declaration thresholds in the CWC are defined according to threat level: no threshold for the chemical warfare agents on Schedule 1; a threshold of 1 kilogram, 100 kilograms, or 1 metric ton for the various subcategories of chemicals on Schedule 2; and a threshold of 30 metric tons for the industrial dual-use chemicals on Schedule 3. Somewhat arbitrarily, facilities whose yearly production falls below the thresholds need not be declared. The CWC declaration requirements also cover "other" production facilities that manufacture more than 200 metric tons per year of "unscheduled discrete organic chemicals," on the grounds that such plants could be used to manufacture scheduled chemicals at some time in the future.

Overview of the First Four Years

ALEXANDER KELLE

THE FIRST FOUR YEARS since the entry into force of the Chemical Weapons Convention (CWC) have been a qualified success. The number of States Parties has grown rapidly, chemical weapons stocks have been declared and verified, the destruction of chemical weapons is under way in three of the four declared possessor states, and hundreds of inspections of chemical industry plants have taken place with relatively few difficulties. Yet where there is light, there is also shadow, and CWC implementation is no exception. A serious financial crisis caused by the failure of many States Parties to pay their assessments and to reimburse the costs of verification activities threatens to cripple the effectiveness of the CWC implementing body, the Organization for the Prohibition of Chemical Weapons (OPCW). Another negative development has been the attempt by a number of States Parties to dilute some of the key verification provisions of the treaty.

Adherence to the CWC

The past four years have seen a rapid growth in the number of States Parties to the CWC. When the Convention entered into force in April 1997, 87 states had ratified; by the end of that year, the number had increased to 105. The most important accessions after the treaty entered into force were those of the Russian Federation, the Islamic Republic of Iran, and Pakistan. Membership grew to 121 States Parties by the end of 1998, to 128 by the end of 1999, and to 143 by early 2001.

Nevertheless, several countries on the African continent, in Southeast Asia, and especially in the Middle East remain outside the purview of the Convention, and the holdouts include a number of states that are believed to possess chemical weapons.¹ During a speech to the UN General Assembly in the fall of 2000, OPCW Director-General José M. Bustani addressed the Middle East region and

expressed his hope that the government of Israel, which has signed but not ratified the CWC, would reconsider. In addition, he asked the governments of Egypt, Lebanon, Libya, and Syria to accede to the Convention. Several states in the region were critical of Bustani's statement, however. Arab representatives expressed concern that the Director-General had failed to mention the strategic imbalance in the Middle East, namely Israel's possession of nuclear weapons and its failure to join the nuclear Non-Proliferation Treaty (NPT). An Israeli representative responded that his government had to protect its citizens in a region where other countries possess chemical weapons, implicitly casting doubt on the effectiveness of the CWC.²

In Northeast Asia, North Korea remains the only non-party to the CWC. (Because Taiwan is not a member of the United Nations, it is ineligible to join.) A U.S. Department of Defense report in September 2000 estimated that North Korea possesses "up to 5,000 metric tons of several types of chemical agents, including nerve, choking, blister and blood" and "is self-sufficient in the production of chemical components for first-generation chemical agents." The Middle East and Northeast Asia are likely to remain the most difficult challenges on the road to universal adherence to the CWC.

Technical Noncompliance

A perplexing trend during the first four years of CWC implementation has been the failure of a number of member-countries to fulfill the basic reporting requirements in the treaty. Among the national implementation measures spelled out in Article VII, States Parties must establish a National Authority to "serve as the focal point for effective liaison with the Organization," and must also inform the OPCW of the legislative and administrative measures that they have taken to implement the Convention. Further, Part II of the Verification

TABLE 1: Required Notifications by States Parties to the OPCW (Cumulative)

	end 1998	EIF plus 2 years	end 1999	EIF plus 3 years	end 2000
Total number of States Parties	121	121	128	133	141
Notification of National Authority	86	n.a.	89	100	106
Notification of points of entry	64	66	73	75	n.a.
Notification of diplomatic clearance number	52	54	59	62	n.a.
Notification of implementing legislation	41	43	45	47	56

EIF = Entry into Force.

SOURCES: For 1998: *OPCW Annual Report 1998*, Annex 4; for EIF plus 2: OPCW Document C-IV/DG.10 of June 21, 1999; for 1999: *OPCW Annual Report 1999*, Annex 4; for EIF plus 3: OPCW Document C-V/DG.8, p. 1; for 2000, Pamela Mills, "Progress in The Hague: Quarterly Review No. 32," *CBW Conventions Bulletin*, no 50, December 2000, p. 13.

Annex provides that within 30 days after the entry into force of the CWC, States Parties must designate points of entry and exit for inspection teams and diplomatic clearance numbers for non-scheduled aircraft. Taken together, the four notification requirements provide the basis for effective communication and collaboration between States Parties and the OPCW. To date, however, the fulfillment of these obligations has been slow and uneven, as shown in Table 1.

Another matter of serious concern is the poor record of several States Parties with respect to payment of their annual dues. States Parties contribute to the budget of the OPCW according to their ability to pay: a modified UN scale of assessment is used to determine each country's annual share. In 1998, 61 member-states paid their dues in full, 23 paid in part, and 37 did not pay at all. The total amount of dues outstanding in late 1998 was slightly less than a quarter of the OPCW annual budget.

Beyond the financial implications, the failure of many States Parties to pay their dues violates a basic treaty obligation. According to Article VIII of the CWC, "a Member of the Organization which is in arrears in the payment of its financial contribution . . . shall have no vote in the Organization if the amount of its arrears equals or exceeds the amount

of the contribution due from it for the preceding two full years." Following this rule, as many as 21 States Parties should have lost their voting rights at the beginning of the OPCW's third year of operation in May 1999. Yet this threat did not improve the payment rate. As of April 15, 1999, only 36 of the then-121 member-states had paid their 1999 dues in full, 28 had paid in part, and 57 had not paid at all. The low payment rate created a gap in available funds amounting to 28 percent of the OPCW budget. Twenty-three States Parties were in arrears to the point that they could have theoretically lost their voting rights in the Organization.⁴

Despite the fact that the number of persistent "deadbeats" has remained at a high level, the Executive Council has not acted to strip even one of the delinquent State Parties of its voting rights. The only explanation for this inaction is that too many members of the Executive Council are themselves in "technical noncompliance" and fear that the same action could be taken against them. States Parties should consider the long-term consequences for the credibility of the CWC of the failure to apply one of the few real sanctions authorized by the treaty.

Another financial controversy, this one concerning reimbursements to the OPCW of the costs of

verification activities (as required by Articles IV and V of the CWC) has also had a serious negative impact on the Organization’s budget. According to the Convention, a State Party that possesses chemical weapons is responsible for the costs of verifying the destruction of its chemical stockpile and any former CW production facilities on its territory. Yet this principle has not prevented the United States and Russia from striving to minimize the reimbursable portion of the verification costs. The less that chemical weapons possessor-states are willing to pay for the verification of their CW storage and destruction activities, the more these costs must be borne collectively by all States Parties.

Russia sought to reduce its financial burden by agreeing to reimburse operational expenses for international verification activities on its territory, but not administrative expenses such as salaries of OPCW personnel. According to the compromise that was eventually worked out, Russia agreed to cover a pro-rated portion of inspector salaries for the period of the inspection plus several additional inspector-days for inspection planning and report writing.⁵ Yet although this matter was settled on paper, reimbursement of verification costs did not proceed as expected. Only four of the States Parties to which the provisions apply—China, France, Japan, and the United Kingdom—reimbursed the OPCW in full. Three countries—India, South Korea, and the United States—partially reimbursed the organization, and two—Iran and Russia—did not pay any verification costs at all. By the fall of 2000, the

unpaid sum had grown to roughly \$5.5 million, putting the OPCW under severe budgetary strain.⁶ Director-General Bustani has warned the Executive Council that the financial shortfall threatens to cripple the operations of the OPCW.

Chemical Weapons Issues

The United States, Russia, India, and South Korea have declared the possession of chemical weapons stockpiles.⁷ Significantly, India and South Korea came clean after years of denying a chemical warfare capability. The four countries have declared a total of 69,863 metric tons of chemical agents and nearly 8,400,000 munitions and containers, which are stored at 33 locations.⁸ Eleven States Parties have declared current or past CW production facilities: the United States, the United Kingdom, China, France, India, Iran, Japan, Russia, South Korea, Bosnia, and Yugoslavia.

Initial inspections of declared chemical weapons stocks began in June 1997 at U.S. military facilities. Systematic verification of CW-related facilities has since accounted for the largest share of inspection activities by the OPCW inspectorate, and roughly two-thirds of inspection activities have taken place at U.S. production, storage, or destruction facilities. OPCW inspectors have continually monitored the operation of the U.S. chemical weapons destruction facilities in Tooele, Utah, and on Johnston Atoll in the Pacific, where the destruction process was completed in November 2000.⁹ As of March 2001, the

TABLE 2: Numbers of Inspections at Chemical Weapons Facilities

	1997	1998	1999	2000
CW production facilities	35	60	55	51
CW storage facilities	26	31	34	31
CW destruction facilities	19	62	54	60
Total	80	153	143	142

SOURCES: The 1997 to 1999 figures are taken from the *OPCW Annual Report 1999*, p. 25; the 2000 figures are from Pamela Mills, “Progress in The Hague: Quarterly Review no. 32,” *CBW Conventions Bulletin*, no. 50, December 2000, p. 13. The cut-off date is December 8, 2000.

United States had destroyed 22 percent of its chemical weapons stockpile, putting it ahead of the timetable in the CWC. Table 2 (page 11) provides an overview of verification activities related to chemical weapons facilities.

None of the inspections of CW destruction facilities in the year 2000 took place in the Russian Federation. Because of a delay in getting the destruction process started in that country, Moscow was unable to meet the first intermediate deadline for destroying one percent of its highest-risk (Category 1) chemical weapons stocks three years after the CWC's entry into force.¹⁰ In November 1999, as permitted under the Convention, Russia asked the Executive Council to extend the intermediate destruction deadline. The Russian authorities contend that although the construction of CW destruction facilities has been impeded by economic difficulties, they plan to meet the next intermediate destruction deadline on April 29, 2002, when 20 percent of the Category 1 chemical weapons stocks are to be destroyed.¹¹ This plan appears unrealistic, however.

Declarations

According to the CWC, initial declarations of relevant industry facilities must be filed within 30 days after the entry into force of the Convention for a State Party. As of November 1998, however, 34 States Parties had not submitted their initial declarations, and a number of other countries had submitted only partial ones. The high level of technical noncompliance was particularly disturbing because the scofflaws included major chemical weapons possessors such as the United States. American officials explained that because of a delay in enacting the implementing legislation needed to collect information from private chemical companies, the U.S. industry declaration could not be submitted by the treaty deadline. In fact, the U.S. declaration was not forthcoming for another three years.

This extended delay led to a seriously imbalanced distribution of industry inspections among States Parties with large chemical industries. In 1998, the

A perplexing trend during the first four years of CWC implementation has been the failure of a number of member-countries to fulfill the basic reporting requirements in the treaty.

member-states of the European Union hosted 64 percent of the Schedule 2 inspections and 54 percent of the Schedule 3 inspections. In an effort to redress this imbalance, members of the European Union included a provision in the OPCW budget limiting the number of Schedule 2 inspections in 1999 that could be conducted at industrial sites that had already received an initial inspection.¹² When the U.S. initial industry declaration was not forthcoming prior to the next (fourth) session of the Conference of the

States Parties in June-July 1999, the EU states again sought to limit the number of industry inspections on their territories. Thus, the U.S. delay in submitting its industry declaration had a seriously disruptive effect on the monitoring regime.

Another problem complicating routine inspections is the fact that a number of important issues related to industry declarations have remained unresolved. To give but one example, the issue of how to declare low concentrations of Schedule 2 and Schedule 3 chemicals contained in mixtures was not clarified during the CWC negotiations in Geneva or the four years of the Preparatory Commission, and required the attention of a "facilitator" for the first three years of CWC implementation before a partial solution was finally worked out. According to the decision approved by the Conference of the States Parties, mixtures of chemicals containing more than 30 percent of a Schedule 2B or Schedule 3 chemical must be declared.¹³

The OPCW will begin implementing the new declaration threshold on January 1, 2002. This long delay before the decision takes effect is needed so that the U.S. government can amend its national implementing legislation, which currently requires domestic companies to declare production facilities only if they produce scheduled chemicals in a concentration exceeding 80 percent. No agreement has yet been reached on declaration thresholds for mixtures containing low concentrations of chemicals listed on Schedules 2A and 2A*. The OPCW Scientific Advisory Board will study this issue and submit a report for consideration at the next session of the Conference of the States Parties in May 2001.

TABLE 3: Numbers of Inspections at Schedule 1, 2, 3, and Unscheduled Discrete Organic Chemical (UDOC) facilities

	1997	1998	1999	2000
Schedule 1	24	13	17	23
Schedule 2	4	68	38	35
Schedule 3	0	13	25	27
UDOC	0	0	0	44
Total	28	94	80	129

SOURCES: The 1997 to 1999 figures are taken from the *OPCW Annual Report 1999*, p. 25; the 2000 figures are from Mills, "Progress in The Hague: Quarterly Review no. 32," *CBW Conventions Bulletin*, no. 50, December 2000, p. 13.

Industry Inspections

The numbers of routine inspections of chemical industry facilities are indicated in Table 3.

When hosting industry inspections, some States Parties have not allowed OPCW inspectors to use previously approved inspection equipment or have refused to provide supporting historical documentation to back up their declaration. Perhaps the most disturbing development has been the demand by some member-states for access to inspectors' notebooks, based on a literal reading of part of the CWC Verification Annex stating that States Parties have the right to receive "a list of samples and copies of information and data gathered" during inspections. Yet extending this provision to cover inspectors' notebooks contradicts another section of the Verification Annex stipulating that "the papers and correspondence, including records, of the inspection team shall enjoy the inviolability accorded to all papers and correspondence of diplomatic agents pursuant to . . . the Vienna Convention on Diplomatic Relations."¹⁴ Unfortunately, the OPCW Executive Council ruled that inspection team leaders must provide copies of inspector notebooks to the inspected State Party on request. This practice clearly contradicts the spirit of the CWC, whose effective implementation depends on an unbiased and independent inspection regime.¹⁵

International Assistance and Cooperation

Article X of the CWC specifies measures to assist States Parties to protect themselves against chemical attack. Activities of the Technical Secretariat in this area have included setting up a database on chemical defense and conducting training courses and workshops to promote and coordinate assistance to States Parties.¹⁶ Another requirement of Article X is that States Parties must provide annual reports to the Technical Secretariat on their chemical defense programs. Between entry into force of the Convention and the end of 1999, however, only 16 of the then-128 member-states provided this information at least once.¹⁷ Furthermore, States Parties are required to select one of three methods for providing assistance to other member-states threatened or attacked with chemical weapons. By the end of 1999, less than half of the States Parties had done so.¹⁸

Article XI of the CWC calls for greater international cooperation among States Parties in the peaceful uses of chemicals. In an effort to implement this provision, the Technical Secretariat has launched a number of activities, including the facilitation of bilateral cooperation agreements, a chemical technology-transfer website, and a database of laboratory equipment being sought or offered. In addition, the Technical Secretariat has

established an implementation support program to assist National Authorities in preparing their declarations, and has sought to facilitate cooperation among National Authorities.¹⁹

Article XI also calls for the liberalization of trade among States Parties in chemicals and technology for peaceful purposes, but this provision conflicts with the ongoing efforts of 32 industrialized states to harmonize their national export controls within an informal forum known as the Australia Group. Because of the deep split between members of the Australia Group and other States Parties seeking to eliminate the group, no consensus statement or action on the matter has been possible thus far.

Conclusions

The record to date of CWC implementation is mixed. Important progress has been made in declaring previously secret stockpiles and in commencing the destruction of chemical weapons in three of the four declared possessor-states. At the same time, however, more than half of the States Parties have persistently failed to live up to some of their basic obligations under the Convention, including notifications and declarations. The same goes for payment of assessed contributions and the reimbursement of verification costs. Regrettably, the Executive Council has not acted to suspend the voting rights of those States Parties whose arrears have exceeded their assessed contributions for the past two years.

With respect to chemical disarmament, the greatest challenge for the successful implementation of the CWC remains assuring the timely destruction of the Russian chemical weapons stockpile, particularly meeting the intermediate destruction deadline of 20 percent of the Category 1 stocks by April 29, 2002. Although much of this Herculean task will have to be shouldered by the Russian Federation itself, significant financial and technical assistance from other member-states—chiefly the United States, the European Union, and Japan—will also be necessary.

The U.S. delay in submitting its industry declaration had a seriously disruptive effect on the monitoring regime.

The implementation of chemical industry declarations and inspection activities was overshadowed by the nearly three-year delay by the United States in submitting its industry declarations. Now that this major obstacle to the equitable implementation of the CWC has been overcome, the most serious

problem lies in the challenge to the inviolability of inspector notebooks, which could render OPCW inspectors vulnerable to intimidation by host government officials. Only by preserving the inspectors' independence and impartiality will the verification process remain credible.

It is small but crucial issues like these—not the absolute number of inspections completed or weapons destroyed—that will ultimately determine the fate of the CWC. For this reason, the need to preserve the integrity of the verification regime should receive a greater level of attention from the States Parties and the OPCW leadership alike.

NOTES

- ¹ On reports that several states in the Middle East have CW programs, see M. Zuhair Diab, "Syria's Chemical and Biological Weapons: Assessing Capabilities and Motivations," *Nonproliferation Review*, vol. 5, no. 1, 1997, pp. 104–111; Dany Shoham, "Chemical and Biological Weapons in Egypt," *Nonproliferation Review*, vol. 5, no. 3, 1998, pp. 48–58; Michael Barletta, "Chemical Weapons in the Sudan: Allegations and Evidence," *Nonproliferation Review*, vol. 6, no. 1, 1998, pp. 115–136; Dany Shoham, "Does Saudi Arabia Have or Seek Chemical or Biological Weapons?" *Nonproliferation Review*, vol. 6, no. 3, 1999, pp. 122–130.
- ² Harvard-Sussex Program, *CBW Conventions Bulletin*, no. 50, item 391 of January 8, 1991, p. 55.
- ³ U.S. Department of Defense, *2000 Report to Congress: Military Situation on the Korean Peninsula*, September 12, 2000, as reported in *CBW Conventions Bulletin*, no. 50, p. 23.
- ⁴ "Note by the Director General: States Parties in Arrears in the Payment of their Financial Contributions to the OPCW for the Preceding Two Full Years as of 11 May 2000," OPCW Document C-V/DG.10, May 12, 2000.
- ⁵ For further details, see the decision of the Executive Council as contained in OPCW Document EC-XI/DEC.1 of September 4, 1998.
- ⁶ OPCW Document C-V/DG.6, 9 May 2000; the fall figures are taken from Pamela Mills, "Progress in The Hague: Quarterly Review no. 32," in *CBW Conventions Bulletin*, no. 50, December 2000, p. 12.
- ⁷ OPCW, *Annual Report 1999*, July 2000, p. 20.
- ⁸ Mills, "Progress in the Hague: Quarterly Review no. 32," p. 13.

- ⁹ Ibid.
- ¹⁰ The intermediate deadline is specified in para 17 of Part IV (A) of the Verification Annex to the CWC, OPCW Document C-V/DEC/CRP.12, May 2, 2000.
- ¹¹ *CBW Conventions Bulletin*, no. 46, December 1999, p. 13.
- ¹² See Footnote 4 on page 74 in the *Draft OPCW Programme and Budget 1999*, dated November 9, 1998.
- ¹³ OPCW Document C-V/DEC/CRP.25, May 18, 2000.
- ¹⁴ On this issue, see Walter Krutzsch and Ralf Trapp (eds.), *Verification Practice Under the Chemical Weapons Convention: A Commentary* (The Hague: Kluwer Law International, 1999), pp. 18–22.
- ¹⁵ For a more detailed analysis of this problem and its negative implications see *CBW Conventions Bulletin*, no. 39, March 1998, p. 15; and Amy E. Smithson, *Rudderless: The Chemical Weapons Convention at 1 1/2*, Report No. 25 (Washington, D.C.: The Henry L. Stimson Center, September 1998), p. 42.
- ¹⁶ For details of these activities, see the relevant sections in the *OPCW Annual Reports 1998 and 1999*.
- ¹⁷ *OPCW Annual Report 1999*, p. 34.
- ¹⁸ *OPCW Annual Report 1999*, Annex 9, p. 61.
- ¹⁹ *CBW Conventions Bulletin*, no. 39, March 1998, p. 14, as well as the relevant sections of the *OPCW Annual Reports 1998 and 1999*.

CWC Compliance Issues

AMY SANDS AND JASON PATE

WHEN STATES ENTER VOLUNTARILY into an arms control or disarmament treaty requiring them to eliminate or renounce certain military capabilities, verification plays a key role in building confidence that other member-states are fulfilling their treaty obligations. If the treaty fails to address compliance problems in a meaningful way, the regime may ultimately collapse when States Parties lose confidence in its effectiveness and decide to fall back on their own military capabilities. As the Chemical Weapons Convention (CWC) reaches the end of its fourth year of implementation, the issue of treaty compliance remains a largely untested arena. Over the next few years, States Parties will confront a critical juncture in which they must address some cases of suspected noncompliance if the regime is to preserve its credibility.

The CWC has two interrelated objectives: the elimination of existing chemical weapons stockpiles within ten years, and a total ban on the future development, production, stockpiling, transfer, and use of such weapons. Given the fact that some possessor-states will take at least a decade to eliminate their chemical stockpiles and that many countries will retain dual-use industrial capabilities enabling them to reconstitute a CW capability, verification is a challenging but essential element of the regime. As José M. Bustani, the Director-General of the Organization for the Prohibition of Chemical Weapons (OPCW), has noted, “The purpose of verification [is] confidence-building, not necessarily confidence in the adversary but in the proper implementation of the negotiated arms control measure.”¹ Even the perception of inadequate verification or an ineffectual response to significant violations could seriously undermine confidence in the CWC.

The drafters of the Convention recognized the difficulty of creating such confidence, given the fact that the dual-use nature of certain precursor chemicals and production equipment can blur the distinc-

tion between legitimate and illicit activities. In view of this reality, the verification regime was devised with a clear understanding that both military and commercial facilities would have to be monitored on an intrusive and ongoing basis. The CWC mandates routine inspections to validate the information provided in State Party declarations to the OPCW, and challenge inspections to address specific allegations of noncompliance. During the treaty negotiations, many delegations saw challenge inspections as a critical verification tool that would not only detect violations in a timely way but would help to deter noncompliant behavior.

As a young organization, the OPCW is still struggling to develop an appropriate approach to compliance issues. Success in this area depends on obtaining and verifying declarations, holding States Parties to the target dates for the elimination of their CW stockpiles, and ensuring enough transparency to build confidence in the effective functioning of the regime. During the initial phase of implementation, the OPCW has focused on analyzing baseline declarations, conducting routine inspections, and assisting States Parties with the establishment of their National Authorities.

As time goes by, however, questions about compliance will inevitably emerge, either because States Parties have provided incomplete or false information in their declarations or because of alleged violations. According to unclassified U.S. government reports, several states of proliferation concern are signatories or parties to the CWC.² How can the OPCW address this compliance problem in ways that strengthen the Convention and the emerging norm against possession as well as use of chemical weapons?

Consultations and Clarifications

Although arms control treaties governing different weapon systems vary in their approach to veri-

fication, all seek to create a baseline from which to judge compliance-related information. When integrated effectively, measures such as declarations, notifications, and on-site inspections make it possible to detect and deter violations and thereby increase confidence that other states are in compliance.

The elements of the CWC verification regime are, in order of increasing intrusiveness, national declarations, routine on-site inspections, consultation and clarification mechanisms, and challenge inspections. Procedures outlined in Article IX of the Convention encourage States Parties to attempt to resolve an ambiguity by communication on a bilateral basis. If one State Party receives a request for compliance-related information from another State Party, it is required to respond within ten days. The two countries may then agree to inspections or other procedures designed to clarify and resolve the compliance concern. A State Party also has the right to request the Executive Council to obtain a clarification under specific guidelines. If, however, the concerns require immediate action or persist for 60 days after a State Party has submitted a request for clarification to the Executive Council, then the concerned State Party—independent of its right to initiate a challenge inspection—may request a special session of the Conference of the States Parties to consider what actions are warranted.

To date, the United States has utilized some of the consultative and clarification procedures in the CWC. According to State Department officials, the U.S. government has requested clarification from several states on a bilateral basis to resolve compliance questions, and in a number of cases, this process has been successful in addressing U.S. concerns. A few other countries have also engaged in bilateral consultations. Of course, bilateral diplomacy can only be effective when both sides have a mutual interest in resolving a compliance concern.

Challenge Inspections

Under Article IX of the CWC, a State Party can request a challenge inspection of any location or facility—declared or undeclared—on the territory or under the jurisdiction of any other State Party for which an unresolved question about compliance exists. If the Executive Council considers the

challenge request to be frivolous, abusive, or beyond the scope of the CWC, it can decide by a three-quarters majority vote to block the inspection. If, however, the Executive Council does not make such a determination, the inspection will proceed. With the permission of the challenged state, the requesting State Party can send an observer to accompany the inspection team.

The OPCW inspectors must attempt to perform their duties in the least intrusive manner possible, while respecting the efforts of the inspected State Party to protect confidential information unrelated to the CWC. At the same time, the inspected State Party must grant access to the challenged site, enable the inspectors to fulfill their mandate, and make every effort to demonstrate compliance. The inspection team will prepare and submit to the Executive Council a final report detailing its assessment of the allegations and whether the right to request a challenge inspection was justified. If it turns out that the challenge request was frivolous or abusive, the Executive Council can force the requesting State Party to bear some of the costs of the inspection. The Executive Council will inform the Conference of the States Parties of the outcome of the inspection and may recommend additional actions that are needed to ensure compliance. In the event of a serious violation, Article XII empowers the Conference of the States Parties to suspend a country's rights and privileges under the CWC, recommend collective measures, and notify the UN General Assembly and the Security Council.

Although the OPCW has conducted two challenge-inspection exercises in the United Kingdom and Brazil, no State Party has yet requested an actual challenge inspection. At present, a wide divergence of opinion exists among member-states over the value of challenge inspections and when it is appropriate to request one. According to a British government official, “deterrence would be more effective if challenge were used, and seen to be used, regularly where there were significant compliance concerns . . . It is clear that [challenge inspections] must not become so sensitive that it is impossible to use them.”³

Several other states oppose the idea of regularly resorting to challenge inspections. Although China, Cuba, India, Iran, Pakistan, and Russia agree that challenge inspections are an “important pillar of the

verification regime,” they believe that the challenge option should be seen as a last resort after all other avenues have been exhausted. These states argue that because challenge inspections will inevitably be politically charged, they should be used with extreme discretion to address only those compliance concerns that pose a major threat to the goals of the treaty. Abusing the right to request challenge inspections, these states contend, would have the effect of trivializing them.⁴

Despite such concerns, challenge inspection remains a key component of the CWC verification regime. Using this measure when appropriate would signal a willingness to pursue compliance questions and would help to deter would-be violators. Challenge inspections would also provide additional information about the activities of a suspected State Party, facilitating the determination of compliance or noncompliance.

Identifying Noncompliance

One of the most complex and difficult questions associated with CWC implementation is how to identify noncompliant states. In judging treaty compliance, states may obtain information about a particular country’s behavior from a variety of sources, including classified intelligence reports, academic studies, and information provided in national declarations to the OPCW or gathered by inspections.

Beyond the initial determination of possible non-compliant behavior, countries must assess the nature of the violation, determine whether it is technical or substantive, and decide how to respond to it. A state is in technical noncompliance with the CWC if it demonstrates a commitment to the general goals of the treaty but for some reason fails to implement its obligations to the letter. For example, the state in question may lack the technical or financial resources to destroy its chemical weapon stockpile according to the timetable in the treaty. Another example of technical noncompliance is the three-year delay by the United States in submitting its chemical industry declaration to the OPCW. Although technical noncompliance is less signifi-

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cant than substantive noncompliance, over time it can undermine confidence in the equity of CWC implementation or in a particular State Party’s commitment to the treaty.

A state is in substantive noncompliance if it seeks to deceive the treaty regime by providing false documentation, concealing an illicit program, or otherwise circumventing the spirit of the CWC while appearing to be technically compliant or at least committed in principle to compliance. Substantive noncompliance is more insidious because it undermines the core goals of the treaty and threatens its credibility. The following case studies address some possible cases of noncompliance.

Iran

States that retain a chemical warfare program but are technically compliant pose a major challenge to the effectiveness of the regime. Because chemical weapons stocks can be easily hidden, such a state may fulfill all of its technical obligations under the treaty but still maintain a significant chemical warfare capability. It is especially difficult to address this type of noncompliance, or allegations thereof, within the context of the CWC without resorting to a challenge inspection.

Iran is a possible example of this type of compliance problem. After Tehran ratified the CWC in November 1997, it denied that it had a chemical warfare program. A year later, Iranian Ambassador Mohammad Alborzi revealed that Iran had developed a CW capability during the Iran-Iraq War but that after the 1988 ceasefire “the decision to develop chemical weapons capabilities was reversed and the process was terminated.”⁵ Today Iran is a member in good standing of the CWC, having declared three former chemical weapons production facilities and several industrial sites that have been inspected by the OPCW.

U.S. intelligence officials have testified, however, that Iran still possesses “several thousand metric tons of weaponized and bulk agent” including “nerve, blister, choking, and blood agents.”⁶ The United States also claims that Tehran has sought

assistance from Russia, China, and other countries to become more self-sufficient in CW production.⁷ Although classified U.S. intelligence reports on Iran may contain a high level of specificity and detail, all unclassified testimony and documents have been “sanitized” to the point that non-governmental analysts have little basis for assessing the credibility of the official allegations.

If, however, the U.S. government claims are true and Iran maintains a stockpile of chemical weapons and an active production capacity, then Tehran is in substantive violation of the CWC.

The United States has not been the only country to point a finger at Iran. Israel, which signed the CWC in 1993 but has yet to ratify it, continues to be ambivalent about the treaty’s effectiveness. Israeli political scientist Gerald M. Steinberg, writing in the November 2000 issue of the official OPCW journal *Synthesis*, noted that Iran’s membership in the Executive Council “did not help to increase the credibility of the regime in Israeli eyes.”⁸ After this statement elicited strong objections from the Iranian delegation to the OPCW, Director-General Bustani issued a statement on December 8, 2000, criticizing Steinberg’s article on the grounds that it contained “unsubstantiated allegations against the Islamic Republic of Iran and its commitment to the CWC.”⁹ The Bustani statement went on to say that the OPCW Secretariat “has no reason whatsoever to question Iran’s full compliance with the CWC” and that “the application of verification measures in Iran is strictly in accordance with the Convention.”¹⁰ Perhaps most telling was the Director-General’s assertion that none of the States Parties to the CWC had raised compliance concerns about Iran within the OPCW.¹¹ Iran subsequently portrayed Bustani’s statement as an official repudiation of “the allegations leveled against Iran by the Zionist regime.”¹²

Thus far, no State Party, including the United States, has been willing to launch a challenge inspection against Iran. This reluctance may arise from concerns that Iran could initiate a retaliatory challenge inspection, although a frivolous or abusive request might be blocked by the Executive Council. Another possible explanation is that the

The longer the delay before the first challenge inspection is carried out, the greater the burden of proof the requesting state will have to bear.

U.S. assessment of Iranian noncompliance is based on sensitive intelligence that Washington is unwilling to disclose publicly. Although some secrecy is warranted to protect intelligence sources and methods, it is also important for the United States to back up its allegations with hard evidence. As the Clinton administration learned from the international outrage that followed the

August 1998 U.S. bombing of a pharmaceutical plant in Sudan that Washington claimed was producing chemical weapons, other countries are no longer willing to accept U.S. government allegations on faith.¹³

If the United States and other like-minded countries continue to raise questions about Iran’s CWC compliance without requesting a challenge inspection, this powerful tool could atrophy from lack of use. The longer the delay before the first challenge inspection is carried out, the greater the burden of proof the requesting state will have to bear. Moreover, the inspection process could become so politically charged that it will be impossible to pursue constructively. If that happens, the value of this key verification tool could be lost forever, not only for the CWC but also for the compliance protocol currently being negotiated to strengthen the Biological Weapons Convention.

China

Another challenging type of noncompliance is a state that appears to be in compliance with the CWC but refuses to reveal the full nature and scope of its past CW program. Although this state may have destroyed its chemical stockpile, an infrastructure for weapons development and production still exists. Thus, despite the country’s technical compliance with and rhetorical commitment to the treaty, its lack of transparency continues to arouse suspicion.

An example of this type of state may be China, which ratified the CWC in 1997. Beijing has declared no current CW stockpiles or production capabilities and claims to have destroyed three former production facilities in keeping with its obligations under the Convention.¹⁴ U.S. intelligence sources,

however, allege that China retains a “moderate” stockpile of CW and has “not acknowledged the full extent of its chemical weapons program.”¹⁵ Another problem is that in the past, China has not exercised sufficient control over exports of dual-use chemicals and technologies.¹⁶

The case of China does not call for a series of challenge inspections to uncover a suspected program, as with Iran. Instead, it calls for greater transparency, including a willingness by Beijing to reveal more about its past program and current capabilities.

Russia

A third type of noncompliance issue concerns a state that is currently in technical noncompliance and may also be in substantive noncompliance, raising serious questions about its commitment to the treaty. Russia is a possible example. The primary reason for Moscow’s technical noncompliance has been its failure to begin destroying its chemical weapons stockpile in a timely manner. This problem has more to do with a lack of funds and available destruction facilities than with a deliberate effort to defy the CWC. It has been alleged, however, that Russia has misled the OPCW as to the actual size of its chemical arsenal and may have secretly destroyed chemical weapons as part of this deception.¹⁷

Even more disturbing than the possibility of a false declaration is the suspicion that Russia developed, and may be continuing to develop, a new generation of CW agents.¹⁸ This program, reportedly code-named *Novichok* (the Russian word for “new-comer”), appears to include binary nerve agents that, while covered by the general prohibition in Article I of the CWC, are not listed on the schedules of chemicals that are subject to verification. It is therefore essential for the OPCW to investigate the alleged *Novichok* program and to ensure that any novel CW agents and their precursors, if they exist, are added to the list of controlled chemicals in Schedule 1.

Recommendations

From this examination of CWC compliance, several recommendations for U.S. policy emerge that would

help to build international attention and support for dealing with compliance questions:

- 1) Strive to increase the transparency of OPCW activities and reports so that State Parties have access to all of the information they need to have full confidence in compliance;
- 2) Strive to increase the transparency of OPCW activities and reports for non-governmental organizations and the news media, so that they can act to increase public awareness of, and support for, the CWC;
- 3) Educate the U.S. Executive and Legislative branches and the general public about CWC compliance issues and challenge inspections;
- 4) Organize and encourage more diplomatic discussion of challenge inspections as a means of addressing significant questions about possible noncompliance;
- 5) Develop a strong case for the first challenge inspection request, while ensuring that the U.S. intelligence community has fully vetted its analysis and is prepared to provide the necessary supporting data to the OPCW; and
- 6) Make sure the United States is prepared to host a challenge inspection because if Washington requests a challenge inspection, it may be challenged in return.

To ensure that the first challenge inspections enhance rather than detract from the credibility of the treaty, effective diplomacy will be needed to build international support in advance and to ensure that the goals and expectations are realistic. The bar must not be set too high because it is unlikely that a challenge inspection will yield conclusive proof of a violation.

If the CWC is to succeed in the long run, the rhetoric supporting chemical disarmament and non-proliferation must be turned into effective action. Although the Convention itself and the OPCW as its implementing organization possess the necessary tools to resolve compliance problems, the real question is whether the States Parties have the political will to address these issues in a way that will strengthen the credibility of the CWC, enhance the chemical nonproliferation norm, and reduce the security threat posed by chemical weapons.

With more than 140 States Parties, the CWC reflects the complexity of global politics today. In addition to major differences among countries in language, culture, and security concerns, much of the OPCW membership lacks experience with arms control implementation, let alone the compliance process. The recent experience in Iraq has also highlighted the difficulty of mobilizing the international community in a dispute over compliance. Because the United States has the greatest concerns in this area, it should take a leadership role in resolving significant compliance problems within the framework of the CWC. Without such leadership, the Convention may never achieve its goals of chemical weapons disarmament and nonproliferation.

As OPCW Director-General Bustani has pointed out, “Patience is undeniably a virtue in international relations. Yet patience should not be confused with inaction. We must be patient in waiting for results. However, we must be impatient when it comes to taking actions.”¹⁹ Unless the States Parties to the CWC address one or more significant cases of suspected noncompliance in the near future, the credibility and effectiveness of the Convention will be at risk.

NOTES

¹ José M. Bustani, “The Chemical Weapons Convention: A Model for the Future,” *OPCW Synthesis*, May 2000, p. 6.

² Committee on Governmental Affairs, *The Proliferation Primer: A Majority Report of the Subcommittee on International Security, Proliferation, and Federal Services, January 1998* (Washington, D.C.: U.S. Government Printing Office, 1998); Office of the Secretary of Defense, *Proliferation: Threat and Response* (1997) <<http://www.defenselink.mil/pubs/prolif97/>>.

³ “Challenge Inspection: The UK View,” *OPCW Synthesis* (May 2000), p. 26.

⁴ “Challenge Inspection: The Indian View, The Russian View, The Cuban View, The Pakistani View, and The Chinese View,” *OPCW Synthesis* (May 2000), pp. 15, 19–24.

⁵ Statements by H. E. Ambassador Mohammad R. Alborzi, The Hague, The Netherlands, November 16–20, 1998.

⁶ Statement by John A. Lauder, Director, DCI Nonproliferation Center, to the U.S. Senate Committee on Foreign Relations, October 5, 2000.

⁷ Statement by A. Norman Schindler, Deputy Director, DCI Nonproliferation Center, to the U.S. Senate Committee on Governmental Affairs, Subcommittee on International Security, Proliferation, and Federal Services, September 21, 2000.

⁸ Gerald M. Steinberg, “Israeli Policy on the CWC,” *OPCW Synthesis* (Autumn/November 2000), p. 31.

⁹ Statement by the Director-General of the Organization for the Prohibition of Chemical Weapons, December 8, 2000.

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² Radio Teheran, English Service, December 11, 2000.

¹³ Michael Barletta, “Chemical Weapons and Sudan: Allegations and Evidence,” *Nonproliferation Review*, vol. 6, no. 1 (Fall 1998), pp. 115–136.

¹⁴ Eric Croddy, “Chinese Chemical and Biological Warfare Capabilities,” in *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report of the National Intelligence Council and Federal Research Division, Library of Congress, April 2000, p. 67.

¹⁵ U.S. Department of Defense, *Proliferation: Threat and Response* (2001), p. 15.

¹⁶ Statement by Robert J. Einhorn, Deputy Assistant Secretary of State for Nonproliferation, to the U.S. Senate Committee on Governmental Affairs, Subcommittee on International Security, Proliferation, and Federal Services, April 10, 1997.

¹⁷ Amy E. Smithson, “A Commentary on the Russian Factor,” in Brad Roberts, ed., *Ratifying the Chemical Weapons Convention* (Washington, D.C.: Center for Strategic and International Studies, 1994), p. 102.

¹⁸ Dr. Vil S. Mirzayanov, “Dismantling the Soviet/Russian Chemical Weapons Complex: An Insider’s View,” *Chemical Weapons Disarmament in Russia: Problems and Prospects* (Washington, DC: The Henry L. Stimson Center, 1995), pp. 24–25; Clifford Krauss, “U.S. Urges Russia to End Production of Nerve Gas,” *New York Times*, February 6, 1997, p. A7; Frank Von Hippel, “Russian Whistleblower Faces Jail,” *Bulletin of the Atomic Scientists*, vol. 49, no. 2 (March 1993), pp. 7–8.

¹⁹ Statement by OPCW Director-General José M. Bustani to the United Nations 55th General Assembly, October 20, 2000.

U.S. Implementation of the CWC

AMY E. SMITHSON

WHEN REPRESENTATIVES of more than 125 countries gathered in Paris on January 13–15, 1993, to sign the Chemical Weapons Convention (CWC), few could have anticipated that the United States would evolve from chief architect and champion of the CWC to the nation most responsible for its less-than-potent launch. After signing the treaty in 1993, Washington largely ignored it, escaping national embarrassment only with a last-minute ratification just four days before its entry into force. Moreover, the United States took steps to dilute the Convention by including waivers in its resolution of ratification and implementing legislation exempting U.S. sites from the same verification rules that American negotiators had earlier demanded be included in the treaty. Overall, Washington's treatment of the CWC has had less to do with a particular conception of the U.S. national interest than with political expediency and lack of high-level government oversight.¹

Negotiating and Ratifying the CWC

Throughout the negotiation of the CWC at the Conference on Disarmament in Geneva, the United States was one of the strongest champions of a ban on chemical weapons. In 1984, then-Vice President George Bush traveled to Geneva to present a draft treaty text that stunned the international community with its scope and intrusiveness.² U.S. officials consistently extolled the CWC as the centerpiece of international efforts to reduce the chemical weapons threat, prodding and cajoling other countries to conclude the agreement.

The U.S. chemical industry also surprised many by supporting intrusive verification. Never before had a U.S. industry volunteered for additional regulation, yet in this instance the chemical sector sought to distinguish its legitimate commercial activities from the odious business of making poison gas. The Chemical Manufacturers Association (now

the American Chemistry Council), the leading trade organization for the U.S. chemical industry, teamed with its counterparts in Europe, Japan, Canada, and Australia to help the negotiators devise procedures for preventing the diversion of chemical plants to illicit weapons production without putting confidential business information at undue risk. U.S. industry made plants available for testing proposed inspection procedures and helped the negotiators fine-tune the formats for declaring industry activities.³ Thanks in large part to the active support of the chemical industry, the CWC was concluded in the fall of 1992 and opened for signature in Paris in January 1993.

Several factors contributed to the presumption that President Bill Clinton would secure with relative ease the U.S. Senate's advice and consent to ratification. First, Congress had mandated in 1985 that the U.S. chemical arsenal be unilaterally destroyed, and the Army began doing so in 1991.⁴ The CWC would prompt other chemical weapons possessors to follow suit, reducing the likelihood that U.S. troops would encounter chemical weapons in the future. Second, verification has always been a litmus test for Senate ratification of an arms control treaty. On these grounds the CWC's prospects seemed good, since most of its inspection measures had been crafted by Reagan administration officials perceived as sticklers for tough verification. The Convention also carried the strong endorsement of four important constituencies: the intelligence community, the U.S. chemical industry, the general public, and the Pentagon, including the Joint Chiefs of Staff.

Yet President Clinton, instead of mobilizing his Cabinet to lead this powerful coalition in a concerted push for treaty ratification, rarely spoke about the CWC during his first years in office. The White House appeared to take for granted that the Senate would recognize the benefits of the treaty.⁵ This oversight proved costly during the waning moments of the 1996 presidential election campaign, when

both Clinton and the Republican candidate, former Senate Majority Leader Robert Dole, chose to play politics with the CWC. On September 11, 1996, Dole wrote a letter to his former legislative colleagues advising them to beware of “illusory” arms control deals. He argued that the CWC was not “effectively verifiable and genuinely global” and pledged that if elected, he would negotiate a treaty that “really does the job instead of making promises of enhanced security which will not be achieved.”⁶ After CWC opponents trumpeted Dole’s letter, President Clinton, aware that the election would be won on domestic issues and enjoying a comfortable lead in the polls, decided not to wage an all-out fight on behalf of a little-known arms control treaty. The White House quietly withdrew the CWC from Senate consideration.⁷

Early in his second term, Clinton had no choice but to mount an eleventh-hour ratification campaign to secure Senate approval of the CWC, lest the treaty enter into force without the United States. The clock had begun ticking on October 31, 1996, with the deposit of the sixty-fifth instrument of ratification by Hungary; the CWC would enter into force automatically 180 days later, on April 29, 1997.⁸ Even at this late date, the administration effort seemed to be little more than an exercise in damage control. Having allowed the treaty’s opponents to set the terms of the debate, the White House had to fight an uphill battle to secure ratification.

The treaty opponents were a small but extremely vocal band of anti-arms control stalwarts, catalyzed by a conservative think-tank called the Center for Security Policy. Beginning in 1996, the Center started papering Capitol Hill with policy briefs blasting the CWC, which it characterized as “fatally flawed.” The Center’s director, former Reagan administration official Frank Gaffney, recruited a number of prominent CWC critics headlined by a trio of former Secretaries of Defense: Casper Weinberger, James Schlesinger, and Donald Rumsfeld.⁹ The opponents argued that the treaty would not be universal, was not verifiable, would

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impose an intolerable burden on American businesses, would require the United States to relinquish defense secrets, would lull the nation into a false sense of security, and would violate the Fourth and Fifth Amendments to the Constitution (which provide guarantees against unlawful searches or seizures and against self-incrimination). By harping on the fact that several suspected proliferators had not signed the CWC, and by taking passages out of context and interpreting them in a negative light, the critics made it

seem as though the treaty contained dangerous, gaping loopholes.

One by one, the critics’ arguments were refuted by an array of prominent individuals advocating ratification, including former Secretary of State James Baker, former Director of Central Intelligence John Deutch, Persian Gulf War commander General Norman Schwarzkopf, and an impressive list of distinguished military commanders headed by General Colin Powell.¹⁰ Beyond the Washington Beltway, public opinion and editorials ran heavily in favor of CWC ratification, and scientific, veterans, and religious groups rallied around the treaty. An independent poll of 1,000 adults showed that 84 percent of Americans supported the CWC.¹¹ Among the most powerful arguments countering the critics’ case were strong statements by the chemical industry declaring its willingness to accept the treaty’s “reasonable” monitoring burdens. Sporting buttons that said “Stand by the Ban!” and “It’s the Right Thing To Do,” chemical industry lobbyists met frequently with senators and staffers. The Chemical Manufacturers Association conducted letter-writing and phone-calling campaigns and prepared press releases and op-eds supporting the treaty.¹²

On Capitol Hill, Senator Richard Lugar (R-Indiana), the Senate’s leading arms control expert, led a vote-by-vote battle for the treaty’s approval. Although the traditional Republican constituencies of industry, the military, and the intelligence community supported the CWC, pro-treaty votes were difficult to secure. Within the Republican Party, the CWC became a battleground between conservative

isolationists and more moderate internationalists. During the weeks before the final vote, many Senate Republicans appeared to be looking for a way out of their quandary. Majority Leader Trent Lott (R-Mississippi) and a dozen or so Republican colleagues remained noncommittal as the floor debate on the treaty began on April 23, 1997. During the second hour of the proceedings, Senator John McCain (R-Arizona) interrupted his colleagues to inform them that their standard-bearer of the previous year, Bob Dole, was making an about-face and throwing his support behind CWC ratification.¹³ Dole's reversal altered the political landscape and set the stage for compromises that both the Clinton administration and Senate conservatives could support. The Senate approved the CWC by a vote of 74 to 26 on April 24, 1997, just five days before the treaty entered into force.¹⁴

Undercutting Implementation

In drafting the domestic laws to ratify and implement the treaty, however, Congress and the Clinton administration began to make a mockery of the CWC's multilateral underpinnings by establishing a separate set of rules for the United States. Hidden in the fine print of these laws were three exemptions to the Convention's landmark monitoring regime. The most damaging of these provisions directly contradicts the obligations that Washington undertook in ratifying the CWC by allowing a U.S. president to refuse an on-site inspection on the grounds that it could "pose a threat" to national security. A second exemption specifies that no samples collected during an inspection may leave U.S. territory for analysis. The third exemption narrows the number of industry facilities that are required to declare mixtures or solutions containing scheduled chemicals that pose a proliferation risk.¹⁵

These three U.S. exemptions, if emulated by other nations, would effectively allow potential violators to block challenge inspections, deny inspectors the ability to send chemical samples abroad for detailed analysis at independent laboratories, and reduce dramatically the number of industry facilities worldwide that are declarable and hence subject to routine inspection. Even as evidence materialized that the exemptions were damaging the treaty, the Clinton administration downplayed their negative

consequences. For example, U.S. officials claimed that the national security exemption was simply boilerplate language that would protect American interests in the event that a frivolous challenge inspection was requested. At other times, administration officials contended that the exemption was harmless because it would never be invoked. Both justifications were weak, however. The CWC already directs nations not to abuse the privilege of challenge inspections and imposes penalties on any State Party that requests a frivolous inspection.¹⁶ Likewise, even if the "boilerplate" exemption is never used to deny a challenge inspection, it invites replication by other countries and could severely handicap the ability of the inspectorate to catch cheaters.

As for the sampling exemption, the Clinton administration initially proposed that the U.S. government purchase one or more Pentagon-designed mobile laboratories and donate them to the CWC's inspectorate for sample analysis in the United States and other countries. Because the mobile laboratory is not on the inspectorate's approved list of equipment, however, chances are poor that it would be approved for use by the Executive Council and the Conference of the States Parties. More recently, the United States has sought the accreditation of a second U.S. laboratory for the analysis of chemical samples.¹⁷ But other governments are likely to question the impartiality of U.S. analyses of U.S. samples at either fixed or mobile facilities, just as American authorities would surely question test results submitted by a suspected cheater that had analyzed samples in its own laboratory. In sum, the Clinton administration's proposed solution for mitigating the effects of the sampling exemption was no solution at all.

With regard to the U.S. exemption narrowing the scope of industry declarations, it should be recalled that both Russia and Iraq concealed their chemical weapons programs within large industrial sites. Thus, by significantly shrinking the pool of industry facilities to which OPCW inspectors are granted routine access, this misguided provision could undermine U.S. national security.

As if the three unilateral exemptions were not bad enough, the U.S. government dallied for nearly three years before complying with the treaty obligation to submit a declaration of its chemical industry

facilities. Although States Parties to the CWC were required to submit their initial industry declarations to the OPCW by the end of May 1997, it was not until December 1999 that the U.S. government issued regulations outlining industry responsibilities under the CWC. This gaffe resulted partly from a delay in passing domestic implementing legislation and partly from a squabble within the Executive Branch over which agency would oversee the treaty's implementation.

U.S. foot-dragging set a poor example that other countries were content to imitate. As of September 8, 1998, 29 member-states of the CWC had yet to provide an initial declaration to the OPCW. Of the 82 States Parties that filed declarations, many were incomplete or inaccurate. Among those countries holding back its declaration at that time was Iran. Because the United States has such a huge chemical industry, Italy, China, France, Germany and other countries threatened to suspend industry inspections on their territories until the United States came into compliance. These tensions were not relieved until early May 2000, when the United States finally submitted its industry declaration.

U.S. officials also set a poor example in their attitude toward on-site inspections. When teams of OPCW inspectors made their initial forays into the field in June and July 1997, among their first stops were at chemical weapons storage and production facilities in the United States. The inspectors had five months of training under their belts, including two and a half weeks at chemical facilities, but little real-world experience in conducting inspections.¹⁸ Given the experience that the U.S. government had accumulated in a variety of bi- and multilateral inspection activities since the 1980s, the OPCW inspectors expected that their U.S. counterparts would be meticulous but professional in observing inspection procedures. For their part, U.S. officials seemed to think that they would teach the rookie CWC inspectors a lesson or two.

As in other countries, the inspectors and their hosts engaged in a certain amount of mutual testing. The atmosphere surrounding the U.S. inspections, however, was more intense and combative than elsewhere. Indicative of this mindset, some officials from the U.S. On-Site Inspection Agency (OSIA)

Whether intentionally or not, the United States triggered a domino effect of uncooperative behavior during CWC inspections.

referred to the procedures for escorting OPCW inspectors as “rules of engagement,” a term normally used for battlefield encounters with an enemy. During an early inspection, the OPCW inspectors found themselves unable to operate some electronic equipment because they had brought the wrong type of plug adapter for U.S. electric current.

OSIA personnel refused to loan the inspectors an adapter and then denied their request to purchase one at a nearby store, arguing that a borrowed or newly purchased adapter was not equipment officially approved for CWC inspections.

In another display of determination to adhere to the letter but not the spirit of the inspection procedures, U.S. officials rejected equipment at the start of an inspection because of a change in the name of one item: the tape used to seal the inspectors' equipment to prevent unauthorized access. In the approved inspection equipment list, the OPCW Technical Secretariat had described this item as “frangible, fractural, adhesive seals.” On actual pieces of equipment sealed with the tape, however, the Technical Secretariat marked the tape simply as “tamperproof seals.” This minor difference in names became the U.S. justification for rejecting equipment sealed with the tape.

Other recurring disputes overshadowed the early inspections of U.S. military facilities. One disagreement involved the tagging of munitions with tamper-indicating markers. The OPCW inspectors sought to tag a sufficient number of items to confirm the U.S. stockpile declaration and the subsequent destruction process, and to sample some of the munitions to verify their contents. After lengthy negotiations, U.S. officials limited the inspectors to tagging only three munitions per storage magazine.¹⁹ U.S. officials also refused to allow OPCW inspectors to weigh one-ton containers filled with chemical agent, claiming to be wary of health and safety concerns stemming from a possible accident during the weighing process. Privately, U.S. officials conceded that the real problem was that not all of the containers were filled to the same level and that some evaporation had occurred over time as a result of routine maintenance activities. Weighing the one-ton containers would therefore probably reveal small inaccuracies in the U.S.

declaration, which was based on the nominal, rather than actual, fill of the containers.

Ironically, the United States was asking the CWC inspectors to abandon the verification standard that had guided U.S. inspection activities since the 1980s. Following this standard, U.S. officials had adamantly refused to accept a color stripe or other markings on the outside of Soviet munitions as proof of identification during inspections under the Intermediate-range Nuclear Forces (INF) Treaty, but had insisted on the use of specialized x-ray equipment to certify the exact dimensions of missile stages.²⁰ Given the hard line that the United States has traditionally taken when assessing other countries' arms control compliance, it is hard to believe that U.S. policymakers would find it acceptable if other nations were to insist that the inspectors leave after only estimating the amount of chemical agent in their bulk containers.

The atmosphere surrounding CWC inspections of U.S. military facilities has remained tense. Said one individual familiar with the situation, "Every single request that the inspectors make is questioned, disputed. It is as though [U.S. officials] are treating every inspection like it was a challenge inspection."²¹ A foreign diplomat described U.S. officials as having "mindsets that are clouded with a confrontational approach, perhaps a legacy of the early bilateral inspections with the Soviet Union, wherein every inspection is treated as a zero-sum game."²² Another individual summarized the situation with a bit of humor: "The U.S. escorts are so inflexible that they have to call Washington to get permission to put a different topping on the pizza."²³ In other words, the U.S. government has yet to adapt to a multi-lateral inspection regime and the transparency and reciprocity that it implies.

This behavior is baffling to those unfamiliar with inside-the-Beltway politics and has led some countries to question American intentions. After all, U.S. military and civilian leaders have foresworn the future use of chemical weapons, including for retaliation, and the Army is required by law to destroy the U.S. chemical arsenal.²⁴ The uncooperative U.S. behavior during inspections can be explained by the fact that some key Pentagon officials responsible for CWC implementation included civilians who had been fierce opponents of arms control during the Reagan years. The Clinton White House, for its part, did not police how well or

how poorly the Defense Department implemented the treaty. As a result, relatively low-level officials were able to sabotage the inspection process without any personal consequences or corrective action being taken. When these factors are considered, U.S. behavior becomes less baffling than disappointing.

Consequences of U.S. Actions

At the time the CWC entered into force, the United States had the world's only operational chemical weapons destruction program and also had numerous military facilities that were subject to inspection. Accordingly, other nations had an opportunity to observe the way the U.S. government treated the OPCW inspectors before similar inspection teams arrived on their soil. Whether intentionally or not, the United States triggered a domino effect of uncooperative behavior during CWC inspections. Two other chemical weapons possessors, Russia and South Korea, repeated nearly word for word the U.S. rationales for curtailing tagging, sampling, and analysis of chemical munitions. Similarly, India balked at the use of weighing equipment, using as precedent the U.S. insistence that ton containers could not be weighed. If this negative trend is not reversed, it will seriously degrade the effectiveness of CWC verification over the long term.

More fundamentally, other CWC members will not allow the United States to create a separate and less rigorous verification regime for itself. Foreign governments took note of the three unilateral U.S. exemptions and some countries initiated steps to duplicate them. India, for example, inserted a provision in its domestic implementing legislation prohibiting samples from being taken out of the country, and Russian lawmakers have similar legislation on the shelf.²⁵ Officials from other countries have told the author in personal conversations that they would copy the U.S. exemptions as the need arose, but not necessarily put them in writing. Unless the United States moves promptly to preserve integrity of the CWC verification regime, it will be largely responsible for sabotaging the international community's principal mechanism for reducing the chemical weapons threat.

U.S. behavior under the CWC has had other negative effects. In part because of the diminished

influence of the U.S. delegation, the governing bodies of the OPCW have approved several policies detrimental to the long-term vitality of the treaty. The Conference of the States Parties has approved new procedures that give host governments justification to hamper inspections on confidentiality grounds, impede the right of inspectors to carry and use approved items of inspection equipment, and interfere with the inviolability of the inspectors' notes. According to the new rules, inspected states can confiscate and retain any piece of recording equipment that host officials claim has not been satisfactorily cleared of data unrelated to treaty compliance. Even more troubling, the inspectors are currently obliged to allow host officials to copy all of the raw data recorded in their notebooks, laptop computers, and other approved equipment (e.g., cameras, video recorders) before they depart from the site.²⁶ This ruling clearly conflicts with provisions in the CWC giving the inspectors special diplomatic privileges and immunities so that they can conduct their duties without undue interference from hostile government officials or facility managers.²⁷

U.S. representatives were poorly positioned to protect the integrity of the CWC throughout the late 1990s, when the United States was in technical violation of the accord for not declaring its chemical industry. Washington has also been paralyzed and unable to demand full treaty compliance from other countries. In particular, no challenge inspections have been launched under the CWC partly because other governments are waiting for U.S. leadership to confront and punish possible cheaters.

The go-it-alone behavior of the United States under the CWC is inconsistent with its past willingness to confront serious challenges to international security through concerted multilateral action. For example, Washington led the effort to build the coalition that fought the Persian Gulf War and subsequently gave vigorous support to the United Nations Special Commission (UNSCOM) overseeing the elimination of Iraq's weapons of mass destruction.

The United States' not-so-benign neglect of the CWC has undermined other important U.S. foreign, defense, and nonproliferation policy objectives. For example, the flawed record of CWC implementation has had damaging effects on the concurrent effort to negotiate a legally binding

protocol to strengthen the Biological Weapons Convention (BWC). Monitoring the BWC is an extremely demanding task that makes the CWC's intricate verification provisions look simple by comparison. Without U.S. leadership, the negotiations on the BWC protocol have become a lackluster affair missing both substance and urgency. The participating countries have observed the difficulties hampering the CWC and have begun to question the merits of establishing another verification regime of comparable intrusiveness and complexity. In a broader context, the statements of U.S. officials celebrating the United States as a global champion of nonproliferation are seen increasingly as empty rhetoric.

Despite its multilateralist talk, the Clinton administration never threw its full weight behind the CWC. Instead of attempting to persuade Congress and the public of the wisdom of proactive engagement in multilateral nonproliferation efforts, the administration allowed a key instrument of international security to become a political football during an election campaign and then failed to make sure that it was implemented effectively. The CWC experience underscores the importance of isolating nonproliferation treaties from presidential politics and other Washington infighting. Otherwise the United States runs the twin risks of continuing to alienate its allies while enticing proliferators to build deadly arsenals in the face of inconsistent U.S. support for treaty regimes.

The CWC may fare better under the administration of George W. Bush, although that outcome is by no means certain. Secretary of State Colin Powell was a leading advocate of the CWC, but Secretary of Defense Donald Rumsfeld was in the opposite corner. The president's policies may be influenced by the fact that the CWC was one of his father's most important national security legacies. If the Bush administration decides to return the treaty to its status quo ante, it should persuade Congress to repeal the three unilateral exemptions that have so damaged the CWC, making it possible to use the treaty to pursue allegations of cheating in an unfettered manner. Friends of the CWC hope that the United States will resume its role as a steadfast advocate of the treaty in both word and deed. But should Washington not redeem itself as a full and equal partner in this multilateral endeavor, foes of the CWC stand ready to contribute to its downfall.

NOTES

- ¹ This chapter draws on two earlier works by the author, *Rudderless: The Chemical Weapons Convention At 1 1/2*, Report no. 25 (Washington, D.C.: Henry L. Stimson Center, September 1998) and “Mangling a No-Brainer: How Washington Barely Ratified the Chemical Weapons Convention,” in *The Battle to Obtain U.S. Ratification of the Chemical Weapons Convention*, Occasional Paper no. 35 (Washington, D.C.: Henry L. Stimson Center, July 1997), pp. 7–36.
- ² See Conference on Disarmament, Document 500 (Geneva: Chemical Weapons Ad Hoc Committee, April 13, 1984).
- ³ Will D. Carpenter, “How Industry Came to Support the CWC,” and Alain Perroy, “The Contribution of the Chemical Industry to the Chemical Weapons Convention,” *OPCW Synthesis Year in Review 2000*, pp. 48-50 and 38-39.
- ⁴ Public Law 99–145, Title XIV, Part B, Section 1412 (50 USC 1521), November 8, 1985 (Department of Defense Authorization Act, 1986) mandated the destruction of all unitary weapons in the U.S. stockpile of lethal chemical agents and munitions by September 1994.
- ⁵ For the tale of how the Clinton administration allowed the treaty to languish, see Amy E. Smithson, “Dateline Washington: Clinton Fumbles the CWC,” *Foreign Policy*, no. 99 (Summer 1995), pp. 169–82.
- ⁶ Bob Dole, letter to Trent Lott, September 11, 1996.
- ⁷ Secretary of State Warren Christopher called Senator Lott to ask that the CWC be withdrawn. See Thomas W. Lippman, “Senate Foes Force Delay on Poison Gas Treaty,” *Washington Post*, September 13, 1996.
- ⁸ See Article XXI, Chemical Weapons Convention.
- ⁹ This trio made their views known in “No to the Chemical Arms Treaty,” *Washington Post*, March 5, 1997.
- ¹⁰ See Thomas W. Lippman, “White House has Rally for Weapons Ban: Sen. Helms Offers List of Treaty Opponents,” *Washington Post*, April 5, 1997.
- ¹¹ Robert Burns, “Poll Backs Chemical Weapons Ban,” *Associated Press* (February 28, 1997).
- ¹² For example, see Fred Webber, “To Stop Poison Gas Attacks,” *Washington Post*, April 14, 1995.
- ¹³ Francis X. Clines, “Dole No Senator, But Might as Well Be,” *New York Times*, April 24, 1997.
- ¹⁴ *Congressional Record*, 105th Cong., 1st sess., April 24, 1997, p. S3651. See pages S3603, S3616, S3623, S3626, S3596-3606 for votes on key amendments. Earlier, to get a vote on the treaty scheduled, the Clinton administration acceded to a long-standing demand of Senator Jesse Helms (R-NC) to reshape the State Department by abolishing three independent foreign-affairs agencies, including the U.S. Arms Control and Disarmament Agency.
- ¹⁵ In the Senate’s draft of the CWC’s implementing legislation, the exemptions were contained in sections 307, 304(f)(1), and 402(a)(2). Almost identical language was in the bill drafted by the U.S. House of Representatives, H.R. 2709, in sections 237, 234(f), and 252(a)(2). The origins of the exemption prohibiting sample analysis outside of U.S. territory are in condition number 18 of the Senate’s Resolution of Ratification, S.Exec.Res. 75, which the Senate passed on April 24, 1997. On October 20, 1998, the House of Representatives voted 333–95 in favor of passage of the omnibus spending bill that included the CWC implementation provisions, referred to by the short title “The Chemical Weapons Convention Implementation Act of 1998.”
- ¹⁶ Chemical Weapons Convention, Article XI, paragraphs 9, 22, and 23.
- ¹⁷ Lawrence Livermore National Laboratory is participating in a series of tests to receive accreditation from the OPCW. The U.S. Army’s laboratory at Aberdeen, Maryland, has already been certified.
- ¹⁸ Dr. John Gee, Deputy Director-General, Technical Secretariat, “Implementing the CWC: Experiences After One Year of Entry into Force,” speech to the Friedrich Ebert Foundation (Bonn, Germany, May 7, 1998), p. 6.
- ¹⁹ Tags are tamper-indicating markers that allow undisputed identification of military equipment controlled by an arms control treaty. According to Part IV(A) of the CWC Verification Annex, paragraph 62, the inspectors “shall employ, as appropriate, agreed seals, markers, or other inventory control procedures to facilitate an accurate inventory of chemical weapons prior to destruction.” The U.S. government sought to limit the number of munitions tagged based on the assumption that all tagged munitions would be sampled, which is not necessarily the case. Sampling and analysis of munitions, U.S. officials noted, is a costly, time-consuming process.
- ²⁰ At the Votkinsk missile production facility, the United States installed a large machine to x-ray exiting railcar canisters to ascertain that they did not contain an SS-20 missile first stage, either standing alone or within the shell of an SS-25 missile stage. George L. Rueckert, *Global Double Zero: The INF Treaty from Its Origins to Implementation* (Westport, Connecticut: Greenwood Press, 1993), p. 157.
- ²¹ Author’s interview on August 12, 1998.
- ²² Author’s interview with a foreign diplomat, August 27, 1998.
- ²³ Author’s interview on August 14, 1998.
- ²⁴ In the aftermath of the Gulf War, President George Bush revised U.S. policy in May 1991 to state that the United States would “formally [forswear] the use of chemical weapons for any reason, including retaliation against any state, effective when the [Chemical Weapons] Convention enters into force.” Gen. John Shalikashvili, then Chairman of the Joint Chiefs of Staff, testified that the U.S. military’s ability to deter chemical attacks on U.S. troops would be rooted not in a chemical retaliatory capability, but in “robust chemical weapons defense and the ability to rapidly bring to bear superior and overwhelming military force.” U.S. Senate Committee on Armed Services, *Military Implications of the Chemical Weapons Convention*, 103rd Cong., 2nd sess., S. Hrg. 103–835 (Washington, D.C.: U.S. Government Printing Office, 1984); U.S. Senate Committee on Foreign Relations, *Chemical Weapons Convention Hearings*, 103rd Congress, 2nd sess., S. Hrg. 103–869 (Washington, D.C.: U.S. Government Printing Office, 1984).
- ²⁵ Srinjoy Chowdhury, “Bill to Restrict Arms Inspection in Security Interests,” *The Statesman*, May 8, 2000.
- ²⁶ See OPCW, “Decision: Measures in Relation to Approved Equipment Following Completion of Inspection Activities,” Document C-I/DEC.51 (The Hague: Organization for the Prohibition of Chemical Weapons, May 16, 1997), subparagraphs 3.1.3, 3.1.4, 3.2.1, and 3.2.5.
- ²⁷ Chemical Weapons Convention, Verification Annex, Part II, paragraphs 11(d), 23, and 62 and Confidentiality Annex, paragraph 17.

Russian Implementation of the CWC

ALEXANDER A. PIKAYEV

AS THE POSSESSOR OF the world's largest stockpile of chemical weapons, Russia has a key role to play in the implementation of the Chemical Weapons Convention (CWC). Following its accession to the treaty in November 1997, Moscow declared its chemical weapons-related facilities in a timely manner and hosted international inspections at these sites. Because of delays in starting its chemical weapons (CW) destruction program, however, Russia missed the first treaty deadline to eliminate one percent of its CW stockpile by April 29, 2000. This setback was the result of several factors: a lack of funding from domestic and international sources, political and bureaucratic instability, disagreements between federal authorities and regional leaders, and public concerns about the environmental consequences of CW destruction. Despite these difficulties, recent developments have improved prospects for effective Russian implementation of the CWC.

Events Prior to Ratification

Even before the breakup of the Soviet Union in 1991, Moscow had concluded that its huge CW stockpile—totaling some 40,000 metric tons—did not have any significant military value. Accordingly, the Soviet Union halted production of chemical weapons in 1987 and began to build a CW destruction facility near the town of Chapayevsk. A mobile destruction facility was also developed, and some former CW production facilities were converted to commercial production.¹ The decision to abandon the chemical warfare program led Soviet—and later Russian—leaders to pursue diplomatic efforts to prohibit chemical weapons, including bilateral negotiations with the United States and the multilateral CWC talks in Geneva.

The Russian Federation signed the CWC on January 13, 1993, the first day it was opened for signature. After 1993, however, the treaty became

a hostage to domestic political debates. Political factions and deputies questioned the feasibility of the ten-year timetable for eliminating all chemical weapons stocks and raised environmental concerns about CW destruction. Because of intense protests from the local population, the CW destruction facility in Chapayevsk had been mothballed in 1988 and converted into a training center. Other regions with CW storage facilities opposed the construction of destruction facilities on their soil and some of them, including Tatarstan and Bashkortostan, passed local legislation prohibiting the transportation of chemical weapons across their territory.

On March 24, 1994, the Defense Committee of the State Duma, the lower house of the Russian Parliament, held hearings on the CWC. The Defense Committee recommended deferring ratification of the Convention until national legislation on chemical weapons destruction had been prepared. To fulfill the Duma's request, President Boris Yeltsin issued a decree in March 1995 making the Ministry of Defense the lead agency for chemical weapons destruction. For purposes of intra-governmental policy coordination, an Interagency Commission (MVK) was established under the aegis of the Russian Security Council. Yuri Baturin, an influential national security advisor to the President, chaired the Interagency Commission. The executive body of the MVK was the President's Committee on Convention-Related Problems of Chemical and Biological Weapons (*Khimbiokom*), which had been established in 1992.

The second measure taken by the Russian government was the preparation of a Federal Program on "Eliminating Chemical Weapons Stockpiles in the Russian Federation," which was issued as Directive No. 305 on March 21, 1996. Presidential Decree No. 542, issued on April 13, 1996, elevated the Federal Program to the Presidential level. It called for destroying all chemical weapons near their storage sites, which meant that seven different

CW destruction facilities would have to be built in six different regions.² Because the Federal Program called for starting CW elimination in 1995, or a year before the document was adopted, it was obsolete by the time it appeared. Moreover, the total cost of the program was estimated at 16.6 trillion rubles, but when the inflation rate in Russia reached 140 percent in 1995, the initial cost estimate ceased to be realistic. Not surprisingly, the Federal Program received a cool reception from Duma members and outside experts.

Meanwhile, in 1995 President Yeltsin submitted the bill “On Eliminating Chemical Weapons” to the State Duma, where it met with significant opposition from ecological groups concerned that the destruction of chemical weapons would contaminate the environment. Nevertheless, a majority of regional leaders were persuaded to support the bill in exchange for promises of significant federal investments in local infrastructure. Protracted debates over the bill continued until December 1996, when the Duma finally approved it. In January 1997, however, the Federation Council—the upper house of Parliament made up of representatives from the Russian regions—unexpectedly vetoed the CW destruction bill. Subsequent negotiations between the two houses of Parliament were unsuccessful, and in April 1997, the Duma overrode the upper house veto by a two-thirds majority vote. The President signed the bill into law on May 2 and it went into effect on May 6.

The new federal law codified the provision in the Federal Program that chemical weapons would have to be destroyed near their storage sites. In addition, the law provided for constructing “social infrastructure” projects—hospitals, housing, roads, electricity lines, and other facilities for the local population—in the regions where CW destruction would take place. According to some estimates, these projects would increase the cost of implementing the Federal Program two- or three-fold. The result was a huge gap between the actual price tag for CW destruction and the budgetary allocation. In 1995–97, only 56.6 billion rubles (less than \$10 million in 1997 rubles) were actually spent for CW disarmament, 14 percent of what had been authorized in the federal budget laws for those years.³

Despite the fact that the Russian Federal Plan for chemical disarmament was unrealistic, it opened the door to CWC ratification.

Despite the fact that the Federal Plan for chemical disarmament was unrealistic, it opened the door to CWC ratification. Because of domestic opposition, Moscow did not ratify the Convention before it entered into force on April 29, 1997, and a vote in the State Duma was not scheduled until October. Prior to the vote, the Cabinet sent the Duma a new cost estimate for CWC implementation totaling about \$5.7 billion for chemical weapons destruction over ten years and \$330 million in ancillary implementation costs (\$250 million for verification activities and \$80 million in assessments to the OPCW). If the destruction period was extended by five years, as permitted by the CWC, destruction costs would increase by \$1.6 billion and the ancillary costs by \$80 million.⁴

During the ratification debate, deputies expressed concerns about several issues. First, implementing the CWC would be far more expensive than the ailing Russian economy and the strapped federal budget could sustain. The deputies also expressed dissatisfaction with the small amount of international assistance, which covered only about two percent of the total cost of the CW destruction program. Another criticism was that destroying the CW stockpiles within the framework of the CWC would be far more expensive than doing so outside the treaty. Under the terms of the Convention, Russia would have to cover the costs of international inspections on its territory and pay annual assessments to the OPCW. The CWC also required Russia to dismantle its former CW production facilities, some of which had already been converted to civilian production. Deputies argued that eliminating these plants would cause severe economic hardship for local populations.

After extensive debate, however, the Duma approved the ratification of the CWC on October 31, 1997, six months after the treaty had entered into force. The Federation Council, under strong pressure from the Kremlin, followed suit on November 5. Even so, lingering concerns led the Russian parliamentarians to include several provisions in the ratification law, which contains five articles. Article 2 instructs the Cabinet to list expenses for CWC implementation as a separate line item in the federal budget, and advises the President to make the

timetable for CWC implementation conditional on developments in the national economy. Article 3 requires the Cabinet to submit an annual report on CWC implementation including decisions of the OPCW, reflecting the lawmakers' concern about the inability of the Russian authorities to defend the country's interests within the Organization. Under Article 4 of the ratification law, Russia retains the right to withdraw from the CWC if international financial assistance is insufficient, if chemical weapons destruction results in serious environmental damage, or if the OPCW does not approve a five-year extension in the destruction deadline and satisfy Moscow's demands to convert former CW production facilities instead of dismantling them.

False Start: 1998–99

Russian ratification of the CWC in November 1997 was followed by some major setbacks. In late April 1998, the new Cabinet led by Prime Minister Sergei Kirienko cut the entire federal budget, including funds for chemical weapons destruction, by 26.2 percent.⁵ At the same time, the Kirienko Cabinet made some preliminary steps to improve planning for CW elimination. In view of the budgetary constraints, the Cabinet decided to concentrate the limited available funds on building a pilot blister-agent destruction facility and social infrastructure projects at Gorny in Saratov oblast, where 1,200 tons of lewisite, mustard agent, and mixtures thereof are stored. Based on the operation of the pilot plant in Gorny, a larger CW destruction facility would be constructed at Kambarka, which has a much larger stockpile of blister agents.

Assuming that sufficient funds were allocated, it was believed that the Gorny facility might become operational in 1999, enabling Russia to meet the first CWC deadline of destroying one percent of its chemical weapons stockpile by April 29, 2000. In August 1998, however, a severe financial crisis led to the devaluation of the ruble and the resignation of the Kirienko Cabinet. As a result, very little money was allocated for chemical weapons destruction at Gorny in late 1998 and 1999.⁶ Although the budget authorized 243.5 million rubles (approximately \$40 million) for Gorny, only 29 million rubles (\$4.8 million) were actually spent.⁷

In addition to financial shortages, interagency competition between the President's Committee

(*Khimbiokom*) and the Radiological, Chemical and Biological Protection Troops (*RKhBZ*), as well as from within the Ministry of Defense, created another obstacle to progress in the CW disarmament. In April 1998, a Presidential decree designated *Khimbiokom* as the lead federal agency for chemical disarmament. Yet the President's Committee was unable to compete with the *RKhBZ*, which since 1996 had played the leading role in CW elimination activities. The position of *Khimbiokom* was further weakened when its chairman was forced to resign on New Year's Eve 1999. In addition, because of frequent personnel changes, the Interagency Commission established in 1996 under the auspices of the Russian Security Council was unable to coordinate policy on chemical weapons destruction: between August 1998 and August 1999, four secretaries of the Security Council were replaced.

Activities at Gorny in 1998 also demonstrated the extent to which CW elimination had been hobbled by the concessions made in the 1996 Federal Program to fund social infrastructure projects in the affected regions. These ancillary activities now accounted for more than three-quarters of the total cost of the CW destruction program. By the time of the financial crisis in August 1998, several infrastructure projects had been constructed at the Gorny site, including housing, roads, a bridge, electric and natural gas supplies, a water purification system, and guesthouses. Yet construction of the CW destruction facility was just getting started. Workers had only completed the foundation of Building 1.1, where the elimination of lewisite was planned, and were still excavating the site for a second building, to be used for the elimination of mustard gas and lewisite-mustard mixtures. By August 1998, construction at Gorny was 2.5 years behind schedule.⁸

Prior to 1999, foreign assistance was the main source of funding for the Russian CW destruction program. Five Western countries donated approximately \$200 million. Although this sum was an order of magnitude more than Moscow had allocated for chemical disarmament, it was still only a tiny fraction of the roughly \$6 billion required to implement the 1996 Federal Program. The main donor was the United States, which in 1994–98 contributed more than \$170 million, or four-fifths of the total amount. Washington agreed to finance the construction of a nerve agent destruction facility at

Shchuchye, in Kurgan oblast, where 14 percent of Russia's chemical weapons are stored. Germany was the second largest donor with a contribution of \$17 million over the same period. By 1998, the Netherlands, Sweden, and Finland also pledged assistance for CW destruction in Russia. Britain and Italy expressed some willingness to provide assistance but were at an early stage of evaluating specific projects.⁹

If properly coordinated and focused, the international assistance was sufficient for Russia to comply with the initial CWC deadline of eliminating one percent of its CW stockpile (about 400 tons) by April 29, 2000. A major problem, however, was that the foreign assistance was spread over three facilities: Shchuchye, Gorny, and Kambarka. Moreover, because of restrictions imposed by the U.S. Congress, the United States could not provide assistance for social infrastructure projects, which had become a precondition for cooperation by the local authorities. The U.S. inability to finance social infrastructure projects caused considerable delays at Shchuchye because Moscow could not cover the remaining cost.

Although Germany provided financial support for the CW destruction facility at Gorny, it preferred not to fund Russian contractors. Until 1998, only one contract was let to a Russian construction company for DM 150,000. Because of limited budgetary resources and the priority given to social infrastructure projects, Russia failed to complete Building 1.1, where the German CW destruction equipment was to be assembled. As a result, the German equipment had to be delivered to the site and kept for years in underground storage. German inspectors regularly visited the storage facility to monitor the condition of the equipment. Ironically, the total cost of these visits was probably equal to that of completing Building 1.1.¹⁰

Until late 1997, the European Union countries justified their reluctance to provide assistance to the Russian CW destruction program by pointing to Moscow's lack of progress in ratifying the CWC. Even after Russia ratified the Convention, however, few EU countries moved to fulfill their earlier promises. Increasingly frustrated by the financial situation, Duma deputies argued that the Presidential Administration had deliberately misinformed them during the ratification process.

On July 3, 1998, the deputy chairman of the Duma Defense Committee, Nikolai Bezborodov,

asked the Duma's Legal Department to investigate how to freeze Russian participation in the CWC because the lack of funds made it impossible to implement the treaty.¹¹ This initiative was probably not intended to result in Russia's formal withdrawal from the treaty, but rather to get the attention of the Russian authorities and international donors. Further debates on withdrawing from the CWC were halted by the financial crisis in August 1998 and the arrival of a new Cabinet led by Yevgeny Primakov and supported by the Communist majority in the State Duma.

Slow Start: 2000–2001

The financial collapse in August 1998 made clear that the 1996 Federal Program could not be implemented under the more austere budgetary situation that had emerged. Instead, the program would have to be restructured with the aim of reducing expenses. It was also evident that foreign assistance, while essential, would play a secondary role in Russia's chemical disarmament efforts. To avoid the bureaucratic tensions that had impeded CWC implementation during the 1990s, an institutionally strong federal agency would have to be given the lead role for CW destruction. It was also understood that the CWC implementation program should be less dependent on the goodwill of the regional authorities and that the lion's share of funds should not be diverted to social infrastructure projects.

In 1999, the bureaucratic structure for CW elimination began to change. In May, Prime Minister Sergei Stepashin established the Russian Munitions Agency and appointed as its general director a senior bureaucrat named Zinoviy Pak. Previously, Mr. Pak had been Minister of Defense Industries until that position was abolished in March 1997. The President's Committee (*Khimbiokom*) was reduced in status and became a main directorate within the new Munitions Agency.

During the summer and fall of 1999, the Munitions Agency became embroiled in a bureaucratic dispute with the Protection Troops (*RKhBZ*) over which agency would control the CW destruction process.¹² After a year of intense debate, the Munitions Agency prevailed. On July 27, 2000, the new Cabinet of Prime Minister Mikhail Kasyanov put the new agency in charge of chemical demilitarization.¹³ One of the arguments favoring

the transition was a need to reassure international donors, who were reluctant to provide assistance to the Russian army. The Munitions Agency also capitalized on the failure of the Protection Troops to meet the first CWC destruction deadline. To smooth the transition, however, the Munitions Agency hired some key figures from the *RKhBZ*, including General Vladimir Kapashin.

Meanwhile, the Russian Parliament continued to develop legislation on chemical disarmament. On October 11, 2000, the State Duma passed a federal law on the social protection of persons engaged in destruction of chemical weapons, and the Federation Council approved it on October 25. This law envisages a short work week for CW destruction workers and an increase in their paid annual leave. They will also receive special hospital treatment, ambulatory medical care, and housing subsidies.¹⁴ Federal budget outlays for CWC implementation have also increased. In FY 2000, the Russian government authorized a total of 500 million rubles for this purpose. In FY 2001, the budget allocation rose six-fold, to 3 billion rubles (\$122.6 million).

On February 8, 2001, the Cabinet issued Directive No. 87 approving guidelines for the establishment within the Munitions Agency of a “Federal Directorate for the Safe Storage and Elimination of Chemical Weapons,” to be financed out of the agency’s budget. The mandate of the Federal Directorate is to implement the safe storage, transportation, and elimination of chemical weapons. It is responsible for letting contracts, accounting of munitions, custody of CW storage sites, and research and development on CW destruction technologies.¹⁵ The status of a Federal Directorate is higher than that of an ordinary directorate and has few analogues in modern Russia.

The Russian government has also made progress in establishing an effective interagency coordination mechanism for CW disarmament, replacing the Interagency Commission that was formally abolished in 1999. At a meeting on January 19, 2001, the Russian Security Council recognized the need to improve interagency coordination before the large-scale destruction of chemical weapons begins. To this end, the Security Council proposed a State Commission on Chemical Disarmament, to be headed by Sergei Kirienko, a former Prime Minister and the Presidential representative to the Volga federal district.¹⁶ The probable rationale for Mr.

Kirienko’s nomination is the fact that the Volga district includes four of the six Russian regions where chemical weapons are stored—Saratov, Kirov, Penza oblasts and the Udmurt Republic—as well as five of the seven CW storage sites.

Developments at Gorny

In November 1999, after it became clear that Russia could not meet the CWC deadline for destroying one percent of its CW stockpile by April 29, 2000, Moscow applied to the OPCW for a two-year extension. The OPCW Executive Council, meeting in The Hague on April 3–7, 2000, granted the requested extension, and in May, the Fifth Conference of the States Parties approved the Council’s decision.¹⁷

In attempting to meet the extended deadline, the Russian authorities have decided to concentrate their activities at both Gorny and Shchuchye, where a nerve agent destruction plant is planned with U.S. assistance. Because of the refusal of the U.S. Congress to authorize new funds for the Shchuchye facility in fiscal years 2000 and 2001, however, its future remains uncertain. Ground-breaking for construction at Shchuchye is planned for early June 2001, using funds appropriated in fiscal year 1999, but it is an open question whether the facility can be completed by 2004 as planned.

Developments in Gorny have been more positive, and it is here that Russian officials plan to destroy the first one percent of the CW stockpile, totaling 400 metric tons of blister agents. During 2000, construction activity at Gorny recovered from the delays caused by budgetary shortfalls in late 1998 and 1999. In June 2000, the buildings for the destruction of lewisite and mustard agent were completed, and assembly of the German equipment for lewisite destruction in Building 1.1 finally got under way. The Cabinet also announced a tender to Russian companies to produce equipment for the second building, which will destroy mustard gas and mustard-lewisite mixtures.¹⁸ In 2001, Russian budget allocations for the construction of the CW destruction facility at Gorny will exceed 1 billion rubles (\$33 million).

Although further delays have ensued, the Russian authorities still hope that CW destruction activities at Gorny will begin in late 2001.¹⁹ Operations will probably start in Building 1.1, which is

further along. Unfortunately, conducting destruction operations in only one of the two plants would not enable Russia to meet the extended deadline for destroying the first one percent of its chemical stockpile by April 29, 2002. The total stockpile of lewisite in Gorny constitutes only 230 tons, and it may not be possible to start operation of the second plant in time to destroy an additional 170 tons of mustard agent and mustard-lewisite mixture by the extended deadline.

Moreover, prospects look bleak for meeting the second original deadline in the CWC: destroying 20 percent (8,000 tons) of the Russian CW stockpile by April 29, 2002. In May 2000, Mr. Pak made the overoptimistic statement that Russia would be able to meet the second deadline despite the need to extend the first deadline. Authoritative sources in the *RKhBZ* estimated more realistically that the Russian CW destruction program is four years behind schedule.²⁰ This assessment suggests that the second deadline will probably be met only by April 2006. Thus, in 2002, Moscow may need to apply to the OPCW for a four-year extension of the second deadline.

Even four years may not be enough, however. It is unclear if the capacity of the Shchuchye facility will be sufficient to dismantle the entire stockpile of nerve agent stored there, estimated at approximately 5,500 tons. Another problem is the fact that the CW stockpiles at Gorny and Shchuchye total approximately 6,600 tons, or considerably less than the 8,000 tons to be destroyed by the second deadline. Thus, even if both the Gorny and Shchuchye stockpiles are destroyed by April 2006, meeting the 20 percent target will be possible only if a third CW destruction facility becomes operational soon enough to destroy an additional 1,400 tons by that date.

This dilemma has led some to propose using mobile destruction facilities for the routine, large-scale elimination of chemical agents. In the past, mobile facilities have been used only to destroy individual damaged or leaking chemical munitions. The concern over mobile facilities is two-fold: how safe they would be for major destruction operations

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when they lack containment structures, and how environmentally sound they would be without “scrubbers” to filter emissions. At present, the Russian government appears to be leaning against using mobile units for the large-scale destruction of chemical weapons.

A New Approach?

In 2000, the Munitions Agency began to reconsider the 1996 Federal Program with the primary aim of reducing its cost. In an address to the State Duma on March 14, 2001,

Zinoviy Pak outlined the main elements of a new approach to CW destruction, including a reduction in the number of future destruction facilities from seven down to three, to be located at Gorny, Shchuchye, and Kambarka. Increasing the capacity of the future CW destruction facility at Shchuchye would make it capable of eliminating nerve agents transported from other sites. Reducing the number of destruction facilities would cut costs considerably, although additional funds would be needed for social infrastructure projects to win the support of local officials.²¹

Beyond the need to save money, a reduction in the number of CW destruction facilities is inevitable because Bryansk oblast refused to give permission for the construction of a CW destruction facility at Pochep. In 1986, the Bryansk region suffered considerably from radioactive fallout caused by the accident at the Chernobyl nuclear power plant in neighboring Ukraine. Because of this experience, the local population fears that CW destruction could worsen the existing problems of environmental contamination. In 2000, Yuri Lodkin, the Communist governor of Bryansk who opposes CW destruction in his region, was re-elected for another four-year term.

The main problem with the proposed downsizing is that it will require the transportation of chemical weapons between regions. The Munitions Agency notes that in the past, chemical weapons were transported safely with no reported accidents, and containers for this purpose are still available. Nevertheless, transporting chemical weapons between

regions is prohibited by the 1996 Federal Program, the 1997 federal law on elimination of chemical weapons, and local legislation in regions such as Tatarstan and Bashkortostan.

Because the 1996 Federal Program was approved by a Cabinet directive and endorsed by a Presidential decree, it could be superseded by new directive and decree. Amending the 1997 law would be much more difficult, however. In the fall of 2000, the Duma considered an amendment proposing to change the language in Article 2 of the 1997 law requiring the destruction of chemical weapons in the vicinity of each CW storage site. The proposed amendment faced significant resistance in the Duma and was publicly denounced by Nikolai Bezborodov, the influential deputy chair of the Defense Committee. Although Mr. Bezborodov claims that the entire committee supports his opposition, the Munitions Agency continues to pursue a change in the law.

An alternative strategy may also exist. Although Article 2 of the 1997 federal law states that chemical weapons must be destroyed near their storage sites, it does not specify that they must be eliminated at *each* of the seven sites. According to some advocates of transporting the weapons, the language of the law provides enough flexibility to implement the new plan. Seeking to avoid a contentious legal battle, however, the Munitions Agency has not attempted to exploit this loophole and is still trying to persuade the Duma to amend Article 2. Some evidence suggests that since the fall of 2000, some deputies have changed their minds and may now be willing to accept the transportation of chemical weapons to other destruction sites.

The prospects for amending the local legislation are less clear. If the Russian Parliament decides to amend Article 2 in a way that permits the inter-regional transportation of chemical weapons, it would then conflict with the regional bans. Ever since President Vladimir Putin came to power, his administration has demonstrated the ability to constrain the ambitions of local leaders, in many cases forcing them to amend regional laws that contradict federal legislation. Moreover, in 2000, seven federal dis-

tricts were established in Russia, and Presidential representatives were appointed in each. These representatives oversee federal law enforcement branches in their districts that previously reported to regional leaders. Thus, the Kremlin appears to be in a considerably stronger position to get its way with the regions than during the 1990s. If Article 2 of the federal law is amended to permit the transport of chemical weapons, then prosecutors' offices would have a formal right to ask the regions to repeal the conflicting legislation.

Another factor that may influence the transportation of chemical weapons is a proposed change in the Russian CW destruction technology. In 2000, experts discussed plans to modify the two-stage neutralization method selected in 1996. The new approach is to drill holes in chemical munitions and introduce reagents that reduce the toxicity of the CW agents inside, making it safer to store and transport the munitions. This modified neutralization technique may allay the concerns of some regional leaders and environmentalists about the safety of stored chemical weapons prior to their destruction, as well as their inter-regional transportation.

Conclusions

Although the Russian CW destruction program is still far behind schedule, cautious optimism is warranted by the fact that the highest levels of the Russian government are now paying attention to the issue. On March 6, 2001, President Putin met with Vice Prime Minister Ilya Klebanov and discussed the problems of CWC implementation. Within the Russian Cabinet, Mr. Klebanov supervises defense industries, including chemical demilitarization.

Still, there is no guarantee that the Russian Parliament and the affected regions will accept the Munitions Agency's new plan to reduce the number of CW destruction facilities to three and to transport chemical munitions from the four other storage sites for elimination. If the proposed restructuring effort fails, it is not clear how far the Kremlin will be willing to go to put CWC implementation back on track.

NOTES

- ¹ Natalia Kalinina, "On Russia's Problems of Ratification of the CWC," in Jonathan Tucker and Alexander Pikayev, eds. *Eliminating a Legacy of the Cold War: Overcoming Obstacles to Russian Chemical Disarmament* (Moscow, 1998), p. 37 (in Russian).
- ² The chemical weapons storage sites are in Gorny, Saratov oblast; Pochev, Bryansk oblast; Kambarka and Kizner, Udmurt Republic; Maradykovsky, Kirov oblast; Leonidovka, Penza oblast; and Shchuchye, Kurgan oblast. Blister agents are stored in Gorny and Kambarka, whereas more modern nerve agents are stored at the five other sites.
- ³ Alexander Pikayev, "Unexpected Ratification," in Tucker and Pikayev, eds., *Eliminating a Legacy of the Cold War*, p. 22 (in Russian).
- ⁴ *Ibid.*, pp. 28, 30, 43.
- ⁵ Alexander Tarasov, "On Resolving Some Problems Related to Implementation of the CWC by the Russian Federation," in Tucker and Pikayev, eds., *Eliminating a Legacy of the Cold War*, p. 50 (in Russian).
- ⁶ Author's discussion with Russian expert on CW disarmament, Moscow, Fall 1998.
- ⁷ Author's discussions with local officials in Saratov oblast, July 1998.
- ⁸ *Ibid.*
- ⁹ Alexander Pikayev, "Afterword," in Tucker and Pikayev, eds., *Eliminating a Legacy of the Cold War*, pp. 110–111 (in Russian).
- ¹⁰ Author's discussions with local officials in Saratov oblast, July 1998.
- ¹¹ Tarasov, "On Resolving Some Problems Related to Implementation of the CWC," p. 53.
- ¹² Alexander Minin, "On the Box with Poisonous Substances," *Nezavisimaya Gazeta*, October 15, 1999 (in Russian).
- ¹³ Yuri Golotyuk, "Army Disarms with Pleasure," *Vremya Novostei*, July 28, 2000, pp. 1–2 (in Russian).
- ¹⁴ "Parliament Adopts Law on Social Protection of Chemical Industry Employees," *Military News Agency Newswire*, October 25, 2000.
- ¹⁵ "Guidelines on Federal Directorate for Safe Storage and Elimination of Chemical Weapons at the Russian Agency for Ammunition," Report of the Press Service of the Government of the Russian Federation, February 9, 2001 (in Russian).
- ¹⁶ "On Implementation of the State Policy in the Area of Chemical Disarmament," Report of Press Service of the Security Council of the Russian Federation, January 20, 2001 (in Russian).
- ¹⁷ Vladimir Georgiyev, "Elimination of Chemical Weapons Delayed," *Nezavisimaya Gazeta*, May 5, 2000 (in Russian). On May 12, 1998, Russia became a member of the OPCW Executive Council, and on July 2, 1999, it was reelected to the Executive Council for another two-year term.
- ¹⁸ "Dangerous Arsenals will be Utilized," *Rossiyskaya Gazeta*, June 23, 2000 (in Russian); "Russian Region Promised More Funds for Destruction of Chemical Weapons," *BBC Monitoring*, October 24, 2000.
- ¹⁹ "On Implementation of the State Policy in the Area of Chemical Disarmament," Report of Press Service of the Security Council of the Russian Federation, January 20, 2001 (in Russian).
- ²⁰ Georgiyev, "Elimination of Chemical Weapons Delayed."
- ²¹ "Russian Government Drafts Decree on Chemical Arms Elimination," *Military News Agency Newswire*, September 21, 2000.

Chemical Industry and the CWC

RICHARD H. BURGESS

THE FOURTH ANNIVERSARY of the entry into force of the Chemical Weapons Convention (CWC) provides an appropriate moment to assess the role of the chemical industry in implementing the treaty. Industry representatives from the major chemical-producing countries were deeply involved in the CWC negotiations, and they also played a crucial role in the decisions of governments to ratify the treaty.¹ According to Fred Webber, president of the American Chemistry Council (formerly the U.S. Chemical Manufacturers Association), “The chemical industry participated in the CWC negotiation because of our contempt for chemical weapons, and of our outrage at the misuse of the legitimate products of chemistry as chemical weapons.” Webber has also described the CWC as “an unprecedented model of industry-government co-operation toward advancing peace and security.”²

By establishing controls, reporting obligations, and facility inspections to verify compliance, the CWC minimizes the likelihood that legitimate commercial products could be diverted and misused for illicit purposes. Although the Convention adds an additional regulatory burden on a heavily regulated industry, chemical industry leaders believe that the treaty is a reasonable legal and policy measure that increases public confidence that chemical companies have no connection to chemical weapons. Industry’s commitment to the successful national and international implementation of the CWC is demonstrated on a daily basis, from on-site verification activities at commercial facilities to interactions with the staff of the Organization for the Prohibition of Chemical Weapons (OPCW) and the National Authorities.

To date, industry’s experience in implementing the treaty has been generally positive, albeit with a few areas of concern. Developments in four areas—industry declarations, trade, on-site verification, and institutional matters—have raised important questions about the future interpretation and appli-

cation of the Convention. More broadly, enhancing the role of industry in CWC implementation will be crucial if the treaty is to live up to its promise as an effective means of preventing the spread and use of chemical weapons.

Declaration Requirements

Since the Convention went into effect, several issues of interpretation have cropped up during national implementation. The reasonable exercise of national discretion, facilitated by input from industry, is needed to prevent the declaration and inspection regime from capturing activities that the treaty was never intended to cover. Yet this exercise of national discretion has given rise to inconsistencies in implementation. For example, the United States has carried over into its domestic implementing legislation the principle, contained in the treaty’s Annex on Confidentiality, of requiring companies to declare and report the minimum amount of information and data needed for the OPCW to execute its responsibilities in a timely and efficient manner. Canada, in contrast, collects information on plants that produce scheduled chemicals even when the level of production is below the quantitative threshold that makes a facility declarable under the treaty. The Canadian government’s initial declaration requirements had no cutoff level for reporting scheduled chemicals, and the current regulations have a minimum of 10 percent of the CWC threshold for facilities that produce chemicals on Schedules 2 and 3. This collection of data beyond what is required by the CWC imposes an unwarranted burden on the Canadian chemical industry.

The U.S. CWC regulations list several types of chemical products that have been exempted from the declaration requirements.³ For example, if a Schedule 1 chemical is not produced intentionally and is present in a mixture at a concentration of less than 0.5 percent, it need not be declared.⁴ Accordingly, polyvinyl chloride plants, which produce cer-

tain nitrogen mustards (classified as Schedule 1 chemicals) at extremely low concentrations as unwanted byproducts, are not declarable under U.S. law.

In addition, the U.S. CWC regulations clarify the provision in the treaty that member-states must declare industrial facilities that produce more than 200 tons per year of unscheduled discrete organic chemicals (UDOCs). These facilities are potentially relevant to the CWC because they could be converted to the production of scheduled chemicals. Because the treaty provisions on UDOCs are vague, however, they have required clarification at the national level to identify which plant sites are declarable and to focus government-industry outreach efforts. For example, the U.S. regulations waive the declaration of UDOC end products that are not isolated for use or sale, or that are produced by means other than chemical synthesis.⁵ By interpreting the definition of UDOCs with sensible exemptions and illustrative examples of declarable and non-declarable facilities, the U.S. government has reinforced its commitment to the concept of requiring the minimum amount of data necessary for CWC compliance. In some cases, the United States has exempted certain types of facilities from declaration that other countries have not.

The U.S. CWC regulations have also established a system under which industry can ask the federal government to provide rulings on treaty-related questions. If a plant site has questions about its declaration requirements under the CWC, or simply wants a clarification, it can request a so-called "Chemical Determination."⁶ A formal response is generally forthcoming within a short period of time. The U.S. government does not make its responses public because they may include proprietary information and because the particular circumstances may be too narrow to be of general applicability. Nevertheless, some companies have chosen to share certain rulings with others.

For example, according to guidance provided through the Chemical Determination process, the U.S. government has ruled that if an unscheduled discrete organic chemical is produced and then converted promptly into a polymer in the same

To date, industry's experience in implementing the treaty has been generally positive, albeit with a few areas of concern.

reactor in a continuous reaction sequence, the facility is not a declarable UDOC facility. A second type of exempted production is the manufacture of soap, in which a complex mixture of natural products (such as palm oil and similar ingredients) is reacted simultaneously with other chemicals to produce another complex mixture. Because mixtures are by definition not discrete organic chemicals, the facilities that produce them are not declarable. A third exemption applies to sites that produce complex mixtures by combining UDOCs whose initial production was previously declared. In the U.S. government's view, each carbon atom should be counted only once and not each time it is converted into a further downstream product.

Questions of differing national interpretation have also arisen with respect to declaring exports and imports of Schedule 2 chemicals because of the lack of a uniform low-concentration threshold for reporting such chemicals. In some countries, trading companies do not report exports and imports of Schedule 2 chemicals at all; in others, the low-concentration threshold for declaring exports and imports differs from that for declaring production, processing, and consumption. As a result of these inconsistencies, the OPCW is unable to compare aggregate national data or to identify trends in chemical trade. Although some of the low-concentration issues were finally settled in 2000, the question of how to declare Schedule 2 chemicals produced as unwanted byproducts at low concentrations is still unresolved.⁷ Canada has proposed that if an unwanted byproduct is consumed or destroyed in the production process, it should not be declared.⁸ This approach, if adopted by the OPCW, would greatly facilitate industry implementation of the Convention.

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Trade Restrictions

On April 29, 2000, the OPCW banned all trade in Schedule 2 chemicals with states that are not members of the CWC. At present, no comparable restriction exists on trade in Schedule 3 chemicals with non-States Parties beyond the requirement to

obtain an end-use certificate. In 2002, however, the Conference of the States Parties may decide to expand the existing restrictions to cover Schedule 3 chemicals.

In industry's view, the application of additional trade restrictions on Schedule 3 chemicals could wreak havoc with the global production and sourcing patterns of commodity chemicals and consumer products. For example, triethanolamine is a Schedule 3 chemical that is widely used to manufacture emulsifiers, detergents, surfactants, lubricants, waxes, polishes, cosmetics, and cleaners. The chemical is ubiquitous in world trade, is sourced globally, and knowledge of the chemistry needed to produce it is widespread. It is therefore unclear what nonproliferation benefits would result from a ban on trade with non-States Parties in this Schedule 3 chemical.

On-Site Inspections

Until quite recently, industry's experience with routine on-site inspections of private commercial facilities was generally positive. Before the CWC entered into force, commercial chemical companies worried that on-site inspections would result in bad publicity and administrative burdens. Fortunately, these concerns did not materialize, and the goal enshrined in the Convention—of balancing commercial interests with the national interest in preventing and deterring the proliferation of chemical weapons—was well served.

In late 2000, however, significant differences of interpretation began to emerge between the OPCW and the United States, and perhaps other States Parties, during industry inspections with respect to access within declared Plant Sites. Definitions in the CWC establish that a declared Plant that produces, processes, or consumes scheduled chemicals is part of a declared Plant Site with its associated infrastructure. OPCW inspectors are entitled to unimpeded access to a declared Schedule 2 Plant to fulfill the inspection aims of verifying the absence of chemical warfare (Schedule 1) agents, confirming the declared production levels of Schedule 2 chemicals, and ensuring that these dual-use chemicals are not being diverted for military purposes.

The U.S. government interprets the Convention to mean that if, during either the visual inspection

of a Schedule 2 Plant or the review of Plant records, the inspectors identify and declare a specific "ambiguity" that is reasonably suggestive of a prohibited activity, they may ask to continue the inspection at other facilities on the same Plant Site. An example of an ambiguity could be the existence of a pipe extending from the declared Schedule 2 Plant to other parts of the Plant Site. If the declared ambiguity clearly justifies inspecting other parts of the Plant Site, U.S. officials will grant the requested access, the specifics of which must then be negotiated through managed-access procedures. The OPCW, however, has sought to establish a broad right to expand a Schedule 2 inspection to cover any part of the Plant Site to confirm the absence of Schedule 1 chemicals. Contrary to the U.S. interpretation of the Convention, the OPCW inspectors have refused to state a specific compliance concern during the inspection of a declared Schedule 2 Plant to justify their demand for expanded access.

Because of this difference in interpretation by the United States and the OPCW, disputes about how inspections should be conducted have played out at industrial facilities. Industry believes that these differences should be resolved through consultations between States Parties and the OPCW rather than during inspections.

Another contentious issue is how the term "Plant Site" should be interpreted for the purposes of a CWC inspection. A facility may contain within its fence line other plants owned and operated by other companies, and undeclared activities not relevant to the CWC may coexist with declared activities. The Convention defines Plant Site as "the local integration of one or more plants, with any intermediate administrative levels, which are under one operational control." Although the overall manager or superintendent of the facility may have general administrative control, such control may be mainly for security and relations with the outside community. Managers of individual Strategic Business Units (SBUs) sometimes have full operational control over what goes on in their portions of the facility, without reporting to the facility manager except on an informal basis. Industry believes that when operational control lies with the SBU manager, it is appropriate to exclude unrelated facilities from the declared and inspectable Plant Site, even when they share utilities and a common security fence.

Conduct of Inspections

Industry's experience has been that planning for an inspection should include preparing a short Pre-Inspection Briefing (PIB) that adequately explains what the inspectors need to know to conduct the inspection. The PIB has certain mandatory elements, such as safety, and should include a proposed inspection plan. Although the inspectors may decide to use the proposed plan or make up their own, it is advisable for the host facility to suggest a reasonable approach.

Under the rules of managed access, the inspected State Party has the right to take whatever measures are necessary to prevent the disclosure of national security information and trade secrets, as long as these provisions are not invoked to evade CWC obligations. According to the Annex on Confidentiality, the inspected State Party may indicate to the inspection team which areas, items of production equipment, and documentation it considers sensitive and unrelated to the purpose of the inspection. The inspection team must respect procedures designed to protect sensitive installations and to prevent the disclosure of confidential data.

The principles of managed access are spelled out in the Verification Annex's provisions on challenge inspections. Such procedures can include covering proprietary equipment with cloth shrouds for the duration of a walk-through by the inspectors. There is reason to be cautious, however, about shrouding control-room computers and instruments if safety considerations require that the operators be able to see the monitors at all times. Allowing one inspector to stand in a doorway and observe a control room for a limited amount of time would be a useful alternative to allowing the entire inspection team to enter the control room. If the inspectors are not granted full access to areas relevant to CWC compliance, every reasonable effort must be made to demonstrate that such areas or structures are not being used for prohibited purposes. With sufficient creativity on the part of the Host Team, it should generally be possible to address the inspectors' compliance concerns.

Protection of Trade Secrets

During the negotiation of the CWC, trial routine inspections of industry sites provided an empirical

basis for devising rules on managed access and the protection of confidential business information (CBI), which were then written into the Convention and its Annexes. Thanks to these rules, no proceeding to remedy the wrongful disclosure of confidential information has yet been initiated under the Annex on Confidentiality.⁹

Some indications suggest, however, that CBI concerns still exist. Early inspections in Germany and elsewhere raised the possibility that the inspectors' laptop computers or notebooks might contain CBI that should not be removed from the plant site. After much discussion, the OPCW decided to erase the hard drives of the inspectors' laptops in such a way that no data could be extracted and to permit the Host Team to view and even copy the inspectors' notes. Although the CWC grants the inspectors' notes the equivalent of diplomatic immunity during an inspection, the treaty also provides that the Host Team has the right to view all data being removed from the site and to make objections if it discovers proprietary information. Inspectors are not required to keep their notes in any particular language, and the Host Team may have difficulty reading them. Also, the OPCW inspectors sometimes make changes between preparing their Preliminary Findings on-site and writing their Final Inspection Report. These factors may lead inspected facilities and host teams to request copies of the inspectors' notes for later review.¹⁰

Industry seeks to satisfy the reasonable concerns of the inspectors while not compromising CBI unnecessarily. If the inspectors detect an ambiguity and ask to see other areas of the plant, the Host Team can work with the site management to decide when and how to invoke managed-access concepts. Difficulties arise, however, when the inspectors refuse to declare an ambiguity, which the Host Team requires before granting further access.

This situation becomes even more complex if the inspected site contains national security information, such as a classified weapons program unrelated to the CWC. Industry's experience has been that close coordination with the host government in advance of an inspection is essential to avoid unanticipated concerns about the protection of such information. By definition, classified programs must not be disclosed to OPCW inspectors, who have neither the appropriate security clearances nor a "need to know."

UDOC Inspections

The general aim of inspecting a plant that produces more than 200 metric tons per year of an unscheduled discrete organic chemical (UDOC) is to verify that the activities of the plant are consistent with the information provided in declarations, with the particular goal of verifying the non-production of undeclared Schedule 1 chemicals. Because UDOC plants produce discrete organic chemicals in high volumes, some of these facilities might be convertible to chemical weapons production. For this reason, the UDOC inspection system serves a useful deterrence function. The CWC Verification Annex requires the Technical Secretariat to randomly select UDOC Plant Sites for inspection on the basis of equitable weighting factors such as geographic distribution, the characteristics of each site, and the nature of its activities. The Convention also provides that a UDOC inspection will last no more than 24 hours, with another 24 hours available for revising the inspectors' report. When OPCW inspectors have requested to conduct the inspection in three eight-hour shifts over three days, Host Teams have denied this request and maintained that the 24 hours must run continuously once the initial briefing is over, even if the plant operates only during regular business hours.

Industry believes that UDOC inspections should not seek more information than what is permitted and reasonable. A "walk-through, talk-through" tour of the plant will generally suffice to demonstrate that the quantities of UDOC being produced are consistent with the declaration and that Schedule 1 chemicals are absent. As for records, a published report of annual output should be adequate, without the need for inspectors to review monthly or more detailed records. Accordingly, OPCW inspector requests for access to detailed records or to undeclared parts of a UDOC facility have elicited industry concerns.

For its part, the inspected plant, working with the Host Team, should avoid leaving ambiguities unresolved because "issues requiring further attention" may lead to an early repeat inspection. Even more serious, if the inspectors cannot assure the OPCW that Schedule 1 chemicals are not present

In late 2000, significant differences of interpretation began to emerge between the OPCW and the United States during industry inspections with respect to access within declared Plant Sites.

at the inspected Plant, the Final Inspection Report may contain "uncertainties" that can create further difficulties.

Institutional Issues

Several institutional issues related to CWC implementation, particularly the relationship between the OPCW and the chemical industry, have arisen during the four years the Convention has been in force. Although the naturally low profile of

the OPCW is consistent with its professional approach to treaty implementation and serves the interests of its member-governments, the limited transparency of OPCW operations has impeded communication with industry.

The OPCW holds an informal annual session with industry representatives to discuss CWC implementation. Beyond these annual meetings, however, industry has few direct opportunities to influence the development of the organization's standard policies, processes, and procedures. In practical terms, industry's primary means of influencing the OPCW is through national delegations. Representatives of the major chemical industries appear to have excellent access to their national delegations on questions of CWC implementation.

The OPCW has also established a Scientific Advisory Board (SAB) that makes recommendations to the Director-General, who can decide whether or not to accept them in the light of political realities and other factors. Industry supported the creation of the SAB to guide the implementation of the Convention and believes that the views of the board should be given considerable weight. A positive development is the use by the SAB of Technical Working Groups including representatives of industry and academia.

Conclusions

The government-industry partnership formed during the negotiation, ratification, and implementation of the CWC has been a key factor in the treaty's success thus far. As a partner in the implementation of the Convention, the chemical industry's first priority is to preserve the integrity and intent of the

verification regime. In some cases, such as seeking access outside a declared plant in the absence of identified ambiguities, it is not clear that the OPCW is applying the terms and procedures as defined in the treaty. On questions involving the scope and nature of verification activities at industry facilities, the Executive Council should consider expanding its oversight role. Such oversight would give State Parties an opportunity to ensure that the verification performance of the OPCW and industry are consistent with the terms of the Convention.

In addition to existing communication channels with industry, the OPCW might wish to consider a more informal consultative process.¹¹ One approach would be the establishment of an industry “docket” on the OPCW web site, which would provide a transparent mechanism for identifying CWC implementation issues relevant to industry and would enable industry representatives to make their views known in communications with the Technical Secretariat and national delegations.

The First Review Conference of the CWC is scheduled for May 2003. It is incumbent on industry to start early to prepare for the conference by evaluating government and OPCW procedures, national implementation measures, and mechanisms to improve policies and procedures that affect industry. Industry cooperation in the ongoing implementation of the CWC is a critical element in achieving the overall aims of the treaty, but industry must take a more proactive role to assure that its interests are represented.

NOTES

- ¹ Chemical trade associations participating in the CWC negotiations were the U.S. Chemical Manufacturers Association, the European Chemical Industry Council, the Japan Chemical Industry Association, the Canadian Chemical Producers Association, and trade associations in Australia, Brazil, and other countries.
- ² Frederick L. Webber, “A U.S. Industry Perspective on the Implementation of the Chemical Weapons Convention,” *OPCW Synthesis*, November 2000. See also, Richard H. Burgess, “A Point of View From the U.S. Chemical Industry,” *OPCW Synthesis*, August 1998, and Burgess, “Implementation of the Chemical Weapons Convention in the United States of America—A Viewpoint From Industry,” *The Monitor*, nos. 5–6, Fall 1999/Winter 2000, p. 8.

³ CWC Regulations 715, 64 Federal Register 73782. Chemical products exempted from declaration are: polymers and oligomers consisting of two or more repeating units that are formed by the chemical reaction of monomeric or polymeric substances; chemicals and chemical mixtures produced through a biological or biomediated process; products from the refining of crude oil, including sulfur-containing crude oil; metal carbides (i.e., chemicals consisting only of metal and carbon); and unscheduled discrete organic chemicals (UDOCs) produced by synthesis that are ingredients or by-products in foods designed for consumption by humans and/or animals.

⁴ CWC Regulations 712.1, 64 Federal Register 73769.

⁵ UDOCs are not subject to declaration if they are produced coincidentally as by-products that are not isolated for use or sale as a specific end product, and are routed to, or escape from, the waste stream of a stack, incinerator, or waste treatment system or any other waste stream; if they are contained in mixtures that are produced incidentally and not isolated for use or sale as a specific end-product; if produced by the mixing (i.e., the process of combining or blending into one mass) of previously declared UDOCs; or if used as intermediates in a single or multi-step process to produce another declared UDOC. Activities that do not result in declaring end products are fermentation, extraction, purification, distillation, and filtration.

⁶ CWC Regulations 711.3, 64 Federal Register 73768.

⁷ International transfers of Schedule 2 chemicals will be prohibited for mixtures containing more than 1 percent of Schedule 2A or 2A* chemicals or 10 percent of Schedule 2B chemicals, except for chemicals identified as consumer goods packaged for retail sale for personal use or packaged for individual use. For declaration purposes, a low-concentration limit of 30 percent will apply to Schedule 2B and Schedule 3 chemicals, and declarations will not be required for activities below that level. The low-concentration declaration status of Schedule 2A and 2A* chemicals is still undecided but is expected to be resolved by mid-2001. Among the options being considered by the OPCW is a uniform low concentration level of 1, 10, or 30 percent for the purposes of Schedule 2A and 2A* declarations. See Daniel Feakes, “Progress in The Hague, Quarterly Review no. 30,” *CBW Conventions Bulletin*, June 2000, p. 26.

⁸ Canada, *Technological Background Paper: Production, Processing and Consumption Plant Site Operations and Their Relationships to the Issue of Low Concentration of Schedule 2 and Schedule 3 Chemicals*, OPCW Executive Council, EC-XXI/NAT.1, July 24, 2000, Twenty-first Session, October 3–6, 2000.

⁹ Webber, “A U.S. Industry Perspective.”

¹⁰ The U.S. government has been reluctant to request copies of the notebooks because it may have to defend against Freedom of Information Act (FOIA, 5 U.S.C. § 552) requests for access to various types of inspection data. This situation may lead the inspected facility to request a copy through the Host Team, without the U.S. government retaining a copy. Thus, the status under FOIA of the copy retained by the site would need to be considered.

¹¹ The Organization for Economic Cooperation and Development (OECD), for example, has made explicit provision for input from business stakeholders through the Business and Industry Advisory Committee (BIAC). Representatives of national industries provide comments to BIAC on a wide range of relevant issues, and participate as appropriate in relevant meetings of the OECD.

Export Controls, Chemical Trade and the CWC

DANIEL FEAKES

PRIOR TO THE ENTRY INTO FORCE of the Chemical Weapons Convention (CWC), several states created an informal mechanism to harmonize their national export controls on chemical weapons precursors and production equipment, known as the Australia Group. Countries that are members of the Australia Group view it as an effective measure for countering proliferation, but some non-members perceive it as a discriminatory cartel that harms their economic development by impeding legitimate trade in chemicals and production equipment. The export control regime contained in the CWC may eventually replace the Australia Group. For that to happen, however, the treaty regime will have to be implemented effectively and all States Parties will need to have confidence that other member-states are complying fully with the Convention.

Evolution of Chemical Export Controls

Until the mid-1980s, trade in dual-use chemicals that can serve as precursors for chemical weapons (CW) was largely unregulated. That situation changed with the discovery that Iraq's production of chemical weapons had relied extensively on precursors and production equipment supplied by Western companies. By the end of 1984, several countries imposed national export controls on CW precursors, including Australia, Canada, the European Community (Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, and United Kingdom), Japan, New Zealand, and the United States.

In April 1985, Australia proposed that these governments should meet to discuss the harmonization of their national export controls. The first meeting took place at the Australian Embassy in Brussels in June 1985 and marked the beginning of what

became known as the Australia Group. This group, which now meets at the Australian Embassy in Paris, has grown from 15 original participants to the current 32.¹ It has no charter or constitution and operates by consensus. New participants are admitted by a unanimous vote, on the condition that they have renounced the possession of chemical (and biological) weapons and have established an effective legally based system of national export controls.

The Australia Group has two main functions.² The first is to harmonize national export controls on a list of 54 dual-use chemical precursors and on various types of dual-use chemical production equipment. (The group also coordinates export controls on biological weapons materials and equipment.) The second function is to share information on the national implementation and enforcement of export controls, and intelligence on the spread of chemical and biological weapons. Because the Australia Group operates in secrecy, the literature on its operations is sparse.³ This lack of transparency has made the Group an easier target for its critics. At its meeting in October 2000, the Group recognized the importance of greater openness and agreed to establish its own website.⁴

Since its inception, the Australia Group has come under harsh criticism from some developing countries. In 1993, an Indian commentator described the group as a "white man's club" that practices "apartheid."⁵ When Cuba, Iran, Pakistan, and Sudan submitted their CWC ratifications to the UN Secretary-General, they attached statements critical of the Australia Group. These countries, together with India, are in the vanguard of Non-Aligned Movement (NAM) opposition to the Australia Group. Although other NAM member-countries have been more cautious, the 1998 NAM summit reiterated the call for "the removal of all and

any discriminatory restrictions that are contrary to the letter and spirit of the [CWC].”⁶

Export Control Provisions of the CWC

Article I of the CWC stipulates that States Parties undertake never to “transfer, directly or indirectly, chemical weapons to anyone,” nor to “assist, encourage or induce, in any way,” another state to engage in any prohibited activity. States Parties are also required to implement specific restrictions on transfers of scheduled chemicals to non-States Parties, and to declare transfers of such chemicals among themselves. Schedule 1 chemicals can only be transferred among States Parties in limited amounts and for particular purposes. Transfers of Schedule 1 chemicals to and from non-States Parties are prohibited, and once transferred to another State Party, these chemicals may not be retransferred. As of April 29, 2000, Schedule 2 chemicals may not be exported to, or imported from, non-States Parties. End-use certificates are currently required for exports of Schedule 3 chemicals to non-States Parties, and additional trade restrictions may be imposed in the future.

With respect to the scope of the prohibitions, some States Parties have suggested that the Convention covers only scheduled chemicals.⁷ In fact, Article II makes clear that the term “chemical weapon” has a broad meaning and is not limited to the chemicals and families of chemicals listed on the three Schedules in the CWC Annex on Chemicals. The Annex itself states that the Schedules “do not constitute a definition of chemical weapons.” Instead, the Convention requires States Parties to monitor, and to restrict if necessary, transfers of *all* toxic chemicals and their precursors.⁸ It can even be argued that Article I prohibits transfers of equipment, financial resources, and intangible technology that are intended for use in conjunction with the activities prohibited by the CWC.

The “chapeau” that opens Article VI, paragraph 2, provides a legal basis for requiring States Parties to implement chemical export controls. This sentence stipulates that “each State Party shall adopt the necessary measures to ensure that toxic chemicals and their precursors are only . . . transferred . . . for purposes not prohibited under this Convention.” Restating the General Purpose Criterion, the sentence makes clear that the “necessary measures”

apply to *all* toxic chemicals and precursors, not just to the chemicals listed on the Schedules. In this way, Article VI builds on and reinforces the non-proliferation obligations in Article I.

Paying due regard to the General Purpose Criterion with respect to chemical transfers is important because the CWC Schedules do not include all known chemical weapons precursors. For example, when chemical export controls were imposed on Iraq in the mid-1980s, Baghdad could no longer import the mustard-gas precursor thiodiglycol. In response, Iraq switched to the precursors 2-chloroethanol and sodium sulfide, which are not listed on the CWC Schedules.⁹

Taking the Convention’s export control measures as a whole, it is clear that the treaty establishes a comprehensive export control regime that applies not only to scheduled chemicals but to the three elements that make up the definition of a chemical weapon (toxic agent, munition, and delivery system) and even to assistance in prohibited activities. At a minimum, States Parties must establish a legally-based export control system to monitor trade in scheduled and unscheduled chemicals, enforce compliance, penalize violations, and provide the OPCW with accurate declarations of transfers of scheduled chemicals.¹⁰

At least in principle, there is no reason why the nonproliferation measures in the CWC could not one day replace those of the Australia Group. Such a development would depend, however, on the political will of the States Parties to implement the export control provisions of the CWC effectively. Another factor is whether the Australia Group can maintain its political legitimacy in the face of the growing universality of the CWC.

The Australia Group and the CWC

The Australia Group was much debated during the negotiation of the CWC. Given the strong opposition of certain developing countries, many expected that concluding the treaty would require the dissolution of the group. The agreed text, however, was a finely balanced document, with both developed and developing countries making compromises.¹¹ Although Article XI states that the Convention “shall be implemented in a manner which avoids hampering the economic or technological development of States Parties,” it stops short

of calling for the abolition of the Australia Group.

In August 1992, the members of the Australia Group pledged to review their national export control policies “in the light of the implementation of the Convention” with the aim of “removing such measures for the benefit of States Parties to the Convention acting in full compliance with their obligations under the Convention.”¹² This so-called “O’Sullivan statement” was a turning point in the CWC negotiations. India’s permanent representative welcomed the Australia Group’s commitment but added that it would have to be carried out “fully and promptly.” He also expressed the opinion of many developing countries that “the Australia Group will have to dissolve itself both in letter and spirit as far as trade in chemicals and related equipment is concerned, in order to promote healthy universality and credibility for the Convention.”¹³

Critics of the Australia Group argue that it has hampered legitimate trade in chemicals. At a 1996 seminar in Tehran, a representative of the Iranian chemical industry observed, “Export control regulations by ‘Australia Group’ . . . have made problems for Iran chemical industry and have caused some losses to the economy of the country.”¹⁴ The counterargument, advanced most strongly by the United States, is that the group’s controls narrowly target those chemicals that have a strong possibility of being used in a CW program. According to a U.S. paper submitted to the 1999 Conference of the States Parties, “controls and informal nonproliferation groups make it more difficult for proliferators and terrorists to acquire materials for CW programs. Such controls and groups do not hinder peaceful legitimate trade.”

A U.S. analysis of applications for the export of the 54 precursor chemicals controlled by the Australia Group found that from 1995 to 1998, the United States rejected only 21 out of 3,722 export applications.¹⁵ These statistics do not reveal how many applications were not made in expectation of denial, however, nor do they address the impact of the export denials on the economies of importing countries.

A new element in the debate over the Australia Group is the existence of an operational CWC

The Convention requires States Parties to monitor, and to restrict if necessary, transfers of all toxic chemicals and their precursors.

regime with more than 140 States Parties, including most of the world’s major chemical-exporting countries. The CWC’s export control regime is a multilateral instrument with a strong international legal framework. Unlike the Australia Group, any country can join the Convention without preconditions. Because an export control regime based on the prospect of universal adherence and

international law is preferable to one based on selectivity and ad hoc agreements, the legitimacy of the Australia Group has increasingly been called into question. As Iran pointed out to the 2000 Conference of the States Parties: “With a well-equipped and well-prepared organization to monitor the implementation, there remains no justification for pursuing arbitrary, unilateral or parallel and extra-conventional regimes.”¹⁶

Along similar lines, OPCW Director-General José M. Bustani has noted: “As more states join the CWC, and as their chemical producers support it, the arguments originally advanced for the continuing maintenance of restrictions on chemicals outside a credible, reliable international legal framework become increasingly redundant. Given this fact, the continuing existence of export controls by some States Parties against others is hard to understand, and very difficult to justify.”¹⁷

National Implementing Legislation

Under the CWC, States Parties are required to enact legislation and adopt administrative measures for implementing the treaty on their territory, and to inform the OPCW Secretariat of such measures. Legislative and regulatory harmonization is in the interest of the global chemical industry, which has stressed the need for a “level playing field.” Because many States Parties are unfamiliar with the concept of multilateral export controls, however, effective implementation of these treaty provisions will not be easy. Even after four years, the CWC export control regime is still in its infancy.

Given the importance of national implementation for the effectiveness and credibility of the Convention, it is a matter of concern that, as of May 11, 2000, only 47 States Parties (35 percent) had notified the OPCW of their implementing legislation,

including domestic laws to implement the export-control provisions of the CWC.¹⁸ Although a comprehensive export control regime covering all States Parties should be a long-term objective, the near-term goal should be to ensure that export controls are properly implemented in those States Parties that have declared Schedule 1, 2, 3, or “unscheduled discrete organic chemical” facilities. The OPCW Technical Secretariat has assisted States Parties in establishing the legislative and regulatory framework required to implement the import/export regime. One innovative approach has been the development of a model legislative package linking CWC implementation to the implementation of other treaties on the sound management of pesticides and toxic industrial chemicals.¹⁹

Even with national legislation and regulations in place, much depends on industry compliance with such measures. Ideally, all major producers of scheduled chemicals and certain unscheduled chemicals should monitor and control their import and export. Achieving this objective would increase the transparency of international trade in CWC-relevant chemicals, contribute to the confidence-building aspect of the Convention, and reduce the risk that the chemicals will be misused.

States Parties will also need to address the issue of transfers of intangible technology, such as production know-how. Because of the dramatic growth in the use of the Internet and e-mail, some commentators view transfers of intangible technology as one of the chief proliferation threats.²⁰ Governments have not yet determined how to enforce controls on such transfers. This issue could be a topic for the 2003 CWC Review Conference, or the Scientific Advisory Board, to consider.

Implementation of CWC Export Controls

The export control regime established by the CWC has two distinct elements. One places prohibitions and restrictions on trade among States Parties, while the other involves the regulation and reporting of trade with non-States Parties. The international trade in Schedule 1 chemicals among States Parties is tiny and mainly involves two toxins, saxitoxin

The more confidence States Parties have in the effectiveness of CWC export controls, the less need there will be for parallel measures such as the Australia Group.

and ricin. Saxitoxin is the most often transferred Schedule 1 chemical, primarily because minute amounts of this toxin are used in medical kits for diagnosing paralytic shellfish poisoning. Nevertheless, the Technical Secretariat has not always been able to match the notifications submitted by the exporting and importing States Parties. Indeed, between 70 and 80 percent of Schedule 1 transfers in 1999 could not be matched.

The Technical Secretariat also receives annual declarations of aggregate amounts of Schedule 2 and 3 chemicals transferred between States Parties. For several reasons, including different calculating methods, customs-related problems, and clerical mistakes, the Secretariat has been unable to reconcile the majority of these transfers, meaning they were either declared by only one State Party or the declared amounts differed by more than 20 percent.²¹ In 1997, over 90 percent of transfers could not be reconciled.²² The following year, the Secretariat initiated a process of clarification with the States Parties concerned and encouraged bilateral or regional consultations. The situation improved slightly in 1999, with “only” 70 to 80 percent of transfers being irreconcilable.²³ Discrepancies are greatest for Schedule 3 chemicals that are traded in large volumes, such as triethanolamine and methyldiethanolamine. In January 2001, the Secretariat hosted a multilateral meeting of States Parties to discuss these discrepancies.

The second element of the CWC export control regime involves prohibitions and restrictions on trade in scheduled chemicals with non-States Parties. All transfers of Schedule 1 chemicals to non-States Parties have been prohibited since entry into force. As of April 29, 2000, States Parties have also been prohibited from exporting or importing Schedule 2 chemicals to or from non-States Parties. To date, little information is publicly available on the implementation of this trade ban. In fact, because trade in Schedule 2 chemicals to non-States Parties was a tiny proportion of the global trade in chemicals, its cessation is unlikely to have a significant commercial impact. Japan, for example, traded only about 10 tons of Schedule 2 chemicals annually between 1996 and 1998.²⁴ The ban might, however, have a more negative impact at the level of

individual companies. Non-States Parties hardest hit by the ban on transfers of Schedule 2 chemicals are presumably those with a developed chemical industry, such as Israel and Taiwan.

In contrast to Schedule 2 chemicals, the CWC does not provide for an automatic ban on the transfer of Schedule 3 chemicals to or from non-States Parties. However, States Parties are required to “consider” the need to establish “other measures” to control Schedule 3 transfers five years after the treaty’s entry into force, namely on April 29, 2002. This decision is potentially significant because the volume of trade in Schedule 3 chemicals is fairly large. Japan, for example, currently trades about 5,000 tons of Schedule 3 chemicals annually. Some States Parties are reluctant to impose a total ban on Schedule 3 exports to non-States Parties, preferring instead to tighten up the implementation of end-user certificates.²⁵ Other member-countries, such as Iran, argue that a trade ban should be imposed in 2002 because it would be too difficult to agree on “other measures.”²⁶ The Technical Secretariat is likely to favor a total ban on trade in Schedule 3 chemicals with non-States Parties because it would act as an incentive for holdout states to join the Convention.²⁷

In lieu of imposing a total ban, the States Parties may decide to increase the transparency of transfers of Schedule 3 chemicals by requiring the reporting of end-use certificates to the Technical Secretariat or the Executive Council. Because the CWC does not currently require States Parties to report end-use certificates, the extent of their actual use is unknown. Some States Parties do not have legal basis for requiring the certificates, while others have the necessary legislation but lack the resources to enforce it effectively. It is also unclear how a State Party would know if a non-State Party had re-exported a Schedule 3 chemical, and what could be done to prevent it. Other options include imposing a partial ban limited to chemicals on Schedule 3A, or a ban on imports.²⁸

With the First Review Conference approaching, the OPCW should consider how best to strengthen the trade restrictions in the CWC. Currently, the only way in which suspicions about illicit transfers can be investigated is by requesting a challenge inspection, but Director-General Bustani has proposed the development of a separate verification mechanism. “The transfer issue . . .” he wrote,

“highlights another important nonproliferation aspect of the Convention’s verification regime which requires additional attention. Shouldn’t there be some mechanism to verify compliance with the ban on the transfer of Schedule 1 and Schedule 2 chemicals to States not party to the CWC? This is a serious matter—one which we can not simply shy away from.”²⁹ A degree of reassurance could be provided if OPCW inspectors conducted random checks of export documents when inspecting Schedule 2 and 3 sites. Shipments of scheduled chemicals might also be tracked by means of electronic tags or Global Positioning Satellite (GPS) transponders.

Enforcement of CWC Export Controls

The more confidence States Parties have in the effectiveness of CWC export controls, the less need there will be for parallel measures such as the Australia Group. To this end, the OPCW Technical Secretariat has signed an agreement with the World Customs Organization to develop and implement joint technical and training assistance projects for national customs services and CWC National Authorities.³⁰

A number of other programs aim to increase the effectiveness of customs enforcement in developing and former communist countries. For example, the U.S. Department of Defense has established joint programs with the U.S. Customs Service and the FBI to train and equip border security personnel in the former Soviet Union and Eastern Europe to prevent, deter, and investigate transfers of nuclear, chemical, and biological weapons materials.³¹ In addition, law enforcement and customs officials have met annually for years under the auspices of the Australia Group and the European Union. Article 15 of the EU regulations on dual-use goods requires member states to “take all appropriate measures to establish direct cooperation and exchange of information between competent authorities.” Such arrangements offer a model for future cooperation within the OPCW.³²

Another important aspect of enforcement is the criminalization of CWC prohibitions.³³ Article VII requires States Parties to enact penal legislation covering violations of the Convention, but various loopholes exist. The CWC does not make the development, production, possession, or use of chemical weapons an international crime, nor does the

treaty contain provisions for the extradition of suspects. To fill this gap, the Harvard-Sussex Program on CBW Armament and Arms Limitation, a non-governmental organization, has drafted an international convention criminalizing violations of the CWC and the Biological Weapons Convention (including transfers of chemical precursors and equipment) that would apply to individuals rather than states.³⁴

Effectiveness of CWC Export Controls

It is too early to assess the effectiveness of the CWC export control regime, although such an assessment may be easier by the time of the First Review Conference in 2003. Nevertheless, three areas can be identified in which the export control provisions of the Convention have had an effect: the proliferation of chemical weapons, the legitimate international trade in chemicals, and the number of states that have ratified the treaty.

CW proliferation. Given the global diffusion of dual-use chemical production technologies, export controls can delay but not deny sensitive technology to determined proliferators.³⁵ As Brad Roberts has argued, “The classic case for export controls is that they retard weapons acquisition programs while also making them more costly. They continue to serve this function even in a time of technology diffusion, although the time they buy and the costs they impose are shrinking.”³⁶

Impact on trade. Far from restricting trade, export controls may actually enable it by creating confidence among suppliers that recipients will use their acquisitions for peaceful and not military purposes.³⁷ Without export controls, suppliers might be reluctant to sell to customers who could be fronts for chemical weapons programs. Given the negative publicity that German companies received when their role in the Libyan and Iraqi chemical weapons programs was revealed, it is possible that in the absence of export controls, many companies would be unwilling to take the risk.

Progress toward CWC universality. One reason that the CWC includes restrictions on trade in scheduled chemicals with non-States Parties is to create

an economic incentive for holdouts to join the treaty. During the months leading up to the ban on trade in Schedule 2 chemicals, the OPCW Director-General sent letters to the governments of all non-States Parties reminding them of the impending prohibition. During 2000, 13 states ratified or acceded to the CWC, nearly twice the number (seven) in 1999. It is possible that if restrictions on trade in Schedule 3 chemicals are implemented in 2002, several more states may join the Convention. Nevertheless, for a number of holdout states, particularly in the Middle East, the political advantages of remaining outside the CWC probably outweigh the economic costs.

Conclusions

The CWC offers a comprehensive, multilateral approach to the problem of chemical proliferation. Although the treaty is still in its infancy and the full implementation of the industry verification regime has only recently begun, the CWC has the potential to develop a strong and nearly universal regime for the regulation of toxic chemicals that could eventually eliminate the need for the Australia Group. The First Review Conference in 2003 will provide an opportunity for States Parties—including members of the Australia Group—to assess their confidence in the treaty and the implementation of CWC export controls.

NOTES

¹ The membership of the Australia Group has grown over time, as follows: 1985—Australia, Canada, EC 10, Japan, New Zealand, and United States; 1986—Norway, Portugal, and Spain; 1987—Switzerland; 1989—Austria; 1991—Sweden and Finland; 1993—Argentina, Hungary, and Iceland; 1994—Czech Republic, Poland, and Slovakia; 1995—Romania; 1996—South Korea; 2000—Cyprus and Turkey. A representative of the European Commission attends as an observer.

² Julian Perry Robinson, “The Australia Group: A Description and Assessment,” in Hans Günter Brauch, Henny J. van der Graaf, John Grin, and Wim Smit, eds., *Controlling Military Research and Development and Exports of Dual Use Technologies as a Problem of Disarmament and Arms Control Policy in the 1990s* (Amsterdam: VU University Press, and New York: St Martin’s Press, 1992), p. 160.

³ In addition to the Robinson chapter, see Amy Smithson, *Separating Fact From Fiction: The Australia Group and the Chemical Weapons Convention* (Washington, D.C.: Henry L. Stimson Center, Occasional Paper No. 34, March 1997).

- ⁴ The Australia Group website is at <www.australiagroup.net>.
- ⁵ K. Subrahmanyam, "Export Controls and the North-South Controversy," *Washington Quarterly*, vol. 16 (Spring 1993), p. 143.
- ⁶ Non-Aligned Movement, "The Final Document of the XIIth Summit of The Non-Aligned Movement, 2-3 September 1998, Durban, South Africa," as posted at <www.nam.gov.za>. Interestingly, since Cyprus began participating in the Australia Group in 2000, there is now one NAM member in the Australia Group.
- ⁷ India, "Chemical Trade and International Cooperation under the Chemical Weapons Convention," OPCW PrepCom document PC-XIII/B/WP.7*, February 23, 1996, p. 2.
- ⁸ Urs Ciplat, "The New Chemical Weapons Convention and Export Controls: Towards Greater Multilateralism?" *Michigan Journal of International Law*, vol. 21 (Spring 2000), p. 417.
- ⁹ Australia, "National Export Licensing Measures," OPCW PrepCom document PC-XIII/B/WP.9, March 26, 1996; Australia, "Non-paper: Chemical Weapons Convention (CWC) Industry Verification: Inspections of Schedule 3 and Discrete Organic Chemical (DOC) Facilities," OPCW CSP document C-IV/NAT.7, June 24, 1999.
- ¹⁰ Michael Bothe, Raija Hanski, Thomas Kurzidem, and Natalino Ronzitti, "National Implementation of the Australia Group Export Constraints and the National Preparation for the Implementation of the CWC: The cases of Germany, Italy and Finland," in Brauch, van der Graaf, Grin, and Smit, eds., *Controlling Military Research and Development and Exports of Dual Use Technologies as a Problem of Disarmament and Arms Control Policy in the 1990s*, p. 223.
- ¹¹ For more on the balances struck in the endgame of the CWC negotiations, see Hassan Mashhadi, "How the Negotiations Ended," *Chemical Weapons Convention Bulletin*, No. 17 (September 1992), pp. 1, 28-30.
- ¹² Ambassador Paul O'Sullivan, Australian permanent representative to the CD, "Statement Made on Behalf of the Australia Group," Document CD/1164, August 7, 1992.
- ¹³ Ambassador Prakash Shah, "The Chemical Weapons Convention: A Third-World Perspective," *Disarmament: A Periodic Review by the United Nations*, vol. XVI (1993), p. 94.
- ¹⁴ Y. Mosafer, "An Overview of the Iran Industry to Chemical Weapon Convention: Expectations and Consequences," presentation to the Regional Seminar on National Implementation of the Chemical Weapons Convention, Tehran, April 22-25, 1996, p. 9.
- ¹⁵ United States of America, "Export Controls and the Chemical Weapons Convention," OPCW CSP document, C-IV/NAT.2, April 29, 1999.
- ¹⁶ Draft Resolution Submitted by Islamic Republic of Iran, Cuba and Pakistan, "Fostering of International Cooperation for Peaceful Purposes in the Field of Chemical Activities," OPCW CSP document C-III/NAT.4, November 19, 1998.
- ¹⁷ José M. Bustani, "Opening Statement by the Director-General to the Conference of the States Parties at its Fifth Session," OPCW CSP document C-V/DG.11, May 15, 2000.
- ¹⁸ "Status of Submission of Initial Declarations and Notifications as of 11 May 2000," OPCW CSP document C-V/DG.8, May 12, 2000. This number includes only those States Parties that have notified the OPCW of their legislation, so it is possible that other States Parties have legislation but have failed to notify the OPCW.
- ¹⁹ "An Integrated Approach to National Implementing Legislation: Model Act Developed by the Secretariat of the Organisation of Eastern Caribbean States," OPCW Secretariat document S/190/2000, May 23, 2000.
- ²⁰ Timothy Williams, "U.S. Controls on Technology Transfer by Intangible Means," *The Monitor*, no. 6 (Summer 2000), p. 12.
- ²¹ Takuya Igarashi, "Lessons from Investigation into Discrepancies in Import and Export Data of Schedule 2 and 3 Chemicals", presentation to the First Annual Meeting of National Authorities and Chemical Industry Representatives, The Hague, 26-27 June 1999.
- ²² "Experiences in Implementing the Provisions of Parts VII and VIII and Section A of Part IX (VA) Within the Verification Regime for 'Other Chemical Production Facilities'," OPCW CSP document C-IV/DG.6, June 17, 1999.
- ²³ José M. Bustani, "Opening Statement by the Director-General to the Executive Council at its Twenty-second Session," December 5, 2000, as posted at <www.opcw.org>.
- ²⁴ Igarashi, "Lessons from Investigation into Discrepancies," p. 3.
- ²⁵ Author interviews in The Hague, January 17, 2000.
- ²⁶ Author interview with Mohammad Khodadadi, Deputy Permanent Representative of Iran to the OPCW, The Hague, January 19, 2000.
- ²⁷ Author interviews in The Hague, January 18, 2000.
- ²⁸ Ibid.
- ²⁹ José M. Bustani, "Opening Statement by the Director-General to the Executive Council at its Twenty-First Session," as posted at <www.opcw.org>, October 3, 2000.
- ³⁰ Ercan Saka, "The Role of Customs Services and the World Customs Organisation's (WCO) Enforcement Programme to Combat Illicit Movement of Prohibited Chemical Weapons," *Reader: International Symposium on Cooperation and Legal Assistance for the Effective Implementation of International Agreements* (The Hague: OPCW, 2001), p. 140.
- ³¹ U.S. Department of Defense, *Proliferation: Threat and Response* (January 2001), posted at <www.defenselink.mil>, pp. 76-77.
- ³² "Council Regulation (EC) No 1334/2000, dated 22 June 2000," *Official Journal of the European Communities* L 159, June 30, 2000, pp. 1-215.
- ³³ Michael P. Scharf, "Clear and Present Danger: Enforcing the International Ban on Biological and Chemical Weapons Through Sanctions, Use of Force, and Criminalization," *Michigan Journal of International Law*, vol. 20 (Spring 1999), pp. 477-521; Cecil Hunt, "The Potential Contribution of the Chemical Weapons Convention to Combating Terrorism," *Michigan Journal of International Law*, vol. 20 (Spring 1999), pp. 523-35.
- ³⁴ "Draft Convention on the Prevention and Punishment of the Crime of Developing, Producing, Acquiring, Stockpiling, Retaining, Transferring or Using Biological or Chemical Weapons," *CBW Conventions Bulletin*, No. 42 (December 1998), pp. 2-5.
- ³⁵ Richard Cupitt, presentation on "The Future of Export Controls" at the 2000 Carnegie Nonproliferation Conference, March 16-17, 2000, proceedings as posted at <www.ceip.org>.
- ³⁶ Brad Roberts, "Rethinking Export Controls on Dual-Use Materials and Technologies: From Trade Restraints to Trade Enablers," *The Arena*, No. 2 (June 1995), p. 3.
- ³⁷ Ibid., p. 4.

Scientific and Technical Developments and the CWC

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THE CHEMICAL WEAPONS Convention (CWC) was drafted with the recognition that it is impossible to envision every way in which toxic chemicals might be used for aggressive purposes. As terrorist organizations and “rogue states” replace the major powers as the most likely candidates to employ chemical weapons, the agents of choice may differ from those developed for battlefield use.¹ Twenty-first century chemical warfare may target civilians or agricultural production, and clandestine production facilities may manufacture toxic agents from chemical precursors not monitored under the CWC control regime.

Recent economic trends in the chemical industry have complicated the problem of controlling illicit chemical weapons production. Globalization has dispersed the means of production, particularly of pesticides, spreading the capability to make toxic chemicals. Expansion of free-trade policies has also made controlling transfers of chemical precursors more difficult for the Organization for the Prohibition of Chemical Weapons (OPCW). Finally, scientific and technical trends in the global chemical industry will have a significant impact on CWC implementation.

The chemical industry has undergone a dramatic transformation over the past 20 years and the pace of change appears to be accelerating. One major trend is an increased emphasis on the production of chemicals that have desirable biological effects, such as pharmaceuticals, crop protection chemicals, flavors, and fragrances.² The methods developed for the discovery and production of these useful products are equally applicable to finding and making chemical warfare agents. Moreover, the diffusion of these technologies is such that the OPCW alone cannot ensure effective control.

The following sections examine the effects on CWC implementation of changing industrial

technologies, including ongoing developments in chemical process technology, dual-use industrial chemicals, and rapid methods for discovering biologically active chemicals. Also considered is how commercial technologies could be misused for the development of novel chemical weapons, and how such abuses might be detected and monitored.

Dual-Use Industrial Chemicals

Many industrial chemicals are so toxic that they could be used either in conventional warfare or for terrorist attacks against civilians. In fact, two chemicals employed as warfare agents in World War I, chlorine and phosgene, are now consumed in large volumes by the chemical industry. Another highly toxic industrial chemical is methyl isocyanate (MIC), a volatile liquid that is widely used for producing carbamate-type insecticides. The extreme toxicity of MIC was demonstrated in 1984, when several tons were released accidentally from a manufacturing facility in the Indian city of Bhopal, killing more than 2,500 people and causing 100,000 injuries requiring medical treatment.³

MIC is relatively simple to produce. Although the major military powers probably considered and rejected it as a potential chemical warfare agent, it may still be attractive to other nations that wish to acquire mass-casualty weapons. Although the conventional production process for MIC is based on phosgene, which is controlled under the CWC, quantities of MIC sufficient for military or terrorist use might be diverted from a plant in which the chemical is made and consumed as an intermediate in pesticide production.

MIC is one of several widely used but highly toxic industrial chemicals whose production is globally distributed. Preventing the diversion of such materials for prohibited purposes poses a major challenge

to the long-term effectiveness of the CWC. Tariff constraints and the economic incentive policies of developing countries such as India have encouraged chemical companies to locate production facilities throughout the world. From the standpoint of the Convention, the effect has been to increase the number of sites that must be monitored to prevent the diversion of lethal industrial chemicals for prohibited purposes. The large and growing number of chemical industry sites, and their location in countries lacking competent regulatory authorities, have increased the difficulty of international control.

New Production Technologies

Changes in process chemistry intended to improve safety and efficiency in chemical plants could make it easier to circumvent controls on the production of warfare agents. For example, MIC is usually made by reacting phosgene (a Schedule 3 chemical) with monomethylamine, a high-volume industrial chemical. Thus, strengthening controls on the production and use of phosgene might help to monitor major diversions of MIC for prohibited purposes. For safety reasons, however, at least one commercial facility avoids the use of phosgene and instead produces MIC by a reaction involving N-methylformamide (NMF), a common industrial solvent.⁴ Because NMF is widely available, the use of this process to produce MIC for chemical warfare purposes would be difficult to monitor.

Since 1980, one of the most significant developments in industrial chemistry has been the increasing use of computers to control manufacturing processes.⁵ Automated control has become the rule for large chemical plants because it permits production under the most efficient reaction conditions and enhances safety for the plant operators by reducing the need for manual intervention to operate chemical process equipment. Automation also lowers the risks to public health and the environment from possible chemical releases.

In the context of producing chemical weapons, however, automated control offers similar advantages. It minimizes operator exposure and limits the release into the atmosphere of toxic vapors that might be detected by sensitive monitoring equipment. Nevertheless, restricting access to automated control systems does not offer a practical means of

controlling CW proliferation because the equipment, software, and know-how are so widely available.

For the clandestine production of toxic chemicals on a scale that might be useful to a terrorist organization, automated control combined with “reactor on a chip” technology offers a new means of production that might be relatively easy to conceal.⁶ Micromachining techniques developed for the electronics industry make possible the construction of intricately patterned microreactors the size of a computer chip. Such reactors, combined with highly reliable chemical pumps developed for chromatographic analyses, have the potential to operate under automated control for days or weeks with little human intervention. Despite its small size, a microreactor with a throughput of two grams per minute could produce a ton of material per year. Many microreactors could be operated in parallel to afford greater throughput. Such devices would require only a small, ventilated enclosure and might even be disguised as a piece of research laboratory equipment.

The advantages of microreactors for safe and efficient production of toxic and explosive chemicals have been demonstrated in industrial laboratories. DuPont engineers working in collaboration with the Massachusetts Institute of Technology have employed microreactors to produce MIC, phosgene, and hydrogen cyanide.⁷ Microreactors are well suited to certain strategies for synthesizing chemical warfare agents. For example, some recipes for VX nerve agent defer producing the highly toxic material until the final step. In such schemes, the sequential conversions of commercial chemicals into the immediate precursor for VX can be carried out in conventional multipurpose reactors commonly used for manufacturing pesticides. The final step, converting the modestly toxic precursor into the lethal agent, simply requires heating under controlled conditions. Such reactions would be easily adaptable to microreactor operation in a remote location or a clandestine laboratory.

Combinatorial Chemistry

New computer-based techniques have accelerated the process of discovering biologically active chemicals for the pharmaceutical and agrochemical

industries. A method known as “combinatorial chemistry” makes it possible to synthesize large “libraries” of chemical compounds that can then be evaluated for useful properties.⁸ In general, this process involves mixing reactive chemicals in multiple combinations to generate hundreds or thousands of compounds, some familiar and others new.

Although this approach would be extremely time-consuming and labor-intensive with traditional synthetic methods, automated reactors can carry out numerous syntheses in parallel. Commercially available systems operate with little human intervention once the control computer has been programmed and the reagents placed in dispensers. The system automatically feeds precise amounts of reactants, catalysts, and solvents into dozens of tiny reaction vessels, and mixes and heats them according to a programmed routine. When the reactions are complete, the products are either isolated in relatively pure form or kept in solution for analysis and evaluation.

The high productivity of automated synthesis requires an equally rapid method for screening the large numbers of compounds generated by combinatorial chemistry for useful biological properties. Traditional screening methods involve the manual dosing of a laboratory animal, plant, or bacterial culture with a given chemical and observing the effect of exposure over a period of time. Because this process is highly inefficient if one seeks to test thousands of chemical compounds, clever procedures have been devised to automate the process. Initial screening methods observe a chemical’s effect on a cell culture or enzyme solution that serves as a surrogate for a living plant or laboratory animal. Using a large array of tiny reaction chambers containing the target cells or enzymes, each chamber is dosed with one of the chemicals to be tested. After a period of time, the reaction chambers are scanned photometrically to measure the biological effects of the chemicals. Those compounds that produce the desired effect in the surrogate system are then tested in the intact organism.

Although combinatorial chemistry and rapid-screening technologies are relatively new, some

The methods developed for the discovery and production of useful products are equally applicable to finding and making chemical warfare agents.

promising drug candidates and agrochemicals have already been developed by these methods.⁹ From the CW nonproliferation viewpoint, the new drug-discovery methods are of concern because they could also be used to develop lethal chemicals for military or terrorist purposes. For example, the physiological target for nerve agents in the human body is cholinesterase, an enzyme that breaks down the messenger molecule acetyl-

choline, which transmits signals between nerve cells. By binding tightly to the catalytic site of cholinesterase and blocking its function, nerve agents disrupt normal nerve transmission, resulting in seizures and death by respiratory paralysis. To develop an “improved” nerve agent, one could screen for compounds that bind tightly to cholinesterase and then test them in tissue culture and in laboratory animals.

By means of combinatorial chemistry and molecular modeling, it might be possible to develop a new compound that combines high toxicity with physiochemical properties that are better suited for effective delivery, such as a nerve agent that is in the form of a gas rather than a liquid for easier dispersal. Other characteristics of novel CW agents that might be pursued include the ability to penetrate the skin or protective garments, or modes of action that defeat conventional antidotes or that incapacitate rather than kill.

Proliferators might also seek to discover entirely new types of chemical warfare agents that could be produced surreptitiously. One example might be a family of nerve agents that operates through a different physiological mechanism than that of classical organophosphorus compounds such as sarin, soman, and VX. Phosphite esters, which are used commercially to make catalysts for the chemical industry, are generally only modestly toxic, but a few have a toxicity comparable to sarin.¹⁰ Studies sponsored by the U.S. and Russian militaries determined that these exceptional compounds operate by a different physiological mechanism, namely by blocking the receptors for a brain chemical known as gamma-aminobutyric acid (GABA).¹¹ Antidotes to classical nerve agents are ineffective against phosphite-type agents. Even more troubling, some

compounds of this class are easily made from common chemicals not covered by the CWC monitoring system. Fortunately, the physiochemical properties of phosphite-type agents may make them unattractive for military use.

The phosphite example shows a limitation of some of the new high-throughput screening techniques for developing new chemical warfare agents. Lethal phosphites would have shown low or modest activity in a test based on cholinesterase inhibition. Only whole-animal testing would have detected lethality based on a previously unrecognized mode of action, such as GABA receptor inhibition. Once the new mode of action had been recognized, however, enzyme or cell-based screening could greatly accelerate the selection of toxic agents with militarily useful properties. Such a development process could be carried out in hundreds of industrial or academic laboratories around the world.

Novel Toxins and Delivery Methods

Some naturally occurring protein toxins such as ricin, which is listed on CWC Schedule 1A, are among the most toxic chemicals known. Despite their inherent toxicity, proteins and peptides (short protein chains) have not been attractive as CW agents because they are difficult to introduce into the body. Protein toxins are not absorbed through the skin and most—with the exception of ricin—are destroyed in the digestive tract. Because of the remarkable potency of many peptides as hormones and drugs, however, pharmaceutical scientists have worked intensively to develop new ways to deliver them.¹²

One approach is to design peptides that can be absorbed through the nasal or bronchial tissues, making it possible to administer them by inhalation. Although developed for medical applications, this method could be adapted for military use. Another approach is to design “pseudo-peptides” made from unnatural amino acids that are not broken down by stomach enzymes and hence can be administered orally. Again, a similar methodology to that used for drug development could be applied to making new chemical warfare agents.

Toxins based on peptides or pseudo-peptides may be particularly adaptable for nonlethal weapons designed to disable a target population without kill-

ing them. Possible examples include disruptions of sensory control mechanisms to cause acute vertigo or temporary blindness. Until recently, the production of polypeptides or their analogs was a laborious process that was usually performed in a laboratory on a milligram scale. Now, commercially available peptide synthesizers are capable of producing gram quantities.¹³ Although this technology is probably too sophisticated for terrorist groups, it might be attractive to developed countries wishing to maintain a clandestine chemical warfare capability.

Monitoring Technologies

Despite the dark side of the new chemical production technologies, the prognosis for controlling CW proliferation is not altogether bleak. Although technology may facilitate the efforts of those seeking to produce chemical weapons surreptitiously, advances in analytical chemistry and data analysis can help to detect such activity. New super-sensitive monitoring techniques may help arms inspectors to ferret out the presence of chemical warfare agents or precursors, and even to spot illicit activity by remotely analyzing trace amounts of chemicals leaking from suspected CW facilities.

Chemical analysis techniques for chemical pollutants, such as dioxins in the atmosphere, are now routinely sensitive to the part per billion (ppb) level, and sometimes to parts per trillion.¹⁴ Great strides have also been made in detecting minute concentrations of pollutants in soil and water. Ideally, one would like to monitor the waste stream discharged from a suspected chemical weapons production facility for chemicals that might indicate a CWC violation, but it is extremely difficult to detect individual chemicals with high sensitivity in complex mixtures of similar materials. For example, detecting VX at the ppb level when mixed with its decomposition products has been a major challenge for the U.S. Army’s chemical weapons disposal program.¹⁵ Nevertheless, solutions to this problem are gradually emerging through advances in chromatography and mass spectrometry.

A promising new technology for monitoring specific chemicals is the “artificial nose” or “sniffer,” which can detect minute amounts of a chemical vapor in the air in much the same way that the human nose identifies a scent. Sophisticated devices

of this sort are being considered to complement the thermal neutron analysis units currently used by airports to detect the presence of bulk explosives in luggage.¹⁶ One “sniffer” is being commercialized by Cyrano Sciences, based on research done at the California Institute of Technology.¹⁷ It utilizes specific responses of polymer membranes to chemical vapors to determine the “smell print” characteristic of a particular compound.

Another approach to detection exposes a test plate bearing an array of chemicals to a vapor or solution. Different classes of chemicals in the array undergo characteristic color changes, which can then be scanned visually or photometrically.¹⁸ Although current arrays lack the desired level of sensitivity or specificity, future generations of such devices may play a useful role in uncovering evidence of CW production. In addition, new luminescent probes immobilized in polymers provide rapid, convenient sensors for detecting organophosphorus nerve agents in water, organic solution, or in the vapor phase.¹⁹ These sensors may be adaptable to field surveys for covert CW production activity.

Organizational Responses

The problem of chemical weapons acquisition by small, sub-national groups shares some characteristics with the diversion of explosives for terrorist use, illegal drug trafficking, and money laundering.²⁰ Accordingly, it may be desirable to adapt techniques now used or contemplated for combating these other problems.

For example, by analogy with the tagging of explosives, companies might be required to incorporate chemical labels in dual-use compounds sold on the open market so as to identify their origin if they are used for prohibited purposes. Labeling CW precursors with carbon-13—a stable, non-radioactive isotope—may be economically feasible because these chemicals are generally produced in small quantities for legitimate purposes. As with on-site inspections, chemical companies may tolerate the cost and trouble of tagging precursors if the results serve their interests.

Proliferators might seek to discover entirely new types of chemical warfare agents that could be produced surreptitiously.

Another potential strategy is to monitor the sales and transfers of dual-use chemicals to detect suspicious activity. Although this approach is already contemplated in the CWC, the deeper involvement of private industry would be needed for it to be effective. Chemical companies and industry trade groups are devoting more attention to knowing their customers and hence are in a

better position to detect unusual or excessive transfers of sensitive chemicals.²¹ The recent development of Internet business-to-business (B2B) trading organizations provides another opportunity to detect questionable sales and transfers. Since many B2B transactions are carried out through centralized, semi-automated marketing tools, it should be possible to develop software programs to spot unusual activity with regard to dual-use chemicals.²²

Although chemical companies are generally reluctant to monitor customers’ use of their products, they currently do so in certain instances. For example, the DuPont Company attempts to limit the sale of its polymers for use in medical implants. This policy arose after DuPont was found liable for post-operative medical problems, even when surgeons and medical suppliers used the company’s products unwisely or for unapproved applications. Similar liability considerations may lead chemical companies to monitor sales and transfers of potential chemical weapons materials. Moreover, despite industry’s distaste for end-use monitoring, companies could be required to assume this role if small-scale proliferation to sub-state actors becomes a serious concern.²³ Industrial trade associations such as the American Chemistry Council could be enlisted to devise nonproliferation schemes that are practical and acceptable to their members.²⁴

Scientific societies such as the American Chemical Society (ACS) and the American Institute of Chemists (AIC) have generally played a minor role in the promotion of chemical nonproliferation activities. In the past, ACS and AIC reflected the views of their members, some of whom helped to develop chemical weapons during the first and second World Wars.²⁵ Now, however, most American chemists strongly support chemical disarmament and nonproliferation. The ACS, as the world’s larg-

est scientific society, could play a significant role in providing technical advice in efforts to control proliferation. Another advantage of enlisting ACS and AIC is that a majority of their members have industry backgrounds that are directly relevant to CWC compliance monitoring.

The National Research Council (NRC) of the U.S. National Academies of Science has published several highly influential studies on chemical weapons destruction.²⁶ The NRC could recruit American experts to study the nonproliferation challenges posed by new chemical technologies and recommend creative solutions. In addition, a new organization, the Inter-Academy Council, has been established to serve as a liaison among the Academies of Science of 15 countries to provide advice on scientific issues with worldwide implications.²⁷ This body would command both the expertise and the international influence to address chemical nonproliferation issues.

NOTES

- ¹ Julian P. Perry Robinson, "Old Wars, New Wars: Chemical Weapons Toward Disarmament," paper delivered to workshop on *Perspectives Toward the Chemical Weapons Convention's Fourth Year*, Forum on the Problems of Peace and War, Firenze, Italy, December 4, 2000.
- ² George W. Parshall, *Homogeneous Catalysis* (New York, John Wiley and Sons, 2nd edition, 1992), p. 4.
- ³ Organization for the Prohibition of Chemical Weapons (OPCW), "Chemical Accidents," <www.opcw.nl/chemhaz/chemacci.htm>, modified December 3, 1997.
- ⁴ Velliur N. M. Rao and G. E. Heinsohn, "Multistage Process with Adiabatic Reactors for the Preparation of Isocyanates", U. S. Patent 4,537,726 (1985) assigned to E. I. du Pont de Nemours and Co.
- ⁵ Chadwick A. Tolman and G. W. Parshall, "Fifty-Year Trends in the Chemical Industry," *J. Chemical Education*, vol. 76 (February 1999), pp. 177–189.
- ⁶ Nicholas P. Chohey with G. Ondrey and G. Parkinson, "Microreactors Find New Niches," *Chemical Engineering* (March 1997), pp. 30–33.
- ⁷ Jan Lerou, cited in Chohey, "Microreactors Find New Niches," p. 31.
- ⁸ Elizabeth K. Wilson, "Computers Customize Combinatorial Libraries," *Chemical and Engineering News* (April 27, 1998), pp. 31–37.

- ⁹ Stu Borman, "Reducing Time to Drug Discovery," *Chemical and Engineering News* (March 8, 1999), p. 34.
- ¹⁰ John F. Casida, M. Eto, A. D. Mosconi, D. S. Milbrath, and J. G. Verkade, "Structure-Toxicity Relations of 2, 6, 7-trioxabicyclo[2.2.2]octanes and Related Compounds," *Toxicology and Applied Pharmacology*, vol. 36 (1976), pp. 261–279.
- ¹¹ Author telephone conversation with John G. Verkade, professor, Iowa State University, Ames, Iowa, November 11, 2000.
- ¹² Karen J. Watkins, "Peptides: A Boom in the Making," *Chemical and Engineering News* (January 8, 2001), pp. 11–15.
- ¹³ *Ibid.*, p. 12.
- ¹⁴ Robert W. Shaw and M. J. Cullinane, "Military Toxic Materials, Destruction of," in Robert A. Meyers, ed., *Encyclopedia of Environmental Analysis and Remediation* (New York: John Wiley and Sons, 1998), pp. 2821–2836, esp. pp. 2826–2827.
- ¹⁵ U. S. Army Program Manager for Chemical Demilitarization, *Low Level VX Expert Panel Report*, Science Applications International Corp., Report No. 04-010-002, May 2000.
- ¹⁶ Lyle Malotky and S. Hyland, "Preventing Aircraft Bombings," *The Bridge*, vol. 28 (Fall 1998), pp. 9–13.
- ¹⁷ Maureen Rouhi, "Electronic Nose, Electronic Tongue," *Chemical and Engineering News* (April 3, 2000), p. 59.
- ¹⁸ Kenneth S. Suslick and N. A. Rakow, "A Colorimetric Sensor Array for Odour Visualization," *Nature*, vol. 406 (August 17, 2000), pp. 710–713.
- ¹⁹ Amanda L. Jenkins, O. M. Uy, and G. M. Murray, "Polymer-Based Luminescent Sensor for Detection of the Hydrolysis Product of the Nerve Agent Soman in Water," *Analytical Chemistry*, vol. 71 (1999), pp. 373–378; Kelly A. van Houten, D. C. Heath, and R. S. Pilato, "Rapid Luminescent Detection of Phosphate Esters in Solution and the Gas Phase . . ." *Journal of the American Chemical Society*, vol. 120 (1998), pp. 12359–12360.
- ²⁰ National Research Council, *Commercial Aviation Security: Integrating People and Equipment to Improve Threat Detection* (Washington, DC: National Academy Press, 2001), in press.
- ²¹ James M. Tour, "Do-It-Yourself Chemical Weapons," *Chemical and Engineering News* (July 10, 2000), pp. 42–45.
- ²² Ann Thayer, "OneChem Launches Application Services," *Chemical and Engineering News* (June 19, 2000), p. 13.
- ²³ Tour, "Do-It-Yourself Chemical Weapons."
- ²⁴ Lois Ember, "Industry Told How to Comply with Chemical Weapons Treaty," *Chemical and Engineering News* (January 10, 2000), p. 7.
- ²⁵ Benjamin Kagan, "Chemical Warfare Research and Development: Ethical?" *The Chemist*, vol. 74 (July/August 1997), p. 18.
- ²⁶ National Research Council, *Review and Evaluation of Alternative Technologies for Demilitarization of Assembled Chemical Weapons* (Washington, DC: National Academy Press, 1999) and reports cited therein.
- ²⁷ National Academy of Sciences, "The Inter-Academy Council," <<http://www4.nationalacademies.org/oia/iap/iaphome.nsf/global/INTERACADEMY+COUNCIL>>.

Issues for the First CWC Review Conference

MICHAEL L. MOODIE

AS REQUIRED BY Article VIII of the Chemical Weapons Convention (CWC), the States Parties will hold a Review Conference in May 2003 to examine the operation of the treaty, including relevant scientific and technological developments. Planning for this meeting has only just begun in the capitals of member-states and at the OPCW Technical Secretariat in The Hague. Whether the Review Conference advances the overall goals of the CWC will depend on the level of political commitment by the States Parties to the goal of permanently eliminating chemical weapons from the planet.

The idea of convening a Review Conference after the fifth anniversary of the CWC's entry into force, and at subsequent five-year intervals, was not universally supported when it was proposed during the endgame of the treaty negotiations in Geneva. This idea was adopted from the nuclear Non-Proliferation Treaty (NPT) and the Biological Weapons Convention (BWC), both of which have five-year review mechanisms. Questions were raised, however, as to whether such reviews of the CWC were worthwhile or even necessary. In contrast to the NPT and the BWC, the CWC text that was nearing completion already incorporated procedures for frequent review during annual sessions of the Conference of the States Parties, the principal organ of the OPCW, and regular meetings of the Executive Council, the executive body charged with promoting effective implementation of the CWC.

Despite this hesitation, the proposal to include a special review mechanism was included in the final agreed text of the Convention. In light of the actual practice of the OPCW during its first four years, the decision was a good one. For both the member-states of the CWC and the broader international community concerned about the future of the treaty,

the 2003 Review Conference will be an important exercise. For it to be a success, however, the States Parties must prepare adequately and recognize that the meeting calls for something other than business as usual.

A Political Perspective

There are three reasons for casting the Review Conference as a special exercise for both States Parties and the OPCW Technical Secretariat. First, the conference provides an opportunity to take a broader, more political perspective on CWC implementation. Although detailed and complex issues relating to specific provisions of the Convention will certainly be raised, the Review Conference should not replicate the work of either the Conference of the States Parties or the Executive Council. Instead, it provides an opportunity to "look at the big picture." Ultimately, CWC implementation is not a mechanistic operation for its own sake but a means to the end of eliminating chemical weapons, which is, at its heart, an international political challenge. The Review Conference should adopt this political perspective and not get bogged down in procedural or technical details.

Second, the importance of the Review Conference should not be underestimated in terms of what it will mean for people's judgments about the effectiveness of the CWC. Some observers have expressed concern about a growing gap between the intent of the negotiators who crafted the Convention and the actions of those in capitals and at the OPCW with the responsibility for implementing it. The latter have been accused of "excessive opacity" and "unnecessary limitations on verification activities" that were not envisioned by the drafters of the treaty.¹

If the Review Conference proceeds without acknowledging the gap between the intent of the negotiators and the practice of implementation, and without doing anything to close that gap, the implications could be profound. Such an outcome would have a negative impact not only on the CWC but on other arms control and nonproliferation agreements. Despite efforts to stress that the Convention is not a panacea for chemical weapons proliferation, national ratification debates aroused high expectations, particularly in the United States. If implementation efforts do not meet those expectations, critics of the CWC will contend that they were right all along and that the treaty was oversold.

Third, the Review Conference is of particular importance because it can adopt a focus that the Conference of the States Parties and the Executive Council have not been in a position to take. Participants in the 2003 meeting should not simply review the accomplishments of the first five years, such as the numbers of inspections carried out. Although such statistics are useful indicators of activity, those who cite them must then answer the question: "What does all this activity add up to?" The key question for the participants at the Review Conference is whether or not the CWC is advancing the fight against the spread of chemical weapons. At present, not everyone would answer that question unreservedly in the affirmative. If, during the Review Conference, the overall effectiveness of the regime is not foremost in the participants' minds, then the conclusions they reach and the actions they recommend will be of only limited importance.

Finally, the Review Conference should not be seen as an opportunity to amend the CWC. Certainly, not everyone was happy with all the provisions of the final treaty text agreed by the Conference on Disarmament in September 1992. Disaffected States Parties may wish to change the provisions they dislike and may see the Review Conference as an opportunity to do so, but that is not what the meeting is intended to accomplish. Rather, the goal of the Review Conference is to consider the treaty's implementation to date and to identify ways of improving it. Any proposed changes should focus on the procedures to operationalize the CWC and how best to strengthen them. If the Review Conference concludes that amendments are needed, it can recommend holding a separate

conference for that purpose, but the review and amendment functions must be kept distinct.

Issues for the Review Conference

Given that the Review Conference should focus on an agenda that is political in nature and compliance-oriented, what are the major issues that participants in the meeting are likely to address?

Chemical Weapons Destruction

The first challenge in eliminating the scourge of chemical weapons is to destroy those weapons that already exist. The two largest CW stockpiles have been declared by the United States and Russia. Although the destruction process in the United States is proceeding reasonably well, its counterpart in Russia is in trouble. It is doubtful in the extreme that Russia will meet the timetable specified in the CWC, even if it is granted a one-time, five-year extension that would give Moscow until 2012 to complete destruction (see Chapter 5).

This predicament is first and foremost a problem for the Russians themselves. Moscow is clearly committed to making progress, and recent reports indicate that the Russian government has increased funding to support its chemical weapons destruction efforts to \$122.6 million in 2001, a six-fold increase over the previous year.² Given that the total bill for Russia's CW destruction is estimated to be at least \$6 billion to \$7 billion, however, even sustained funding at the proposed annual level over the next decade would not suffice.³

Russian government officials sometimes seem to imply that the responsibility and financial burden for Russian CW destruction rests more with foreign governments than with their own.⁴ Although it is true that the Russian government cannot be held fully accountable for the decisions of its Soviet predecessor, Moscow voluntarily assumed the obligations and deadlines spelled out in the CWC. It is also true that other countries have an interest in the destruction of the Russian CW stockpile and should therefore provide more assistance. The United States, for example, should restore the funding it had committed for construction of a nerve agent destruction facility at Shchuchye. The Europeans and the Japanese can and should do more. But most of all, the Russians must show that they are making

the CW destruction issue a higher priority. By demonstrating their commitment, they can create a political environment that encourages other countries to provide assistance.

Meetings of U.S., European, and Japanese representatives with Russian officials in advance of the First Review Conference could provide an opportunity for progress on this issue. These preparatory efforts could lay the groundwork for a decision at the Conference itself to take extraordinary measures, both by Russia and other States Parties, to come to grips with one of the most serious challenges to effective implementation of the CWC.

U.S. Unilateral Exemptions

Moscow is not likely to be the only target of criticism during the Review Conference. Washington will come in for its share of censure as well, particularly for the three unilateral exemptions included in its domestic CWC legislation (see Chapter 4). Many people deem these U.S. provisions to be serious impediments to effective implementation of the Convention, both because they violate the spirit, if not the letter, of the treaty and because they have set bad precedents that other countries have begun to emulate. Even if the United States never invokes these provisions but another government does, Washington would be in a weak position to criticize. More broadly, the unilateral nature of the exemptions has had a negative impact on international perceptions of the United States, including its approach to treaty compliance, its support for multilateral diplomacy, and its commitment to the objectives of the CWC.

The U.S. government must decide how to address the criticisms it is certain to receive at the Review Conference. One course would be for administration officials to claim that there is little they can do about the exemptions because they were imposed by Congress, which in its current political configuration is unlikely to agree to changes. Yet this approach would heighten the perception among other countries that regardless of the administration in power, the United States applies a double standard and is unwilling to accept obligations to which it expects others to adhere.

The key question for the participants at the Review Conference is whether or not the CWC is advancing the fight against the spread of chemical weapons.

A better course would be for the United States to acknowledge the serious problems that the exemptions have created for CWC implementation and to indicate the intention do something tangible to address them. Prior to the Review Conference, Washington will need to assess the impact of the three exemptions on CWC implementation, including their effects on the general political environment. This assessment would then provide a context for judging whether the potential benefits of retaining the exemptions outweigh the costs. Although it is unlikely that all three exemptions can be removed from the U.S. implementing legislation, the administration may be able to make progress toward eliminating or mitigating at least some of them.

On-Site Inspections

On-site inspections constitute a major element of CWC implementation. For this reason, a number of issues related to inspections are certain to attract considerable discussion at the Review Conference. One set of issues relates to the conduct of inspections at industrial facilities, where States Parties have begun to employ a number of practices that clearly diverge from the intentions of the CWC negotiators. According to one assessment, “access to plant sites, facility records, etc., is currently being discussed by States Parties, not with an eye to ensuring as transparent an inspection process as is consistent with the confidentiality provisions of the Convention, but with a view to limiting the ability of OPCW inspectors to obtain information which they need to accomplish the aims of the inspection mandate.”⁵ The practice of requiring inspectors to provide copies of pages in their notebooks to the inspected State Party is often cited as an example of a measure that runs directly counter to the principle of inviolability of inspection records that the CWC negotiators intended when drafting Part II of the Verification Annex.⁶

Another example of a case in which the implementation practice is more restrictive than the negotiators intended concerns inspections at industrial plants that produce, process, or consume Schedule 2 chemicals. In this case, some States

Parties have narrowly defined the perimeter of the Plant Site and restricted inspector access to such an extent that the inspectors say they have been unable to satisfy their mandate to verify the absence of chemical warfare agents (Schedule 1 chemicals). Not everyone agrees with this assessment. Industry representatives agree that verifying the absence of Schedule 1 chemicals is a key inspection objective, but they contend that inspectors cannot use it as justification for seeing everything at a facility or for entering any site, declared or undeclared (see Chapter 6). Obviously, these differing interpretations must be resolved, but other countries appear to be following the U.S. lead by imposing restrictions on inspections. If these questionable practices become widespread before they can be addressed, confidence in the effectiveness of inspections will diminish.

Another inspection-related issue is the appropriate method of selection and the nature of inspections at industry facilities that produce unscheduled discrete organic chemicals (UDOCs). On this issue as well, conflicting views favor more limited or more intrusive inspections. Because this issue is fairly urgent and is considered a technical matter, the Executive Council or the Conference of the States Parties should address it prior to the 2003 Review Conference. Whether these efforts can resolve the issue satisfactorily, or whether it should be raised to the political level at the Review Conference, will depend on how “dug in” the contending positions become.

A third inspection-related set of issues that could come before the Review Conference pertains to challenge inspections, which are in many ways the most important implementation tool in the CWC. To date, the provisions related to challenge inspections have never been invoked, although suspicions have been raised that some States Parties are in substantive violation of the CWC. The United States, for example, claims publicly that Iran continues to produce chemical weapons in violation of its treaty commitment, yet Washington has never followed up these allegations by requesting a challenge inspection in Iran (see Chapter 3).

If the challenge inspection provisions remain unused until the Review Conference, the meeting should address the implications of that situation. It must be recognized that the longer such measures are not employed, the more difficult it will become

to do so. As a result, States Parties could lose a critical tool for promoting the fundamental goals of the CWC.

Another aspect of challenge inspections that may come before the Review Conference relates to the attempt by some States Parties to re-write (through reinterpretation) the provisions relating to the launching of such inspections. The treaty makes clear that one State Party can request a challenge inspection in another State Party at any time; the inspection will proceed unless a three-quarters majority of the Executive Council votes within 12 hours to stop it. In recent discussion, however, some countries have argued that a State Party can request a challenge inspection only after all other consultation procedures specified in the CWC have been exhausted. In fact, the treaty does provide for alternative methods to resolve compliance questions. But the treaty language is clear—as was the intent of the negotiators—that these methods are alternatives to, not prerequisites for, challenge inspections. Reinterpreting the CWC provisions to impose such restrictions on challenge inspections would be another way of eliminating a key tool for bolstering confidence that all States Parties are complying with their treaty obligations.

Scientific Advances

An important issue that is certain to be raised at the Review Conference is the adaptability of the CWC in the face of advances in chemical science and technology. Certain areas of chemistry and biology relevant to the Convention are changing rapidly and will continue to do so (see Chapter 8). Participants in the Review Conference will have to ask themselves how the treaty can meet its fundamental goals in the face of such change.

The area of toxins is an important example. Advanced biotechnology can create novel toxins that have scientific or medical applications but can also be misused as weapons.⁷ Even if such advanced toxins are not specifically mentioned in the treaty-defined schedules of chemicals, they are, nevertheless, still banned by the treaty under the General Purpose Criterion. During the mid-1990s, it was alleged that Russia was working on novel chemical agents using precursors that were not listed on the CWC's schedules, and some analysts worried that

such compounds were not covered by the basic prohibitions of the treaty. That suggestion was wrong, again because of the General Purpose Criterion.

Nevertheless, the Review Conference will have to say something about how the treaty will face the challenge of scientific and technological innovations. In similar reviews of the Biological Weapons Convention, individual State Parties have contributed background papers addressing the implications for the BWC of rapid advances in the biological sciences. States Parties should prepare similar papers for the CWC Review Conference covering chemistry and other sciences relevant to the Convention. In addition, the CWC established a Scientific Advisory Board (SAB) to provide expert advice on scientific and technical issues to the OPCW Director-General, the Technical Secretariat, and the States Parties. The SAB could make an important contribution by assessing the critical areas of scientific advance that warrant attention, not only by the Review Conference but on a more sustained basis by those responsible for CWC implementation.

Information Transparency

The Review Conference is likely to consider how information related to fundamental implementation measures such as declarations and inspections is handled within the OPCW, and when and how it is made available to States Parties. Although the OPCW conducts verification activities on behalf of and for the benefit of member-states, the data that it collects and keeps on file are not necessarily accessible to individual States Parties. As OPCW Director-General Bustani has observed, “[S]tates which traditionally favor a high degree of transparency and verifiability may find that their reliance on an international agency for the collection of data, when combined with limitations with respect to access to that data, may make multilateral verification less attractive than they had originally thought, in particular when they are themselves expected to accept a high degree of intrusion.”⁸ The problem is that if States Parties do not receive adequate information about implementation activities, they have little basis for judging the performance of the OPCW and how well it is serving the CWC’s fundamental goals.

The negotiators of the Convention sought to achieve a reasonable balance between information transparency, on the one hand, and protecting proprietary and national security information unrelated to the treaty, on the other. According to Tom Inch, chairman of the Advisory Committee to the UK National Authority, the OPCW is guilty of tilting this balance by giving precedence to protecting confidential information over transparency concerns. “Because of confidentiality issues,” he writes, “it is difficult for the UK Advisory Committee to know how clear and comprehensible States Parties’ declarations are. . . . Another and perhaps more important example is the fact that it is very difficult to assess the effectiveness of inspection procedures.”⁹ Inch argues that many confidentiality issues are more imaginary than real, and that greater transparency is needed to build the necessary confidence in CWC implementation. This issue relates closely to the central challenge that should be the focus of the Review Conference: building confidence that the fight to eliminate chemical weapons is moving forward.

International Cooperation and Assistance

The Review Conference is certain to consider the CWC’s provisions on assistance and cooperation. Questions likely to be raised include the nature and extent of the voluntary commitments by States Parties to provide defensive equipment and other forms of assistance to member-states attacked or threatened with chemical weapons. During the first four years of CWC implementation, States Parties and the OPCW have tended to view assistance issues as secondary to operational matters such as declarations and inspections. Because the assistance provisions of the CWC have important political implications, however, they should not be ignored. The Review Conference will provide a good opportunity for States Parties to demonstrate interest in making tangible progress in this area.

The issue of international cooperation is likely to receive considerable attention for political reasons, with the debate likely to focus on the future of chemical export controls (see Chapter 7). A particular target will be the Australia Group, an informal mechanism used by like-minded nations to harmonize their national export controls on dual-use chemicals and production equipment. Some

CWC States Parties, particularly leading members of the Non-Aligned Movement (NAM), argue that any export controls related to the CWC should be an integral part of the treaty-based regime rather than external to it. They contend that the Australia Group is discriminatory because not all States Parties can join. They further argue that the group violates Article XI of the Convention because its members can and do deny chemical-related exports to States Parties suspected of covert proliferation activities, even though they may be in good standing with the treaty.

Australia Group members respond that they, as well as all States Parties, have a treaty-based obligation not to transfer chemicals or other materials that could be used to make chemical weapons. They note that, despite four years of operation, the CWC-based export control mechanisms are not yet strong enough to provide confidence that those obligations are being carried out effectively. Moreover, Australia Group members argue that as long as individual States Parties have the right to make their own judgments as to which countries are in compliance with the treaty, they also have the right and the obligation to determine to whom they will export relevant chemicals and equipment and how they will make and implement those decisions.

Although the Review Conference is unlikely to resolve this contentious issue, the dispute over the Australia Group is important not only because of its implications for the CWC but for other arms control treaties as well. A similar controversy has arisen in the negotiations for a legally binding protocol to the BWC. If either of these debates is concluded in a way that could be portrayed as establishing a precedent, the other treaty will inevitably be affected.

Progress Toward Universality

A final substantive issue that is likely to get attention at the 2003 Review Conference is how the small but significant group of holdout countries can be persuaded to join the CWC. Not surprisingly, some of the states of greatest concern as chemical weapons proliferators have not signed and/or ratified the Convention. Their non-participation

The Review Conference is likely to consider how information related to fundamental implementation measures such as declarations and inspections is handled within the OPCW.

poses a major roadblock to achieving the treaty's fundamental goal of eliminating chemical weapons from the planet. With the important exception of North Korea, the holdouts are concentrated primarily in South East Asia, Central Africa, and, most importantly, the Middle East.

In one sense, it is a measure of the success of the CWC that the membership issue has reached the stage of having to deal with the hard cases after only four years of operation. But

expectations should not be high that the OPCW will have much leverage in getting reluctant or recalcitrant nations to join. The device of denying chemical exports to non-States Parties as a means of inducing them to accede to the treaty has not really worked and is likely to become even less effective over time. Those countries subject to trade restrictions have generally found ways around them, have identified alternative chemicals, or have determined that they can live without. Even if a ban on trade in scheduled chemicals with non-States Parties did create some economic pressure, it is not at all clear that it would be strong enough to overcome the strategic or other national interests that have prompted the decision not to ratify.

Particularly in the Middle East, adherence to the CWC is not a question that will be decided in isolation from other developments that shape regional security dynamics. One could envision that key states such as Israel, Egypt, and Syria might join the Convention as part of an overall political settlement for the region that includes some mechanism for addressing the future of Israel's nuclear weapons, but CWC membership would probably not be the first or even an early step. Given the fact that several known chemical proliferators remain outside the Convention, participants in the Review Conference should consider how to deal with this fundamental challenge to the regime.

Institutional Issues

Since the primary focus of the Review Conference must be on substantive issues at the political level, it is essential to avoid the trap of spending too much time on "nuts and bolts" administrative issues. Already the OPCW has a reputation of being overly

sensitive to “pay and promotion” matters such as its salary scale relative to other international organizations. Even so, some institutional issues are highly political because they determine how well the organization can recruit the talent it needs to perform effectively, both politically and technically, and the relative priority that member-states assign to the regime.

For example, the relatively low level of national representation at the OPCW is a matter of concern. Many States Parties cover activities at the organization with a junior diplomat from the bilateral embassy to the Netherlands, yet such officials often lack the technical capability and political authority to make decisions or even effective interventions. Although important decisions before the Conference of the States Parties or the Executive Council are made in capitals, the current low level of representation at the OPCW complicates and hampers the work of the organization and makes it less efficient and effective. The Review Conference should discuss how higher levels of national representation can be achieved and sustained.

Another institutional issue that could be raised at the Review Conference is the decision to make the OPCW a “non-career” organization. Most OPCW employees, including inspectors, work on contracts of limited duration. This situation inevitably results in high staff turnover, increases the demand for training, and has other ramifications that, in the minds of some observers, diminish the effectiveness of the organization. The Review Conference may therefore be asked to reconsider its approach to staffing, at least in some critical personnel areas such as the inspectorate and the operational sections of the OPCW.

Conclusions

The 2003 Review Conference of the CWC provides an important opportunity to bolster the norm against chemical weapons. A number of tough issues must be addressed, and the decisions made by the participants will have important implications not only for the future effectiveness of the Convention but for the role of arms control as a tool of international security policy.

Fully exploiting this opportunity will require two things of the participants. First, they must be fully prepared. The issues are many, difficult, and

complex, and it will take time and hard work for national delegations to develop their positions. Few national capitals have begun to think about the Review Conference, whether the substance of the issues, the tradeoffs that might be made, or the preferred outcomes. Because a lack of adequate preparation will risk unproductive and sterile debates that do little to achieve progress on the challenges that lie ahead, the time to start is now.

Second, participants should not shy away from being creative. Diplomats, like most other people, are comfortable doing the familiar. Many of those participating in the Review Conference will have attended similar meetings and will have standard expectations about how it will be conducted and what the final product should be, but they should set their sights higher. In addition to producing a backward-looking analysis of what has worked or not worked during the first five years of the CWC implementation, the participants should look forward. In particular, they should concentrate on developing an action plan that lays out milestones for progress on the tough issues before them. By taking a forward-looking approach, the Review Conference will demonstrate a commitment to the total elimination of chemical weapons and create a favorable political environment for making significant progress toward that goal.

NOTES

- ¹ “Editorial: The CWC and the BWC Yesterday, Today, Tomorrow,” *CBW Conventions Bulletin*, no. 50, December 2000, p. 1.
- ² “Russians Set to Meet Conditions to Assure U.S. Support for Chem Demil,” *Chem-Bio Weapons and Defense Monitor*, vol. 3, no. 2, February 16, 2001, p. 8.
- ³ According to one Russian estimate, Russia must allocate \$950 million annually to meet the 2007 deadline or \$425 million if the deadline is extended to 2012. Valery Semin, “International Assistance to Russia,” *OPCW Synthesis*, August 2000, p. 12.
- ⁴ *Ibid.*, p. 15.
- ⁵ Walter Krutzsch, “Article VI of the Chemical Weapons Convention: Past, Present, and Future,” *CBW Conventions Bulletin*, no. 50, December 2000, p. 7.
- ⁶ *Ibid.*
- ⁷ Malcolm Dando, *The New Biological Weapons: Threat, Proliferation, and Control* (Boulder: Lynne Rienner Publishers, 2001), pp. 45–66.
- ⁸ José M. Bustani, “The Chemical Weapons Convention: A Model for the Future,” *OPCW Synthesis: Year in Review 2000*, p. 7.
- ⁹ Tom Inch, “The Chemical Weapons Convention: A Viewpoint from the Chairman of the Advisory Committee to the UK National Authority,” *CBW Conventions Bulletin*, no. 50, December 2000, pp. 3–4.

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APPENDIX: STATES PARTIES AND SIGNATORY STATES TO THE CHEMICAL WEAPONS CONVENTION AS OF 12 FEBRUARY 2001

1. Afghanistan signed 14-01-93
2. Albania signed 14-01-93 and ratified 11-05-94
3. Algeria signed 13-01-93 and ratified 14-08-95
4. Argentina signed 13-01-93 and ratified 02-10-95
5. Armenia signed 19-03-93 and ratified 27-01-95
6. Australia signed 13-01-93 and ratified 06-05-94
7. Austria signed 13-01-93 and ratified 17-08-95
8. Azerbaijan signed 13-01-93 and ratified 29-02-00
9. Bahamas signed 02-03-94
10. Bahrain signed 24-02-93 and ratified 28-04-97
11. Bangladesh signed 14-01-93 and ratified 25-04-97
12. Belarus signed 14-01-93 and ratified 11-07-96
13. Belgium signed 13-01-93 and ratified 27-01-97
14. Benin signed 14-01-93 and ratified 14-05-98
15. Bhutan signed 23-04-97
16. Bolivia signed 14-01-93 and ratified 14-08-98
17. Bosnia and Herzegovina signed on 16-01-97 and ratified 25-02-97
18. Botswana acceded 31-08-98
19. Brazil signed 13-01-93 and ratified on 13-03-96
20. Brunei Darussalam signed 13-01-93 and ratified 28-07-97
21. Bulgaria signed 13-01-93 and ratified 10-08-94
22. Burkina Faso signed 14-01-93 and and ratified 08-07-97
23. Burundi signed 15-01-93 and ratified 04-09-98
24. Cambodia signed 15-01-93
25. Cameroon signed 14-01-93 and ratified 16-09-96
26. Canada signed 13-01-93 and ratified 26-09-95
27. Cape Verde signed 15-01-93
28. Central African Republic signed 14-01-93
29. Chad signed 11-10-94
30. Chile signed 14-01-93 and ratified 12-07-96
31. China signed 13-01-93 and ratified 25-04-97
32. Colombia signed 13-01-93 and ratified 05-04-00
33. Comoros signed 13-01-93
34. Congo signed 15-01-93
35. Cook Islands signed 14-01-93 and ratified 15-07-94
36. Costa Rica signed 14-01-93 and ratified 31-05-96
37. Côte d'Ivoire signed 13-01-93 and ratified 18-12-95
38. Croatia signed 13-01-93 and ratified 23-05-95
39. Cuba signed 13-01-93 and ratified 29-04-97
40. Cyprus signed 13-01-93 and ratified 28-08-98
41. Czech Republic signed 14-01-93 and ratified 06-03-96
42. Democratic Republic of the Congo signed 14-01-93
43. Denmark signed 14-01-93 and ratified 13-07-95
44. Djibouti signed 28-09-93
45. Dominica signed 02-08-93 and ratified 12-02-01 and will become a State Party 14-03-02
46. Dominican Republic signed 13-01-93
47. Ecuador signed 14-01-93 and ratified 06-09-95
48. El Salvador signed 14-01-93 and ratified 30-10-95
49. Equatorial Guinea signed 14-01-93 and ratified 25-04-97
50. Eritrea acceded 14-02-00
51. Estonia signed 14-01-93 and ratified 26-05-99
52. Ethiopia signed signed 14-01-93 and ratified 13-05-96
53. Federal Republic of Yugoslavia acceded 20-04-00
54. Fiji signed 14-01-93 and ratified 20-01-93
55. Finland signed 14-01-93 and ratified 07-02-95
56. France signed 13-01-93 and ratified 02-03-95
57. Gabon signed 13-01-93 and ratified 08-09-00
58. Gambia signed 13-01-93 and ratified 19-05-98
59. Georgia signed 14-01-93 and ratified 27-11-95
60. Germany signed 13-01-93 and ratified 12-08-94
61. Ghana signed 14-01-93 and ratified 09-07-97
62. Greece signed 13-01-93 and ratified 22-12-94
63. Grenada signed 9-04-97
64. Guatemala signed 14-01-93
65. Guinea signed 14-01-93 and ratified 09-06-97
66. Guinea-Bissau signed 14-01-93
67. Guyana signed 06-10-93 and ratified 12-09-97
68. Haiti signed 14-01-93
69. Holy See signed 14-01-93 and ratified 12-05-99
70. Honduras signed 13-01-93
71. Hungary signed 13-01-93 and ratified 31-10-96
72. Iceland signed 13-01-93 and ratified 28-04-97
73. India signed 14-01-93 and ratified 03-09-96

74. Indonesia signed 13-01-93 and ratified 12-11-98
75. Iran (Islamic Republic of) signed 13-01-93 and ratified 03-11-97
76. Ireland signed 14-01-93 and ratified 24-06-96
77. Israel signed 13-01-93
78. Italy signed 13-01-93 and ratified 8-12-95
79. Jamaica signed 18-04-97 and ratified 08-09-00
80. Japan signed 13-01-93 and ratified 15-09-95
81. Jordan acceded 29-10-97
82. Kazakhstan signed 14-01-93 and ratified 23-03-00
83. Kenya signed 15-01-93 and ratified on 25-04-97
84. Kiribati acceded 07-09-00
85. Kuwait signed 27-01-93 and ratified 28-05-97
86. Kyrgyzstan signed 22-02-93
87. Lao People's Democratic Republic signed 13-05-93 and ratified 25-02-97
88. Latvia signed 06-05-93 and ratified 23-07-96
89. Lesotho signed 07-12-94 and ratified 07-12-94
90. Liberia signed 15-01-93
91. Liechtenstein signed 21-07-93 and ratified 24-11-99
92. Lithuania signed 13-01-93 and ratified 15-04-98
93. Luxembourg signed 13-01-93 and ratified 15-04-97
94. Madagascar signed 15-01-93
95. Malawi signed 14-01-93 and ratified 11-06-98
96. Malaysia signed 13-01-93 and ratified 20-04-00
97. Maldives signed 01-10-93 and ratified 31-05-94
98. Mali signed 13-01-93 and ratified 28-04-97
99. Malta signed 13-01-93 and ratified 28-04-97
100. Marshall Islands signed 13-01-93
101. Mauritania signed 13-01-93 and ratified 09-02-98
102. Mauritius signed 14-01-93 and ratified 09-02-93
103. Mexico signed 13-01-93 and ratified 29-08-94
104. Micronesia (Federated States of) signed 13-01-93 and ratified 21-06-99
105. Monaco signed 13-01-93 and ratified 01-06-95
106. Mongolia signed 14-01-93 and ratified 17-01-95
107. Morocco signed 13-01-93 and ratified 28-12-95
108. Mozambique acceded 15-08-00
109. Myanmar signed 14-01-93
110. Namibia signed 13-01-93 and ratified 27-11-1995
111. Nauru signed 13-01-93
112. Nepal signed 19-01-93 and ratified 18-11-97
113. Netherlands signed 14-01-93 and ratified 30-06-95
114. New Zealand signed 14-01-93 and ratified 15-07-96
115. Nicaragua signed 09-03-93 and ratified 05-11-99
116. Niger signed 14-01-93 and ratified 9-04-97
117. Nigeria signed 13-01-93 and ratified 20-05-99
118. Norway signed 13-01-93 and ratified 07-04-94
119. Oman signed 02-02-93 and ratified 08-02-95
120. Pakistan signed 13-01-93 and ratified 28-10-97
121. Panama signed 16-06-93 and ratified 07-10-98
122. Papua New Guinea signed 14-01-93 and ratified 17-04-96
123. Paraguay signed 14-01-93 and ratified 01-12-94
124. Peru signed 14-01-93 and ratified 20-07-95
125. Philippines signed 13-01-93 and ratified 11-12-96
126. Poland signed 13-01-93 and ratified 23-08-95
127. Portugal signed 13-01-93 and ratified 10-09-96
128. Qatar signed 01-02-93 and ratified 03-09-97
129. Republic of Korea signed 14-01-93 and ratified 28-04-97
130. Republic of Moldova signed 13-01-93 and ratified 08-07-96
131. Romania signed 13-01-93 and ratified 15-02-95
132. Russian Federation signed 13-01-93 and ratified 05-11-97
133. Rwanda signed 17-05-93
134. Saint Kitts and Nevis signed 16-03-94
135. Saint Lucia signed 29-03-93 and ratified 9-04-97
136. Saint Vincent and the Grenadines signed 20-09-93
137. Samoa signed 14-01-93
138. San Marino signed 13-01-93 and ratified 10-12-99
139. Saudi Arabia signed 20-01-93 and ratified 09-08-96
140. Senegal signed 13-01-93 and ratified 20-07-98
141. Seychelles signed 15-01-93 and ratified 07-04-93
142. Sierra Leone signed 15-01-93
143. Singapore signed 14-01-93 and ratified 21-05-97
144. Slovak Republic signed 14-01-93 and ratified 27-10-1995
145. Slovenia signed 14-01-93 and ratified 11-06-97
146. South Africa signed 14-01-93 and ratified 13-09-95
147. Spain signed 13-01-93 and ratified 03-08-94
148. Sri Lanka signed 14-01-93 and ratified 19-08-94
149. Sudan signed 24-05-99 and ratified 24-05-99

Appendix: States Parties and Signatory States to the CWC

150. Suriname signed 28-04-97 and ratified 28-04-97
151. Swaziland signed 23-09-93 and ratified 20-11-96
152. Sweden signed 13-01-93 and ratified 17-06-93
153. Switzerland signed 14-01-93 and ratified 10-03-95
154. Tajikistan signed 14-01-93 and ratified 11-01-95
155. Thailand signed 14-01-93
156. The former Yugoslav Republic of Macedonia acceded 20-06-97
157. Togo signed 13-01-93 and ratified 23-04-97
158. Trinidad and Tobago acceded 24-06-97
159. Tunisia signed 13-01-93 and ratified 15-04-97
160. Turkey signed 14-01-93 and ratified 12-05-97
161. Turkmenistan signed 12-10-93 and ratified 29-09-94
162. Uganda signed 14-01-93
163. Ukraine signed 13-01-93 and ratified 16-10-98
164. United Arab Emirates signed 02-02-93 and ratified 28-11-00
165. United Kingdom of Great Britain and Northern Ireland signed 13-01-93 and ratified 13-05-96
166. United Republic of Tanzania signed 25-02-94 and ratified 25-06-98
167. United States of America signed 13-01-93 and ratified 25-04-97
168. Uruguay signed 15-01-93 and ratified 06-10-94
169. Uzbekistan signed 24-11-95 and ratified 23-07-96
170. Venezuela signed 14-01-93 and ratified 03-12-97
171. Viet Nam signed 13-01-93 and ratified 30-09-98
172. Yemen signed 08-02-93 and ratified 02-10-00
173. Zambia signed 13-01-93 and ratified 09-02-01 and will become a State Party 11-03-01
174. Zimbabwe signed 13-01-93 and ratified 25-04-97

SOURCE: OPCW

(Dates presented day-month-year)

ABOUT THE CBWNP PROGRAM AT THE MONTEREY INSTITUTE

The Chemical and Biological Weapons Nonproliferation (CBWNP) Program at the Center for Nonproliferation Studies (CNS) of the Monterey Institute of International Studies monitors the global proliferation of chemical and biological weapons and develops strategies for halting and reversing their spread.

The CBWNP research effort focuses on motivational factors driving the acquisition of chemical and biological weapons by states and terrorist groups, as well as efforts to implement the Chemical Weapons Convention (CWC) and to strengthen the Biological Weapons Convention (BWC). The Program also augments CNS community-building efforts in the nuclear field by training Monterey Institute students and visiting scholars from the Newly Independent States and China in technical and policy issues related to chemical and biological weapons nonproliferation.

CBWNP staff members work at the CNS offices in Monterey, California, and Washington, D.C. The Program's main products are reports, computer databases,

workshop proceedings, congressional testimony, and occasional papers, many of which are posted on the CNS web site [<http://cns.miis.edu>]. CBWNP staff also write op-ed pieces and articles aimed at a broader audience of interested citizens, deliver papers at major conferences, and participate in training sessions on chemical and biological terrorism for first responders.

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