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THE CHEMICAL WEAPONS CONVENTION TREATY:
PRESENT AND FUTURE ISSUES

by

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Preface

I selected this topic based on a request from the Institute of National Security Studies (INSS) for further research in this area. The INSS is interested in a number of national security issues, especially arms control and counterproliferation. This topic (INSS Reference Number 1.6) will explore how arms control, specifically in this case chemical weapons, represents an evolving challenge in the world of international security.

I would like to acknowledge the guidance and assistance from my research advisor, Prof. William T. Pendley, not only in preparing this paper, but throughout the year in expanding my knowledge of international security policy. I would also like to acknowledge Dr. Barry Schneider for helping me select this topic and for his guidance in the area of proliferation of weapons of mass destruction. Finally, I would like to acknowledge Col Vic Budura and Lt Col Tom Clark for their assistance in the topic of space operations, specifically the future use of satellites for treaty monitoring.

Abstract

This topic was selected from a number of topics provided by the Institute of National Security Studies (INSS), and it basically asked what would be the future of the Chemical Weapons Convention (CWC) Treaty. Because the CWC is fairly current (signed in 1992, entered into force in 1997), most of the research was done using the Air University Library's periodical search engines. The paper describes the history of the CWC, to include the timelines of its evolution from the Geneva Protocol of 1925 to today. The treaty not only analyzes the use of chemical weapons, but also its production and stockpiling. The paper further describes the hotly-debated issues of the treaty, which include the political issues of the willingness of the signatories to impose sanctions against violators, the treatment of non-state actors such as terrorist groups or commercial manufacturers, and whether the treaty should reconsider its decision not to include chemical weapons that were dumped in the seas before 1985. The paper then goes over the issue of advancing technology in the area of satellite imagery and the affect it will have on the ability of nations to monitor the treaty for violations. The paper then summarizes and makes a recommendation to wait and allow the CWC process to mature before addressing the issue of a follow-on treaty.

Chapter 1

Introduction

*In 1995, the Japanese cult Aum Shinrikyo left plastic bags filled with sarin, a nerve gas, on the Tokyo subway. A dozen people died and more than 5,000 were hurt. The toxin was only 25% military strength, otherwise the toll would have been far worse. The cult also was experimenting with VX, a nerve gas 10 times more deadly than sarin...*¹

—Barbara Slavin

Recently, the Russian Duma voted to ratify the Chemical Weapons Convention (CWC) Treaty, bringing to an end the historic year of 1997, which saw the same treaty ratified by the United States Senate.² The treaty, first completed in 1992, signed by over 160 nations in 1993, and entered into force on April 29, 1997, calls for the destruction of all chemical weapons stockpiles and the elimination of all chemical weapon production capability. During the intense and heated negotiations that led to this treaty, methods to monitor and verify compliance with the treaty, as well as penalties for non-compliance, were some of the more hotly debated topics.

This paper will discuss these issues, as well as other issues that have developed in the more than five years since the treaty was first completed. Specifically, this paper will address the need for a follow-on to the CWC, based on the changes that have occurred politically since 1992, and because of technological improvements which might affect the ability of nations to effectively monitor the treaty in the future.

This paper will try to look into the future by first discussing the history of the treaty, both the important timelines and specifics of the treaty itself. Then it will analyze the changes in the political landscape, to include the 1997 confrontation between Iraq and the United Nations' weapons inspection team, and how non-state players like terrorist groups are affected. Included in the politics of the treaty will be a review of some limitations of the treaty that could cause future re-evaluation. Finally, changes in technologies which could affect the capabilities of nations to monitor for compliance will be addressed.

Notes

¹ Slavin, Barbara, "Biochemical weapons: poor man's nukes", *USA Today*, 26 November 1997, p. 17A.

² Myre, Greg, "Russia giving up chemical weapons", *Washington Times*, November 16, 1997, p. 15.

Chapter 2

History

...keep in mind that this treaty is not about our weapons. The United States is getting rid of its chemical weapons stockpile, regardless of what happens with the CWC. This treaty is about other countries' weapons, and whether to call on other countries to do the same thing we are doing.¹

—John D. Holum

Timelines

The history of the CWC dates back to the 1925 Geneva Protocols, which banned the first use of chemical weapons during conflicts.² The CWC, which bans all use of chemical weapons, was first put forward in 1968, after the issue of chemical weapons gained a good deal of public and congressional attention in the United States because of an accidental dispersal of nerve agents over lands near Dugway Proving Ground in Utah that killed several thousand sheep.³ Because the Cold War and the nuclear arms race garnered most of the world's attention at the time, it remained dormant until 1984, when then-Vice President George Bush offered to amend the verification part of the treaty by pushing for “anytime-anyplace” challenge inspections, which became the core of the treaty's verification protocol.⁴ The United States followed that up in 1985 by declaring their intent to destroy their entire chemical stockpile, and urged all other nations to follow suit.

The end result was the treaty was signed by almost 160 countries in 1993, with the stipulation the treaty would enter into force six months after the 65th nation ratified the agreement. It was envisioned the treaty would enter into force by 1995, but Russia and the United States, holders of the world's two largest chemical stockpiles, played a game of "wait and see", waiting for the other country to make the first move. When the 65th nation (Hungary) ratified the agreement in October 1996, setting the date for entry into force at April 29, 1997, both the United States and Russia saw the treaty was going to move on without them. Failure of the United States and Russia to ratify would be significant from a world view, because it would be quite likely that other nations would be reluctant to open up their military and industrial facilities for inspection and bear other burdens of the CWC regime if it were not able to fulfill its main purpose—chemical weapons disarmament.⁵ From a United States standpoint, failure to sign the treaty by the end of April would cause the following penalties:

- The U. S. would forfeit their seat on the Executive Council for at least one year, thereby costing them the chance to draft the rules by which the Convention would be enforced.
- The U. S. would not be able to participate in the critical first sessions of the Organization for the Prohibition of Chemical Weapons (OPCW), which monitors compliance.
- The U. S. would lose the right to administer and conduct inspections.
- Because of trade restrictions imposed on non-member states, U. S. chemical manufacturers were concerned that they would risk serious economic loss.⁶

The U. S. was able to get the treaty ratified before the entry into force date (see Figure 1), and the Russian Duma ratified the treaty in early November, assuring both countries a place at the international conference of signatories in December 1997.⁷ The price the Russian government paid for signing after the entry into force date was the absence of Russian citizens from the OPCW's 369 staff members and 140 inspectors, as well as no Russian involvement in early OPCW decision making.⁸

Countries Ratifying the Chemical Weapons Convention
(as of April 29, 1997)

Country	Date Signed	Date Ratified	Country	Date Signed	Date Ratified
Albania	1/14/93	5/11/94	Maldives	10/1/93	5/31/94
Algeria	1/13/93	8/14/95	Mali	1/13/93	4/28/97
Argentina	1/13/93	10/2/95	Malta	1/13/93	4/28/97
Armenia	3/19/93	1/27/95	Mauritius	1/14/93	2/9/93
Australia	1/13/93	5/6/94	Mexico	1/13/93	8/29/94
Austria	1/13/93	8/17/95	Monaco	1/13/93	6/1/95
Bahrain	2/24/93	4/28/97	Mongolia	1/14/93	1/17/95
Bangladesh	1/14/93	4/25/97	Morocco	1/13/93	12/28/95
Belarus	1/14/93	7/11/96	Namibia	1/13/93	11/27/95
Belgium	1/13/93	1/27/97	Netherlands	1/14/93	6/30/95
Bosnia and Herzegovina	1/16/97	2/25/97	New Zealand	1/14/93	7/15/96
Brazil	1/13/93	3/13/96	Niger	1/14/93	4/9/97
Bulgaria	1/13/93	8/10/94	Norway	1/13/93	4/7/94
Cameroon	1/14/93	9/16/96	Oman	2/2/93	2/8/95
Canada	1/13/93	9/26/95	Papua New Guinea	1/14/93	4/17/96
Chile	1/14/93	7/12/96	Paraguay	1/14/93	12/1/94
China	1/13/93	4/25/97	Peru	1/14/93	7/20/95
Cook Islands	1/14/93	7/15/94	Philippines	1/13/93	12/11/96
Costa Rica	1/14/93	5/31/96	Poland	1/13/93	8/23/95
Côte d'Ivoire	1/13/93	12/18/95	Portugal	1/13/93	9/10/96
Croatia	1/13/93	5/23/95	Republic of Korea	1/14/93	4/28/97
Czech Republic	1/14/93	3/6/96	Republic of Moldova	1/13/93	7/8/96
Denmark	1/14/93	7/13/95	Romania	1/13/93	2/15/95
Ecuador	1/14/93	9/6/95	Saint Lucia	3/29/93	4/9/97
El Salvador	1/14/93	10/30/95	Saudi Arabia	1/20/93	8/9/96
Equatorial Guinea	1/14/93	4/25/97	Seychelles	1/15/93	4/7/93
Ethiopia	1/14/93	5/13/96	Slovak Republic	1/14/93	10/27/95
Fiji	1/14/93	1/20/93	South Africa	1/14/93	9/13/95
Finland	1/14/93	2/7/95	Spain	1/13/93	8/3/94
France	1/13/93	3/2/95	Sri Lanka	1/14/93	8/19/94
Georgia	1/14/93	11/27/95	Suriname	4/28/97	4/28/97
Germany	1/13/93	8/12/94	Swaziland	9/23/93	11/20/96
Greece	1/13/93	12/22/94	Sweden	1/13/93	6/17/93
Hungary	1/13/93	10/31/96	Switzerland	1/14/93	3/10/95
Iceland	1/13/93	4/28/97	Tajikistan	1/14/93	1/11/95
India	1/14/93	9/3/96	Togo	1/13/93	4/23/97
Ireland	1/14/93	6/24/96	Tunisia	1/13/93	4/15/97
Italy	1/13/93	12/8/95	Turkmenistan	10/12/93	9/29/94
Japan	1/13/93	9/15/95	United Kingdom of Great Britain and Northern Ireland	1/13/93	5/13/96
Kenya	1/15/93	4/25/97	United States of America	1/13/93	4/25/97
Lao People's Democratic Republic	5/13/93	2/25/97	Uruguay	1/15/93	10/6/94
Latvia	5/6/93	7/23/96	Uzbekistan	11/24/95	7/23/96
Lesotho	12/7/94	12/7/94	Zimbabwe	1/13/93	4/25/97
Luxembourg	1/13/93	4/15/97			

Figure 1: Countries Ratifying the Chemical Weapons Convention⁹

Treaty Specifics

*In considering the value of this treaty, we must bear in mind that today keeping and producing chemical weapons are legal. The gas Saddam Hussein used to massacre Kurdish villagers in 1988 was produced legally. In most countries, terrorists can produce or procure chemical agents, such as sarin gas, legally. Regimes such as Iran and Iraq can build up their stockpiles of chemical weapons legally.*¹⁰

—Madeleine K. Albright

The CWC, as its name implies, covers only chemical weapons, and has no jurisdiction over biological weapons. The CWC defines chemical weapons as including not only toxic chemicals but also ammunition and equipment for their dispersal. Toxic chemicals are stated to be: “any chemical which, through its chemical effect on living processes, may cause death, temporary loss of performance, or permanent injury to people or animals.”¹¹ The chemical weapons usually fall into two categories: nerve agents, like sarin and VX, and blister agents, like mustard gas (see Figure 2). The distinction between chemical weapons and biological weapons is important because during the 1997 confrontation between Iraq and the UN, much was written about Iraq’s ability to produce small quantities of weapon material which could kill large numbers of people. Those types of materials are usually biological agents, such as anthrax or ebola, and are not covered by the CWC or this paper.

Characteristics of Chemical Warfare Agents				
Agent	Color	Odor	Rate of Action	Effect on Body
<i>Sarin (GB)</i>	Colorless Liquid	None in Pure Form	Very Rapid — Seconds to Minutes	Inhibits Nerve Conduction
<i>VX</i>	Colorless to Amber Liquid	None	Very Rapid — Seconds to Minutes	Inhibits Nerve Conduction
<i>Mustard</i>	Colorless to Pale Yellow Liquid	Garlic or Horse Radish	Delayed — Hours	Irritates Skin, Eyes, and Respiratory Tract

Figure 2: Characteristics of Chemical Warfare Agents¹²

The CWC bans the use, production, stockpiling, and transfer of chemical weapons.¹³ It also calls for all participants to destroy any weapons in their possession or any they have abandoned; destroy facilities for the production of chemical weapons; not engage in preparations for chemical warfare; not to use riot control agents, such as tear gas, as a method of warfare; to declare within 30 days of entry into force the kind and quantity of chemical weapons, any chemical facilities, and plans for destruction of chemicals and facilities; and finally, to cooperate with the OPCW, which is responsible for verifying compliance with other countries.¹⁴

An important part of the treaty is the method it uses to control the export of potentially dangerous chemicals. For the purposes of routine verification, the CWC grouped relevant chemicals into three lists, or schedules, on the basis of their relative danger and their usability for permitted purposes.¹⁵ Schedule 1 contains chemicals which their main use has been prohibited by the Convention. Signatories agree not to export Schedule 1 chemicals to any non-signatory, and might only transfer to a signatory state for research, medical, pharmaceutical or protective purposes. Schedule 2 contains a

significant number of chemicals that, besides their possible use as precursors for chemical weapons, have extensive applications for purposes not prohibited by the Convention. Schedule 2 chemicals may be traded with non-signatories until April 29, 2000, three years after entry into force. Schedule 3 contains 17 chemicals with very extensive uses for purposes not prohibited under the Convention. Schedule 3 chemicals may be freely traded until April 29, 2002, at which time additional controls will be considered.^{16 17}

The compliance part of the treaty was the most intensely debated part because it makes unprecedented demands on all parties. Governments, even those in compliance, may be subjected to on-site, short-notice challenge inspections at facilities so sensitive their very existence has not been publicly revealed. Parties may be required to impose sanctions against violators and against non-signatories, even if those violators are their allies. And thousands of chemical manufacturers will have to open their doors to inspectors on a routine basis.¹⁸

Non-ratification of the treaty is an important issue, especially when potentially troubling countries like Iraq, North Korea, Syria and Libya have shown no signs of becoming treaty members. Just as serious is non-compliance, like Iraq has shown in its dealings with the UN. Both non-ratification and non-compliance are treated basically the same way, with sanctions against the offending countries. Signatory countries would be prohibited from selling certain chemicals to the offending countries. The certain chemicals could be dual-use chemicals, called such because they have a legitimate purpose such as in pesticides, but could also be used in chemical weapon development. Or they could be precursor chemicals, which by themselves are harmless, but could also

be developed in chemical weapons. Many states have ambitious programs for the development of a domestic chemistry-related industry. Such programs might include processing raw materials from natural resources, treatment of foodstuffs to provide better nutrients, production of insecticides and other pesticides for agriculture, and petroleum refining. States which have not ratified the Convention will in the future find it increasingly difficult, if not impossible, to obtain many of the chemicals as well as much of the technology required for such programs.¹⁹

The demilitarization cost of the treaty is also cause for concern, because the treaty calls for all weapons to be destroyed within ten years of initial declaration, with a possible extension of five more years. The United States has decided the best way to dispose of its chemical weapon stockpile is to build environmentally-safe incinerators at each of the eight chemical weapon storage sites in the U. S. and on Johnston Atoll in the Pacific Ocean. Cost estimates for destroying the United States stockpile of approximately 31,000 tons is between 9-12 billion dollars, and current U. S. plans show the project complete by 2004, three years ahead of the CWC requirement.²⁰ Russia, on the other hand, has estimated its cost to destroy 40,000 tons of chemical weapons at between 3.5-6 billion dollars, which U. S. experts say is too low and everyone agrees Russia will have a hard time finding the money to complete the project by 2007 without U. S. or other foreign help.

The United States government, as part of the Nunn-Lugar Cooperative Threat Reduction Program, has decided to invest money in the Russian chemical demilitarization project. The U. S. plans to help Russia destroy its chemical weapons stockpile by assisting in design and construction of a prototype facility for the destruction of chemical

weapons.²¹ The prototype facility will be built at Shchuch'ye, about 800 miles southeast of Moscow, where 14% of the chemical weapons stockpile is now stored. Construction will start in 2000, with operations scheduled to begin in 2004.²²

Notes

¹ "Interview—John D. Holum: The Future of the Chemical Weapons Convention", *Arms Control Today*, January/February 1997, p. 3.

² Stern, Jessica E., "Lethal Compounds: The New Chemical Weapons Ban", *The Brookings Review*,

³ "Chemical Weapons Convention: Ratification and Implementation", *Congressional Digest*, June-July 1997, p. 166.

⁴ Smithson, Amy E., "Dateline Washington: Clinton Fumbles the CWC", *Foreign Policy*, Summer 1995, p. 172.

⁵ Batsanov, Serguei, "Preparing for the entry into force of the Chemical Weapons Convention", *NATO Review*, September 1996, p. 19.

⁶ Albright, Madeleine K. and Jon L. Kyl, "Should the Senate Ratify the Chemical Weapons Convention?", *Congressional Digest*, June-July 1997, p. 174, 176.

⁷ Hoffman, David, "Lower House of Russian Parliament Ratifies Global Chemical Weapons Ban", *Washington Post*, Nov. 1, 1997, p. 22.

⁸ Nadein, Vladimir and Viktor Litovkin, "U.S. Bans Chemical Weapons—While State Duma Exposes Russia to Threat of Sanctions", *Current Digest*, Vol. XLVIII, No. 44, p. 19.

⁹ "Agreement Text: Preamble, Obligations, and Chemical Guidelines", *Congressional Digest*, June-July 1997, p. 170.

¹⁰ Albright, Madeleine K. and Jon L. Kyl, "Should the Senate Ratify the Chemical Weapons Convention?", *Congressional Digest*, June-July 1997, p. 172.

¹¹ "Chemical Warfare Agents: Disposal of the U. S. Stockpile", *Congressional Digest*, June-July 1997, p. 165.

¹² "Chemical Warfare Agents: Disposal of the U. S. Stockpile", *Congressional Digest*, June-July 1997, p. 165.

¹³ Myre, Greg, "Russia giving up chemical weapons", *Washington Times*, Nov. 6, 1997, p. 15.

¹⁴ Flowerree, Charles C., "The Chemical Weapons Convention: A Milestone in International Security", *Arms Control Today*, October 1992, p. 4.

¹⁵ Batsanov, Serguei, "Preparing for entry into force of the Chemical Weapons Convention", *NATO Review*, September 1996, p. 16.

¹⁶ "The Advantages of Ratifying", *Organization for the Prohibition of Chemical Weapons (OPCW) Website*, pp. 4-5, On-line, Internet, 30 December 1997, Available from <http://www.opcw.nl/advanta.htm>

¹⁷ "Chemical Weapons Convention: Ratification and Implementation", *Congressional Digest*, June-July 1997, p. 167.

¹⁸ Stern, p. 32.

Notes

¹⁹ “The Advantages of Ratifying”, *Organization for the Prohibition of Chemical Weapons (OPCW) Website*, p. 4. On-line, Internet, 30 December 1997, Available from <http://www.opcw.nl/advanta.htm>

²⁰ “Chemical Warfare Agents: Disposal of the U. S. Stockpile”, *Congressional Digest*, June-July 1997, p. 165.

²¹ Smith, Harold P., “Cooperative Threat Reduction: Defense By Other Means”, *Defense 97*, Issue 3, pp. 42-46.

²² “Parsons to Build Russian Plant”, *Engineering News-Record*, December 16, 1996, p. 15.

Chapter 3

Political Issues

On some inspection missions, we've had to wait several hours because the Iraqis supposedly couldn't find the keys to certain sites we needed to enter. We have been denied access to facilities even as our air surveillance showed a stream of trucks going out the back entrance. And while they delayed us from entering some sites, we have seen Iraqi officials burning documents and throwing the embers into a river.¹

—Alan Dacey

There are basically three different political issues or questions that need to be resolved if the treaty is to remain useful. The first issue is the resolve of the world body to impose sanctions for non-compliance. The second issue is how to deal with non-state actors like terrorist groups and commercial manufacturers. And the third issue is how to deal with weapons, which are not technically covered by the treaty, but are still a danger to the environment.

World Resolve

There are really two parts to the world resolve issue, the ability to do challenge inspections, and the willingness to impose sanctions for violations. Both issues will severely challenge the OPCW as it tries to administer the treaty.

The nature of challenge inspections has changed dramatically from the “anytime-anyplace” proposal from 1984. The major opposition to these no-notice challenge

inspections was based on the fear by many, including the United States, that during the course of these inspections, industrial espionage would occur and valuable trade secrets would be compromised. Companies are concerned they will incur a loss of confidential business information in the course of on-site inspections or as a result of treaty-imposed reporting requirements, which will effect their competitiveness and possibly even their viability.² Because of this, whenever a challenge is issued, the challenged country is allowed a reasonable amount of time to sanitize the suspected site so that none of their legal processes are revealed. Critics of the treaty have claimed the challenge inspection protocol has lost its teeth, because the time allowed would allow any potential violator the opportunity to hide/move all the incriminating evidence. This was brought into focus by the 1997 Iraq confrontation with the United Nations special weapons team. It was noted that Iraq effectively stonewalled the team and allowed itself the chance to remove any incriminating evidence, and the protocols associated with the UN ban were supposedly more restrictive than the CWC protocols.³ This issue will have to be monitored very closely because it is one of the cornerstones of the treaty itself. How the nations of the world deal with states that do not comply with this requirement of the treaty will ultimately determine the success or failure of the treaty.

The second issue, the willingness of the signatories to impose sanctions against violators, is considered by critics as another weak part of the treaty. The main issue is money, because trade in chemical agents is important to the economy of many countries. During 1994, the total sales value of chemicals exported from the United States exceeded \$51 billion, up 15 percent over the previous year.⁴ In another example, Russia claimed that chemicals made up 40% of all its exports, and failure to ratify the treaty could have

cost them as much as 60 billion dollars a year.⁵ It has been speculated that once Russia ratified, Iran followed suit to protect its important chemical industry. With Russia, China, India and all major Western European nations inside the treaty framework, Iran—a major oil-producing country—thought it could be shut out of most markets for its petrochemicals.⁶ In a country with a struggling economy, how willing would that country be to voluntarily restrict itself from trading with one of its customers. That country might just test the waters to see how comprehensive the monitoring process is, to see if the process can even detect the continued sale of prohibited chemicals. What would happen if a country like Russia was caught selling prohibited chemicals to a country like Iraq? More importantly, what would happen to the treaty if it was determined there was considerable violations from many of the world's leading nations? Obviously, this would threaten the viability of the treaty itself, and it must be monitored closely as the rounds of inspections begin.

Non-State Actors

In dealing with the CWC, non-state actors fall into two different categories, terrorist groups and commercial manufacturers. In one sense, the two groups could be looked at the same way because neither of them is directly controlled by the nation's government.

The issue of how the treaty will treat terrorist groups could simply be dismissed by stating the treaty only deals with sovereign nations. In this sense, the CWC will effect how countries deal with terrorist groups because every country is required to adopt domestic legislation that criminalizes the behavior prohibited by the treaty. That means law enforcement tools against potential terrorist use would be improved. Now law enforcement agencies can only go after a “conspiracy to use” chemical weapons. Under

the CWC implementing legislation, simple possession will be a basis for action.⁷ But the issue is more complex than that, because the terrorist groups will either be operating inside the boundaries of signatory states, or inside the boundaries of the few countries that haven't ratified the treaty. In the first case, consider that Iran has ratified the treaty, and Iran is a country that harbors terrorists. If one of the terrorist groups in Iran is discovered to be developing chemical weapons, then Iran has an obligation to take action against them. Failure to do so would be grounds for sanctioning Iran under the treaty.⁸ From this example, if a challenge is made against a suspected terrorist site within Iran, then Iran will have a difficult decision to make. If Iran decides to ignore the challenge by claiming not to have any control over the terrorist group, then it would open itself up to sanctions as if it violated the treaty itself. If Iran allows the inspection, then it would face the wrath of the terrorist group. The terrorist group could either decide to turn against Iran with terrorist acts, or the terrorist group could pull out of the country and withdraw all monetary support, or both.

In the second case, where the terrorist group is operating inside a state that hasn't ratified the treaty, then the group will be treated the same way the state is treated. However, now that Iran has ratified, it is very likely other countries associated with terrorist groups, like Libya and Syria, will also ratify over time. That happened with the Nuclear Non-Proliferation Treaty, which now has 185 members, including many, like Iraq and North Korea, that have an interest in nuclear weapons. The gravitational pull, trade restrictions and the intense international attention would probably draw Libya and Syria into the CWC.⁹

In either case with terrorist groups, the CWC may not have an effect on them because chemical weapons may not be their weapon of choice. Even though the Aum Shinrikyo cult used sarin for their attack, as instruments of terror, biological weapons may pose a greater threat in the future. A few grams of the right toxin would cause more harm than a ton of nerve gas, and a test tube's worth of infectious material could start an epidemic that sustains itself.¹⁰

With commercial manufacturers, the primary issue to clear up will be the lack of agreement between current export control regulations and new CWC export controls. Currently, U. S. manufacturers are governed by two lists, the Department of Commerce's Export Administration Regulation (EAR) Commodity Control List with 54 chemicals and 10 toxins, and the Department of State's International Traffic in Arms Regulation (ITAR) Munitions List with 22 chemicals. The 50 chemicals on the CWC schedules do not match either list, so the EAR and ITAR lists will have to be updated so U. S. companies can be monitored for compliance.¹¹ Once the export control lists are updated, the issue will basically come down to whether the manufacturer is producing an illegal chemical, or selling precursor chemicals to a treaty violator. Once again, the strength of the monitoring process and the willingness to impose sanctions will come into play depending on how many manufacturers try to circumvent the treaty and get caught.

Weapons not covered by the treaty

Earlier, this paper stated the CWC called for all participants to destroy all their chemical stockpiles, or "any they abandoned." Once again, this seems to be a simple issue, but prior actions from some of the world's leading nations have complicated the issue. What the CWC doesn't cover is sea-dumped chemical weapons. In fact, it makes

a clear exception for them, stating it does not cover chemical weapons dumped before 1985. It further states as long as those chemical weapons remain sea-dumped, there is no obligation to destroy them.¹²

What makes this issue so potentially dangerous is the tremendous quantities of chemicals involved, and the countries involved in dumping them. As stated earlier in this paper, the two countries with the largest current stockpiles are Russia and the United States, with 40,000 and 31,000 tons respectively. After World War II ended, the occupying powers were responsible for all the Nazi chemical weapons in their zone. The captured German chemical weapons totaled over 296,000 tons; the American zone had almost 94,000 tons, the British zone over 122,000 tons, the Russian zone over 70,000 tons, and the French zone over 9,000 tons.¹³ All these chemicals ended up dumped in the sea, and no one knows what kind of health and environmental risks these chemicals pose today or will present tomorrow. This issue will have to be addressed in the future, possibly after all the present chemical stockpiles are destroyed.

Notes

¹ Dacey, Alan, "Bundled out of Baghdad", *Newsweek*, November 24, 1997, p. 29.

² Smithson, Amy E. and Frank Gaffney Jr., "Should the U. S. ratify the treaty banning chemical weapons?", *Insight*, March 17, 1997, p. 29.

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⁸ *Ibid*, p. 5.

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⁹ Ibid, p. 4.

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¹³ Chepesiuk, Ron, p. 42.

Chapter 4

Technological Issues

The technological issues mainly revolve around the ability to monitor the treaty for compliance. An essential part of this is to understand how the monitoring of the treaty was envisioned to be carried out, and then to understand what capabilities are on the horizon that could affect the monitoring of the treaty.

Current Treaty Monitoring

The verification system set up by the CWC looks at both military installations and wide segments of the commercial chemical industry. Since a lot of chemicals have a dual-use capability, the plants that produce them in significant quantities need to be monitored. The verification system is designed to limit chemical weapon activities through the use of routine monitoring involving declarations, initial visits, systematic inspections of declared chemical weapon storage, production and destruction facilities as well as routine inspections in the relevant civilian chemical production facilities. An outgrowth of the “anytime-anyplace” inspection proposal of 1984, the convention puts in place for the first time challenge inspections allowing one country to have an inspection conducted at any suspected chemical weapon facility or location in another country at short notice, with no right of refusal.¹

Some critics of the treaty have said the treaty is not verifiable, since it is impossible to detect small quantities of chemicals. Although it would be difficult to detect production of a small quantity of a forbidden chemical, that small quantity isn't a threat until the country has produced enough of the chemical. Once the quantity grows to be militarily significant, and as the country involved begins to weaponize it by putting it into shells, training with it, or preparing to use it, the likelihood of detection rises dramatically. So militarily significant violations are likely to be detected.²

Detected by what? It is important to note that the CWC verification regime simply states any nation can ask for an immediate inspection of a suspected site, and does not get into specifics on how the treaty is monitored. So the regime complements, but does not replace, existing U. S. intelligence sources and methods, which will remain the primary means for monitoring treaty compliance in a timely and definitive fashion.³ It is safe to say that “existing U. S. intelligence sources and methods” use space assets, and future monitoring of the CWC will also place a premium on the use of space assets.

Future Treaty Monitoring

The future monitoring of the treaty has its roots in previous monitoring practices, which date back to the Cold War and centered on the nuclear arms race. Reconnaissance satellites played an important role in verifying nuclear arms treaties during the extended Cold War period. For decades, satellites have been able to detect missile silos, mobile missiles, nuclear test preparations and other nuclear activities.⁴ Arms treaties in the Cold War era set limits on missile improvements that would have changed the diameter of a missile by barely three inches—and since satellites are the means by which treaties are verified, it has to be assumed that the satellites could see such a change.⁵

Having said that about nuclear arms treaty verification, one has to understand the signs of chemical weapon proliferation are not readily picked up by satellites, partly because many chemical companies use modern environmental safeguards that make it difficult to pinpoint possible covert weapon sites. Given the large number of chemical facilities worldwide, even the CWC's vigorous verification measures cannot provide an ironclad guarantee that all instances of small-scale cheating will be detected.⁶ What can be picked up from satellites today are communication and electronic signals, because the National Reconnaissance Office (NRO) has developed and launched a series of signals intelligence (SIGINT) satellites which can provide valuable information about the intentions and capabilities of a foreign power.⁷ It is safe to say the capability exists today to intercept enough communication and electronic signals from a suspected site to assist in determining if a site should be inspected. The way the treaty is currently monitored, once a nation suspects another nation of an illegal site, the first nation can call for an immediate inspection of the suspected site. The first nation does not have to give any justification for its suspicions, meaning it does not have to compromise its sources.

Farther into the future, the use of advanced optical imaging will contribute to the treaty monitoring process. Current technology has multispectral imagery satellites on orbit, but advances in hyperspectral and ultraspectral imagery will ultimately be the key to chemical manufacturing detection.⁸ Detection of vapors and effluent liquids associated with many manufacturing processes could be accomplished by a mass spectrometer that ionizes samples at ambient pressure using an efficient corona discharge.⁹ These techniques are currently found in state-of-the-art environmental monitoring systems. There are also spectrometers that can analyze chemical samples from glass vials.¹⁰ Using

this technology, combined with hyperspectral and ultraspectral capability, which will increase the sensitivity necessary to monitor sites from the distance of space, is the challenge that needs to be solved to monitor the CWC from satellites in the future.

Once the challenge of monitoring with either hyper or ultraspectral imagery satellites is solved, then the next evolutionary step would be to collect and fuse data from all sensory inputs—optical, olfactory, infrared, multispectral, tactile, acoustical, laser radar, millimeter wave radar, X-ray, DNA patterns, and human intelligence—to identify objects, people or processes. The idea would be to compare a sensory signature against a preloaded database to identify matches or changes in the signature for identification or comparison.¹¹ Once again, it's just a matter of time before satellites can be packaged with stronger sensors and faster computer packages to accomplish this task.

With technological advances occurring rapidly, the future issue for the treaty will be how to deal with treaty violations when a site is no longer “suspected,” but “confirmed” from space. When the treaty was written sometime before 1992, the idea of confirming chemical processes from space probably wasn't envisioned. The way the current treaty is written, even if a site is confirmed from space, the host nation will be allowed time to sanitize the area, which doesn't make much sense. It's still too early to tell if such capability will ever be developed, but the OPCW must be cognizant of it and understand how this change in capability could effect future treaty monitoring.

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⁶ Smithson, p. 164.

⁷ Sweetman, p. 47.

⁸ New World Vistas: Air and Space Power for the 21st Century, Sensors Volume, USAF Scientific Advisory Board, 1997, p. xii

⁹ "Technologies Brightest Stars", *Research and Development*, October 1993, p. 17.

¹⁰ Spacecast 2020: High Leverage Space Technologies for National Security in the 21st Century, Briefing to Industry, 9-10 November 1994, p. 4.

¹¹ Spacecast 2020, p. 2.

Chapter 5

Summary

The CWC sets the standard that it is wrong for any nation to build or possess a chemical weapon, and gives us strong and effective tools for enforcing that standard. This is not a magic wand. It will not eliminate all danger. It will not allow us to relax or cease to ensure the full preparedness of our armed forces against the threat of chemical weapons. What it will do is make chemical weapons harder for terrorists or outlaw states to buy, build, or conceal. ... Most nations play by the rules and want the respect and benefits the world bestows upon those who do.¹

—Madeleine K. Albright

The Chemical Weapons Convention Treaty has been a huge step forward for the world in the area of nonproliferation of weapons of mass destruction, with over 160 nations signing the treaty by 1993. With the entry into force on April 29, 1997, the world now has a chance to rid itself of all chemical weapons. While this is a positive step, there are still serious challenges that must be faced. The political challenges that still need to be solved include the willingness of the signatories to impose sanctions against violators and non-ratifiers, the ability to incorporate non-state actors like terrorist groups and commercial manufacturers, and what to do with all the sea-dumped weapons not covered by the treaty. The technological challenges involve how to incorporate advances in satellite technology into the monitoring process. The use of space assets, in the near term with SIGINT satellites, farther into the future with hyperspectral and ultraspectral

imagery satellites, and even farther into the future with sensory signatures, will greatly enhance the ability to detect suspected treaty violations now and possibly in the future be the means to confirm treaty violations.

Based on the different political and technical issues discussed in this paper, it would be very easy to state the need for a future follow-on treaty that would address these issues and make the chemical weapons ban more effective. But it is really too early to make that kind of statement, because not enough has happened yet to back it up.

States are just beginning to get their initial inspections, and only on military sites since no country has submitted a complete list of its commercial manufacturers to the OPCW, and because the OPCW has been slow to set up its organization due to initial budgetary problems. Legislation to update the export control lists and strengthen law enforcement capabilities has not yet occurred. There has yet to be a challenge inspection, so the issues of world resolve and willingness to impose sanctions will remain untested. Likewise, no country has been caught in any illegal activity, either manufacturing the newly banned chemical weapons in their own country, or selling the banned chemicals to other countries. Finally, it must get closer to April 29, 2000 before the issue of non-ratification becomes clearer, because that is when the current non-ratifiers will face the loss of revenues in trading Schedule 2 chemicals. Based on all this, it doesn't make sense to rush to judgment on the need for a follow-on treaty at this time. Once the treaty has had a few years to mature and be tested, then a true assessment can be made about the need for a follow-on treaty.

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