THE HENRY L. STIMSON CENTER

Separating Fact from Fiction: The Australia Group and the Chemical Weapons Convention

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Pragmatic steps toward ideal objectives

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Acknowledgments

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Amy E. Smithson
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Executive Summary

Preventing the proliferation of weapons of mass destruction has been widely recognized as perhaps the most daunting defense and foreign policy challenge of the post-Cold War era. In particular, the chemical weapons proliferation problem is changing in ominous and important ways. Not only are more than twenty countries believed to possess chemical weapons, the Japanese religious cult Aum Shinrikyo shattered the taboo against terrorist use of weapons of mass destruction by releasing poison gas in the Tokyo subway on March 20, 1995. Because the ingredients and technology to make chemical weapons are readily available on the commercial marketplace, there is a need for a concerted and multifaceted effort to confront chemical weapons proliferation.

Given these circumstances, one would think that mechanisms to control the flow of dual-use materials and equipment to countries believed to be proliferating chemical weapons would garner widespread domestic and international support. Instead, two such mechanisms—the Chemical Weapons Convention (CWC) and the Australia Group—have received a mixed welcome, partly because confusion has been created about the trade provisions of the CWC and the Australia Group's relationship to the treaty. The CWC, which enters into force on April 29, 1997, outlaws the development, production, stockpiling, transfer, and use of chemical weapons. The Australia Group is a collection of countries that began acting in concert in the mid-1980s to suppress the proliferation of chemical and biological weapons through export controls.

This report presents a factual discussion of the Australia Group's history and *modus operandi*, as well as of the CWC's trade-related provisions. The first segment of the report relates the Australia Group's origins, followed by an account of how Australia Group meetings generally operate and the criteria for joining the collective. Next, the discussion moves to how the Australia Group expanded the scope of its activities and its membership. The North-South discord and the Australia Group's rebuttal of its critics in view of the challenges of containing proliferation in the post-Cold War era are explored in the ensuing sections. The final two segments of the report offer a discussion of the domestic misperceptions about the Australia Group and the CWC and some concluding observations about the need for a variety of complementary tools to restrict the proliferation of biological and chemical weapons.

Separating Fact from Fiction

On both an international and domestic level, misunderstandings exist about the Australia Group, the CWC, and their relationship to each other. Much of the confusion stems from a fundamental misreading of the CWC's provisions. Several of the misinterpretations of the CWC's provisions and inaccuracies about the Australia Group's activities are listed below, along with a factually accurate explanation of how these two mechanisms have operated and will continue to operate.

Fiction: The CWC would start a "poisons for peace" assistance program, *requiring* the United States and other participating countries to modernize chemical weapons facilities or sell chemical weapons

ingredients to any and all countries that join the treaty—even those suspected of being proliferators or of sponsoring terrorist activities.

Fact: Article XI of the CWC admonishes participating states not to "maintain among themselves any restrictions...which would restrict or impede trade and the development" of peaceful research and industrial endeavors. However, this Article also clearly stipulates that efforts to enhance free trade must not be "incompatible with the obligations undertaken under this Convention." Foremost among the CWC's purposes, as stated in Article I, is that participating states "undertake never under any circumstances...to assist, encourage or induce, in any way" the proliferation of chemical weapons. In short, the principal obligations embedded in Article I have priority with respect to the Article XI language about trade cooperation. Finally, the CWC obligates states to destroy existing weapons stockpiles and chemical weapons production facilities within 10 years.

Fiction: The CWC requires the elimination of the Australia Group and precludes the unilateral use of export controls.

Fact: *Nowhere* in the CWC's text is there a requirement to abolish the Australia Group or the exercise of unilateral export controls. States that join the CWC retain the sovereign right to conduct trade in the manner that they see fit, and for the foreseeable future the Australia Group will function much as it has in the past. In the United States, requests for the sale of chemicals on the Australia Group and CWC control lists will be subjected to the existing license review process.

Fiction: Other states participating in the CWC will still be able to continue to peddle chemical weapons ingredients to aspiring proliferators.

Fact: All states participating in the CWC must pass treaty implementing legislation that enacts criminal and civil penalties for individuals or corporations caught vending CWC-controlled chemicals that are found to have been used to proliferate weapons. Virtually all countries that are significant suppliers of chemicals (e.g., Germany, Switzerland, France, Japan) have already passed laws with criminal penalties and stiff fines for those who would try to profiteer from chemical weapons proliferation.

Fiction: The CWC's entry into force will decrease the effectiveness of the Australia Group.

Fact: The CWC and the Australia Group are mutually reinforcing. The concept and practice of export controls is actually embedded in the CWC. The CWC's list of controlled chemicals looks deceptively shorter than the Australia Group's list—43 CWC control items to the Australia Group's 54. However, the CWC will actually monitor *hundreds* of chemicals because some of the items on its control lists are actually families of chemicals. The treaty contains unprecedented automatic export controls to penalize states that do not join the CWC and to reduce the ability of these holdout states to start or maintain a chemical weapons program. Therefore, numerous countries that have never before applied export controls to combat the proliferation of chemical weapons will begin doing so when they ratify the CWC. At present, 68 countries have ratified the CWC, more than doubling the number of countries that are enforcing export controls via the Australia Group.

Fiction: The Australia Group benefits the North's interests exclusively.

Fact: The Southern hemisphere has the most to gain from the success of efforts to prevent the proliferation of chemical weapons. Since 1918, all incidents of battlefield chemical weapons use have taken place in developing countries.

Fiction: The Australia Group's export controls are discriminatory and retard the efforts of states to develop their economies.

Fact: An examination of trade statistics conclusively proves that allegations about the negative effects of export controls on trade patterns are overblown. The overall chemical trade between North and South has noticeably increased in value since the inception of the Australia Group.

Fiction: Simple solutions, such as "fixing" the 1925 Geneva Protocol banning the use of chemical weapons, are preferable to the CWC.

Fact: No signal mechanism is sufficient to address the problem of chemical weapons proliferation. In addition to the CWC and the Australia Group, other important components to a successful chemical weapons nonproliferation regime are robust intelligence programs, strong and convincing chemical weapons defense programs, and improved domestic and international counter-terrorism measures. Also, the political will to punish countries that violate or do not join the CWC, as well as terrorists who follow Aum Shinrikyo's example, will be crucial to the long-term viability of a chemical weapons nonproliferation regime. The battle against chemical weapons proliferation must be fought one case at a time, with multiple tools, tenacity, and punishment by strong sanctions and force when necessary. When the choice is between poisons or peace, the obvious choice for America and for the international community is the latter.

Separating Fact from Fiction: The Australia Group and the Chemical Weapons Convention

Amy E. Smithson

A superpower conflict that spiraled into an out-of-control nuclear holocaust was the nightmare scenario that came to characterize the Cold War. In the post-Cold War era, the overriding national security concern is that rogue leaders and terrorist groups will obtain and use weapons of mass destruction. Therefore, preventing the proliferation of weapons of mass destruction has been widely recognized as perhaps the most daunting defense and foreign policy challenge of the foreseeable future.

When it comes to ranking weapons of mass destruction, citizens and policy makers perceive nuclear weapons to be a more pressing threat than chemical and biological weapons. For several reasons, however, apathy about these two "lesser" types of weapons of mass destruction is ill-advised. Horrendous destruction would result from the detonation of even a small nuclear weapon, but the fact of the matter is that thousands of more lives would be lost if just 30 kilograms of the biological agent anthrax were unleashed.[1] Some biological agents can incubate for days and then cause lethal illness; some chemical agents can cause virtually instantaneous death. (See Tables 1 and 2.) What makes these weapons all the more disturbing is that some chemical and biological agents can be neither seen nor smelled, and that some biological agents can spread with alarming quickness through human populations. Biological agents can also be used to decimate livestock and crops.

Another factor that should be taken into consideration is that aggressors can only use the weapons they can acquire. Evidence indicates that despots and terrorists are more likely to get their hands on chemical or biological weapons than on nuclear weapons. To begin with, the technical capabilities needed for chemical and biological weapons proliferation are much lower than they are for nuclear weapons. The ingredients for chemical and biological weapons are available in the commercial marketplace at a reasonable price. Accordingly, while hundreds of millions of dollars are required to mount a modest nuclear weapons program, a chemical or biological weapons capability can be assembled for a fraction of that cost.[2] Chemical and biological weapons programs can also be concealed amidst commercial facilities, which is another reason they are thought of as "weapons of choice" for the next century.[3] Aspiring proliferators are also aware that the behavioral

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[1] A Hiroshima-size atomic bomb of about 12.5 kilotons would kill between 23,000 and 80,000 people, while 30,000 to 100,000 people would die if 30 kilograms of anthrax spores were released. U.S. Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, OTA-ISC-559 (Washington, D.C.: Government Printing Office, August 1993), 53.

[2] According to one analysis, the comparative cost for civilian casualties is "$2,000 per square kilometre with conventional weapons, $800 with nuclear weapons, $600 with nerve-gas weapons, and $1 with biological weapons." Joseph D. Douglass, Jr. and Neil C. Livingstone, *America the Vulnerable: The Threat of Chemical and Biological Warfare* (Lexington, Mass.: Lexington Books, 1987), 16.

[3] Biological weapons have been assessed as "the weapon of choice by 2025." Center for Counterproliferation Research, *The NBC Threat in 2025: Concepts and Strategies for Adversarial Use of Nuclear, Biological and Chemical Weapons* (Washington, D.C.: National Defense University, September 1996), iii.

Table 1: Characteristics and Symptoms of Some Biological Agents.

Type of Agent	Name of Agent	Rate of Action	Symptoms/Effects
Bacteria	Anthrax (*Bacillus anthracis*)	*Incubation*: 1-6 days *Length of illness*: 3-5 days	Fever and fatigue, often followed by a slight improvement, then abrupt onset of severe respiratory problems; shock and death usually follow with 2 days of respiratory problems; *high lethality*
	Bubonic Plague (*Yersinia pestis*)	*Incubation*: 2-10 days *Length of illness*: 1-2 days	Malaise, high fever, tender lymph nodes, can lead to hemorrhage, circulatory failure, and death; *high lethality*
Toxin	Botulinum toxin	*Incubation:* hours to days *Length of illness:* 24-72 hours	Weakness, dizziness, dry throat and mouth, blurred vision, progressive weakness of muscles, abrupt respiratory failure may cause death; *high lethality*
	Ricin	*Incubation:* hours *Length of illness:* days	Rapid onset of nausea, vomiting, severe cramps, vascular collapse; can start with nonspecific symptoms of weakness, fever, and cough; *high lethality*
Rickettsiae	Q Fever (*Coxiella burnetii*)	*Incubation:* 10-20 days *Length of illness:* 2 days-2 weeks	Pneumonia, cough, chest pain; *very low lethality*
Virus	Ebola	*Incubation:* 7-9 days *Length of illness:* 5-16 days	Tissue and organ destruction, bleeding from all orifices; *high lethality*
	Venezuelan Equine Encephalitis	*Incubation:* 1-5 days *Length of illness:* days to weeks	Fever, chills, gastrointestinal hemorrhage, sever headache, nausea, vomiting, delirium; can lead to coma, shock, and death; *low lethality*

Source: North Atlantic Treaty Organization, *NATO Handbook on the Medical Aspects of NBC Defense Operations AMedP-6(B) Part II* (also *U.S. Army Field Manual 8-9, U.S. Navy Medical Publication 5059, U.S. Air Force Joint Manual 44-151V12V3*) (Washington, D.C.: U.S. Government Printing Office, 1 February 1996), Annexes B, C.

norms against chemical and biological weapons are not as robust as those against nuclear weapons. Not surprisingly, therefore, over 20 countries are believed to be chemical weapons proliferators, while about a dozen are thought to have biological weapons programs.[4] (See Figure 1.) International pariahs, such as Libya and North Korea, are actively pursuing these weapons.

Table 2: Characteristics and Symptoms of Some Chemical Agents.

Type of Agent	Name (Symbol)	Rate of Action	Mechanism/Effects
Blister Agents	Sulfur Mustard (HD) Lewisite (L)	Delayed Rapid	*Skin contact*: Skin blistering, blindness, potentially fatal lung damage
Blood Agents	Hydrogen Cyanide (AC) Cyanogen Cyanide (CK)	Rapid Rapid	*Inhalation*: Oxygen in blood is blocked, leading to extreme starvation of body tissues (anoxia)
Choking Agents	Chlorine Phosgene (CG)	Variable Delayed	*Inhalation*: Fluid build-up in the lungs leading to fatal choking
Nerve Agents	Tabun (GA) Soman (GD) Sarin (GB) VX (VX)	Very Rapid Very Rapid Very Rapid Rapid	*Skin contact or inhalation*: Nervous system disruption leading to convulsions, paralysis, and death

Source: Central Intelligence Agency, *The Chemical and Biological Warfare Threat* (Washington, D.C.: Central Intelligence Agency, 1995), 8, and Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks, OTA-ISC-559* (Washington, D.C.: U.S. Government Printing Office, 1993), 47.

So, it would appear, are terrorists. The Japanese religious cult Aum Shinrikyo experimented with and made small quantities of biological and chemical agents. On 20 March 1995, Aum

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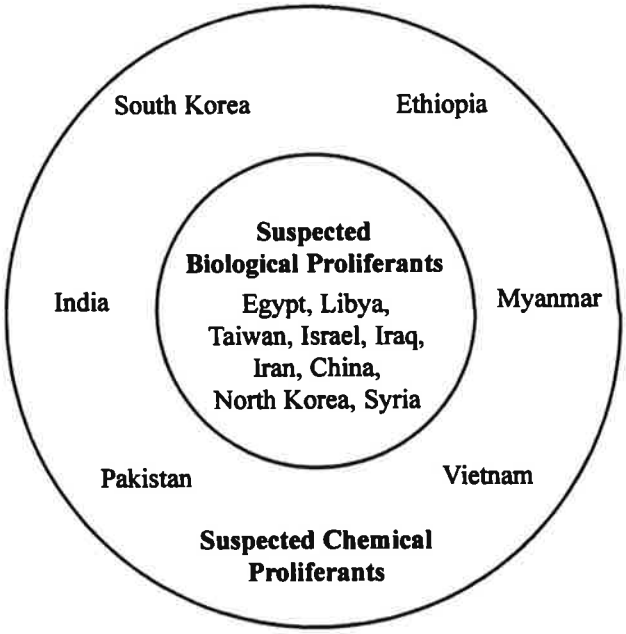
[4] In the words of former Secretary of State Warren Christopher, "some 20 countries already have, or may be developing, chemical weapons." Statement before the Senate Foreign Relations Committee (Washington, D.C.: U.S. Department of State, 28 March 1996), 2. The Central Intelligence Agency puts the number of suspected chemical weapons proliferants at more than 15. See testimony of Gordon Oehler in U.S. Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction, Part I.* Hearing, 104th Congress, 2nd sess. 31 October and 1 November 1995. S. Hrg 104-422 (Washington, D.C.: Government Printing Office, 1995), 488.

Shinrikyo released the nerve agent sarin in a crowded Tokyo subway, killing a dozen and injuring over 5,500.[5] This attack proved another of the advantages of chemical and biological weapons over nuclear weapons: sophisticated delivery systems are not needed. Cult members carried sarin-filled two-ply plastic bags aboard several subway trains, and released the agent by puncturing the bags with sharp objects, such as the tip of an umbrella.[6] Commuters on the trains and in subway stations were quickly overcome by the fumes. Aum Shinrikyo's activities demonstrated conclusively what security experts have long feared, that biological and chemical weapons are no longer the domain of governments.

Figure 1: Suspected Chemical and Biological Weapons Proliferators.



Sources: Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks, OTA-ISC-559* (Washington, D.C.: Government Printing Office, 1993), 64-65; U.S. Arms Control and Disarmament Agency, *Annual Report to Congress* (Washington, D.C.: Arms Control and Disarmament Agency, 7 August 1996); U.S. Arms Control and Disarmament Agency, *Threat Control Through Arms Control, Report to Congress 1994* (Washington, D.C.: Arms Control and Disarmament Agency, 13 July 1995); U.S. House of Representatives, Committee on Armed Services, *Containing the Chemical and Biological Threat in the Post-Soviet Era.* Committee Report, 102nd Congress. H. Rpt. 102-15, cited in The Business Alliance to Protect Americans from Chemical Weapons, *Making Americans Safer: The Case for the Chemical Weapons Convention (CWC)* (Washington, D.C.: Business Executives for National Security and the Chemical Manufacturers Association, 1996).

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[5] For more on this incident, see Paul Blustein, "Gas Attack Shuts Tokyo Subway: 6 Die, Hundreds Hurt As Rail Commuters Flee Trains, Stations," *Washington Post*, 20 March 1996, A1; Nicholas D. Kristof, "Hundreds in Japan Hunt Gas Attackers After 8 Die: Police Tighten Security Steps at Stations," *New York Times*, 21 March 1995, A1; and *Global Proliferation of Weapons of Mass Destruction,* which provides a complete accounting of Aum Shinrikyo's activities.

[6] Kyle Olson, interview with the author, Washington, D.C., 14 September 1995. Olson's testimony can also be found in *Global Proliferation of Weapons of Mass Destruction.*

Perhaps the most vexing aspect of trying to thwart the proliferation of chemical and biological weapons is the so-called dual-use factor, that is, materials and equipment that have both commercial and military applications. To illustrate, numerous chemicals that are integral components of ordinary commercial products—fertilizers, pesticides, textile dyes, and shampoos—can also be used to produce chemical weapons. Chlorine is a fairly well-known dual-use chemical. Another is thiodiglycol, which can be an ingredient in either ball-point ink or mustard gas.[7] Similar examples in the pharmaceutical and biotechnology industries are fermenters and freeze-drying equipment, items commonly utilized to manufacture medicines that are also crucial to making and weaponizing a biological agent. The dual-use nature of materials and equipment thus makes it difficult to curtail weapons proliferation without inhibiting legitimate commercial endeavors.

Given these circumstances, one would think that mechanisms to control the flow of dual-use materials and equipment to countries believed to be proliferating chemical and biological weapons would garner widespread domestic and international support. Instead, two such mechanisms—the Chemical Weapons Convention (CWC) and the Australia Group—have received a mixed welcome, partly because the Convention's trade provisions and the Australia Group's export controls have been misrepresented and misunderstood. The Convention was designed to eliminate existing chemical weapons stockpiles and production facilities and to impede the spread of chemical weapons. The Australia Group is a collection of countries that began acting in concert in the mid-1980s to suppress the proliferation of chemical and biological weapons through export controls.

In important ways, the turmoil that has been associated with the Australia Group is linked to the entry into force of the CWC, which will occur on April 29, 1997.[8] The CWC outlaws the development, production, stockpiling, transfer, and use of chemical weapons. The treaty requires the destruction of chemical weapons stockpiles and production facilities within a 10-year time frame. International inspectors will monitor the elimination of chemical arsenals, and they will also routinely monitor commercial facilities to guard against the diversion of dual-use chemicals to covert weapons production. Short-notice challenge inspections will be used to investigate allegations of cheating. These challenge inspections can be conducted at any facility in a participating country.[9]

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[7] Chlorine, which is commonly used to purify water, was employed as a weapon in World War I. For an in-depth study of another dual-use chemical, see S. J. Lundin, ed., *Verification of Dual-use Chemicals under the Chemical Weapons Convention: The Case of Thiodiglycol*, Stockholm International Peace Research Institute (Oxford: Oxford University Press, 1991).

[8] A total of 65 countries must ratify the CWC to trigger its entry into force. Hungary deposited the 65th ratification on 31 October 1996, starting a six-month countdown toward the treaty's activation. Other countries that have already ratified the CWC include Germany, Japan, the United Kingdom, Australia, Canada, Mexico, South Africa, Uzbekistan, India, Saudi Arabia, Turkmenistan, and Brazil.

[9] For a layman's explanation of the CWC's monitoring provisions, see Amy E. Smithson, ed., *The Chemical Weapons Convention Handbook*, Handbook no. 2 (Washington, D.C.: The Henry L. Stimson Center, September 1993).

As the CWC negotiations were coming to a close in the early 1990s, many governments struggling with economic development called for the abolition of the Australia Group when the CWC was activated. If the CWC's monitoring agency found no evidence of chemical weapons proliferation within their borders, these countries argued, then their economies should not be subjected to export controls. In fact, the Australia Group's existence was such an affront to some countries that they maneuvered to hold the conclusion of the CWC negotiations hostage to their quest to have the Conference on Disarmament adjudicate this matter in their favor.[10] Although their efforts did not succeed, this apparent willingness to jettison a major international arms control accord indicates the depth of resentment with which some countries held the Australia Group. Since the conclusion of the CWC negotiations, the North-South discord about the Australia Group subsided. However, a few countries, most often Iran and India, have continued to decry the Australia Group's existence throughout the subsequent negotiations in the Preparatory Commission to settle the CWC's operational details.[11]

In the United States, some confusion has been created about the trade provisions of the CWC and the Australia Group's relationship to the treaty. The first of two fallacious assertions made in this regard is that the CWC would start a "poisons for peace" assistance program, *requiring* the United States and other major chemical producers to sell chemical weapons precursors to states thought to be proliferating weapons of mass destruction. If true, the CWC would negate the Australia Group and any other national export controls. The second is that the CWC *requires* the elimination of the Australia Group. Many who are unfamiliar with the terms of the treaty or of the Australia Group's operations have simply accepted these contentions as accurate.

Thus, the use of export controls, the Australia Group, and the CWC have become mired in controversy. The dissension over the Australia Group has been fueled partly by the fact that relatively little has been written on this subject. The purpose of this report is to present a factual discussion of the Australia Group's history and *modus operandi*, as well as of the CWC's trade-related provisions. The first segment of the report relates the Australia Group's origins, followed by an account of how Australia Group meetings generally operate and the criteria for joining the collective. Next, the discussion moves to how the Australia Group expanded the scope of its

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[10] In the summer of 1992, Pakistan led 14 non-aligned nations in introducing a flurry of proposals pertaining to different aspects of the CWC draft text. All agreed, however, that the group's most strenuous objections related to the draft language on export controls, which they argued was discriminatory and omitted a requirement for the Australia Group's dismantlement. Unable to rally support to their cause, this protest fell by the wayside as Dr. Adolf Ritter von Wagner, the German chairman of the Conference on Disarmament's Ad Hoc Committee on Chemical Weapons, held to a consensus decision making rule and brought the negotiations to a close early in August. For more on the CWC's negotiating end game, see Hassan Mashhadi, "How the Negotiations Ended," *Chemical Weapons Convention Bulletin,* no. 17 (September 1992): 1, 28-30; Amy E. Smithson, "Chemical Weapons: The End of the Beginning," *Bulletin of the Atomic Scientists* 48, no. 8 (October 1992): 36-40 and "Tottering Toward a Treaty," *Bulletin of the Atomic Scientists* 48, no. 6 (July/August 1992): 9-11.

[11] Since 1993, the states that have signed the CWC have been meeting periodically as the Preparatory Commission in the Hague. Appendix I of the CWC created this political and technical decision-making body to establish detailed verification procedures, prepare an administrative and operational budget, recruit and train inspectors, and establish the rules of procedure and infrastructure for implementing the treaty.

activities and its membership. The North-South discord and the Australia Group's rebuttal of its critics in view of the challenges of containing proliferation in the post-Cold War era are explored in the ensuing sections. The final two segments of the report offer a discussion of the domestic misperceptions about the Australia Group and the CWC and some concluding observations about the need for a variety of complementary tools to restrict the proliferation of biological and chemical weapons.

The Origins of the Australia Group

The Iran-Iraq War of the 1980s highlighted the dual-use dilemma and the grave consequences of not moving aggressively to halt chemical weapons proliferation. By 1984, evidence was mounting that Iraqi forces were using mustard gas and hydrogen cyanide to achieve parity against Iranian "human wave" offensives. In this conflict, Iraq also gained the ignoble distinction of being the first country to use nerve agent, tabun specifically, in war. Negative publicity aside, the international community's response to Iraq's flagrant violation of the 1925 Geneva Protocol, which bans the use of chemical weapons, was tepid.[12] Perhaps the most infamous chemical attack took place in March 1988, when at least 3,000 Kurdish civilians died after Iraq bombed Halabja with mustard gas and possibly the nerve agent sarin.[13] Another high-profile event of the late 1980s—Libya's construction of a chemical weapons production facility at Rabta under the guise of a pharmaceutical plant[14]—also helped to heighten concerns about the proliferation and use of chemical weapons.

Western governments slowly began to acknowledge, much to their dismay, that commercial trade in dual-use chemicals and expertise was fueling programs to develop and produce chemical weapons. Out of greed, ignorance, or complacency, companies and individuals from West Germany, Great Britain, Japan, Austria, Belgium, the Netherlands, Italy, Switzerland, France, and the United States, among other countries, had sold Iraq and Libya products that facilitated their

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[12] The declaration resulting from a January 1989 conference of 149 states condemned chemical weapons proliferation and use, but did not even mention Iraq by name. Vic Utgoff, *The Challenge of Chemical Weapons: An American Perspective* (New York: St. Martin's Press, 1991), 123-5. Iraq acceded to the Geneva Protocol on 8 September 1931. The United Nations sent several investigatory teams to the region in the mid-1980s, which confirmed Iraqi use of chemical weapons. Further punitive measures were not taken, however, and an international uproar ensued amongst arms control advocates. To what extent Iran retaliated in kind is disputed, with different experts saying Iran may have used mustard, phosgene, or cyanide. Gordon M. Burck and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation* (New York: Greenwood Press, 1991), 239-46.

[13] For more detail, see Ministry of Defense, Chemical & Biological Defense Establishment, *Report on Analysis of Samples Collected in Northern Iraq* (United Kingdom: Ministry of Defense, March 1993) and "Scientific First: Soil Samples Taken from Bomb Craters in Northern Iraq Reveal Nerve Gas—Even Four Years Later" (New York: Physicians for Human Rights and Human Rights Watch, 29 April 1993).

[14] For the story of Rabta, see U.S. Congress, Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction*, OTA-BP-ISC-115 (Washington, D.C.: Government Printing Office, December 1989), 42-4. Chapter 2 of this report contains an excellent tutorial on chemical weapons proliferation.

proliferation aims.[15] As these nations individually began to enact export controls in the mid-1980s, Australian analysts were among the first to recognize that proliferators were selectively shopping for desired items among Western suppliers, requesting sales from one nation if turned down by another. Concerned about the possible arrival of chemical weapons proliferation in the Pacific region, the Australian government proposed in April 1985 that supplier nations meet to discuss the problem.[16]

Australian officials believed that proliferation would be more effectively stemmed if existing export control policies were harmonized and if more countries introduced such measures.[17] In June 1985, 15 nations gathered at the Australian embassy in Brussels for an informal meeting. See Table 3 for a list of the original Australia Group members. At that time, these countries all had export controls in place for four bulk "precursor" or dual-use chemicals that could be diverted to make mustard and G-class nerve agents, such as tabun, sarin, and soman. When the participants next met in May 1986 at the Australian embassy in Paris, they settled upon an approach for more expansive controls to frustrate attempts to proliferate the more lethal V-class nerve agents, notably VX.[18]

This approach consisted of a "core list" of chemicals that all participants would formally control and a "warning list" of chemicals each country would issue to its domestic industry for further voluntary action. While the governments normally reviewed export license applications for core list chemicals on a case-by-case basis, exporters were allowed to make decisions about requests for warning list chemicals. If exporters breached procedures concerning the core list, legal penalties would apply.

Table 3:
The Original Australia Group Members.

Australia
Canada
Belgium
Denmark
France
Germany
Greece
Ireland
Italy
Japan
Luxembourg
Netherlands
New Zealand
United Kingdom
United States

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[15] Australia Group, "Current Export Controls on Materials Used in the Manufacture of Chemical and Biological Weapons," Australia Group Document AG/Dec92/Press/Chair/8 (Paris: 22 December 1992), 1. See also Burck and Flowerree, *International Handbook on Chemical Weapons Proliferation*, 35-84, 267-72.

[16] For an account of the early efforts to institute export controls and of the Australia Group's initial activities, see Julian P. Perry Robinson, "The Australia Group: A Description and Assessment," *Controlling the Development and Spread of Military Technology: Lessons from the Past and Challenges for the 1990s*, eds. Hans Gunter Brauch, Henny J. Van Der Graff, John Grin, and Wim A. Smit (Amsterdam: Vu University Press, 1992), 157-76.

[17] Peter Furlonger, "Outline of the Work of the Australia Group in Preventing the Proliferation of Chemical and Biological Weapons," Paper presented at the Asian Seminar on Export Controls (Tokyo: January 1995), 2.

[18] Robinson, "The Australia Group," 159, 161.

Chemicals on the warning list could be upgraded to the core list.[19] The 35-chemical warning list was adopted at the May 1986 meeting, while a core list of eight chemicals was approved at a mid-September 1987 meeting.[20]

Operational Practices of the Australia Group

While the Australia Group set out to harmonize export control policies, participating states did not uniformly apply export controls at the outset. For example, Japan at first enforced export controls only with Iraq and Iran; other participating countries controlled all requests for core list chemicals. Some states applied export controls to some warning list chemicals as well as those on the core list.[21] Though not required to do so, most participating countries began following an Irish precedent that put warning list chemicals under statutory controls.[22] Although the Australia Group's agreed principles were not legally binding, in practice the export control policies of participants became more uniform as the years passed.

For example, the Australia Group initiated a "no undercut" policy in 1993. When an Australia Group member denies an export license request because of concerns that the item will be used to further proliferation, it notifies other members of the particulars of the case (e.g., item in question, who asked for it, the supplier). If other countries are approached for the same item or by the same end-user or supplier, they are to consult with the country that first denied the license. Both countries could mutually conclude that the initial denial was well-founded, which would result in a second refusal of the export license request. Or, the two Australia Group members could agree that the initial denial was not well-founded and that the second country is free to sell. Finally, the two members could disagree about the case, reflecting again the non-binding nature of the Australia

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[19] Ibid., 161-2. A State Department official points out that a request for a controlled item can be turned down quietly or more directly. For instance, those requesting controlled items can put out "feelers" to the domestic export office and can unofficially be told no, if circumstances warrant. Or, the applicant can be quietly encouraged to withdraw the export control request, which otherwise would be denied. Finally, the review process can run its course, with the application officially denied. Interview with the author, Washington, D.C., 1 February 1995.

[20] The initial core list consisted of five chemicals. Arms Control and Disarmament Agency, Office of Public Affairs, "Australia Group," Fact Sheet (Washington, D.C.: Arms Control and Disarmament Agency, 12 April 1996), 3.

[21] Robinson, "The Australia Group," 163. In May 1989, the United States controlled six of the nine core chemicals on a global basis, with 40 more chemicals being controlled only if headed for Iran, Iraq, Syria, or Libya. Worldwide controls were instituted for nine chemicals as of December 1989, and ten more were added to the overall U.S. list. U.S. General Accounting Office, *Arms Control: U.S. and International Efforts to Ban Chemical Weapons*, GAO/NSIAD-91-37 (Washington, D.C.: U.S. General Accounting Office, September 1991), 9. For more, see 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 *Controlling the Development and Spread of Military Technology*, 221-33.

[22] U.S. General Accounting Office, *U.S. and International Efforts to Ban Chemical Weapons*, 15.

Group. The objective of this policy is to hinder would-be proliferators from "shopping around" amongst Australia Group members. Moreover, the Australia Group made the no-undercut policy public to enhance its deterrent effect.[23]

Such policies are indicative of the Australia Group's cohesion, but the cooperative nonetheless remains informal. Although decisions are taken by consensus, the Australia Group lacks a formal charter or constitution.[24] The Australia Group retains its informal character, which is a departure from the strict protocol normally observed at international gatherings. All participants have advance knowledge of the agenda before a meeting, which on average lasts three-to-four days. The first item of business is usually the "information exchange," which entails intelligence briefings about proven or suspected proliferators; dealers, shipping companies, or other unscrupulous businesses fronting for proliferators; and other information that will assist licensing officials in evaluating export requests.[25] The information-sharing aspect of the Australia Group is one of the activities its members most value because it provides governments an expanded information base to help officials decide when proliferation concerns merit the denial of an export request.

In subsequent sessions, participants separate into subsidiary expert groups to discuss such matters as whether new items should be added to the various control lists and how to improve the effectiveness and enforcement of export controls. Decisions are taken by unanimity in a final plenary meeting.[26] In 1995, the Australia Group began meeting once a year in October, instead of its previous biannual meeting format.[27]

Not long after the Australia Group was formed, additional countries began expressing interest in becoming involved. All current Australia Group members must approve the application of a prospective member. The first criterion considered is whether the applying state is believed to possess chemical or biological weapons programs. Second, members assess the status of the

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[23] According to a U.S. State Department official, another purpose of this policy is to create a more level commercial playing field within the Australia Group to facilitate industry support for the group's activities. Interview with the author, Washington, D.C., 1 February 1995; U.S. Arms Control and Disarmament Agency, Office of Public Affairs, "Australia Group Meeting," Fact Sheet (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 28 July 1993).

[24] Australia Group, "Current Export Control," 22 December 1992, 2; Arms Control and Disarmament Agency, "Australia Group," 12 April 1996, 1.

[25] Australia Group members began sharing information about their national export control enforcement regimes in December 1990. Law enforcement and customs officials participate in the discussions about effectiveness in implementing export controls. U.S. Arms Control and Disarmament Agency, "Australia Group Meeting," 28 July 1993.

[26] The Australians, as executive secretary, have developed a document numbering system, staff the meetings, and provide other basic administrative services such as photocopying. Participants pay their own travel and lodging bills. State Department official, interview with the author, Washington, D.C., 1 February 1995.

[27] "Press Release: Australia Group Meeting," Australia Group Document Number AG/Nov94/Press/Chair/14 (Paris: 1 December 1994).

applicant's export controls and track record in this area, including whether the country has already incorporated the Australia Group's controlled items in its export regulations.[28]

Expansion of the Australia Group

Gradually, the Australia Group added more chemicals to the control lists and upgraded them to the core list. By 1988, a total of 44 chemicals were listed, a number that rose to 50 in 1989. At the May 1991 meeting, the participants agreed that export controls should be required for all 50 chemicals listed at that time, in effect, merging the warning and core lists.[29] Four more dual-use chemicals were added to the control list in 1992, bringing the total to 54. Table 4 delineates the Australia Group chemical control list, some of the commercial uses for these chemicals, as well as their possible military applications.

Table 4: The Australia Group Chemicals—Commercial and Military Applications.

Chemical	Commercial Use	Chemical Agent(s)
Thiodiglycol	Plastics, ball-point pen ink, organic synthesis*	Mustard gas
Phosphorus Oxychloride	Insecticides, gasoline additives, flame retardants	Tabun
Dimethyl Methylphosphonate	Fire retardant	Sarin, soman
Methyl Phosphonyl Difluoride	Organic synthesis	Sarin, soman
Methyl Phosphonyl Dichloride	Organic synthesis	Sarin, soman
Dimethyl Phosphite	Lubricant additive	Sarin, soman
Phosphorus Trichloride	Insecticides, organic synthesis, gasoline additives, dyestuffs	Tabun, sarin, soman
Trimethyl Phosphite	Insecticides, organic synthesis catalysts, optical brightener	Sarin

[28] Some applications have been rejected, and it is generally known within the group which member(s) "black-balled" an applicant and why. Some countries approach the Australian government, which is the official point of contact for the group, discreetly and want total reassurance that they will be approved before applying. Others take a more direct, even public approach. State Department official, interview with author, Washington, D.C., 1 February 1995.

[29] U.S. General Accounting Office, *U.S. and International Efforts to Ban Chemical Weapons*, 15.

Table 4: Australia Group Chemicals—Commercial and Military Applications, Cont.

Chemical	Commercial Use	Chemical Agent(s)
Thionyl Chloride	Plastics, pesticides, chlorinating agent, organic synthesis	Mustard gas, sarin, soman
3-Hydroxy-1-methylpiperidine	Pharmaceuticals	BZ†
N,N-Diisopropyl-(beta)-Aminoethyl Chloride	Organic synthesis	VX
N,N-Diisopropyl-(beta)-Aminoethane Thiol	Organic synthesis	VX
3-Quinuclidinol	Pharmaceuticals	BZ
Potassium Fluoride	Cleaning agent for brewery, dairy, and other food processing equipment; glass and porcelain manufacturing	Sarin, soman
2-Chloroethanol	Insecticides, solvents, organic synthesis	Mustard gas
Dimethylamine	Detergents, pesticides, gasoline additives, vulcanization of rubber, missile fuel, organic synthesis, pharmaceuticals	Tabun
Diethyl Ethylphosphonate	Gasoline additive, plastics, heavy metal extraction	(Ethyl) sarin
Diethyl N,N-Dimethylosphoramidate	Organic synthesis	Tabun
Diethyl Phosphite	Paint solvent, lubricant additive	Sarin, soman
Dimethylamine Hydrochloride	Pharmaceuticals, pesticides, gasoline additives	Tabun
Ethyl Phosphinyl Dichloride	Organic synthesis	(Ethyl) sarin
Ethyl Phosphonyl Dichloride	Organic synthesis	(Ethyl) sarin
Ethyl Phosphonyl Difluoride	Organic synthesis	(Ethyl) sarin
Hydrogen Fluoride	Fluorinating agent, catalyst agent	Sarin, soman

Table 4: Australia Group Chemicals—Commercial and Military Applications, Cont.

Chemical	Commercial Use	Chemical Agent(s)
Methyl Benzilate	Tranquilizers, organic synthesis	BZ
Methyl Phosphinyl Dichloride	Organic synthesis	VX
N,N-Diisopropyl-(beta)-Amino-Ethanol	Organic synthesis	VX
Pinacolyl Alcohol	Organic synthesis	Soman
O-Ethyl 2-Diisopropylamino-ethyl Methylphosphonite	Specific uses not identified	VX
Triethyl Phosphite	Plasticizers, lubricant, additives, organic synthesis, dyestuff, optical brighteners	VX, sarin, soman, tabun
Arsenic Trichloride	Ceramics, insecticides, pharmaceuticals	Lewisite
Benzylic Acid	Organic synthesis	BZ
Diethyl Methylphosphonite	Organic synthesis	VX
Dimethyl Ethylphosphonate	Organic synthesis	(Ethyl) sarin
Ethyl Phosphinyl Difluoride	Organic synthesis	(Ethyl) sarin
Methyl Phosphinyl Difluoride	Organic synthesis	VX, sarin, soman
3-Quinuclidone	Pharmaceuticals	BZ
Phosphorus Pentachloride	Plastics, pesticides	Tabun
Pinacolone	Organic synthesis	Soman
Potassium Cyanide	Pesticide, fumigating, electroplating, gold and silver extraction	Tabun, hydrogen cyanide
Potassium Bifluoride	Fluorine production, catalyst agent	Sarin, soman
Ammonium Bifluoride	Ceramics, disinfectant for food equipment, electroplating	Sarin, soman
Sodium Bifluoride	Antiseptic, neutralizer in laundry operations	Sarin, soman

Table 4: Australia Group Chemicals—Commercial and Military Applications, Cont.

Chemical	Commercial Use	Chemical Agent(s)
Sodium Fluoride	Disinfectant, glass and steel manufacturing	Sarin, soman
Sodium Cyanide	Dyes & pigments, nylon production, fumigant, gold and silver extraction	Tabun, hydrogen cyanide, cyanogen cyanide
Tri-ethanolamine	Cosmetics, detergents	Mustard gas
Phosphorus Pentasulphide	Insecticide, lubricant oil additives, pyrotechnics	VX
Di-isopropylamine	Organic synthesis	VX
Diethylaminoethanol	Textile softeners, organic synthesis, pharmaceuticals, paint manufacture, anticorrosion compounds	VX, sarin, soman, tabun
Sodium Sulphide	Paper manufacturing, rubber manufacturing, metal refining, dye manufacturing	Mustard gas
Sulphur Monochloride	Pharmaceuticals, sulfur dyes, insecticides, catalyst agent	Mustard gas
Sulphur Dichloride	Insecticides, chlorinating agent, rubber vulcanizing	Mustard gas
Triethanolamine Hydrochloride	Toiletries, insecticides, waxes, polishes, textile specialties, lubricants, cement additive	Mustard gas
N,N-Diisopropyl-2- Aminoethyl Chloride Hydrochloride	Organic synthesis	VX

* Organic synthesis refers to the process of making other chemical compounds.

† Incapacitating agent

Source: Central Intelligence Agency, *The Chemical and Biological Warfare Threat* (Washington, D.C.: Government Printing Office, 1995), 9-16, and U.S. Arms Control and Disarmament Agency, "Australia Group Export Controls on Materials Used in the Manufacture of Chemical and Biological Weapons, Control List of Dual-use Chemicals: Commercial and Military Application," Fact Sheet (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 6 September 1996).

Whereas the chemicals controlled by the Australia Group indicate the cooperative's intent to quickly deprive proliferators of the principal dual-use chemicals that could be used to make mustard gas and nerve agents, the nature of the CWC's control lists is somewhat different. The CWC uses three lists or "Schedules" to rank chemicals according to the risk they pose to proliferation. Both warfare agents and dual-use chemicals are on the CWC's control lists.[30] The CWC's Schedules appear to be deceptively shorter than the Australia Group's controls—43 CWC control items to the Australia Group's 54. However, the CWC will actually monitor *hundreds* of chemicals because some of the items on its Schedules are actually families of chemicals. (See Annex 1.) With this approach, the treaty's verification provisions can focus on "an appropriate range of key chemicals....[to] sustain confidence in the overall CWC regime."[31] Both the Australia Group and the CWC control lists can be modified, but the CWC controls apply only to chemicals, not to equipment.

As early as 1987, the Australia Group began to consider expanding its scope to include controls on dual-use chemical equipment to hinder further the efforts of proliferating countries to develop an indigenous capacity to make chemical weapons. Aspiring proliferators would be impeded if key pieces of equipment could not be readily obtained. Similar to the pattern followed for the coordinated control of precursor chemicals, individual countries began enacting export controls and momentum built for the Australia Group to draft warning guidelines for dual-use chemical equipment in mid-1990. In May 1991, based upon recognized evidence that certain types of equipment were being sought for proliferation purposes, all participants agreed to control dual-use equipment.[32] The control list for chemical manufacturing facilities and equipment includes reactor vessels, storage tanks and containers, heat exchangers, distillation columns, condensers, degassing

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[30] Schedule 1 consists of warfare agents and highly toxic chemicals, which must be eliminated except for small quantities that can be produced for protective purposes (e.g., testing of vaccines, gas masks), or medical, research, or pharmaceutical purposes. Schedule 2 contains dual-use chemicals that are not extensively used in industry, and Schedule 3 is comprised of widely traded dual-use chemicals. A couple chemical agents of World War I vintage, such as phosgene, hydrogen cyanide, and cyanogen chloride are on Schedule 3. These chemicals also have commercial uses.

[31] Robert J. Mathews, "A Comparison of the Australia Group List of Chemical Weapon Precursors and the CWC Schedules of Chemicals," *Chemical Weapons Convention Bulletin*, no. 21 (September 1993): 2.

[32] Among the states taking the initiative to control dual-use equipment were Britain, Germany, and the United States. Robinson, "The Australia Group," 164-5. On 16 November 1990, President George Bush issued Executive Order 12735 to stiffen chemical and biological export controls. Not long afterward, the Enhanced Proliferation Control Initiative, introduced on 13 December 1990, tightened U.S. export control procedures for dual-use items and equipment related to chemical, biological, and missile proliferation. Export control licenses were required for all fifty Australia Group chemicals listed, not just the eleven on the core list at that time. The United States also imposed civil and criminal penalties related to the export of technical expertise and knowledge of activities that would aid proliferating countries. See Clyde H. Farnsworth, "U.S. Moves to Cut Chemicals' Spread," *New York Times*, 15 December 1990, A7; U.S. Department of State, "Curbing the Spread of Weapons of Mass Destruction," *U.S. Department of State Dispatch* 2, no. 10 (11 March 1991); Ian Anthony, "The United States," in *Arms Export Regulations*, Ian Anthony, ed. (Oxford: Oxford University Press, 1991), 186-7.

and filling equipment, valves and multi-walled piping, pumps, incinerators, detectors, and related technology.[33] (For the complete list, see Annex 2.)

In 1990, the Australia Group agreed once more to expand the scope of its controls, this time with the objective of countering the proliferation of biological weapons.[34] The following year, the Group began drafting a prospective list of control items. Approved at the June and December 1992 meetings, the core list contained 20 viruses, including such notorious killers as the Ebola, Lassa fever, Marburg, Machupo, and Hantaan viruses. Also on the core list were four rickettsiae, 13 bacteria, and ten toxins. Like the two-tiered approach first used with chemical precursors, a warning list of eight viruses, five bacteria, and four toxins was also established. The control list for animal pathogens listed 15 viruses and one bacteria. These core and warning lists also contained genetically-modified micro-organisms. Dual-use equipment to be controlled included fermenters, centrifugal separators, aerosol inhalation chambers, and cross-flow filtration and freeze-drying equipment. Complete bio-safety facilities at the P3 or P4 containment levels and equipment to be used in such facilities would be subject to control.[35] A P4 level of containment is required for work on life-threatening diseases or agents.[36] The plant pathogens control list added in mid-1993 included genetically-modified micro-organisms, two bacteria, and six fungi on the core list, as well as awareness raising guidelines for two additional bacteria, two fungi, one virus, and other genetically-modified micro-organisms.[37] (See Annex 3 for the entire list.)

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[33] See the December 1991 list and the elaborated 1993 version that contains definitions of terms and the following statement of understanding: "These controls do not apply to equipment which is specially designed for use in civil applications (for example food processing, pulp and paper process, or water purification, etc.) and is, by the nature of its design, inappropriate for use in storing, processing, producing, or conducting and controlling the flow of chemical warfare agents or any of the AG-controlled precursor chemicals." Australia Group, "Control List of Dual-Use Chemical Manufacturing Facilities and Equipment, and Related Technology," Australia Group Document AG/Dec91/Equip/Chair/6 (Paris: December 1991); Australia Group, "Control List of Dual-Use Chemical Manufacturing Facilities and Equipment, and Related Technology," Australia Group Document AG/Jun93/Equip/Chair/9 (Paris: June 1993).

[34] Furlonger, "Outline of the Work of the Australia Group," 3.

[35] Australia Group, "List of Biological Agents for Export Control," Australia Group Document AG/Jun92/BW/Chair/12 (Paris: June 1992). For more on these viruses, see Laurie Garrett, *The Coming Plague: Newly Emerging Diseases in a World Out of Balance* (New York: Farrar, Straus and Giroux, 1994). See also U.S. General Accounting Office, *Arms Control: U.S. and International Efforts to Ban Biological Weapons*, GAO/NSIAD-93-113 (Washington, D.C.: General Accounting Office, December 1992), 35-6.

[36] The higher the number, the more physical barriers a facility has to prevent an organism from escaping the laboratory. The P3 and P4 containment designations are synonymous with the BL3, BL4, L3, and L4 containment levels in the 1983 Laboratory Biosafety Manual of the World Health Organization. For diagrams of such facilities, see pages 28-29 of *The Chemical and Biological Warfare Threat* (Washington, D.C.: U.S. Government, 1995).

[37] Australia Group, "List of Plant Pathogens for Export Control," Australia Group Document AG/Jun93/BW/Chair/28 (Paris: June 1993).

In addition to expanding the materials being controlled, the Australia Group increased its membership. As Table 5 shows, several more European countries joined, as did a couple of South American and Asian states. These additions have brought the total number of Australia Group countries to 30. The European Commission also participates as an observer.

Within the Australia Group, there are different views as to how large the cooperative should swell. Former non-aligned countries have begun petitioning to join the Australia Group, and one, Argentina, has already entered its ranks. Some members see advantages in recruiting as many states as possible as a way of enhancing the effectiveness of the control network. Others believe that the important factor is not how many countries are involved, but which ones belong to the Australia Group. According to this viewpoint, the countries that should be targeted for Australia Group membership are those that are significant suppliers of chemicals. Admitting countries that are not major suppliers of chemicals would make the Australia Group less efficient while only marginally increasing the Australia Group's effectiveness.[38] Since its inception, however, the membership of the Australia Group has slowly grown.

Table 5: Additions to the Australia Group's Membership.

Year Joined	Country
1986	Portugal, Spain, and Norway
1987	Switzerland
1991	Sweden and Finland
1992	Austria
1993	Argentina, Hungary, and Iceland
1994	Czech Republic, Poland, and the Slovak Republic
1995	Romania
1996	South Korea

North-South Differences Over the Australia Group

Expectations and attitudes about disarmament, technical and financial assistance, export controls, and economic development have been ripening below and above the equator for decades. The 1970 Nuclear Non-Proliferation Treaty (NPT) was a major benchmark in that regard. The NPT obligates non-nuclear weapons states to forfeit nuclear weapons aspirations to become eligible for technical and economic assistance to develop peaceful uses of the atom, thus legitimizing a link between peace and economic development.[39] Morocco's King Hassan II expressed the views of many developing countries when he characterized this linkage in the following terms: "We believe that disarmament will have no true significance unless it engenders in the countries of the North the

[38] Foreign diplomat, interview with the author, Washington, D.C., 27 February 1997.

[39] For the text of the NPT, especially Articles II and IV, see U.S. Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements: Texts and Histories of the Negotiations* (Washington, D.C.: Arms Control and Disarmament Agency, 1990), 98-102.

dynamics of cooperation with the countries of the South to help the latter to free themselves from underdevelopment."[40]

Even though the NPT process coupled peace and economic progress, the 1972 Biological and Toxin Weapons Convention (BWC) and the CWC *did not* follow this precedent. Partly because the CWC and the BWC require that all participating states eliminate their chemical and biological arsenals, neither treaty specifically provides for technical or developmental assistance in exchange for forsaking chemical and biological weapons.[41] Article III of the BWC, which prohibits the development, production, stockpiling, acquisition, and retention of biological weapons, stipulates that participating states not assist other countries in obtaining biological weapons.[42] Likewise, Article I of the CWC commits states not to "assist, encourage, or induce, in any way" any efforts to proliferate or use chemical weapons. The directives not to facilitate proliferation and the requirement to abolish existing biological and chemical stockpiles are the most important ones in the CWC and the BWC.

However, confusion has arisen because both treaties also state that participating countries "have the right" to engage in "the fullest possible exchange of" materials, equipment, and scientific and technical information related to peaceful purposes. In that vein, the text of the BWC states that the treaty is to be "implemented in a manner designed to avoid hampering the economic or technological development of participating states." Similar language is included in the CWC.[43] As will be discussed below, the provisions in the BWC and CWC encouraging free trade do not overrule the principal obligations to eliminate and not proliferate biological and chemical weapons.

Understanding that determined proliferators would go to great lengths to procure weapons of mass destruction, concerned industrialized countries decided to institute export controls on an

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[40] Morocco assessed the CWC's language about economic development and export controls as a "compromise among the concerns which have been expressed." Hassan's 1 January 1992 statement to the United Nations Security Council was quoted in Conference on Disarmament, document CD/PV.634 (Geneva: 22 August 1992), 24-5.

[41] The CWC does permit member states to request technical and other assistance from a *voluntary* fund if they are threatened with or suffer a chemical attack. Gas masks, decontamination equipment, and antidotes are examples of the type of assistance that might be provided. Participating states are also allowed to consult the data bank of information about chemical weapons defenses that the treaty's implementing agency will assemble. Article X stipulates that states can maintain defense programs against chemical weapons, which will be closely monitored. See paragraphs 5 and 7 through 11 of Article X in the *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction* (Washington, D.C.: Arms Control and Disarmament Agency, October 1993). Under Article VII of the BWC, member states are "to provide or support assistance" in the event that the United Nations Security Council concludes that a violation of the treaty has endangered a treaty party. The text of the BWC can be found in *Arms Control and Disarmament Agreements: Texts and Histories of the Negotiations*, U.S. Arms Control and Disarmament Agency (Washington, D.C.: Government Printing Office, 1996).

[42] The BWC has 140 adherents but lacks verification provisions. An international negotiation under the auspices of the Conference on Disarmament is currently underway to draft a verification protocol for the BWC.

[43] These terms are contained in Article X of the BWC and in Article XI of the CWC.

individual and collective basis in order to buttress the NPT, the BWC, and the budding CWC. Among the additional mechanisms created to further cut off the supply of weapons ingredients to aspiring proliferators were the London Suppliers Group and the Missile Technology Control Regime. As the number of these supplier control groups grew, developing countries increasingly came to view export controls as an illegitimate tool of international relations, alleging that such policies hindered economic development by unjustly punishing states that were not engaged in proliferation activities.

Launched in this setting, the Australia Group was ideal grist for an ongoing, polarized North-versus-South debate. Suspicions about the Australia Group flourished in developing countries when officials from the governments involved declined to talk openly about the Australia Group in its formative years. Early news reports about the Australia Group were sparse and emphasized the secretive nature of its activities.[44] Even the parliaments of member governments were told the barest minimum in public sessions.[45] These circumstances encouraged developing countries to judge the Australia Group less on the absolute merits of its activities than on its association with a pattern of discrimination, whether real or perceived. With little concrete information available, many developing countries categorized the Australia Group as another supplier control group acting, in their view, to sustain the industrialized world's monopoly on certain technologies and capabilities and to deprive developing countries of resources, know-how, and opportunities.

Since all states participating in the CWC agree to chemical weapons disarmament, the developing countries have argued that trade amongst the treaty parties must be absolutely unfettered, with no chemical export controls in existence. To that end, Argentina asserted:

> States which have given the international community satisfactory guarantees regarding their commitments with respect to the non-proliferation of weapons of mass destruction should not encounter limitations on their legitimate aspirations to develop and accede to dual-use technologies for the development and welfare of their peoples.[46]

Pakistan echoed that sentiment, adding that the CWC's intrusive verification provisions made it clear that "the developing countries should obviously not be subjected to the double jeopardy of additional

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[44] According to one reporter, the group's "existence is so sensitive with some governments that it has not been given a name." Don Oberdorfer, "Chemical Arms Curbs Are Sought," *Washington Post*, 9 September 1985, A1. See also Gary Thatcher, "Their Secret Task is to Halt the Spread of Chemical Weapons," *Christian Science Monitor*, 13 December 1988, B14-5; the remarks of an anonymous Australian official in Lois R. Ember, "Worldwide Spread of Chemical Arms Receiving Increased Attention," *Chemical & Engineering News* (14 April 1986): 8-16.

[45] Australian Foreign Minister Gareth Evans briefly mentioned the Australia Group in a March 1987 parliamentary speech. Robinson, "The Australia Group," 159. State Department official Richard Clarke gave Congress a three-paragraph description of the Australia Group in April 1991. U.S. Congress, Joint Economic Committee, *Arms Trade and Nonproliferation: Part 1*, 101st Cong., 2d sess., S.Hrg. 101-1296 (Washington, D.C.: Government Printing Office, 1991), 89-90.

[46] Conference on Disarmament, document CD/PV.613 (Geneva: 20 February 1992), 14.

measures outside the convention, such as the existing export controls practised by the 'Australia Group.'"[47]

This controversy, which threatened to derail the conclusion of the CWC negotiations, forced the Australia Group into its inaugural public statement. On 6 August 1992, Australia's Ambassador Paul O'Sullivan announced the Australia Group's support for the CWC, its awareness of the need to facilitate trade, and its intent to review its export control policies "with the aim of removing such measures" toward those states that comply fully with the CWC.[48] This announcement left some developing countries hopeful, but others unassuaged.[49] Nonetheless, it eased the way for the grudging acceptance of the compromise language in Article XI of the CWC regarding trade relationships between treaty parties. This language appeared to support the viewpoints of both North and South and would give both sides justification to prolong their dispute over the Australia Group.

Combating Proliferation in the Post-Cold War Era

With the end of the Cold War, the Soviet and American security umbrellas that had defined international relations since World War II disappeared and retracted, forcing a fundamental restructuring of the international community. Among other changes to occur was the reshaping of the movement of non-aligned countries that had often objected so vehemently to the Australia Group. The neutral and non-aligned Group of 77, which actually consisted of over 100 countries, began to splinter along regional lines as some countries sought new arrangements to improve their security and economies.[50] Major security alliances, such as the North American Treaty Organization, and international security cooperation regimes, such as the NPT, labored to adjust to the post-Cold War environment.

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[47] Pakistan called upon states with export controls "to publicly declare their intention to dismantle such measures for the States who become parties to the convention." Conference on Disarmament, document CD/PV.617 (Geneva: 19 March 1992), 21. India, Algeria, Nigeria, and Mexico expressed similar sentiments. See, respectively, Conference on Disarmament, documents CD/PV.619 (26 March 1992), 25; CD/PV. 621 (21 May 1992), 5; CD/PV.624 (10 June 1992), 7; and CD/PV.627 (27 July 1992), 5. Developing countries are not alone in making this argument. See, for example, the views of a German industry consultant, Ernst Wyszomirski, "The CWC and Barriers to Chemical Trade," *Chemical Weapons Convention Bulletin* (June 1995): 1-3.

[48] Conference of Disarmament, document CD/PV.629 (Geneva: 6 August 1992), 16-7.

[49] India falls in the former category, Pakistan and Iran in the latter. According to Pakistan, "No categorical assurance has been provided that the Australia Group would be dismantled once the convention enters into force," and the resulting text "ignores the legitimate concerns of some delegations." Iran's delegate remarked, "There are no commitments under article XI to assure that the fragile chemical industries of the developing countries will not be adversely affected by the convention." See Conference on Disarmament, number CD/PV.635 (Geneva: 9 March 1992), 18, 23, and 50-1, respectively.

[50] The failure of the non-aligned countries to force a vote on the Australia Group in the final stages of the CWC negotiations was a sign of the decay in the non-aligned movement's cohesion.

Whether coincidentally or spurred by the shifting global power balances, some countries stepped up their efforts to obtain weapons of mass destruction. North Korea, Iraq, Syria, and Libya headed the list of states with rogue leaders bent on flouting international behavioral norms. Saddam Hussein's threats to use chemical weapons against coalition forces and civilians alike during the Gulf War accented the urgent need to maintain and reinforce mechanisms to restrain chemical weapons proliferation. After this conflict, the United Nations Special Commission uncovered Iraq's extensive programs to obtain weapons of mass destruction. Although prior to the Gulf War Iraq was known to have a well-developed chemical weapons program, the disclosure of the extent of Hussein's biological weapons program stunned the world. Not only had Iraq conducted research on novel biological agents, it had stockpiled enough to kill tens of millions of people and loaded Scud missiles with botulinum toxin, anthrax, and aflatoxin, a deadly poison.[51] In view of the revelations about the Iraq biological weapons program, the Australia Group agreed to revise its control lists for dual-use items related to biological weapons proliferation.[52]

The Soviet Union's collapse also created another potentially severe proliferation problem. Russia inherited the USSR's 40,000-metric ton chemical stockpile. In October 1994, the Russian Duma categorized this arsenal and Russia's chemical weapons complex as being in a state of "emergency or near-emergency," referring to the potential for severe environmental problems at these sites if the weapons were not properly managed and destroyed.[53] However, a fall 1995 study also emphasized the security problems at Russia's chemical weapons storage sites, concluding that these sites "appear to be vulnerable to theft from within and attack from without."[54] In addition,

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[51] For more on Iraq's extensive biological weapons capabilities, see Rolf Ekeus, "Beware Iraq's Biowar Legacy," *Jane's International Defense Review* 29 (June 1996): 104; Gordon Oehler's testimony before the Governmental Affairs Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, Part I. S.Hrg. 104-422, 104th Cong., 2d sess. (Washington, D.C.: Government Printing Office); Barbara Starr, "Iraq reveals a startling range of toxin agents," *Jane's Defence Weekly* (11 November 1995): 4; U.S. Arms Control and Disarmament Agency, *Annual Report to Congress* (Washington, D.C.: Arms Control and Disarmament Agency, 7 August 1996). Iraq also possessed a large chemical weapons stockpile, including the nerve agents VX and sarin and the blister agent mustard. As of October 1996, the United Nations Special Commission (UNSCOM) had already supervised the destruction of 480,000 liters of live chemical agent; 28,000 chemical munitions; and 1.8 million liters, and over 1 million kilograms of more than 40 precursor chemicals. See Ekeus; Oehler; Philip Shenon, "Czechs Told U.S. They Detected Nerve Gas During the Gulf War," *New York Times*, 19 October 1996, 1; Starr; U.S. Arms Control and Disarmament Agency, *Annual Report to Congress*; and United Nations, *Report of the Secretary-General on the activities of the Special Commission established by the Secretary-General pursuant to paragraph 9 (b) (I) of resolution 687 (1991)* S/1996/848 (New York: United Nations, 11 October 1996).

[52] U.S. Arms Control and Disarmament Agency, "Australia Group," 12 April 1996, 5.

[53] See Committee on Defense, "On the Course of Preparation of the Russian Federation for the Process of Destruction of Chemical Weapons and for Ratification of the 'Convention on Prohibition of Development, Production, Stockpiling and Use of Chemical Weapons and On Their Destruction,'" (Moscow: State Duma of the Federal Assembly of the Russian Federation, 11 October 1994), 4.

[54] See Amy E. Smithson, "Improving the Security of Russia's Chemical Weapons Stockpile," in *Chemical Weapons Disarmament in Russia: Problems and Prospects* (Washington, D.C.: The Henry L. Stimson Center, 1995): 5-20. In the 1997 Defense Authorization Act, Congress approved $133.5 million in funds to address

concerns arose that some of Russia's chemical and biological experts could be lured to sell weapons, secrets, other materials, or their expertise to proliferators.

Although the Russian government has enacted export controls for dual-use chemicals and also passed penal laws for activities associated with chemical weapons proliferation,[55] Russia is not a member of the Australia Group. Moreover, Moscow's arms sales practices of have been heavily criticized.[56] Russia also stands accused of perpetuating a chemical weapons program that developed an entirely new generation of lethal nerve agents, and questions remain about the status of Russia's biological weapons program.[57] Similarly, China is thought to have both chemical and biological weapons programs. China is not an Australia Group member, and Beijing's arms sales policies have

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problems in Russia's chemical and biological weapons programs via the Cooperative Threat Reduction Program, which is also known as the Nunn-Lugar program after the two senators that initiated this effort to secure and safely dismantle the former Soviet Union's weapons of mass destruction. This funding included $15 million to improve the security of Russian weapons of mass destruction; $10 million to improve Russian control and accounting of its mass destruction weapons; $15 million to dismantle chemical and biological weapons and facilities in Russia; $15 million to improve border security in the former Soviet states; and $78.5 million for a chemical destruction facility in Shchuche, Russia.

[55] On December 7, 1994, replacing an earlier presidential directive, Boris Yeltsin ordered stricter control of dual-use chemicals, equipment and technology. "News Chronology," *Chemical Weapons Convention Bulletin*, no. 27 (Boston: Harvard-Sussex Program on CBW Armament and Arms Limitation, March 1995), 20. According to Articles 188, 189, and 355 of the Russian penal laws passed in 1996, those who smuggle chemical munitions, materials, and equipment will receive a twelve-year prison sentence; those who release controlled technologies or otherwise sell services associated with the manufacture of chemical weapons will be imprisoned for up to seven years; and any one who produces or proliferates chemical weapons will receive a prison sentence of up to ten years. This summary of Russia's new penal laws was provided by Dr. Alexander N. Kaliadin on February 24, 1996 at a workshop on chemical weapons destruction hosted by the Center for Nonproliferation Studies at the Monterey Institute of International Studies in Monterey, California.

[56] In October 1995, for example, when Lieutenant-General Anatoly Kuntsevich, formerly a top official in the Soviet/Russian chemical weapons program, was fired from his post overseeing Russia's chemical disarmament and arrested for selling approximately 1,800 pounds of dual-use chemical weapons precursors to Syria. See Sonni Efron, "Russia Investigates Alleged Chemical Arms Smuggling," *Los Angeles Times*, 25 October 1995, 4; and Clara Germani and Will Englund, "Chemical sale to Mideast probed; Ex-Russian general linked to smuggling of poison gas material," *Baltimore Sun*, 24 October 1995, 1A.

[57] For a detailed account of the Soviet/Russian chemical weapons development program, see the essay by Dr. Vil Mirzayanov, entitled "Dismantling the Soviet/Russian Chemical Weapons Complex: An Insider's Perspective" in *Chemical Weapons Disarmament in Russia: Problems and Prospects*, 21-34. See also the unclassified *Report on Demonstration of Russian Commitment to Comply with Three Agreements on Chemical and Biological Weapons*, (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 1 October 1994) and U.S. Arms Control and Disarmament Agency, *Annual Report to Congress* (1996).

also been denounced.[58] When all of these circumstances are combined, the post-Cold War proliferation climate appeared quite grim.

These very circumstances redoubled the determination of the Australia Group members to continue their work, regardless of the criticism they encountered from some developing countries. The CWC's pending entry into force and the onset of efforts to strengthen the BWC in 1991[59] did not alter this decision.

> Despite these international agreements, there are active chemical and biological weapons programs underway in some proliferating countries. Hence the continuing need for national measures to prevent civilian industry and traders from becoming unwitting contributors to [chemical and biological weapons] programs.[60]

The Australia Group started to rebut those who contend that it should disband, stating that its activities were not in conflict with current or imminent arms control agreements. Rather, not taking additional active measures in concert with other treaty regimes was tantamount "to tacit support for the manufacture of weapons of mass destruction."[61]

The Australia Group began reminding its critics that one of the most important provisions of both the BWC and the CWC was to avoid assisting in any way, directly or indirectly, another country's efforts to acquire biological or chemical weapons. After its October 1996 meeting, the

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[58] China has been criticized many times for selling dual-use chemical precursors to the Middle East. In 1993, the Chinese ship Yin He, bound for Iran, was alleged to be carrying precursor chemicals. See, among many others, Patrick E. Tyler, "China Says Saudis Found No Arms Cargo on Ship," *New York Times*, 3 September 1993. In 1996, U.S. officials cited concerns about China's "recent and ongoing" policy of supplying chemicals to Iran, including the reported the delivery of almost 400 tons of nerve agent precursors and nearly complete chemical weapons factories. R. Jeffrey Smith, "Chinese Firms Supply Iran With Gas Factories, U.S. Says," *Washington Post*, 8 March 1996; Bill Gertz, "China sold Iran missile technology," *Washington Times*, 21 November 1996, 1; and U.S. Department of Defense, Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, D.C.: Government Printing Office, April 1996), 9-10.

[59] The Third Review Conference of the BWC authorized a group of experts, known as VEREX, to survey and evaluate potential verification measures for a verification protocol for the BWC. In September 1994, a new ad hoc group was formed to negotiate a legally binding protocol. For a summary of the issues involved in this negotiation, see Marie Isabelle Chevrier, "From Verification to Strengthening Compliance: Prospects and Challenges of the Biological Weapons Convention," *Politics and the Life Sciences* (August 1995): 209-19.

[60] Australia Group, "Press Release: Australia Group Meeting," Australia Group Document AG/May94/Press/Chair/13 (Paris: 19 May 1994). The 1972 BWC has no verification protocol, and the Australia Group asserts that its biological weapons control lists "underpin the present weak provisions of the BWC." Furlonger, "Outline of the Work of the Australia Group," 7. For more, see Graham S. Pearson, "Strengthening the Biological and Toxin Weapons Convention: The Outcome of the Special Conference," *Chemical Weapons Convention Bulletin*, no. 26 (December 1994): 1, 3-6. Similarly, the CWC does not specifically address dual-use equipment. However, Article I, which obligates states not to assist another country in acquiring chemical weapons, can be interpreted as applying to equipment and other chemicals not listed on the CWC Schedules. Thirty-four of the Australia Group's 54 controlled chemicals are on the CWC's Schedules.

[61] Australia Group, Press Release, 1 December 1994. See also the Australia Group's 19 May 1994 Press Release.

Australia Group reiterated that its participants strongly believed that full adherence to the CWC and BWC "will be the best way to eliminate these types of particularly inhumane weapons from the world's arsenals. In this context, the maintenance of effective export controls will remain an essential practical means of fulfilling obligations" under these two treaties.[62] All Australia Group members pledged to be original parties of the CWC and re-emphasized their efforts to "ensure that relevant national regulations promote the object and purpose of the CWC and are fully consistent with the Convention's provisions...while ensuring they do not restrict or impede trade and other exchanges facilitated by the CWC."[63]

In addition to highlighting the obligations of the CWC and the BWC not to abet proliferation, the Australia Group has initiated activities to encourage awareness of proliferation problems, to animate more countries to enact export controls, and to enhance understanding of the Australia Group. For instance, the Australia Group has taken steps to capitalize on the willingness of some developing countries to revise their security policies and practices by taking very public steps to dismantle programs to develop weapons of mass destruction. Notable examples of this welcome phenomenon include South Africa's denuclearization, the repudiation of a simmering nuclear arms race between Argentina and Brazil, and the 1992 Mendoza agreement renouncing chemical and biological weapons in the Southern Cone.[64] Collectively and individually, the Australia Group began engaging in dialogues with non-member countries that proliferators have approached for dual-use chemical and biological exports. The Australia Group has also sponsored a series of seminars to explain proliferation and export controls.[65]

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[62] Australia Group, "Media Release: Australia Group Meeting, 14-17 October 1996, Paris," Australia Group Press Release (Paris: 17 October 1996).

[63] Australia Group, "Australia Group Countries Welcome Prospective Entry into Force of the Chemical Weapons Convention," Australia Group Press Release (Paris: 17 October 1996).

[64] Negotiated by Chile, Argentina, and Brazil, the 5 September 1991 Mendoza Agreement prohibits the development, production, acquisition, stockpiling, and use chemical and biological weapons. Bolivia, Paraguay, and Uruguay have acceded to the accord. See Conference on Disarmament, document CD/1126 (Geneva: 17 February 1992), 1-3. For more on the Argentina and Brazil's denuclearization, see their 18 July 1991 agreement about the peaceful use of nuclear energy and 4 March 1994 agreement with the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the application of safeguards. International Atomic Energy Agency, Information Circulars, INFCIRC/395 and INFCIRC/435 (Vienna: 26 November 1991 and March 1994). For more on South Africa's nuclear devolution, see David Albright, "South Africa's Secret Nuclear Weapons," *ISIS Report* (May 1994): 1-17.

[65] These seminars, arranged initially in response to requests from Eastern European countries, took place in London (1990), Paris (1991), Budapest (1992), and Oslo (1993). Argentina hosted a regional seminar for Latin American countries in November 1994. Australia Group, "Export Licensing Measures on Materials Used in the Manufacture of Chemical and Biological Weapons: Background Paper," Australia Group Document AG/Nov94/Press/Chair/15 (Paris: 1 December 1994). Japan hosted regional seminars for Asian countries in 1993 and 1994. Australia Group, 19 May 1994 Press Release. Romania and Argentina both held seminars on nonproliferation for regional countries in 1996, and France and Japan have plans to convene similar seminars in 1997. Australia Group, 17 October 1996 Press Release.

In the North-South context, two interrelated myths have clouded understanding about the Australia Group in particular and the role of export controls in general. The first myth is that export controls and therefore the Australia Group benefit only or mostly the North's security interests. Contrary to that perception, the South has the most to gain from the success of efforts to stem the proliferation of chemical weapons. Since 1918, all incidents of chemical weapons use on the battlefield have taken place in developing countries.

The second myth is that export controls and the Australia Group advance only the North's economic interests. Upon closer examination, the South's allegations about the negative effects of export controls on overall trade patterns are overblown. "Commercial statistics prove beyond all doubt that export controls neither reduce nor affect legitimate trade flows; nor have they affected price structures."[66] One study notes that the chemicals on the Australia Group's export control lists constitute less than one percent of the chemical exports from developed to developing countries. The overall trade in chemicals between North and South increased in value from $33 to $57 billion between 1980 and 1991. During the time period when the Australia Group was expanding its control lists, U.S. chemical manufacturers consistently devoted "21 percent of total U.S. industry investment" to developing countries. With the global market for chemical and allied products thriving at well over a $1.26 trillion, this study concludes that the impact of "formal cooperative programs for the peaceful uses of chemicals...would be nil."[67] Therefore, the facts do not support the claim that export controls are discriminatory and have a negative effect on trade between the developed and developing world.

Finally and somewhat ironically, the concept and practice of export controls is actually embedded in the CWC. The treaty contains unprecedented automatic export controls to penalize states that do not join the CWC and to reduce the ability of these holdout states to start or maintain a chemical weapons program. Three years after entry into force, signatories will be prohibited from trading in Schedule 2 chemicals with non-treaty parties. Five years after the CWC is activated, the members will vote on whether to extend that prohibition to the more widely traded chemicals on Schedule 3. For the first three years after the CWC's entry into force, the CWC requires that end-user certificates or their equivalent be obtained from importers of Schedule 2 and 3 chemicals that

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[66] Organization for the Prohibition of Chemical Weapons, Preparatory Commission, "Argentina: International Seminar on Non-Proliferation of Chemical and Bacteriological Weapons," PC-IX/B/WP.11 (The Hague: Organization for the Prohibition of Chemical Weapons, 6 December 1994), 2-3.

[67] Brad Roberts, "Rethinking Export Controls on Dual-Use Materials and Technologies: From Trade Restraints to Trade Enablers," *The Arena*, no. 2 (June 1995): 2.

operate in states that have not joined the CWC.[68] Export controls, therefore, are integral to the operation of the CWC.

Misperceptions in America Concerning the CWC and the Australia Group

Domestically, the trade-related provisions of the CWC and the Australia Group's activities have been misrepresented in anticipation of the debate over whether the Senate should provide advice and consent to ratification of the CWC. In this regard, opponents of the CWC have propagated a pair of arguments based on a fundamental misreading of the CWC's text. First, treaty adversaries have asserted that the CWC's provisions undermine the concept and practice of export controls. Second, they have argued that the CWC mandates the abolition of the Australia Group.

The first of these off-base arguments has been printed by some of the nation's leading newspapers. For example, a *Wall Street Journal* editorial entitled "Poisons for Peace" warned that the CWC "would give all signatories access to our latest chemical technology," including such signatories as China, Russia, Cuba, and Iran. "In other words," the *Journal* continued, "forget about the trade embargoes and forget about foreign policy. The treaty would require the U.S. to facilitate the modernization of the chemical-weapons industry in a host of countries."[69] Oped articles in other major newspapers repeated similar assertions to the extent that fiction has become mistaken for fact. In the *Washington Post*, Lally Weymouth decried how the CWC would weaken the Australia Group:

> If ratified the convention will end restrictions on trade in deadly chemicals and chemical technology. Treaty-signers, in fact, will have a right to demand both the chemicals and the relevant technical information they need from other signatories, who will have an obligation to fulfill the requests.[70]

According to these misguided interpretations of the treaty, the CWC would compel the United States and other treaty parties with advanced chemical industries (e.g., Germany, Switzerland) to revitalize chemical weapons production facilities and to peddle chemical weapons ingredients to any and all countries that joined the treaty—even those suspected of being proliferators or of sponsoring terrorist

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[68] In the CWC, see Article II, Article VI, Annex on Chemicals, and the Verification Annex, Part VII and Part VIII (C). While additional measures can also be taken to reduce the possibility of foul play with these chemicals, the end-user "certificates are to state that the chemicals will only be used for non-prohibited purposes, that they will not be re-transferred, their type and quantity, and the identity of the end-user." Michael P. Walls, "Trade Implications of the Chemical Weapons Convention," *Industry Insights*, Chemical and Biological Arms Control Institute (June 1995): 2.

[69] Editorial, "Poisons for Peace," *Wall Street Journal*, 9 September 1996, 16.

[70] See Lally Weymouth, "...Chemical Weapons Fraud," *Washington Post*, 12 September 1996, 7. Virtually identical arguments are made by Senators Jesse Helms (R-North Carolina) and Jon Kyl (R-Arizona) in two of America's other major newspapers. Jesse Helms, "Why this chemical weapons treaty is badly flawed," *USA Today*, 12 September 1996, 15; and Jon Kyl, "A Treaty That Deserved to Die," *New York Times*, 13 September 1996, 35.

activities. At times, CWC opponents also claimed that the treaty called directly for the Australia Group to disband.[71]

The CWC is a lengthy, complicated legal document, but consultation of the treaty's text quickly reveals the fallacy of these two arguments. Article XI of the CWC indeed instructs parties to the CWC to implement the treaty "in a manner which avoids hampering the economic or technological development" of participating states, including the admonition that states not "maintain among themselves any restrictions...which would restrict or impede trade and the development" of peaceful research and industrial endeavors. Furthermore, the CWC asks states to review their trade regulations "to render them consistent with the object and purpose" of the CWC.[72] However, Article XI also clearly stipulates that efforts to enhance free trade among treaty parties must not be "incompatible with the obligations undertaken under this Convention."

Only those who skip the treaty's first page could miss the clear pronouncement of the CWC's principle purposes, as stated in Article I. To wit, participating states "undertake never under any circumstances...to assist, encourage or induce, in any way" the proliferation of chemical weapons. According to the analysis of one U.S. chemical industry lawyer, "This general obligation [in Article I] clearly extends to trade that would abet illegal [chemical weapons] production, storage, or use."[73] A careful reading of the trade-related provisions in Article XI shows that the language has been "artfully crafted," notably the phrase about how cooperation in trade should not be incompatible with any other CWC obligations. This wording allows that the Australia Group and other unilateral export controls intended to stem the proliferation of chemical weapons to continue since they are "wholly compatible" with the CWC's principal objectives.[74] In short, the principal obligations embedded in Article I have priority with respect to any of the Article XI language about trade cooperation, which helps explain why the neutral and non-aligned countries were so displeased with this language.

Another reason that the developing countries were so disgruntled is that the CWC, unlike the NPT, does not mandate technical cooperation and assistance to commercial industry facilities in participating states. The suggestion that assistance will be provided to modernize any facilities that

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[71] The Center for Security Policy has been promoting this inaccurate interpretation of the CWC. "Unilateral trade embargoes and multilateral technology control arrangements against such parties to the CWC would be prohibited. *This obligation is a recipe for rampant chemical weapons proliferation.*" See the Center for Security Policy, "Clinton's Chemical Power Play: Bad for the Senate, Bad for the National Interest," Decision Brief 97-D 7 (Washington, D.C.: Center for Security Policy, 13 January 1997), 2. Emphasis in the original. See also the Center for Security Policy, "Clinton 'Made a Mistake about It' in Arguing the C.W.C. Will Protect U.S. Troops," Decision Brief 97-D 21 (Washington, D.C.: Center for Security Policy, 6 February 1997) and "No D.N.A. Tests Needed to Show that Claims About Republican Paternity of C.W.C. Are Overblown," Decision Brief 97-D 24 (Washington, D.C.: Center for Security Policy, 10 February 1997).

[72] Other language to this effect can be found in the CWC's Preamble and in Article VI.

[73] Walls, "Trade Implications of the Chemical Weapons Convention," 2.

[74] Ibid., 3.

have a prior or present involvement with the production of chemical weapons is utterly fictitious, because the CWC stipulates that chemical weapons production facilities are to be destroyed within ten years.[75] *Nowhere* in Article XI, or, for that matter in the rest of the CWC's text, are American or foreign companies directed to sell controlled chemicals to suspected proliferators, to countries thought to sponsor terrorist activities, or to specific treaty members.

In the United States, requests for the sale of chemicals on the Australia Group and CWC control lists will still be subjected to the existing license review process.[76] Exporters wishing to ship controlled chemicals to countries of concern must provide the Commerce Department full information that demonstrates that the end-use of the chemical in question will be peaceful. License requests will be reviewed on a case by case basis in an interagency process headed by the Commerce Department.

All other states participating in the CWC, whether they are members of the Australia Group or not, must pass treaty implementing legislation that enacts criminal and civil penalties for individuals or corporations caught vending CWC-controlled chemicals that are found to have been used to proliferate weapons. In Australia and the United Kingdom, for example, the most serious offenses associated with chemical weapons activities (e.g., production, acquisition, sale, or otherwise assisting chemical weapons proliferation) carry a penalty of imprisonment for life. Failure to comply with the treaty's trade restrictions by illegally selling CWC-controlled chemicals will result in a prison sentence of up to 5 years in Canada and Norway. For similar activities, South Africa will jail offenders for up to 15 years. Those convicted of profiteering from chemical weapons proliferation will also be assessed stiff fines, and a variety of other offenses carry penalties as well.[77]

Should the U.S. government find evidence that a foreign firm has been peddling controlled chemicals to a suspected proliferator, the United States would bring this information to the attention of the country in question in a diplomatic demarche, insisting that the foreign government enforce its law to prosecute the company or individuals involved. If suitable action is not forthcoming, the United States would have grounds to declare that state in violation of its obligations under the CWC. Therefore, concerns that the CWC in some way facilitates chemical weapons proliferation have been grossly exaggerated.

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[75] See footnote 27, which explains the limited and voluntary assistance available in the event that a chemical attack is threatened or occurs, or for the defense programs that participating states are allowed to maintain.

[76] See Executive Order 12938, 14 November 1994, and the Enhanced Proliferation Control Initiative, 13 December 1990. The CWC's prohibitions are passed on to U.S. companies and citizens via the treaty's implementing legislation, which also requires congressional approval. In the 104th Congress, Senator Richard Lugar (R-Indiana) introduced this legislation as S. 1732. Note especially, Section 203(a) and Section 203(b)(2) of the draft bill.

[77] In Germany, for instance, those that do not fulfill the CWC's reporting requirements will be fined or given prison sentences of up to 5 years. For their help in understanding the penalties that different countries have set for CWC violations, the author would like to thank the Legal Division of the Provisional Technical Secretariat in the Hague and Edward Tanzman, who has published several studies on the CWC's implementing legislation and its legal implications.

The second assertion made by treaty opponents is also without foundation. *Nowhere* in the CWC's text is there a requirement to eliminate the Australia Group. "In fact, the CWC does not require that the Australia Group controls, or U.S. unilateral controls, be dismantled."[78] States that join the CWC must bring their trade policies into harmony with the CWC's purposes to block chemical weapons proliferation and otherwise to enable free trade, but they will retain the sovereign right to conduct trade in the manner that they see fit. The Australia Group's elimination is not imminent. The CWC and the Australia Group are mutually reinforcing,[79] not mutually exclusive.

According to Ambassador Stephen Ledogar, who headed the U.S. delegation to the CWC negotiations:

> The continued operation of the informal Australia Group after the CWC enters into force is consistent with the provisions of the CWC and will serve to support and complement the objectives of the CWC by allowing members to harmonize their export controls on dual-use [chemical weapons]-relevant chemicals and share information on the proliferation of chemical weapons.[80]

Even though the Australia Group was intended to be an interim measure, not a permanent fixture, for the foreseeable future the Australia Group will function much as it has in the past.[81] Furthermore, as additional CWC member states ratify the treaty and pass its required implementing legislation and enact stricter nonproliferation policies, numerous countries that have never before applied export controls to combat the proliferation of chemical weapons will begin doing so. At present, 68 countries have ratified the CWC, more than doubling the number of countries that are enforcing export controls via the Australia Group.

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[78] Walls, "Trade Implications of the Chemical Weapons Convention," 3.

[79] For example, thiodiglycol is controlled by the CWC, but the two chemicals that can be used to produce it (2-chloroethanol and sodium sulphide) are also on the Australia Group control list. Organisation for the Prohibition of Chemical Weapons, Preparatory Commission, "Australia: National Export Licensing Measures," PC-XIII/B/WP.9 (26 March 1996): 2.

[80] Senate Foreign Relations Committee, *Hearings on the Chemical Weapons Convention*, 103d Cong., 2d sess., S.Hrg. 103-869 (Washington, D.C.: Government Printing Office), 188.

[81] The proliferation problems that have arisen in the post-Cold War years have convinced many Australia Group members that the collective should exist indefinitely. Also, since the Australia Group controls biological items as well, arguments can be made to continue the Australia Group's activities until the negotiation and successful entry into force of the BWC's verification protocol. Initially, it was thought that the Australia Group would dissolve after the CWC was in force and working effectively. Mathews, "Comparison of the Australia Group List," 1, and Walls, "Trade Implications of the Chemical Weapons Convention," 3.

Poisons or Peace?

Cases like Iraq and Libya, the latter accused by the United States accused in February 1996 of constructing at Tarhunah "the world's largest underground chemical weapons facility,"[82] clearly illustrate that countries will go to great lengths to acquire weapons of mass destruction. Chemical weapons are the mass destruction weapon most easily within the reach of would-be proliferators. Aum Shinrikyo has also proven that governments are not alone in their desire and ability to acquire chemical weapons. As horrifying as the March 1995 subway gassing was, the prospects of chemical terrorism seem remote to those outside of Japan. However, evidence from the 1993 World Trade Center bombing indicates that chemical terrorism may already have been attempted in America.[83] The chemical weapons proliferation problem is changing in ominous and important ways that demand a response to avert catastrophe. The need for a concerted and multifaceted effort to confront chemical weapons proliferation could not be more apparent.

Those who have been in the trenches fighting against the proliferation of chemical and biological weapons have long been aware that no simple, sweeping solutions exist. The 15 countries that gathered in Paris in 1985 to found the Australia Group recognized that to make a serious dent in a problem of this magnitude and complexity, a more far-reaching legal infrastructure requiring the elimination of chemical weapons stockpiles and production facilities, punitive measures, international inspection capabilities, and a more rigorous behavioral norm against chemical weapons would be have to be put in place. The Australia Group members envisioned the CWC, which has all of these attributes, as the anchor of a chemical weapons proliferation regime, much as the NPT has been the centerpiece of nuclear nonproliferation efforts.

In addition to the CWC and the Australia Group, other important components to a successful chemical weapons nonproliferation regime are robust intelligence programs, strong and convincing chemical weapons defense programs, and improved domestic and international counter-terrorism measures.[84] Also, the political will to punish countries that violate or do not join the CWC, as well

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[82] See the testimony of Central Intelligence Agency Director John M. Deutch before the Senate Select Committee on Intelligence, 22 February 1996, quoted in Tim Weiner, "Huge Chemical Arms Plant Near Completion in Libya, U.S. Says," *New York Times*, 25 February 1996, 8.

[83] According to the judge in this infamous bombing case, the truck parked in the Trade Center's underground garage was loaded with sodium cyanide, which would have become cyanide gas if the heat from the conventional explosion had not been so intense. John F. Sopko, "The Changing Proliferation Threat," *Foreign Policy*, no. 105 (Winter 1996-97): 14.

[84] With the passage of the Nunn-Lugar-Domenici bill in the 1997 Defense Authorization Act, Congress took a constructive step to begin to prepare the country to cope with the threat from chemical and biological weapons terrorism. For a summary of this legislation, see ibid., 17-9. The legislation, which aims to buttress the 1995 Comprehensive Terrorism Act, furnishes the following funds: $35 million to train local emergency response personnel, including $10.5 million for medical strike force teams; $15 million for nuclear, chemical, and biological emergency response preparations; $15 million to conduct preparedness drills over the next 5 years; $2 million for a coordinator to oversee all preventive and defensive efforts against weapons of mass destruction; $15 million for equipment to detect and intercept weapons of mass destruction or their ingredients at U.S. borders. The

as any terrorists who follow Aum Shinrikyo's example, will be crucial to the long-term viability of a chemical weapons nonproliferation regime. For CWC hold-out states, punishment above and beyond the treaty's automatic economic sanctions may be necessary to underscore the international community's commitment to penalize the proliferation and use of chemical weapons. Unless the United States and other countries make the world's chemical weapons outlaws pay a harsh price for their behavior, more governments and terrorist groups may be tempted to stockpile and wield poison gas.

In many capitols around the world, it has become politically expedient to tout simple solutions. For example, some critics of the CWC have suggested that amending the Geneva Protocol would be a quicker and easier route to banning chemical weapons.[85] However, the CWC's opponents have yet to explain how and why the Geneva Protocol might be altered. More importantly, none of the more than 160 countries that have signed the CWC have shown any interest in undertaking another expensive and time-consuming negotiation. Even if countries could be persuaded to drop the CWC and renegotiate the Geneva Protocol, there would be fewer impediments to chemical weapons proliferation while the marathon talks took place. The critics' proposal is therefore not a viable alternative to address the problem of chemical weapons proliferation.

Even the most powerful country cannot alone contain the proliferation of chemical, biological, or nuclear weapons; multilateral action is essential for success. Yet, another dimension of complexity is added when many countries with different levels of military and economic development work together to try to resolve such problems. Each state has a unique perception of its security threat as well as distinct economic interests. These factors affect the solutions that individual countries believe would most suitably address a complicated international security problem. The key to success is to find common ground—in this case, the need to reduce the threat of weapons of mass destruction—and meaningful, mutually agreeable courses of action. Another key element of success is to set up a multi-tiered system whereby participating states all initiate and administer the needed laws and programs at different levels, all the way down to the appropriate training for customs and law enforcement officials. The institution of such multi-tiered, multilateral systems is a time-consuming process, but one that is essential to keep weapons of mass destruction from being disseminated and to uphold agreed international standards of behavior.

Those who insist that a single mechanism—whether it be the CWC, the Australia Group, the Geneva Protocol, or some other program, entity, or treaty—is sufficient to address chemical weapons

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Nunn-Lugar-Domenici bill would also allow the Pentagon to send military assistance in the event that a chemical or biological terrorist attack occurred in the United States. See Laurie H. Boulden, "Preparations to Confront Chemical and Biological Terrorism," *The CBW Chronicle II*, no. 2 (Washington, D.C.: The Henry L. Stimson Center, September 1996): 1-2, and U.S. House of Representatives, *Conference Report on H.R. 3230, National Defense Authorization Act for Fiscal Year 1997*, as printed in the *Congressional Record* H9073-8 (Washington, D.C.: Library of Congress, 30 July 1996).

[85] Among others, Kathleen Bailey has made this proposal. See her testimony in *Chemical Weapons Convention* (Treaty Doc. 103-21), Senate Foreign Relations Committee, S.Hrg. 103-869, 103d Cong., 2d sess. (Washington, D.C.: Government Printing Office, 1994): 142.

proliferation are seriously underestimating the nature and severity of the problem and overburdening the nonproliferation tool they favor. In the absence of grand solutions, the battle against chemical weapons proliferation must be fought one case at a time, with multiple tools, tenacity, and assertive responses to states that defy international behavioral norms. When the choice is between poisons or peace, the obvious choice for America and for the international community is the latter.

Annex 1: Chemicals Controlled by the CWC

Schedule 1: Military Agents with No or Low Commercial Use

- Alkyl phosphonofluoridates (e.g., the nerve agents sarin and soman)
- Alkyl s-aminoethyl alkyl phosphonothiolates and corresponding alkylated or protonated salts (e.g., the nerve agent VX)
- Sulfur mustards (e.g., mustard gas)
- Lewisites
- Alkyl phosphonyldifluorides
- Chlorosarin
- Alkyl phosphoramidocyanidates (e.g., the nerve agent tabun)
- Alkyl s-aminoethyl alkyl phosponites and corresponding alkylated or protonated salts (e.g., QL, a key precursor for VX)
- Nitrogen mustards
- Ricin
- Saxitoxin
- Chlorosoman

Schedule 2: High Risk Precursors and Toxic Chemicals with Moderate Commercial Use

- Amiton: O,O-Diethyl S-[2-(diethylamino)ethyl]phosphorothiolate and corresponding alkylated or protonated salts

- PFIB 1,1,3,3,3-Pentafluoro-2(trifluoromethyl)-1- propene

- BZ: 3-Quinuclidinyl benzilate

- Chemicals, except for those listed in Schedule 1, containing a phosphorus atom to which is bonded one methyl, ethyl, or propyl (normal or iso) group but not further carbon atoms,

  e.g., Methylphosphonyl dichloride
  Dimethyl methylphosphonate
  Methylphosphinyl dichloride
  Ethylphosphonyl dichloride
  Diethyl ethylphosphonate

  Exemption: Fonofos: O-Ethyl S-Phenyl ethylphosphono-thiolothionate

- N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) phosphoramidic dihalides,
  e.g., Dimethyl phosphoramidic dichloride

- Dialkyl (Me, Et, n-Pr, or i-Pr) N,N-dialkyl (Me, Et, n-Pr, or I-Pr)-phosphoramidates, e.g., Diethyl N,N-dimethylphosphoramidate

- Arsenic trichloride

- 2,2-Diphenyl-2-hydroxyacetic acid

- Quinuclidine-3-ol

- N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts,

  e.g., 2-chlorethyl trimethylammonium chloride
  Diethylaminoethyl-2-chloride

- N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethane-2-ols and corresponding protonated salts, e.g., Diisopropylethanolamine

  Exemptions:
  N,N-Diamethylaminoethanol and corresponding protonated salts,
  N,N-Diethylaminoethanol and corresponding protonated salts

- N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethane-2-thiols and corresponding protonated salts, e.g., 2-Diethylaminoethanethiol

- Thiodiglycol: Bis(2-hydroxyetyl)sulfide

- Pinacolyl alcohol: 3,3-Dimethylbutane-2-ol

Schedule 3: High Commercial Volume Dual-Use Chemicals

- Phosgene: Carbonyl dichloride
- Cyanogen chloride
- Hydrogen cyanide
- Cholorpicrin: Tricholonitromethane
- Phosphorus oxychloride
- Phosphorus trichloride
- Phosphorus pentachloride
- Trimethyl phosphite
- Triethyl phosphite
- Dimethyl phosphite
- Diethyl phosphite

- Sulfur monochloride
- Sulfur dichloride
- Thionyl chloride
- Ethyldiethanolamine
- Methyldiethanolamine
- Triethanolamine

Source: The Chemical Weapons Convention, Annex on Chemicals.

Annex 2: Australia Group Control List of Dual-use Chemical Manufacturing Facilities and Equipment and Related Technology

I. Manufacturing Facilities and Equipment

Note 1. The objective of these controls should not be defeated by the transfer of any non-controlled item containing one or more controlled components where the controlled component or components are the principal element of the item and can feasibly be removed or used for other purposes.

(NB: In judging whether the controlled component or components are to be considered the principal element, governments should weigh the factors of quantity, value, and technological know-how involved and other special circumstances which might establish the controlled component or components as the principal element of the item being procured.)

Note 2. The objective of these controls should not be defeated by the transfer of a whole plant, on any scale, which has been designed to produce any chemical weapon agent or Australia Group-controlled precursor chemical.

1. Reaction Vessels, Reactors or Agitators

Reaction vessels or reactors, with or without agitators, with total internal (geometric) volume greater than 0.1m³ (100ℓ) and less than 20m³ (20,000ℓ), where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) tantalum or tantalum alloys;

(f) titanium or titanium alloys; or

(g) zirconium or zirconium alloys.

Agitators for use in the above-mentioned reaction vessels or reactors where all surfaces of the agitator that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) tantalum or tantalum alloys;

(f) titanium or titanium alloys; or

(g) zirconium or zirconium alloys.

2. Storage Tanks, Containers or Receivers

Storage tanks, containers or receivers with a total internal (geometric) volume greater than $0.1 m^3$ (100ℓ) where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) tantalum or tantalum alloys;

(f) titanium or titanium alloys; or

(g) zirconium or zirconium alloys.

3. Heat Exchangers or Condensers

Heat exchangers or condensers with a heat transfer surface area of less than $20m^2$, where all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;
(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) graphite;

(f) tantalum or tantalum alloys;

(g) titanium or titanium alloys; or

(h) zirconium or zirconium alloys.

4. Distillation or Absorption Columns

Distillation or absorption columns or internal diameter greater than 0.1m; where all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) graphite;

(f) tantalum or tantalum alloys;

(g) titanium or titanium alloys, or

(h) zirconium or zirconium alloys.

5. Filling Equipment

Remotely operated filling equipment in which all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight; or

(b) alloys with more than 25% nickel and 20% chromium by weight.

6. Valves

Multiple seal valves incorporating a leak detection port, bellows-seal valves, nonretum (check) valves or diaphragm valves, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) tantalum or tantalum alloys;

(f) titanium or titanium alloys; or

(g) zirconium or zirconium alloys.

7. Multi-Walled Piping

Multi-walled piping incorporating a leak detection port, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) graphite;

(f) tantalum or tantalum alloys;

(g) titanium or titanium alloys; or

(h) zirconium or zirconium alloys.

8. Pumps

Multiple-seal, canned drive, magnetic drive, bellows or diaphragm pumps, with manufacturer's specified maximum flow-rate greater than 0.6m³/h, or vacuum pumps with the manufacturer's specified maximum flow-rate greater than 5m³/h (under standard temperature (0°C) and pressure (101.30 kPa) conditions) in which all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight;

(c) fluoropolymers;

(d) glass or glass-lined (including vitrified or enamelled coating);

(e) graphite;

(f) tantalum or tantalum alloys;

(g) titanium or titanium alloys;

(h) zirconium or zirconium alloys;

(i) ceramics; or

(j) ferrosilicon.

9. Incinerators

Incinerators designed to destroy chemical weapon agents, Australia Group-controlled precursors or chemical munitions, having specially designed waste supply systems, special handling facilities, and an average combustion chamber temperature greater than 1,000°C, in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with the following materials:

(a) nickel or alloys with more than 40% nickel by weight;

(b) alloys with more than 25% nickel and 20% chromium by weight; or

(c) ceramics.

Statement of Understanding
These controls do not apply to equipment which is specially designed for use in civil applications (for example, food processing, pulp and paper processing, or water purification) and is, by the nature of its design, inappropriate for use in storing, processing, producing or conducting and controlling the flow of chemical warfare agents or any of the Australia Group-controlled precursor chemicals.

II. Toxic Gas Monitoring Systems and Detectors

Toxic gas monitoring systems and dedicated detectors...

- designed for continuous operation and usable for the detection of chemical warfare agents, AG-controlled precursors or organic compounds containing phosphorus, sulphur, fluorine or chlorine at concentrations of less than 0.3 mg/m^3;

- designed for the detection of cholinesterase-inhibiting activity.

III. Related Technology

The transfer of "technology," including licenses, directly associated with...

- chemical weapon agents;
- Australia Group-controlled precursors; or
- Australia Group-controlled dual-use equipment items,

...to the extent permitted by national legislation.

Controls on "technology" transfer do not apply to information "in the public domain" or to "basic scientific research."

The approval for export of any Australia Group-controlled item of dual-use equipment also authorizes the export to the same end-user of the minimum "technology" required for the installation, operation, maintenance, or repair of that item.

Definition of Terms

"Technology"
Specific information necessary for the "development," "production," or "use" of a product. The information takes the form of "technical data" or "technical assistance."

"Basic scientific research"
Experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective.

"Development"
"Development" is related to all phases before "production" such as...

- design
- design research
- design analysis
- design concepts
- assembly of prototypes
- pilot production schemes
- design data
- process or transforming design data into a product
- configuration design
- integration design
- layouts

"In the public domain"
"In the public domain," as it applies herein, means technology that has been made available without restrictions upon its further dissemination. (Copyright restrictions do not remove technology from being in the public domain.)

"Production"
"Production" means all production phases such as...

- construction
- production engineering
- manufacture
- integration
- assembly (mounting)
- inspection
- testing
- quality assurance

"Technical Assistance"
May take forms such as instruction, skills, training, working knowledge, and consulting services. (NB: "Technical Assistance" may involve transfer of 'technical data'.)

"Technical Data"
May take forms such as blueprints, plans, diagrams, models, formulae, tables, engineering designs and specifications, manuals and instructions written or recorded on other media or devices such as disk, tape, or read-only memories.

"Use"
Operation, installation (including on-site installation), maintenance (checking), repair, overhaul, or refurbishing.

Annex 3: Australia Group Control List of Dual-Use Biological Equipment, and Biological Agents

I. Dual-use Biological Equipment For Export Control

1. Complete Containment Facilities at P3, P4 Containment Levels

Complete containment facilities that meet the criteria for P3 or P4 (BL3, BL4, L3, L4) containment as specified in the WHO Laboratory Biosafety manual (Geneva, 1983) are subject to export control.

2. Fermenters

Fermenters capable of cultivation of pathogenic micro-organisms, viruses or for toxin production, without the propagation of aerosols, and having a capacity equal to or greater than 100 liters. Sub-groups of fermenters include bioreactors, chemostats and continuous-flow systems.

*3. Centrifugal Separators**

Centrifugal separators capable of the continuous separation of pathogenic micro-organisms, without the propagation of aerosols, and having all the following characteristics:

(a) flow rate greater than 100 liters per hour;

(b) components of polished stainless steel or titanium;

(c) double or multiple sealing joints within the steam containment area;

(d) capable of in-situ steam sterilization in a closed state.

*Centrifugal separators include decanters.

4. Cross-flow Filtration Equipment

Cross-flow filtration equipment capable of continuous separation of pathogenic microorganisms, viruses, toxins, and cell cultures without the propagation of aerosols, having all the following characteristics:

(a) equal to or greater than 5 square meters;

(b) capable of in-situ sterilization.

5. Freeze-drying Equipment

Steam sterilizable freeze-drying equipment with a condenser capacity greater than 50 kgs of ice in 24 hours and less than 1000 kgs of ice in 24 hours.

6. Equipment that incorporates or is contained in P3 or P4 (BL3, BL4, L3, L4) containment housing, as follows:

(a) Independently ventilated protective full or half suits;

(b) Class III biological safety cabinets or isolators with similar performance standards.

7. Aerosol inhalation chambers

Chambers designed for aerosol challenge testing with microorganisms, viruses, or toxins and having a capacity of 1 cubic meter or greater.

Experts propose that the following item be included in awareness raising guidelines to industry:

1. Equipment for the micro-encapsulation of live micro-organisms and toxins in the range of 1-10um particle size, specifically...

(a) Interfacial polycondensors;

(b) Phase separators.

2. Fermenters of less than 100 liter capacity with special emphasis on aggregate orders or designs for use in combined systems.

3. Conventional or turbulent air-flow clean-air rooms and self-contained fan-HEPA filter units that may be used for P3 or P4 (BL3, BL4, L3, L4) containment facilities.

II. Australia Group List of Biological Agents for Export Control: Core List[1]

1. Viruses

V1. Chikungunya virus
V2. Congo-Crimean hemorrhagic fever virus
V3. Dengue fever virus
V4. Eastern equine encephalitis virus
V5. Ebola virus
V6. Hantaan virus
V7. Junin virus
V8. Lassa fever virus
V9. Lymphocytic choriomeningitis virus
V10. Machupo virus
V11. Marburg virus
V12. Monkey pox virus
V13. Rift Valley fever virus
V14. Tick-borne encephalitis virus (Russian Spring-Summer encephalitis virus)
V15. Variola virus
V16. Venezuelan equine encephalitis virus
V17. Western equine encephalitis virus
V18. White pox
V19. Yellow fever virus
V20. Japanese encephalitis virus

2. Rickettsiae

R1. Coxiella burnetii
R2. Bartonella quintana (Rochalimea quintana, Rickettsia quintana)
R3. Rickettsia prowasecki
R4. Rickettsia rickettsii

3. Bacteria

B1. Bacillus anthracis
B2. Brucella abortus
B3. Brucella melitensis
B4. Brucella suis
B5. Chlamydia psittaci
B6. Clostridium Botulinum
B7. Francisella tularensis

B8. Burkholderia mallei (pseudomonas mallei)
B9. Burkholderia pseudomallei (pseudomonas pseudomallei)
B10. Salmonella typhi
B11. Shigella dysenteriae
B12. Vibrio cholerae
B13. Yersinia pestis

4. Genetically Modified Micro-organisms

GI. Genetically modified micro-organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the core list.

G2. Genetically modified micro-organisms or genetic elements that contain nucleic acid sequences coding for any of the toxins in the core list, or their subunits.

5. Toxins as follow and subunits thereof;[2]

TI. Botulinum toxins
T2. Clostridium perfringens toxins
T3. Conotoxin
T4. Ricin
T5. Saxitoxin
T6. Shiga toxin
T7. Staphylococcus aureaus toxins
T8. Tetrodotoxin
T9. Verotoxin
T10. Microcystin (Cyanginosin)
T11. Alflatoxins

[1] Except where the agent is in the form of a vaccine.
[2] Excluding immunotoxins.

III. Australia Group List of Biological Agents for Export Control: Warning List[1]

1. Viruses

WV1. Kyasanur Forest virus
WV2. Louping ill virus
WV3. Murray Valley encephalitis virus
WV4. Omsk hemorrhagic fever virus
WV5. Oropouche virus
WV6. Powassan virus
WV7. Rocio virus
WV8. St. Louis encephalitis virus

2. Bacteria

WB1. Clostridium perfringens*
WB2. Clostridium tetani*
WB3. Enterohemorrhagic Escherichia coli, serotype 0157 and other verotoxin producing serotypes
WB4. Legionella pneumophila
WB5. Yersinia pseudotuberculosis

3. Genetically Modified Micro-organism

WG1. Genetically modified micro-organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the warning list.
WG2. Genetically modified micro-organisms or genetic elements that contain nucleic acid sequences coding for any of the toxins in the warning list, or their subunits.

4. Toxins as follow and subunits thereof;[2]

WT1. Abrin
WT2. Cholera toxin
WT3. Tetanus toxin
WT4. Trichothecene mycotoxins
WT5. Modeccin
WT6. Volkensin
WT7. Viscum Album Lectin I (Viscumin)

*The Australia Group recognizes that these organisms are ubiquitous, but, as they have been acquired in the past as part of biological weapons programs, they are worthy of special caution.

[1] Except where the agent is in the form of a vaccine.
[2] Excluding immunotoxins.

IV. Australia Group List of Animal Pathogens for Export Control[1]

1. Viruses

AV1. African swine fever virus
AV2. Avian influenza Virus[2]
AV3. Bluetongue virus
AV4. Foot and mouth disease virus
AV5. Goat pox virus
AV6. Herpes virus [Pseudorabies virus] (Aujeszky's disease)
AV7. Hog cholera virus (synonym swine fever virus)
AV8. Lyssa virus
AV9. Newcastle disease virus
AV10. Peste des petits ruminants virus
AV11. Porcine enterovirus type 9 (synonym: swine vesicular disease virus)
AV12. Rinderpest virus
AV13. Sheep pox virus
AV14. Teschen disease virus
AV15. Vesicular stomatitis virus

[1] Except where the agent is in the form of a vaccine.
[2] This includes only those Avian influenza viruses of high pathogenicity as defined in EC Directive 92/401 EC: "Type A viruses with an IVPI (intravenous pathogenicity index) in 6 week old chickens of greater than 1.2, or Type A viruses HS or H7 subtype for which nucleotide sequencing has demonstrated multiple basic amino acids at the cleavage site of haemegglutinin."

2. Bacteria

AB3. Mycoplasma mycoides

3. Genetically-modified Micro-organisms

AG1. Genetically modified micro-organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the list.

V. Australia Group Control List of Plant Pathogens for Export Control Core List

1. Bacteria

PB1. Xanthomonas albilineans
PB2. Xanthomonas campestris pv. citri

2. Fungi

PF1. Colletotrichum coffeanum var. virulans (Colletotrichum Kanawae)
PF2. Cochliobolus miyabeanus (Helminthosporium oryzae)
PF3. Microcyclus ulei (syn. Dothidella ulei)
PF4. Puccinia graminis (syn. Puccinia graminis f. sp. tritici)
PF5. Puccinia striiformis (syn. Pucciniaglumarum)
PF6. Pyricularia grisea/Pyricularia oryzae

3. Genetically-modified Micro-organisms

PG1. Genetically-modified micro-organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity derived from the plant pathogens identified on the export control list.

VI. Items for Inclusion in Awareness Raising Guidelines

1. Bacteria

PWB1. Xanthomonas campestris pv. oryzae
PWB2. Xylella fastidiosa

2. Fungi

PWF1. Deuterophoma tracheiphila (syn. Phoma tracheiphila)
PWF2. Monilia rorei (syn. Moniliophthora rorei)

3. Viruses

PW1. Banana bunchy top virus

4. Genetically-modified Micro-organisms

PWG1. Genetically-modified micro-organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity derived from the plant pathogens identified on the awareness raising list.

About the Chemical and Biological Weapons Nonproliferation Project

Chemical and biological weapons have proliferated more widely than nuclear weapons, in part because the behavioral norms against chemical and biological weapons are not as robust as those against nuclear weapons, and partly because biological and chemical weapons are more easily acquired. In conjunction with the 1993 ceremonies to sign the Chemical Weapons Convention (CWC), the Stimson Center launched a project to monitor domestic and international preparations to implement the CWC and to strengthen the 1972 Biological and Toxin Weapons Convention (BWC). This project serves as problem-solver and an information clearinghouse in these general subject areas.

Project Publications. The project issues a periodic newsletter, *The CBW Chronicle*, that covers the spectrum of topics associated with implementing the CWC and strengthening the BWC and distributes it to officials in government, industry, diplomats, academia, and nongovernmental organizations here and abroad.

- ***The U.S. Senate and the Chemical Weapons Convention: The Price of Inaction*** (November 1995), political and security experts detail the repercussions if the Senate does not ratify the CWC soon. Among the factors negatively effected by the Senate's long delay are the U.S. ability to track chemical weapons proliferation and American safety, security, and leadership.
- ***Chemical Weapons Disarmament in Russia: Problems and Prospects*** (October 1995), includes the first, public in-depth discussion of security shortcomings at Russia's chemical weapons storage facilities and the most detailed account publicly available of the controversial chemical weapons development program of Soviet origin by Dr. Vil Mirzayanov, who blew the whistle on this program. In addition, the report provides discussion and analysis of the tools available to address these problems, including the CWC and the Cooperative Threat Reduction program, which provides U.S. assistance to secure and dismantle former Soviet weapons of mass destruction.
- ***The U.S. Chemical Weapons Destruction Program: Views, Analysis, and Recommendations*** (October 1994) provides an overview of the controversies associated with the Army's stockpile incineration program, which is slated to operate in eight different U.S. sites where chemical weapons are stored. The Army's destruction program is explained, opponents' charges against this program and the Army's public outreach program are critiqued, and recommendations are made to improve oversight of the Army's program.
- Managers from a variety of commercial chemical companies voice their thoughts about the CWC's reporting and inspection requirements and offer recommendations to facilitate the CWC's effective implementation in ***Implementing the Chemical Weapons Convention: Counsel from Industry*** (January 1994).
- Experts from the International Atomic Energy Agency (IAEA), which is the model for the CWC's new international monitoring agency, offer warnings and recommendations about how to establish the CWC's monitoring agency in ***Administering the Chemical Weapons Convention: Lessons from the IAEA*** (April 1993).

- ***The Chemical Weapons Convention Handbook*** describes the basic components of the treaty and provides other introductory information.

Other information. The Carnegie Corporation of New York funds this project, which is directed by Amy E. Smithson. A supplemental grant from the Plowshares Fund was awarded primarily to support CWC treaty ratification activities. The Henry L. Stimson Center is a nonprofit, nonpartisan institution devoted to public policy research. The Center concentrates on particularly difficult national and international security issues where policy, technology, and politics intersect.

For more information, please see the project's webpage at:
WWW.Stimson.Org/Pub/Stimson/CWC/.

About the Author

Dr. Amy E. Smithson is a senior associate at the Henry L. Stimson Center, where she directs the Chemical and Biological Weapons Nonproliferation Project. The project conducts analytical research across the spectrum of complex topics associated with implementing the Chemical Weapons Convention and strengthening the Biological and Toxin Weapons Convention. Research bridges the technical and policy communities to create problem-solving recommendations that both communities can feasibly execute. Aside from project publications, journal articles, and editorials, outreach efforts involve workshops, symposia, congressional testimony, and regular contact with the print and electronic media to disseminate the project's research to domestic and international audiences. Previously at the Stimson Center, she has worked on projects that address the reshaping of U.S. foreign policy in the post-Cold War era; the restructuring of U.S. national security institutions; the utility of confidence-building measures and collective security; the changing roles and tactics of subnational actors; and the full range of security issues pertaining to the former Soviet Union and the Korean Peninsula. She also co-edited *Open Skies, Arms Control, and Cooperative Security*. She holds a doctorate from George Washington University and a masters degree from Georgetown University.