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Advancing the Law of Weapons Control - Comparative Approaches to Strengthen Nuclear Non-Proliferation

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ADVANCING THE LAW OF WEAPONS CONTROL — COMPARATIVE APPROACHES TO STRENGTHEN NUCLEAR NON-PROLIFERATION

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INTRODUCTION	1031
I. OVERVIEW OF THE REGIMES	1039
A. <i>The Nuclear Non-Proliferation Treaty Regime</i>	1040
1. Objectives and Primary Obligations	1040
2. Legal Bases and Institutional Oversight	1041
3. Restrictions on Trade	1042
4. Protection of Confidential Information	1043
5. Penal Consequences	1044
6. Mechanisms to Address Non-Compliance — The United Nations' Role	1044
B. <i>CWC</i>	1045
1. Objectives and Primary Obligations	1045
2. Legal Bases and Institutional Oversight	1046
3. Restrictions on Trade	1047
4. Protection of Confidential Information	1048
5. Penal Consequences	1051
6. Mechanisms to Address Non-Compliance — The United Nations' Role	1051

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II.	RECORD KEEPING AND REPORTING	1052
A.	<i>NPT</i>	1054
1.	Objectives and Relationship to Regime's Goals ...	1054
2.	Material Subject to Reporting and Methods of Reporting	1055
3.	Facility Information	1057
4.	Import-Export Activity	1058
B.	<i>CWC</i>	1059
1.	Objectives and Relationship to Regime's Goals ...	1059
2.	Material Subject to Reporting and Methods of Reporting	1060
3.	Facility Information	1061
4.	Import-Export Activity	1062
C.	<i>Options to Strengthen NPT Verification</i>	1062
III.	ROUTINE INSPECTIONS	1066
A.	<i>Determining the Frequency and Intensity of Inspections</i>	1068
1.	<i>NPT</i>	1068
2.	<i>CWC</i>	1069
3.	Options to Strengthen NPT Verification — Determining Frequency and Intensity of Inspections	1072
B.	<i>Strengthening the Effectiveness of Inspections</i>	1072
1.	Inspector Issues	1073
2.	Conduct of Inspections and Rights of Access	1079
IV.	INSPECTIONS OF UNDECLARED ACTIVITIES AND FACILITIES ..	1086
A.	<i>NPT</i>	1087
1.	Resolving Questions of Non-compliance under Current NPT Safeguards: Special Inspections	1088
2.	"Extended Access" Inspections	1090
B.	<i>The CWC Challenge Inspection Scheme</i>	1092
1.	Requests for Clarification	1093
2.	Invoking Challenge Inspections	1093
3.	Inspectors	1094
4.	Preparations for a Challenge Inspection	1094
5.	Conduct of a Challenge Inspection	1095
6.	Protection of Confidential Information During Challenge Inspections/Managed Access	1097
7.	Post-Inspection Activities	1097

C. *Options to Strengthen NPT Verification —*

Investigating Non-Compliance 1098

1. Explicit Consultation and Clarification Procedures 1098

2. State Party Invocation of Inspections 1099

3. Non-refusable Special Inspections 1099

4. Right of Access to Undeclared Sites 1100

5. Specification of Inspection Procedures and Powers of Inspectors 1100

6. Increased Protection of Confidential Information .. 1100

7. Specification of Special Inspection Procedures and Powers 1101

V. CONCLUSION: LEGAL IMPLEMENTATION OF NEW APPROACHES 1101

A. *Methods of Implementation* 1102

1. Interpret INFCIRC/153 Safeguards Agreements ... 1103

2. Apply Measures Under the IAEA Statute 1104

3. New Model Arrangements 1106

B. *Areas of Further Inquiry* 1107

C. *Concluding Observations* 1110

INTRODUCTION

The Nuclear Non-Proliferation Treaty of 1968 (NPT)¹ embodies international law’s answer to the most important question of our age: how to reduce the threat of global nuclear conflagration.² As the cornerstone of the international effort to prevent the proliferation of nuclear weaponry, the NPT has been and continues to be an impressive success.³

1. Treaty on the Non-Proliferation of Nuclear Weapons, *opened for signature* July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161 (entered into force March 5, 1970) [hereinafter NPT]. The NPT has over 170 States Parties. The NPT regime, as referred to in this article, consists of: the Treaty; the Statute of the International Atomic Energy Agency, *done* Oct. 26, 1956, 8 U.S.T. 1093, 276 U.N.T.S. 3 (entered into force July 29, 1957) [hereinafter IAEA Statute]; national safeguards agreements negotiated on the basis of the NPT model safeguards agreements contained in *The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, IAEA Doc. INFCIRC/153 (May 1971) [hereinafter INFCIRC/153]; and the “common law” of NPT verification that has developed in 20 years of practice.

2. President Clinton recently described efforts to reduce the threat of nuclear proliferation as “our most serious task and our most solemn obligation.” President William Clinton, Remarks at the Nixon Center for Peace and Freedom Policy Conference (Mar. 1, 1995).

3. Most analysts express respect for its widespread success.

[T]he NPT enjoys the widest adherence of any arms control agreement in history. As the only nuclear non-proliferation agreement of global reach, the treaty has codified an international standard of behavior against which actions of even states

Yet, recent developments suggest that the NPT can, and perhaps should, be strengthened, especially with regard to investigation of non-compliance. The consequences of nuclear proliferation are of such obvious severity that improvements in the NPT should be pursued without fear of disturbing its political support.⁴

Recent events have sharpened proliferation anxieties. First, the Soviet Union's breakup left nuclear weapons in various republics.⁵ The NPT may be credited with providing a framework under which the new states of the former Soviet Union could adhere to non-proliferation principles.⁶ As a result, most observers believe that there will be no Soviet nuclear weapons outside Russia by 1996.⁷ However, the Soviet

outside the regime are measured. . . . [T]he nearly 25 years the NPT has been in force have been free of a single addition to this list of declared nuclear powers.

Thomas Graham, Special Representative of the President for Arms Control, Non-Proliferation and Disarmament, Statement to the USIA Foreign Press Center (Dec. 13, 1994); see also Jozef Goldblat, *The Non-Proliferation Treaty: Status of Implementation and the Threatening Developments*, in NUCLEAR NON-PROLIFERATION AND THE NON-PROLIFERATION TREATY 2 (M.P. Fry et al. eds., 1990) (noting that the NPT's record of compliance is unprecedented for arms control agreements).

4. Simply put, "[n]uclear technology makes it possible to release more energy in one micro-second from a single nuclear weapon than all the energy released by conventional weapons used in all wars throughout history." UNITED NATIONS DEP'T FOR DISARMAMENT AFFAIRS, NUCLEAR WEAPONS: A COMPREHENSIVE STUDY at 9, U.N. Doc. A/45/373, U.N. Sales No. E.91.IX.12 (1991). For a discussion of the terrifying risks posed by nuclear proliferation, see John H. Nuckolls, *Post-Cold War Nuclear Dangers: Proliferation and Terrorism*, 267 SCIENCE 1112 (1995).

5. Ukraine, Belarus, and Kazakstan, in addition to Russia, were left with nuclear weapons when the Soviet Union disintegrated. At that time, Ukraine became the third largest nuclear power with approximately 4,000 weapons, while Belarus was left with approximately 1200. John M. Broder & Stanley Meisler, *Terrifying Quest for A-Arms*, L.A. TIMES, Jan. 19, 1992, at A1, A8. Kazakstan was left with approximately 1800 weapons, but 1150 of these were strategic weapons capable of reaching the United States, only slightly fewer than the 1300 strategic weapons left in Ukraine. *Id.*; see also Perry in *Kazakhstan to Discuss Nuclear Issues*, AGENCE FRANCE PRESSE, Apr. 4, 1995, available in LEXIS, News Library, Curnws File.

6. In November 1994, Ukraine became the last of the four weapons-possessing former Soviet Republics to ratify the NPT. By ratifying, Ukraine joined Belarus and Kazakstan as eligible to receive nearly \$650 million from the United States to assist in shipping their weapons to Russia or to destroy them in exchange for United States economic assistance. Douglas Jehl, *Ukrainian Agrees to Dismantle A-Arms*, N.Y. TIMES, Jan. 13, 1994, at A6; see also Jane Perlez, *Treaty to Cut A-Weapons Now in Effect*, N.Y. TIMES, Dec. 6, 1994, at A10.

7. Ukraine has removed the nuclear warheads from all 46 of its SS-24s and over half of its 130 SS-19s and plans to be rid of all its nuclear weapons by 1996. *Perry Giving Ukraine Aid to Scrap Weapons*, WASH. POST, Apr. 1, 1995, at A21. Belarus should complete the task earlier, transferring its last SS-25 missiles to Russia by July, 1995. *Belarus to Complete Nuclear Arms Transfer to Russia by July*, AGENCE FRANCE PRESSE, Mar. 15, 1995, available in LEXIS, News Library, Curnws File. Kazakstan has been transferring its missiles and nuclear bombers to Russia while the United States has purchased its weapons-grade fissile material. This process should leave Kazakstan free of nuclear weapons by 1996. *Perry in Kazakhstan to Discuss Nuclear Issues*, *supra* note 5.

Union's breakup has raised fears that components of their weapons will spread to other States or sub-national groups.⁸ Indeed, small amounts of plutonium and enriched uranium smuggled from nuclear facilities have been seized in Eastern Europe.⁹ Since only a small amount of enriched uranium and an even smaller amount of plutonium is necessary to make a nuclear weapon, any potential failure or shortcoming of current safeguards could prove catastrophic.

Second, the discovery of an Iraqi clandestine nuclear weapons program demonstrated that an NPT State Party, apparently in good standing, could pursue a weapons program undetected.¹⁰ Iraq's billion dollar investment in a nuclear weapons program was largely accomplished with the aid of foreign suppliers providing technical assistance, materials and equipment.¹¹ Through a secret procurement network, Iraq began a parallel program to enrich its indigenous uranium, avoiding scrutiny by inspectors who monitored only its declared nuclear power facilities.¹² Because of the program's secrecy, Iraq's nuclear capabilities might have escaped detection if not for the extraordinarily intrusive search for weapons of mass destruction to which Iraq was subject after its defeat.¹³

8. Although Russian nuclear weapons remain protected, the lack of adequate security and control of fissile materials have left these stockpiles vulnerable to diversion. David Albright & Kevin O'Neill, *Jury-Rigged, but Working*, BULL. ATOM. SCIENTISTS, Jan. 1995, at 23. See generally Barry Kellman and David Gualtieri, *Barricading the Nuclear Window: A Legal Regime to Curtail Nuclear Smuggling* (forthcoming).

9. Experts are unsure of the exact quantities that have been removed from existing stockpiles in the former Soviet Union. See Jane Perlez, *Tracing a Nuclear Risk: Stolen Enriched Uranium*, N.Y. TIMES, Feb. 15, 1995, at A3; see also *National Security Military Procurement FY96 Defense Authorization: Hearings Before the Subcomm. on Military Procurement and the Subcomm. on Research and Development of the House Comm. on National Security*, 105th Cong., 1st Sess. (1995) (testimony of Gary Milhollin, Professor, University of Wisconsin Law School).

10. With support of foreign suppliers, Iraq was on the verge of nuclear weapons capabilities prior to IAEA detection in 1991. See generally R. Jeffrey Smith, *Iraq's Secret A-Arms Effort: Grim Lessons for the World*, WASH. POST, Aug. 11, 1991, at C1; Rolf Ekeus, *The Iraqi Experience and the Future of Nuclear Nonproliferation*, WASH. Q., Autumn 1992, at 67.

11. This assistance was vital in the development of two enrichment facilities which required highly technical knowledge and equipment. The antiquated uranium enrichment method employed at the two locations is known as electromagnetic isotope separation. Iraq was also in the process of developing a more sophisticated enrichment process employing centrifuge capabilities. See Lawrence Scheinman, *Lessons from Post-War Iraq for the International Full-Scope Safeguards Regime*, ARMS CONTROL TODAY, Apr. 1993, at 3. For a discussion of German exports to Iraq's nuclear program, see Barry Kellman, *Bridling the International Trade of Catastrophic Weaponry*, 43 AM. U. L. REV. 755, 787-89 (1994).

12. See Ekeus, *supra* note 10, at 70.

13. These special verification efforts included a combination of chemical and isotopic analysis of samples, defector-generated information and assistance of experts familiar with Iraq's enrichment process. More aggressive verification efforts came from shared resources and highly sensitive information from various nations including an American-piloted U-2

Third, using inspection techniques employed during the post-Gulf War inspections in Iraq, concerns arose that North Korea had not declared all of the plutonium it had separated.¹⁴ It has been widely reported that North Korea had secretly built a small reactor and an associated plutonium separation plant and was building two larger reactors despite declaring that it had separated only a small quantity of plutonium.¹⁵ North Korea's resistance to NPT inspections exhibits some limitations of NPT safeguards.¹⁶

These episodes reinforce public attention on the continuing threat posed by the spread of nuclear weapons and powerfully dramatize the importance of the NPT in addressing that threat. The NPT undergirds the global norm against proliferation and establishes the ignominy of possessing clandestine nuclear weapons as a principle of international law.¹⁷ That said, many analysts, while acknowledging the treaty's accomplishments, have suggested that the NPT's basic mechanisms need to be reexamined and perhaps adjusted.¹⁸

reconnaissance aircraft loaned to UNSCOM to provide intelligence data. See JULIE L. KLARE & JEFFERY H. GROTEE, REPORT FOR THE DEFENSE NUCLEAR AGENCY: IMPLICATIONS OF THE UNSCOM EXPERIENCE IN IRAQ FOR ARMS CONTROL VERIFICATION REGIMES 11 (Institute for Defense Analysis IDA Paper No. P-2835, 1993).

14. See generally CHARLES BALL, STOPPING NORTH KOREAN NUKES: POSSIBLE WITHOUT WAR? 25 (Lawrence Livermore Nat'l Lab. Director's Series on Proliferation No. UCRL-LR-114070-5, 1994); see Marc D. Millot, *Facing the Emerging Reality of Regional Nuclear Adversaries*, WASH. Q., Summer 1994, at 41.

15. Based on IAEA evidence and its own analysis, the U.S. Central Intelligence Agency believed that the North had probably separated enough plutonium for one or two nuclear weapons. David Albright, *How Much Plutonium Does North Korea Have?*, BULL. ATOM. SCIENTISTS, Sept.-Oct. 1994, at 46.

16. See *U.S.-N. Korea Nuclear Agreement: Hearings Before the Subcomm. on East Asian and Pacific Affairs of the Senate Foreign Relations Comm.*, 103d Cong., 2d Sess. (1994) (testimony of Robert L. Gallucci, Ambassador-at-Large).

17. It should also be noted that the NPT has played an essential role in persuading numerous countries, including Brazil and Argentina, to eschew nuclear weapons programs and South Africa to dismantle their nuclear weapons. In addition, Sweden, the former Yugoslavia, and other nations have been persuaded to turn away from the development of nuclear weapons.

18. See generally DAVID FISCHER, TOWARDS 1995: THE PROSPECTS FOR ENDING THE PROLIFERATION OF NUCLEAR WEAPONS (1993); COUNCIL ON FOREIGN RELATIONS, NUCLEAR PROLIFERATION — CONFRONTING THE NEW CHALLENGES (1995); JAMES F. KEELEY, INTERNATIONAL ATOMIC ENERGY AGENCY SAFEGUARDS: OBSERVATIONS ON LESSONS FOR VERIFYING A CHEMICAL WEAPONS CONVENTION (1988); Michael M. May, *Nuclear Weapons Supply and Demand*, 82 AM. SCIENTIST 526 (1994); Marvin H. Miller, *Stemming the Spread of Nuclear Weapons*, TECH. REV., Aug. 1987; Roger C. Molander & Peter A. Wilson, *On Dealing with the Prospect of Nuclear Chaos*, WASH. Q., Summer 1994.

The apparent failure to detect the Iraqi nuclear weapons program has prompted considerable reexamination of the entire NPT regime by some of its most high-ranking officials and supporters. See Hans Blix, *Verification of Nuclear Nonproliferation: The Lesson of Iraq*, WASH. Q., Autumn 1992, at 57; ANTHONY FAINBERG, STAN. U. CTR. FOR INT'L SECURITY &

Since 1991, the International Atomic Energy Agency (IAEA) has considered strategies to strengthen the effectiveness of NPT safeguards — particularly in regard to detecting activities and facilities not declared under the treaty.¹⁹ In general terms, the IAEA seeks to achieve greater transparency, openness, and unpredictability in its verification scheme.²⁰ In furtherance of this policy, the Standing Advisory Group on Safeguards Implementation (SAGSI), an independent expert group appointed by the Director General of the IAEA,²¹ has outlined an approach to enhance the effectiveness of safeguards.²²

This article analyzes in-depth the SAGSI recommendation that more effective safeguards draw upon “the elements (including the managed access provisions) contained in Part X of the Verification Annex to the Convention on the Prohibition of Chemical Weapons.”²³ SAGSI found

ARMS CONTROL, STRENGTHENING IAEA SAFEGUARDS: LESSONS FROM IRAQ (1993); KLARE & GROTEE, *supra* note 13; Joseph F. Pilat, *Iraq and the Future of Nuclear Nonproliferation: The Roles of Inspections and Treaties*, 255 SCIENCE 1224 (1992); Scheinman, *supra* note 11; see also *Hearings Before the House Committee on Foreign Affairs*, 103d Cong., 1st Sess. (1993) (testimony of Lynn E. Davis, Undersec. of State for Int'l Security Aff.). (“The experience with Iraq was an important lesson. We must be prepared to confront the threat that certain states are willing to disregard their obligations under the NPT. To that end, we are working to strengthen the IAEA’s safeguards system, including the use of special inspections and environmental sampling in order to improve its capabilities to detect clandestine activities.”).

19. See *Report to the Director General on the 36th Series of SAGSI Meetings*, at 17 (Apr. 19–23, 1993) [hereinafter *SAGSI Report*]. Statements made at the 1990 NPT Review Conference and the Director General’s statement during the February 1991 Board of Governor’s meeting spoke of the need for more effective safeguards and identified specific issues to be addressed. *Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System: Report by the Director General*, at 1, IAEA Doc. GC(XXXVIII)/17 (Aug. 29, 1994) [hereinafter IAEA Doc. GC(XXXVIII)/17]; see generally Gamini Seneviratne & Ann MacLachlan, *IAEA Preparing New Safeguards System for Presentation to NPT Meeting*, NUCLEAR FUEL, Oct. 24, 1994, at 10.

20. “Transparency” refers to the completeness of a State’s declarations as to its nuclear program from a wide range of sources. “Openness” refers to the rights of prompt access granted to the IAEA to verify or confirm declarations. IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 18–19. To enhance unpredictability, access might be at short or no notice with respect to an inspection’s timing, location, and the range of activities to be verified.

21. See Senthil Ratnasabapathy, *Disarmament: IAEA Seeks Enhanced Powers to Check Proliferation*, INTER PRESS SERVICE, Mar. 28, 1995, available in LEXIS, News Library, Curmws File.

22. See *SAGSI Report*, *supra* note 19, at 22 (“[T]he Agency’s current safeguards must be enhanced to provide significant confidence as to the absence of undeclared nuclear facilities as well as of the absence of undeclared activities at declared nuclear facilities.”). The IAEA has considered that report’s recommendations and assessed means of implementing them.

23. See *id.* at 7. The IAEA Board of Governors has identified several provisions of the CWC that differ from the NPT regime and has suggested that adopting similar measures in IAEA arrangements with State Parties would substantially enhance the effectiveness of safeguards.

that the Chemical Weapons Convention (CWC)²⁴ offers approaches for verification and investigation that may be adaptable to the NPT.

It is altogether appropriate that SAGSI should recommend examination of the CWC. The CWC is the latest contribution to the development of the international law of weapons control. In terms of its fundamental moral objectives, the CWC follows a long tradition of efforts to control the methods of warfare.²⁵ The CWC is novel because it represents an unprecedented multilateral effort to eradicate an entire category of catastrophic weapons and assure their continued absence through a far-reaching system to verify compliance.²⁶ The Convention propounds a comprehensive regulatory regime to effectuate its objectives that is the most elaborately detailed codification of principles and methodologies to control weapons of war worldwide.²⁷

The CWC contributes, therefore, not only to the international law of armed conflict by establishing substantive rules of permissible conduct; analogous to any legal code, it establishes a governance system that may be adapted to related but distinct spheres of activity. As the threat of nuclear weapons compels consideration of new approaches, comparing the CWC with the NPT becomes more than an academic exercise. This

24. The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, *opened for signature* Jan. 13, 1993, 32 I.L.M. 800 [*hereinafter* CWC]. As of August, 1995, the CWC has 159 signatories and has been ratified by 35 countries. Search of PTS-OPCW PrepCom Home Page, <http://www.opcw.nl/info.htm> (Aug. 25, 1995). The CWC will enter into force 180 days after the 65th country deposits its instrument of ratification. CWC art. XIX. Two important parts of the CWC are the Annex on Implementation and Verification, *id.* at 824 [*hereinafter* Verification Annex] and the Annex on the Protection of Confidential Information, *id.* at 871 [*hereinafter* Confidentiality Annex].

25. Indeed, medieval knights were restricted by the law of arms from using poison gas. More recently, the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases and Bacteriological Methods of Warfare, June 17, 1925, 26 U.S.T. 571, 94 L.N.T.S. 65, has embodied during this century the prohibition against using poisons as weapons. These efforts and manifold other agreements, cumulatively, comprise the international law of weapons control, which may accurately be considered a subset of the broader category of laws of armed conflict and war crimes. "For over seven thousand years, humanitarian principles regulating armed conflicts evolved gradually in different civilizations. In time, these humanitarian principles formed a protective fabric of norms and rules designed to prevent certain forms of physical harm and hardships from befalling innocent civilian non-combatants[.]" M. CHERIF BASSIOUNI, *CRIMES AGAINST HUMANITY IN INTERNATIONAL CRIMINAL LAW* 150 (1992).

26. See Fred Webber, *To Stop Poison Gas Attacks*, WASH. POST, Apr. 4, 1995, at A23.

27. United Nations Secretary-General Boutros Boutros-Ghali, speaking at the ceremony opening the CWC for signature in Paris, France, on Jan. 13, 1993, stated that the CWC "must go down in history as one of the most tangible signs of the current advance towards a universal order. . . . [The CWC is] a decisive advance in the history of disarmament." See generally John Holum, Director of the United States Arms Control and Disarmament Agency, Speech before the ABA Symposium on Implementation of the Chemical Weapons Convention (Feb. 7, 1995) (transcript on file with *Michigan Journal of International Law*).

article identifies those aspects of the CWC that may prove instructive to enhancing NPT verification.

While the CWC built on the NPT's verification mechanisms in many respects, the CWC proposes potentially more effective methods for detecting and investigating prohibited weapons activities. Specifically, the CWC may be a model for expanding and strengthening NPT safeguards as to: (1) what should be verified, (2) what suspicions trigger broader or more penetrating verification requirements, and (3) what limits apply to that power, expanded though it may be. This article asserts that these are issues of law and that rigorous comparison of two elaborate international treaties requires legal analysis. Yet, it must be borne in mind that the CWC has not yet entered into force. Its innovative verification measures have not been implemented and are thus far unproven.

The timing of this effort is significant. In 1995, the NPT came under its most important review as to whether it should be extended and, if so, for how long.²⁸ By its own terms, the NPT was to be in force for twenty-five years at which point States Parties would decide whether to extend it.²⁹ As the 1995 Review Conference approached, some states asserted that the five declared nuclear weapons states had failed to live up to their obligation to negotiate nuclear disarmament.³⁰ Many states also pressed for negotiation of a comprehensive test ban treaty and a cutoff in the production of fissile materials.³¹ While these issues are

28. See Alexander T. Lennon, *The 1995 NPT Extension Conference*, WASH. Q., Autumn 1994, at 202; CAROLINE MILLAR, NPT EXTENSION: LEGAL AND PROCEDURAL ISSUES 13 (Lawrence Livermore Nat'l Lab. Director's Series on Proliferation No. UCRL-LR-114070-7, 1994); Mitchell Reiss, *The Last Nuclear Summit*, WASH. Q., Summer 1994, at 5; John Simpson, *The 1995 NPT Conference, Substantive Issues Will Shape the Outcome*, SECURITY DIALOGUE, 1994, at 223.

29. Joseph Cirincione, *Third PrepCom Highlights Uncertainties: NPT Showdown Ahead*, ARMS CONTROL TODAY, Dec. 1994, at 3.

30. See generally William Epstein, *Give More to Get More: Extension of the Nuclear Non-Proliferation Treaty*, BULL. ATOM. SCIENTISTS, Nov./Dec. 1994, at 15; David A. Koplow, *Parsing Good Faith: Has the United States Violated Article VI of the Nuclear Non-Proliferation Treaty?*, 1993 WIS. L. REV. 301. Senior officials of the United States government respond to these concerns, noting that the Intermediate-range Nuclear Forces Treaty (INF) eliminated 2,000 warheads and an entire class of nuclear weapons and that START I and II commit the United States to dismantling another 17,000 weapons as well as their delivery mechanisms. Graham, *supra* note 3. However, START II currently awaits the advice and consent of the U.S. Senate.

31. With regard to a comprehensive nuclear test ban, see John Edmonds, *A Complete Nuclear Test Ban — Why Has It Taken So Long?*, 25 SECURITY DIALOGUE 375 (1994). With regard to a fissile material cut-off, see BRIAN G. CHOW & KENNETH A. SOLOMON, RAND, *LIMITING THE SPREAD OF WEAPON-USABLE FISSILE MATERIALS* (1993) (prepared for the Undersec. of Def. for Pol'y); and Frans Berkhout et al., *A Cutoff in the Production of Fissile Material*, 19 INT'L SECURITY 167 (1994). The United States has strongly supported negotia-

crucial to the success of nuclear non-proliferation efforts and to international security generally, their discussion tended to drown out concerns over less politically-charged issues, including how to strengthen the NPT's capabilities to detect non-compliance.

The 174 nations represented at the Review Conference agreed to indefinitely extend the NPT. This decision, embodied in a document entitled "Extension of the Treaty on the Non-Proliferation of Nuclear Weapons," was part of a package containing two other documents. First, "Strengthening the Review Process for the Treaty" continues the practice of holding a review conference every five years, but calls for more systematic preparation on substantive issues. Second, "Principles and Objectives for Nuclear Non-proliferation and Disarmament" reaffirms the goals of complete elimination of nuclear weapons as well as general and complete disarmament under strict international control. It also contains a set of twenty principles dealing with: universality, non-proliferation, nuclear disarmament, nuclear-weapons-free zones, security assurances, safeguards, and peaceful uses of nuclear energy. In addition, a compromise resolution was agreed that all states in the Middle East should join the NPT and take steps to establish a Middle Eastern zone free of weapons of mass destruction.³²

Since the conclusion of the 1995 Review Conference, the IAEA has decided to implement changes to its safeguards system by applying some new information-gathering measures immediately and by negotiating application of additional measures with individual states. Initially, the IAEA will require expanded descriptions of the nuclear fuel cycle; in the second phase, the IAEA will seek declaration of and physical access to other kinds of locations functionally related to nuclear fuel cycle operations.³³

The following five sections of this article develop a mode of analysis and recommendations designed to build on these recent developments. Section I is an overview of the major elements of the NPT and

tion of a comprehensive nuclear test ban treaty and a cut-off in fissile material in order to be in the strongest possible position to negotiate indefinite extension of the NPT and to discourage other nations from developing their own nuclear arsenals. *Hearings Before the House Committee on Foreign Affairs*, *supra* note 18 (testimony of Lynn E. Davis, Undersec. of State for Int'l Security Aff.).

32. *1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons*, U.N. Doc. NPT/CONF.1995/32 (1995); see generally William Epstein, *Indefinite Extension — With Increased Accountability*, BULL. ATOM. SCIENTISTS, July 1995, at 27; Barbara Crossette, *Treaty Aimed at Halting Spread of Nuclear Weapons Extended*, N.Y. TIMES, May 12, 1995, at A1.

33. Gamini Seneviratne, *New IAEA Safeguards System to Be Applied in Two Phases*, NUCLEAR FUEL, July 31, 1995, at 10.

CWC regimes, leaving the description of verification mechanisms to subsequent sections. Section II describes each regime's record keeping and reporting scheme and analyzes how the CWC's approach could be useful in the NPT context. Section III examines CWC routine inspections and environmental monitoring and applies elements of that scheme to: 1) develop a risk-based approach to select facilities for inspection; and 2) suggest methods to improve inspections by increasing inspectors' rights of access. Section IV describes how each treaty handles suspicions of non-compliance, focusing on the CWC's procedures for challenge inspections and managed access. Section V presents this article's conclusions and discusses the possible legal methods to implement discussed NPT reforms as well as how these measures could affect protected legal rights.

I. OVERVIEW OF THE REGIMES

The NPT and the CWC are, to date, the most far-reaching and comprehensive multilateral attempts to control the proliferation of catastrophic weaponry. Because the CWC was partially modelled after the NPT, they share many characteristics, including:

- proscription of certain proliferative activities;
- vesting of oversight authority in an international organization;³⁴
- requirements to keep records and make regular, verifiable reports to that organization;
- an obligation to submit to initial and regular inspections to verify the accuracy of reports, including the taking of samples of monitored substances;
- procedures to protect confidential information;
- a means to settle disputes and obtain clarifications from a State Party about compliance concerns, and, if necessary, suspicion-based inspections to investigate non-compliance; and
- an enforcement mechanism that permits recourse to the United Nations Security Council.

These similarities should not mask crucial distinctions. Although both regimes share a basic framework, their subject matter, history, and methodology differ markedly.

34. Treaty compliance determinations are not vested in international organizations.

This overview presents the elements of each regime, focusing on their objectives, legal bases, means of institutional oversight, methods to protect confidential information, trade restrictions, potential penal consequences, and mechanisms to address non-compliance. Both regimes devote considerable attention to verification efforts, but as following sections fully discuss these efforts, they are omitted from this overview.

A. *The Nuclear Non-Proliferation Treaty Regime*

The NPT regime, including national safeguards agreements and the IAEA Statute, embody the international effort to ban illicit transfers of nuclear material and acquisition or transfer of nuclear weaponry. Regional agreements supplement the NPT.³⁵

1. Objectives and Primary Obligations

The objectives of the NPT are to: 1) halt the spread of nuclear weapons development programs, 2) promote nuclear disarmament, and 3) promote the peaceful use of nuclear technologies and materials. The IAEA Statute fosters these objectives by establishing and administering safeguards to ensure that nuclear materials, equipment, facilities, and information are not used to further military purposes.

The NPT distinguishes between states that tested a nuclear device prior to 1967 (nuclear weapons states or "NWS")³⁶ and non-nuclear-weapon states ("NNWS"). Different obligations apply to each category of states. In brief, NWS agree: 1) not to assist, encourage, or induce any NNWS in acquiring nuclear weapons;³⁷ 2) to share the benefits of peaceful application of nuclear power for civilian purposes;³⁸ and 3) to attempt to curb the nuclear arms race at an early date.³⁹ The NPT does not prohibit NWS from producing nuclear weapons. The NNWS agree: 1) not to receive, manufacture, or otherwise acquire nuclear explosive devices, either directly or indirectly;⁴⁰ and 2) to accept international

35. For example, the Treaty for the Prohibition of Nuclear Weapons in Latin America, *opened for signature* Feb. 14, 1967, 634 U.N.T.S. 281 (also known as the Tlateloco Treaty), calls for a regional nuclear-weapons-free zone and establishes the Agency for the Prohibition of Nuclear Weapons in Latin America (OPANAL).

36. There are five such states: China, France, the former Soviet Union, the United Kingdom and the United States. This category does not include the three republics of the former Soviet Union that were left with nuclear weapons on their territory: Belarus, Kazakstan, and Ukraine.

37. NPT, *supra* note 1, art. I.

38. *Id.* arts. IV-V.

39. *Id.* art. VI.

40. *Id.* art. II.

safeguards on all their peaceful nuclear activities, under the auspices of the IAEA, including on-site inspections and other means to verify compliance with NPT obligations.⁴¹

2. Legal Bases and Institutional Oversight

Several documents are important to the operation of NPT safeguards. Article III of the NPT creates the obligation to accept safeguards but does not define the framework or procedures to be applied under the safeguards system. Instead, the NPT uses the system established by the IAEA, notably the power to apply safeguards⁴² according to individual safeguards agreements negotiated on the basis of INFCIRC/153, which sets out the content and structure of those agreements between NPT NNWS parties and the IAEA.⁴³

There are two general types of safeguards agreements: 1) those that apply safeguards to all nuclear material in a country (known as "comprehensive" or "full scope" safeguards); and 2) those that apply safeguards to a specific quantity of nuclear material.⁴⁴ Despite some variations, independent safeguards agreements closely follow the framework established in INFCIRC/153. The IAEA and the State Party negotiate, based on a safeguards agreement, Subsidiary Agreements with more detailed procedures such as the control measures to be applied at safeguarded facilities.⁴⁵ Subsidiary Agreements consist of two parts: a general part that applies to the State Party as a whole, and a specific part, known as a facility attachment, that defines the safeguards provisions for each facility.⁴⁶

NPT safeguards are administered by the IAEA which comprises three principal organs.⁴⁷ The General Conference includes all IAEA

41. *Id.* art. III.

42. IAEA Statute, *supra* note 1, art. XII.

43. INFCIRC/153, *supra* note 1.

44. See D.M. Edwards, *International Legal Aspects of Safeguards and the Non-Proliferation of Nuclear Weapons*, 33 INT'L & COMP. L.Q. 1 (1984).

45. See generally Michael J. Wilmshurst, *The Adequacy of IAEA Safeguards for the 1990s*, in NUCLEAR NON-PROLIFERATION AND THE NON-PROLIFERATION TREATY 2, 13 (M.P. Fry et al. eds., 1990). In the interests of national security and to protect the confidentiality of certain information, Subsidiary Arrangements are not typically released to the public.

46. The general part is negotiated first, followed by the facility attachments. See MARK MULLEN, VERIFICATION OF A CHEMICAL WEAPONS CONVENTION: SUMMARY OF LESSONS LEARNED FROM THE VERIFICATION EXPERIENCE OF THE INTERNATIONAL ATOMIC ENERGY AGENCY 15 (1991).

47. NPT, *supra* note 1, art. III(1). The IAEA is not a party to the NPT nor was it created by the NPT.

Member States.⁴⁸ The Board of Governors is the executive body of the IAEA, consisting of 35 members elected or designated based on geographical distribution. The Secretariat, headed by a Director General appointed by the Board of Governors, is responsible for IAEA administration as well as on-site verification activities.⁴⁹

3. Restrictions on Trade

The NPT restricts the international transfer of nuclear weapons, nuclear material, and equipment. NWS cannot transfer nuclear weapons or nuclear explosive devices "to any recipient whatsoever."⁵⁰ Nor may a NNWS receive nuclear weapons or nuclear explosive devices, or the control thereof, from "any transferor whatsoever."⁵¹ All NPT State Parties, both NWS and NNWS, must safeguard the transfer to any NNWS of a) source or fissionable material; or b) equipment or material designed or prepared for the processing, use, or production of special fissionable material for peaceful purposes.⁵²

The Zangger Committee developed a "trigger list" of materials and equipment. Shipment of these items to a NNWS triggers the requirement of IAEA safeguards.⁵³ This trigger list includes components, equipment, and materials necessary for the nuclear fuel cycle, but does not ban transfers of sensitive technologies such as enrichment and reprocessing equipment.⁵⁴ To export nuclear material or equipment to NNWS that are not NPT parties, supplier states must require that trigger list items will not be diverted to nuclear weapons and that each recipient state has negotiated a safeguards agreement with the IAEA. Furthermore, suppliers must seek assurances from recipient states that any trigger list items

48. As of mid-1992, there were 114 Member States to the IAEA Statute.

49. NPT, *supra* note 1, arts. VI-VII.

50. *Id.* art. I.

51. *Id.* art. II.

52. *Id.* art. III(2).

53. IAEA Doc. INFCIRC/209 (Sept. 1974). Ten States started the Zangger Committee soon after the NPT entered into force by informing the IAEA of their intentions to require safeguards on a uniform set of nuclear exports: Australia, Denmark, Canada, Finland, West Germany, the Netherlands, Norway, the Soviet Union, the United Kingdom, and the United States. Subsequently, Austria, Czechoslovakia, East Germany, Ireland, Japan, Luxembourg, Poland, and Sweden sent similar memoranda. See generally Frans Berkhout, *The NPT and Nuclear Export Controls*, in *NUCLEAR NON-PROLIFERATION: A REFERENCE HANDBOOK* 45 (Darryl Howlett & John Simpson, eds., 1992).

54. In recent years, the Zangger Committee has completed talks on trigger list equipment and materials for gas centrifuge enrichment, gaseous diffusion enrichment and reprocessing. According to the State Department, the U.S. is leading an effort among supplier states to clarify "additional sensitive technologies" on the list. Fritz W. Schmidt, *The Zangger Committee: Its History and Future Role*, *NONPROLIFERATION REV.*, Fall 1994, at 38.

will not be reexported to a third state unless safeguards are effectively applied in that state.⁵⁵

To rectify some shortcomings in the Zangger Committee, the Nuclear Suppliers Group (NSG or "London Club") was formed in the 1970s to draw up a more comprehensive list of materials, equipment, and technology that would trigger IAEA safeguards when exported to any NNWS not party to the NPT.⁵⁶ The NSG's Guidelines for Nuclear Transfers⁵⁷ require the recipients of trigger list items to provide effective physical protection for these items, and to pledge not to use them for the manufacture of nuclear explosives.⁵⁸ If materials are diverted or if supplier/recipient understandings are violated, NSG members should consult promptly on possible common action.⁵⁹

4. Protection of Confidential Information

The IAEA must "take every precaution to protect commercial and industrial secrets and other confidential information coming to its knowledge in the implementation of the Agreement[,] and severe conditions limit how it may publish or communicate any information obtained in connection with a safeguards agreement.⁶⁰ Furthermore, the IAEA can only require the "minimum amount of information and data consistent with carrying out its responsibilities[.]"⁶¹

Similar restrictions prohibit the Director General and staff (including inspectors) from disclosing any "industrial secret or other confidential information" obtained through their official duties.⁶² Inspectors may not seek to obtain confidential information unnecessary to the performance of their duties, nor unnecessarily reveal any information coming to their attention. Disciplinary and fiscal penalties can be imposed on IAEA

55. For fear of discrediting the NPT, the Zangger countries cannot target strict nuclear controls toward certain nations with questionable proliferation credentials.

56. The NSG is nominally separate from the NPT. It allows its members flexibility and latitude in controlling items to NNWS while enlisting the cooperation of all supplier states. The NSG "trigger list" includes source and special fissionable material, nuclear reactors and certain reactor components, non-nuclear materials for reactors such as heavy water and nuclear-grade graphite, reprocessing plants and equipment, and equipment for the separation of isotopes of uranium. IAEA Doc. INFCIRC/254, Annex A (Feb. 1978); see also Joseph Pilat, *The Major Suppliers: A Baseline for Comparison*, in INTERNATIONAL NUCLEAR TRADE AND NONPROLIFERATION 39, 39-41 (William C. Potter ed., 1990).

57. IAEA Doc. INFCIRC/254, *supra* note 56.

58. See generally Berkhout, *supra* note 53.

59. See ROLAND TIMERBAEV, MONTEREY INST. OF INT'L STUDIES, A MAJOR MILESTONE IN CONTROLLING NUCLEAR EXPORTS (1992).

60. INFCIRC/153, *supra* note 1, § 5.

61. *Id.* § 8.

62. IAEA Statute, *supra* note 1, art. VII(F).

inspectors for damages due to their negligence or violation of IAEA regulations.⁶³

5. Penal Consequences

The NPT itself neither includes penal consequences for private persons who violate its provisions nor requires State Parties to enact penal legislation to punish individuals who commit treaty violations. Yet, the Convention on the Physical Protection of Nuclear Material,⁶⁴ though not squarely part of the NPT regime, requires States Parties to criminalize several offenses with respect to the handling of nuclear materials, including *inter alia*: unauthorized receipt, possession, use, transfer, alteration, disposal or dispersal of nuclear material; theft or robbery of nuclear material; embezzling or fraudulently obtaining nuclear material; and demanding nuclear material by threat or use of force or other form of intimidation.⁶⁵ The Convention also requires various types of inter-state cooperation in penal matters and requires States Parties to include treaty offenses in their extradition treaties⁶⁶ and to "afford one another the greatest measure of assistance in connection with criminal proceedings brought in respect of the offenses set forth in article 7."⁶⁷

6. Mechanisms to Address Non-Compliance — The United Nations' Role

If a state refuses to grant access to the IAEA for the purpose of carrying out safeguards, the IAEA's Board of Governors can "call upon" the state to take the required action (i.e., comply and grant access) without delay.⁶⁸ If the state refuses to "take fully corrective action within a reasonable time," the IAEA Board of Governors may:

- 1) curtail or suspend assistance being provided by the IAEA or by another State Party and call for the return of material and equipment made available to the State Party in non-compliance, or

63. Paul C. Szasz, *International Atomic Energy Safeguards*, in INTERNATIONAL SAFEGUARDS AND NUCLEAR INDUSTRY 73, 130-32 (Mason Willrich ed., 1973).

64. Convention on the Physical Protection of Nuclear Material, Oct. 26, 1979, 18 I.L.M. 1419 (1979). As of September 1992, the Convention had 42 signatories. *Review Conference Finds 1987 Nuclear Materials Pact Sound*, 18 WORLD ENV'T REP. No. 24, at 202 (Nov. 24, 1992).

65. Convention on the Physical Protection of Nuclear Material, *supra* note 64, art. 7.

66. *Id.* art. 11.

67. *Id.* art. 13.

68. INFCIRC/153, *supra* note 1, ¶ 18.

2) suspend the non-complying State Party from the exercise of the privileges and rights of membership in the IAEA Statute.

If the State Party still refuses to comply, the Board of Governors may find that the IAEA is not able to verify that there has been no diversion, and report the matter to the Security Council and General Assembly of the United Nations.⁶⁹ These bodies presumably will be able to take all measures available to them under the United Nations Charter.⁷⁰

B. CWC

The CWC seeks to eradicate an entire category of catastrophic weapons and to ensure their continued non-production. Unlike the NPT, the CWC requires disarmament. States Parties having chemical weapons (CW) must destroy them. The CWC has not adopted the NPT distinction between weapons and non-weapons states; the CWC's prohibitions and obligations will apply identically to all States Parties. In most other respects, the two treaties establish similar regimes with similar approaches.

1. Objectives and Primary Obligations

The CWC has two goals. First, it mandates declaration and destruction of existing chemical weapon stockpiles and production facilities.⁷¹ Destruction of CW must begin within two years and be completed not later than ten years after the CWC takes effect.⁷² Each State Party may destroy its weapons and facilities by any means it chooses, so long as the destruction can be verified.⁷³ Second, the CWC seeks to verify that States Parties do not initiate or resume CW production or storage. Each State Party may produce and use toxic chemicals for legitimate commercial purposes, but every State Party, including those with no CW to

69. IAEA Statute, *supra* note 1, art. XII(C).

70. The Security Council could find a State Party's non-compliance a threat to international peace and security and take appropriate collective action under Chapter VII of the Charter. *See Szasz, supra* note 63, at 116.

71. CWC, *supra* note 24, art. I, ¶¶ 2-4.

72. *Id.* art. IV, ¶ 6. The destruction of chemical weapons production facilities must begin within one year and be completed not later than ten years after the CWC takes effect. *Id.* art. V, ¶ 8.

73. Verification Annex, *supra* note 24, pts. IV(A), ¶¶ 13-14, V, ¶ 11, V, ¶ 44(a). Means of destruction will be subject to each State Party's environmental, health, and safety restrictions, CWC, *supra* note 24, arts. IV, ¶ 11, V, ¶ 11.

destroy, must ensure that chemicals are not used for CWC-prohibited purposes.⁷⁴

Accordingly, the twelve chemical groups listed on "Schedule 1" in the Annex on Chemicals⁷⁵ that present the greatest risk to the CWC's object and purpose, may be produced only for research, medical, pharmaceutical or protective purposes at a single "small-scale" facility or at "other facilities" in a severely limited quantity and for only limited purposes. A State Party cannot produce, acquire, retain or use these chemicals outside the territories of States Parties and cannot transfer such chemicals outside its territory except to another State Party and according to several restrictions.

2. Legal Bases and Institutional Oversight

Unlike the NPT, which leaves many details of verification to individual safeguards agreements, Subsidiary Arrangements, and facility attachments, the CWC contains both the general obligations of States Parties and the entire verification mechanism, including declaration requirements and detailed inspection timetables and procedures. The regime's other legally significant documents are facility agreements to be negotiated with each State Party containing specific inspection procedures to be followed at declared facilities.⁷⁶

To accomplish its goals, the CWC creates the Organization for the Prohibition of Chemical Weapons (OPCW), an international body that will monitor the production capabilities and activities of States Parties in order to ensure that the objectives of the CWC are being met. The

74. CWC, *supra* note 24, art. VI, ¶ 1.

75. The CWC lists chemicals that could be used in chemical weapons on three "Schedules." Schedule 1 includes chemical weapons agents and other chemicals, i.e., their immediate precursors, that pose a *high* risk to the CWC's object and purpose. Schedule 2 includes toxic chemicals and their immediate precursors that pose a *significant* risk, but have some commercial value. Schedule 3 chemicals, which are produced in large commercial quantities, pose even less risk but may have been used as CW agents in the past. In addition, declarations must be made regarding facilities that manufacture organic chemicals beyond certain threshold quantities, known as "other" or "PSF" (phosphorous, sulfur, fluorine) chemical production facilities. *Id.*, Annex on Chemicals, pt. A.

76. Under the CWC, Schedule 1 and Schedule 2 facilities must have a facility agreement. Schedule 3 and "other" facilities will not have such agreements, unless the State Party insists on one. The OPCW has elaborated model facility agreements. See *GENERIC TEXT ELEMENTS FOR MODEL FACILITY AGREEMENTS* (on file with *Michigan Journal of International Law*); *DISCUSSION PAPER PREPARED BY THE SECRETARIAT: FACILITY SPECIFIC SECTIONS OF THE MODEL FACILITY AGREEMENT FOR SINGLE SMALL SCALE FACILITIES, SCHEDULE 1 FACILITIES, SCHEDULE 2 FACILITIES, AND SCHEDULE 3 FACILITIES* (on file with *Michigan Journal of International Law*); see also *Experts Group on Chemical Industry Activities: Initial Report*, att. 1 (draft facility agreement for Schedule 2 facilities), OPCW Doc. PC-IV/B/WP.5 (July 23, 1993) (revisions of this draft agreement appear in the second and third reports of the Experts Group on Chemical Industry Facilities) [hereinafter *Initial Report*].

OPCW, which comprises three organs, will be vested with extensive legislative, investigative, and judicial responsibilities. The Conference of States Parties will be authorized to enact rules of procedure, assess compliance and resolve issues as to the CWC's scope. The Executive Council will oversee day-to-day activities, including supervising verification. The Technical Secretariat will have primary responsibility for monitoring and inspecting facilities that could relate to illegal chemical weapons production.⁷⁷

3. Restrictions on Trade

To stem international proliferation of chemical weapons, the CWC restricts transfers of dual-use chemicals. Any transfer of weapons agents or their precursors among States Parties must be for purposes not prohibited by the CWC. No State Party may assist, encourage, or induce anyone to engage in any activity prohibited to a State Party by the CWC.⁷⁸ A State Party may transfer Schedule 1 chemicals outside its territory only to another State Party and only for research, medical, pharmaceutical, or protective purposes. Both the transferring and receiving States Parties must notify the Technical Secretariat of each transfer of these chemicals and annually declare the previous year's transfers.⁷⁹

Chemicals listed on Schedule 2 may be transferred only to or received from States Parties. This restriction will take effect three years after the CWC enters into force; during the interim, each State Party must require an end-use certificate for transfers of these chemicals to states not party to the CWC.⁸⁰ Export restrictions of precursor chemicals listed on Schedule 3 of the Annex on Chemicals apply only to transfers made to states not party to the CWC. For these transfers, each State Party must adopt measures to ensure that the transferred chemicals are

77. See generally CWC, *supra* note 24, art. VIII.

78. *Id.* art. I, ¶ 1(d).

79. Verification Annex, *supra* note 24, pt. VI, ¶¶ 2-3. If Schedule 1 chemicals are transferred to another State Party, they cannot be retransferred to a third State. *Id.* pt. VI, ¶ 4. "Not less than 30 days before any transfer to another State Party both States Parties shall notify the Technical Secretariat of the transfer." *Id.* pt. VI, ¶ 5. In addition,

[e]ach State Party shall make a detailed annual declaration regarding transfers during the previous year. The declaration shall be submitted not later than 90 days after the end of that year and shall for each Schedule 1 chemical that has been transferred include the following information: (a) the chemical name, structural formula, and Chemical Abstracts Service registry number, if assigned; and (b) the quantity acquired from other States or transferred to other States Parties. For each transfer the quantity, recipient and purpose shall be included.

Id. pt. VI, ¶ 6.

80. *Id.* pt. VII, ¶¶ 31-32.

only used for purposes not prohibited under the CWC and obtain a certificate to this effect from the receiving state.⁸¹ States Parties must also "review their existing national regulations in the field of trade in chemicals in order to render them consistent with the object and purpose of [the CWC]."⁸²

4. Protection of Confidential Information

An impressive CWC innovation is the attention given to protection of confidential information.⁸³ The CWC's Confidentiality Annex preserves a State Party's interest in both national security information and confidential business information, and balances it with the CWC's interest in full disclosure and transparency.

a. Responsibilities of the OPCW

To protect confidential information, the OPCW will require only the minimum amount of information necessary to carry out its responsibilities. The CWC denotes information as confidential if: 1) the State Party so designates it; or 2) in the Director-General's judgment, its unauthorized disclosure could cause damage to the State Party to which it refers

81. *Id.* pt. VIII, ¶ 26.

82. CWC, *supra* note 24, art. XI, ¶ 2(e). Since 1985, the "Australia Group" has played an important role in coordinating export controls on 54 chemicals and dual-use equipment important to the development and spread of chemical weapons. Since the CWC's conclusion, the 26 members of the Australia Group have agreed to review controls on exports to signatory states. See *AG Meeting Ponders Future of Chemical Controls*, EXPORT CONTROL NEWS, June 30, 1994, available in LEXIS, News Library, Curwms File; Jessica E. Stern, *Lethal Compounds: The New Chemical Weapons Ban*, BROOKINGS REV., Summer 1994, at 32; Gary K. Bertsch & Richard T. Cupitt, *Nonproliferation in the 1990's: Enhancing International Cooperation on Export Controls*, WASH Q., Autumn 1993, at 53.

83. See Barry Kellman et al., *Disarmament and Disclosure: How Arms Control Verification Can Proceed Without Threatening Confidential Business Information*, 36 HARV. INT'L L.J. 71 (1995). The international chemical industry played an important role at the Conference on Disarmament (CD) in CWC negotiations, recognizing early on that without the cooperation and approval of the very industry to be regulated, the CWC would be difficult to implement. The chemical industry's role in the negotiations was bolstered by the Government-Industry Conference Against Chemical Weapons, held in Canberra, Australia in 1989, where chemical trade associations representing 95% of the world's production capacity met with delegates and CD diplomats from 60 nations and agreed that industry would actively work with governments to ban CW. In the United States, the Chemical Manufacturers Association (CMA) advised U.S. negotiators as to the viewpoints of the American chemical industry — particularly as to verification procedures needed to protect CBI. The CMA has supported a negotiated ban on chemical weapons since 1978. See generally OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, THE CHEMICAL WEAPONS CONVENTION: EFFECT ON THE UNITED STATES CHEMICAL INDUSTRY, PUB. NO. OTA-BP-ISC-106, at 10 (1993); see also Kyle B. Olson, *The U.S. Chemical Industry Can Live with a Chemical Weapons Convention*, ARMS CONTROL TODAY, Nov. 1989, at 21; *Industry Urges Quick Implementation of U.N. Chemical Weapons Convention*, Int'l Trade Rep. (BNA) 79 (Jan. 20, 1993).

(including private interests that the State Party represents) or to the mechanisms implementing the CWC. The level of sensitivity of confidential data is to be established based upon uniformly applied criteria categorized in a classification system.⁸⁴

The Technical Secretariat is primarily responsible for protecting confidential information and establishing a stringent regime governing its handling. Toward this end, it must develop agreements and regulations specifying information States Parties must provide.⁸⁵ Confidential information will be securely stored at the OPCW or, in some cases, with a State Party,⁸⁶ in a way that precludes the identification of the facility to which the information pertains.⁸⁷ Access to and handling of confidential information by employees of the OPCW will be strictly controlled and its dissemination within the OPCW will be on a need-to-know basis. CWC-related information will not be published or released but for narrow exceptions. The Director-General, inspectors, and other staff must not disclose any confidential information that they have acquired in the course of their duties.⁸⁸

b. Protection of Confidential Information During Inspections

Before conducting inspections, the OPCW and the State Party must negotiate facility agreements for certain declared facilities that include

84. Confidentiality Annex, *supra* note 24, ¶ 2. The Technical Secretariat will evaluate whether information contained in documents submitted by State Parties contains confidential information. The OPCW has elaborated a draft confidentiality policy and a classification system. See *Expert Group on Confidentiality: First Interim Report*, app., OPCW Doc. PC-VI/B/WP.1 (Jan. 14, 1994) (Draft OPCW Policy on Confidentiality); *Expert Group on Confidentiality: Second Interim Report*, Annex, OPCW Doc. PC-VI/B/WP.15 (Mar. 18, 1994) (Draft OPCW Classification System for Confidential Information).

85. Confidentiality Annex, *supra* note 24, ¶¶ 1–2. Inspectors must request only that information which is necessary to fulfill their mandate. They are also prohibited from making records of information not related to CWC compliance. *Id.* ¶ 8.

86. A State Party that receives information from the OPCW, including another State Party's data, must treat that information according to the level of confidentiality assigned by the OPCW. If requested, a State Party must furnish details as to how it handles that information. Data must be handled in accordance with the State Party's rights, CWC obligations, and the requirements of the Confidentiality Annex. *Id.* ¶ 4.

87. *Id.* ¶ 2(f). Such documents include: initial and annual reports and declarations, general reports on verification activities and other information provided in compliance with the CWC. The exceptions are: 1) general information on the implementation of the CWC; 2) information released with the express consent of the State Party to which the information refers; and 3) confidential information released by the OPCW pursuant to agreed procedures which ensure that release only occurs in strict conformity with the needs of the CWC. *Id.* (A)(2)(b–c).

88. *Id.* ¶¶ 6–7. This obligation continues even after the end of their functions. Also, staff members must sign individual secrecy agreements covering the period of their employment and five years thereafter. *Id.* ¶ 9. The Preparatory Commission is currently drafting these agreements.

detailed and specific arrangements with regard to the following issues: (a) areas of the facility to which the inspectors will be granted access; (b) storage of confidential information on-site; (c) scope of inspection in agreed areas; (d) taking and analysis of samples; (e) access to records; and (f) use of instruments and continuous monitoring equipment.

During both routine and challenge inspections, a State Party may indicate to the inspection team sensitive equipment, documentation, or areas that are unrelated to the inspection's purpose.⁸⁹ The inspection team must consider the inspected State Party's proposals and must fully respect procedures designed to protect sensitive installations and to prevent the disclosure of confidential data. Once an inspection is completed, the report must contain only facts relevant to the CWC and must be handled just as any other CWC confidential information. If sampling is conducted during inspections, the Director-General is responsible for the samples' security, integrity, preservation and confidentiality, and must establish a stringent regime for their collection, handling, transport, and analysis.⁹⁰

c. Procedures in Case of a Breach of Confidentiality

The Director-General must establish procedures to follow in the event of a breach or alleged breach of confidentiality. If the Director-General justifiably believes that the obligation to protect confidential information has been violated or if there has been an allegation to this effect, he/she may investigate. States Parties must cooperate in any such investigation. If a breach is established, a State Party must take "appropriate action."⁹¹

If staff members breach confidentiality, the Director-General must impose appropriate punishment or discipline. In serious cases, the Director-General may waive the employee's immunity from jurisdiction, but the OPCW cannot be held liable for any breach of confidentiality com-

89. *Id.* ¶ 13.

90. Verification Annex, *supra* note 24, pt. II, ¶¶ 56–57. The Director-General must also certify the laboratories that perform analyses and oversee the standardization of procedures and equipment at them. All samples must be accounted for, and unused samples returned to the inspected State Party. *Id.*

91. Confidentiality Annex, *supra* note 24, ¶¶ 18–21. It is an open question as to what "appropriate action" might entail. The procedures to be followed in the event of a breach or an alleged breach of confidentiality, and presumably the resulting responsibilities of the State Parties, are to be developed by the Director-General and approved by the Conference of State Parties. See *Discussion Paper by the Executive Secretary: Issues Relating to the Breach or Alleged Breach of Confidentiality*, OPCW Doc. PC-VII/B/WP.1 (May 4, 1994).

mitted by its members. Where the OPCW and a State Party divulge confidential information, an *ad hoc* Commission will settle the dispute.⁹²

5. Penal Consequences

Each State Party must enact penal legislation to prohibit legal and natural persons in its territory or under its control from undertaking CWC-prohibited activities.⁹³ The term "prohibited activities" is undefined, but presumably includes prohibitions against the development or use of chemical weapons or riot control agents as a method of warfare. Whether penal sanctions could apply to additional conduct, such as producing Schedule 1 chemicals in excess of the CWC's limitations, transferring chemicals to a state in contravention of the CWC's obligations, or obstructing verification activities is left for each State Party to decide. Also left to each State Party to decide is the meaning of the term "penal" as well as the penalties that might result from a violation.

States Parties must provide each other with the "appropriate form of legal assistance."⁹⁴ With this obligation, the CWC unites principles of international criminal and administrative law enforcement with arms control. Using the various forms of legal assistance in criminal and administrative matters, States Parties may be better able to investigate suspected CWC violations. Because other States Parties will be required to provide legal assistance, each will have access to information located in other countries.

6. Mechanisms to Address Non-Compliance — The United Nations' Role

In cases where the Executive Council has requested that a State Party redress a situation and the State Party has failed to do so within the specified time, the Executive Council is authorized to consult with the States Parties involved. Failing that, the Conference may restrict or suspend a State Party's rights and privileges under the CWC until it conforms to its obligations. The CWC does not specify possible sanctions for violations of specific obligations, giving flexibility to the Conference to react as it deems appropriate in a specific case. A State Party may not be deprived of its membership, however.

92. *Id.* ¶¶ 2.0–2.3. States Parties must assist in the investigation of an alleged breach and assist in taking appropriate action if a breach is discovered. *Id.* ¶ 4.1.

93. CWC, *supra* note 24, art. VII.

94. *Id.*

Where the State Party's action threatens the object and purpose of the Convention, collective measures may be recommended. This could include withholding from the malefactor any relevant exports of chemicals, technical equipment and scientific-technical know-how. Yet, the prerogatives of the United Nations Security Council must be respected as collective action may proceed only in conformity with international law. The Conference may bring cases of particular gravity to the United Nations, which presumably can respond in any way authorized by the United Nations Charter.⁹⁵

II. RECORD KEEPING AND REPORTING

The NPT and CWC each establish, as the foundation of its respective verification regime, a system of data record keeping, accounting, and reporting.⁹⁶ Each regime's regulatory system focuses on the presence of particular substances (nuclear material under the NPT and "Scheduled" chemicals under the CWC). These regimes share significant similarities, yet the differences are striking. Briefly stated, the NPT and CWC record keeping and reporting schemes can be contrasted by the following salient traits:

(1) The objective of the NPT record keeping and reporting scheme is, relative to the CWC, to identify information in-depth, whereas the objective of the CWC's scheme is to cover a greater breadth of substances and activities. Accordingly, the NPT demands more exact measurements of small quantities of material and more precisely specifies the mechanisms to meet those demands than the CWC. But CWC record keeping and reporting requirements apply to wider types and quantities of materials than the NPT.

(2) Because CWC-regulated chemicals have many legitimate applications, as compared to the fewer uses of nuclear material, CWC record keeping and reporting requirements apply to a broader array of facilities engaged in a multitude of industrial activities. Furthermore, the type of information about facilities, especially as to

95. See generally *id.* arts. XII, VIII, ¶¶ 2, 36; WALTER KRUTZSCH & RALF TRAPP, A COMMENTARY ON THE CHEMICAL WEAPONS CONVENTION 218-28 (1994).

96. It should be noted that each regime uses sources of information in addition to record keeping and reporting, including publicly available information from the media, information generally available to governments, information from international trade organizations, and information obtained by States through national technical means and other intelligence sources. See generally *SAGSI Report*, *supra* note 19. These types of information can contribute significantly to the overall verification effort and could be incorporated with the expanded declarations that are developed in this section.

design specifications, that must be reported under each regime is different.

Both of these distinctions highlight the CWC's broad regulatory coverage, a notable departure from the NPT's focused band of coverage.

To strengthen safeguards, the IAEA is considering plans to apply "expanded declarations."⁹⁷ Initiatives regarding expanded declarations promote the goal of achieving greater transparency in a State Party's nuclear fuel cycle and related activities.⁹⁸ Expanded declarations might include: information on all nuclear materials (including ore concentrates); descriptions and locations of all nuclear-related production facilities (including design information beyond that already provided); information regarding training, research and development; and data regarding manufacture, import, and export of certain equipment and non-nuclear materials.⁹⁹

This section compares the CWC's declaration scheme to that of the IAEA. It describes the record keeping and reporting requirements of each treaty and explains the reasons for their similarities and differences. This section then offers options for expanded declarations as to materials or technologies not currently declarable.

97. Parts of this plan have already been implemented (including Board of Governors decisions regarding the early provision of design information and a voluntary reporting scheme), which provide some guidance as to the types of information States Parties might be required to declare. A model declaration has been developed, and the IAEA Secretariat is using it in preparatory consultations with States Parties that are hosting field trials. Three States Parties have submitted further suggestions on an expanded declaration scheme. See IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 19-20; see also *SAGSI Report*, *supra* note 19, at III-4, ¶ 16 (discussing the related issue of transparency of facility operations).

98. Two important principles support an expanded declarations scheme. First, materials and activities would be declared without regard to their location or whether operations are conducted by governments or the private sector. Second, declarations would be updated regularly and include a statement as to future activities. RICHARD HOOPER, SAFEGUARDS UNDER THE NON-PROLIFERATION TREATY: A TECHNICAL PERSPECTIVE 7 (1994).

99. See IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 18-19.

According to an August 1994 IAEA progress report on the program, an expanded declaration should include information about all of a country's nuclear material, not just any amount above the arbitrary limit set in the safeguards agreement. After all, early weapons efforts typically produce amounts below those limits. The declaration also should contain a description and the location of all nuclear-related processes, production, research and development, and training sites. This would include sites with no nuclear material.

A. NPT

Each NPT NNWS Party must accept safeguards for the exclusive purpose of verification of the fulfillment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices. . . . The safeguards required by this article shall be applied on all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.¹⁰⁰

1. Objectives and Relationship to Regime's Goals

The basic elements of the NPT safeguards system consist of: 1) requiring states to develop an accounting system for nuclear material and to keep records accordingly; 2) requiring states to report regularly to the IAEA concerning nuclear material, associated processes, and nuclear facilities and design information; 3) installing monitoring equipment, seals and other devices to prevent covert diversion; and 4) permitting on-site inspections at safeguarded facilities to examine records and take measurements at strategic points therein.

Safeguards enable the IAEA to detect diversion¹⁰¹ of significant quantities of nuclear material from peaceful activities at each declared facility to the manufacture of nuclear explosive devices; the likelihood of timely detection thus deters diversion. NPT safeguards also engender confidence as to the nature of each state's nuclear activity and expedite international cooperation concerning nuclear energy development.¹⁰² However, the NPT record keeping system was not designed to verify compliance with the basic obligations in Articles I and II relating to

100. NPT, *supra* note 1, art. III(1). The IAEA Director-General has asserted that nuclear material is subject to safeguards even if it is not declared. The IAEA's rights and obligations under comprehensive safeguards agreements are not limited, therefore, by a state's declarations concerning nuclear material and facilities. See MYRON KRATZER, *THE NEGOTIATING BACKGROUND AND INTENT OF SPECIAL INSPECTION PROCEDURES OF INFCIRC/153* (1992) cited in GEORGE BUNN, *DOES THE NPT REQUIRE ITS NON-NUCLEAR-WEAPON MEMBERS TO PERMIT INSPECTION BY THE IAEA OF NUCLEAR ACTIVITIES THAT HAVE NOT BEEN REPORTED TO THE IAEA?* 6 n.13 (Ctr. for Int'l Security & Arms Control Occasional Paper, 1992).

101. The term "diversion" means any use of safeguarded items in violation of any condition of a safeguards agreement. IAEA Doc. INFCIRC/26, ¶ 17.

102. See Lawrence Scheinman, *Nuclear Safeguards and Non-Proliferation in a Changing World Order*, SECURITY DIALOGUE, Dec. 1992, at 37.

non-transfer and non-receipt of nuclear weapons or other nuclear explosive devices nor to detect clandestine production of nuclear weapons.¹⁰³

2. Material Subject to Reporting and Methods of Reporting

NPT safeguards employ the technique of material accountancy: collecting measurements of nuclear material at each facility that enable the state and the IAEA to maintain a current picture of the materials' location and movement and to verify that such materials are not impermissibly diverted. Each NNWS State Party must establish and maintain a system of accounting for and control of all nuclear material.¹⁰⁴ The IAEA then applies its safeguards, including independent measurements, to verify the reports of the state's system.¹⁰⁵

NPT safeguards begin at the point where nuclear material is of suitable composition and purity to be enriched in an isotope separation plant or to be fabricated into fuel elements.¹⁰⁶ Materials "in mining or ore processing activities" are specifically exempted from NPT safeguards.¹⁰⁷ According to one knowledgeable analyst:

The most serious limitation on the IAEA's safeguards is that they apply only to registered material, that is, to material of which the Agency is cognizant. These include material reported in an initial inventory or imported (possibly notified by both the exporter and the importer) or produced in registered and thus safeguarded facilities. No matter how thorough and effective the Agency's controls of these materials are, it is in principle possible for a state to have an unregistered domestic source of nuclear material (i.e., a uranium mine) and clandestine production facilities. It is also possible for a state to receive unregistered material from non-parties to the NPT

103. See generally John M. Deutch, *The New Nuclear Threat*, FOREIGN AFF., Fall 1992, at 120, 122.

104. INFCIRC/153, *supra* note 1, ¶ 112 ("'Nuclear material' means any source or any special fissionable material as defined in Article XX of the Statute. The term source material shall not be interpreted as applying to ore or ore residue.").

105. *Id.* ¶ 7.

106. See *id.* ¶ 34. This point may be as the material leaves a particular facility or as it leaves a particular stage within a facility. The type of plant is not determinative; it is the composition and purity of the material which govern the starting point of safeguards. Safeguards also begin when nuclear material suitable for enrichment or fuel fabrication, or any other nuclear material produced at a later stage in the nuclear fuel cycle, is imported into the state. Therefore, any material which has not reached the stage where it is suitable for enrichment or fuel fabrication is not subject to safeguards, unless the material is exported or imported. MOHAMED I. SHAKER, *THE NUCLEAR NON-PROLIFERATION TREATY* 725 (1980).

107. INFCIRC/153, *supra* note 1, ¶ 33.

either for immediate use in weapons or for prior processing in clandestine facilities.¹⁰⁸

Each facility is divided into material balance areas (MBA),¹⁰⁹ and the quantity of material in an MBA is determined. A book inventory of that MBA may be maintained by recording measured flows into and out of the area at appropriate key measurement points (KMP). The operator takes a physical inventory of all material in the MBA, and a material balance is constructed (*i.e.*, all the nuclear material on hand in the MBA is determined). These records may be verified by the IAEA;¹¹⁰ the correspondence between the contents of the MBA on paper and these records is the basis to judge whether any material is unaccounted for. Material unaccounted for is then evaluated by statistical methods to establish, with reasonable confidence, if significant losses or diversions have occurred.¹¹¹

Each NNWS must make periodic reports of safeguarded nuclear material and the features of facilities relevant to safeguarding such material to the IAEA.¹¹² The IAEA can require only the minimum amount of information and data consistent with carrying out its safeguards responsibilities.¹¹³ Two types of reports must be submitted to the IAEA: accounting reports and special reports. Accounting reports must correspond to the accounting records and must be submitted for each material balance area.¹¹⁴ Special reports are required, without delay, if:

108. Szasz, *supra* note 63, at 95.

109. INFCIRC/153, *supra* note 1, ¶ 110. A material balance area means an area inside or outside a facility such that: (a) the quantity of nuclear material in each transfer into or out of each MBA can be determined; and (b) the physical inventory of nuclear material in each MBA can be determined when necessary, in accordance with specified procedures. An MBA is constructed or laid out so as to make it possible to measure, count or otherwise determine every movement of nuclear material into or out of it, as well as all nuclear material held within it. Typical MBAs are the store of fresh fuel, the bay in which spent fuel is stored, and the core of reactor.

110. The IAEA verifies the plant operator's accounting by a combination of measures, including: (1) review and analysis of the reports, (2) comparison of the reports to the records, (3) audit or examination of the records (to test for internal consistency), (4) independent counting, identification, and measurement of selected items to check the correctness of the records and reports, and (5) certain supporting activities such as observing the calibration and functioning of the operator's measurement systems. MULLEN, *supra* note 46, at 21.

111. SHAKER, *supra* note 106, at 749.

112. The NPT system follows and measures (or verifies measurements of) the flow of nuclear material in NNWS, not only within nuclear facilities but also from one facility to another within each of these States or between two or more of these States. The system looks at the entirety of the State's peaceful nuclear activities and not at isolated individual facilities. *Id.* at 719.

113. INFCIRC/153, *supra* note 1, ¶ 8.

114. *Id.* ¶¶ 62-67. These reports must be made at regular intervals or, in some cases, on an *ad hoc* basis.

1) any unusual incident leads the State Party to believe that there is or may have been loss of nuclear material that exceeds the limits specified in the Subsidiary Arrangements, or

2) the containment has unexpectedly changed for that specified in the Subsidiary Arrangements to the extent that unauthorized removal of nuclear material has become possible.¹¹⁵

For all reports to the IAEA, the IAEA may request, and the State Party must provide, "amplifications or clarifications of any report."¹¹⁶

3. Facility Information

The NPT safeguards system and reporting requirements apply exactly if nuclear material is being produced, processed or used in any nuclear facility, or is outside a facility, or if the facility is expected to contain safeguarded nuclear material.¹¹⁷ Less than one thousand facilities fulfill this definition. The IAEA is considering a broader declaration encompassing a larger number of facilities that would include "a description and the location of all nuclear related processes, production, research and development and training."¹¹⁸

The IAEA is empowered to examine each safeguarded facility's design to ensure that it will not be used for any military purposes.¹¹⁹ However, safeguards agreements have not implemented this power except to require that the IAEA be notified of the design of the facilities to be safeguarded so that it can determine what control measures are required and how to carry out its functions.¹²⁰ Yet, even that information need not be transmitted if it is commercially sensitive and is available for examination in the state concerned.¹²¹ A requirement for states to submit more extensive design information is being considered.¹²²

115. *Id.* ¶ 68.

116. *Id.* ¶ 69.

117. *Id.* ¶ 106. "'Facility' means: (a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or (b) any location where nuclear material in amounts greater than one effective kilogram is customarily used."

118. IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 19.

119. IAEA Statute, *supra* note 1, art. XII(A)(1).

120. *The Agency's Safeguards System (1965, as provisionally extended in 1966 and 1968)*, at ¶¶ 30-32, IAEA Doc. INFCIRC/66/Rev. 2; *see generally* Szasz, *supra* note 63, at 99.

121. INFCIRC/153, *supra* note 1, ¶¶ 8, 42-43, 46.

122. IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 13; *see also* *Iraq's Nuclear Weapons Capability and IAEA Inspections in Iraq: Joint Hearings Before the Subcomm. on Europe*

One identified problem as to design information concerns the timing of its submission. Currently, information about a new facility must be provided at least 180 days before nuclear material is introduced, but this timeframe might be inadequate. Earlier submission of information, perhaps when a decision is made to construct a facility or when construction begins, would enable the IAEA to: create confidence in the facility's peaceful purpose, simplify safeguards implementation, carry out safeguards research, undertake budgetary planning, and schedule actions to be taken jointly with the state and the facility operator.¹²³

4. Import-Export Activity

NPT Article III(2) applies IAEA safeguards to nuclear materials exports. No State Party may provide to a NNWS, including NPT non-parties, any special fissionable material or equipment specifically designed for processing or producing special fissionable material, unless that material or equipment is subject to IAEA safeguards.¹²⁴ Advance notifications to the IAEA are required of any exported safeguarded nuclear material to enable the IAEA to identify and, if possible, verify the quantity and composition of the exported material and, if desired or requested, to affix seals when it has been prepared for shipping.¹²⁵ Similarly, advance notification of imported nuclear material that is

& the Middle East, the Subcomm. on Economic Policy, Trade & Environment, and the Subcomm. on International Security, International Organizations & Human Rights of the House Foreign Affairs Comm., 103d Cong., 1st Sess. (1993) (statement of Robert Gallucci, Asst. Sec. of State for Politico-Military Aff.) ("The board has strengthened obligations to provide notice and early submission of design information on new nuclear facilities or changes to existing facilities.").

123. Experience has demonstrated that much earlier notification to the IAEA is needed both to enhance knowledge and to reinforce confidence. Unreported construction of nuclear facilities raises suspicion and notification should occur no later than the time construction begins. Lawrence Scheinman, *Safeguards: New Threats and New Expectations*, DISARMAMENT (1992); see also *Against the Spread of Nuclear Weapons: IAEA Safeguards in the 1990s*, at 17, IAEA Doc. IAEA/PI/A38E (Dec. 1993) [hereinafter *Against the Spread of Nuclear Weapons*]; J. CHRISTIAN KESSLER, VERIFYING NON-PROLIFERATION TREATIES: OBLIGATION, PROCESS, AND SOVEREIGNTY 52 (National Defense University/National War College Monograph, 1994); Lennon, *supra* note 28, at 210 ("voluntary reporting of installation plans and early design information has been encouraged by the IAEA with the intention of improving the capability of the agency to verify those installations by establishing a more accurate 'baseline' from which measurements could be taken.").

124. NPT, *supra* note 1, art. III(2). This provision potentially discriminates in favor of nonmember states because NNWS Parties must accept safeguards on all of their peaceful nuclear activities whereas states that have not entered the NPT may receive nuclear materials if they have concluded a safeguards agreement governing specific projects or facilities, but not their entire program. See Harald Müller, *The Future of the NPT: Modifications to the Nuclear Non-Proliferation Treaty Regime*, 14 HARV. INT'L REV. 10, 10-12 (1992).

125. Subsequent notification might also be required to indicate the receipt of nuclear material. INFCIRC/153, *supra* note 1, ¶¶ 92-95.

required to be safeguarded enables the IAEA to verify the quantity and composition of the material at the time it is received.¹²⁶

To supplement safeguards agreements, states are encouraged to voluntarily report their import and export activities. For instance, a state can provide additional information on its imports, exports and production of nuclear material which can be correlated with its declared nuclear activities and its accounting reports. The IAEA Board of Governors has also invited states to report all exports and imports of trigger list equipment and non-nuclear material used in the nuclear industry. Most exports of these items can be reported to the IAEA as a function of a state's export control laws. Reports of exports can subsequently be correlated with information about the importing state's declared nuclear program.¹²⁷ Exporters, however, are not obliged to report transfers of dual-use nuclear equipment.

B. CWC

In contrast to the NPT's strictly limited yet intense scheme of regulation, the CWC throws a far more pervasive net over the chemical activities that it regulates. Like the NPT, the CWC only regulates facilities that produce, process, or consume chemicals listed on its schedules. But, under CWC "declaration" requirements, States Parties must maintain records and make reports as to many more substances and types of facilities than the NPT.

1. Objectives and Relationship to Regime's Goals

The approach to controlling chemical weapons proliferation differs from the NPT's approach to nuclear proliferation. Whereas controlling nuclear proliferation is based on a tight accounting of nuclear materials, chemical weapons control cannot successfully adopt a similar strategy because chemical weapons are typically derived from substances that are used by legitimate commercial facilities.¹²⁸ The existence of dynamic and diversified global chemical industries, whose production may be readily converted to lethal CW agents, requires more extensive verification procedures than those for nuclear weapons.

126. An exception to these requirements applies to transfers of nuclear material among states covered by the Euratom Agreement. See SHAKER, *supra* note 106, at 732-33.

127. See SAGSI Report, *supra* note 19, at II-4.; *Against the Spread of Nuclear Weapons*, *supra* note 123, at 17-18.

128. Jay Brin, *Ending the Scourge of Chemical Weapons*, TECH. REV., Apr. 1993, at 32, 35 (observing that many legitimate commercial chemicals are the same as those used to make toxic warfare agents).

2. Material Subject to Reporting and Methods of Reporting

To imitate the NPT-style materials accounting would be very expensive and impractical in the chemical context. Therefore, the CWC declarations scheme has a broader scope, but is not nearly so exacting.¹²⁹ Within 30 days after the CWC enters into force, each State Party must submit an initial declaration on chemical weapons¹³⁰ and on scheduled chemicals and "other" facilities.¹³¹ Thereafter, each State Party must make annual declarations regarding relevant chemicals and facilities.¹³² These initial and annual declarations form the basis of the system to verify that neither the state nor its citizens are engaged in CWC-prohibited activities.

The information to be declared varies with the schedule triggering the declaration. As to Schedule 1 chemicals and related facilities, detailed, site specific information must be provided that approaches the precision of NPT reporting requirements.¹³³ While less data must be provided about Schedule 2 chemicals, and even less about Schedule 3 chemicals, these declaration requirements will generate a broad information base to track the key components of weapons agents. For example, declarations regarding Schedule 2 chemicals and related facilities focus on aggregate national data and must (a) identify the chemical, (b) specify the quantity produced, processed, consumed, imported, and exported, and (c) indicate the purposes for the chemical including the final prod-

129. The CWC's goal of preventing development of a militarily significant chemical weapons capability makes allowance for the fact that small quantities of toxic chemicals may not be monitored with precision. Barbara H. Rosenberg, *A New Approach for Limiting Chemical Weapons?*, ORBIS, Fall 1992, at 604.

130. Regardless of whether a State Party possesses chemical weapons, it must make a series of initial declarations within thirty days after the CWC enters into force for it regarding chemical weapons, old or abandoned chemical weapons, chemical weapons production facilities, various other facilities, and riot control agents. As to some of these items, the declarations must trace the State Party's activities back to 1 January 1946. If a State Party declares that it owns or possesses either chemical weapons or any chemical weapons production facility, its declarations must also provide its general plan for their destruction.

131. CWC, *supra* note 24, art. VI, ¶¶ 3-6.

132. *Id.* art. VI, ¶¶ 7-8. For more current detail regarding declarations, see *Initial Report*, *supra* note 76.

133. Initial and annual declarations must identify and quantify each Schedule 1 chemical produced, acquired, consumed or stored. Annual declarations must include detailed information regarding the past year's activities and must be submitted not later than 90 days after the end of that year. Furthermore, annual declarations regarding the projected activities and anticipated production for the coming year must be made not less than 90 days before the beginning of that year. Each State Party must notify the OPCW of planned changes related to its initial declaration within 180 days before changes take place. Verification Annex, *supra* note 24, pt. VI, ¶¶ 13-20.

uct types.¹³⁴ Schedule 3 declarations require identification of plant sites producing each Schedule 3 chemical, and must specify the approximate amount of production of the chemical and the purposes for which it was or will be produced.¹³⁵ Declarations for "other" facilities must list those facilities and include the approximate aggregate amount of production of "unscheduled discrete organic chemicals" in the previous calendar year expressed in specified ranges.¹³⁶

3. Facility Information

Similar to the NPT, facilities that must make declarations, and therefore are subject to CWC inspections, are determined solely by the presence of declarable materials. There is no independent selection of inspectable facilities based on equipment contained therein. But in striking contrast to the NPT, the large quantity and variability of Scheduled chemicals appreciably inflates the number of facilities that must make declarations. It is estimated that these requirements will apply to approximately 25,000 commercial facilities worldwide.¹³⁷

Declarations with regard to each Schedule 1 chemical facility require a detailed description of the facility, including equipment inventory, detailed diagrams, and the volume of the reaction vessels in the production lines. Information and detailed diagrams must also be provided concerning any anticipated changes at the facility with respect to

134. Declarations of Schedule 2 chemicals are of three types. First, initial and annual declarations must be provided including aggregate national data for the previous calendar year. Second, initial and annual declarations are required for all plant sites that produced, processed or consumed more than the threshold amounts of Schedule 2 chemicals during any of the previous three years or is anticipated to do so in the next calendar year. Third, declarations must be submitted of all plant sites that produced at any time since 1 January 1946 a Schedule 2 chemical for chemical weapons purposes. In addition to identifying the chemicals produced and the plant site, information must be provided that identifies when the chemical was produced and where it was delivered. The deadline for initial declarations is not later than 30 days after the CWC enters into force for that State Party; for annual declarations, not later than 90 days after the end of the previous calendar year, annual declarations on anticipated activities must be submitted not later than 60 days before the beginning of the following calendar year. *Id.* pt. VII, ¶¶ 1-9.

135. Identical to Schedule 2 chemicals and with the same deadlines, initial and annual declarations of Schedule 3 chemicals and related facilities must include aggregate national data for the previous calendar year's activities. Initial and annual declarations are required for all plant sites that produced during the previous calendar year or are anticipated to produce in the next calendar year more than 30 tonnes of a Schedule 3 chemical. Finally, declarations must be submitted for all plant sites that produced at any time since 1 January 1946 a Schedule 3 chemical for chemical weapons purposes. *Id.* pt. VIII, ¶¶ 1-2.

136. *Id.* pt. IX, ¶¶ 1-8.

137. See Brin, *supra* note 128, at 32, 35 (observing that these facilities produce, process, or consume some 70,000 assorted chemicals comprising billions of tons of materials).

equipment inventories.¹³⁸ For Schedule 2 chemicals, design information is not required, but information must be provided that identifies the owner and location of the plant site and, for each plant within the site, its activities, its use of Schedule 2 chemicals, whether it is multi-purpose, and its production capacity.¹³⁹

4. Import-Export Activity

The CWC restricts transfers of Schedule 1, 2, and 3 chemicals. Schedule 1 chemicals present the greatest risk to the CWC's objectives and purposes and are most severely constrained. They may be transferred only to another CWC State Party and only for specific purposes; they may not be retransferred. Both the transferring and the receiving States Parties must notify the Technical Secretariat of each transfer at least thirty days in advance. Furthermore, each State Party must make annual declarations regarding transfers of Schedule 1 chemicals during the previous year identifying the chemical and specifying the quantity, recipient, and purpose.¹⁴⁰

No specific notification requirements apply to transfers of Schedule 2, 3, or other chemicals or equipment. For Schedule 2 chemicals, initial and annual declarations aggregate the total amount of imported and exported chemicals.¹⁴¹ Initial and annual declarations of Schedule 3 chemicals must include aggregate national data for the previous year's imports and exports.¹⁴² For Schedule 2 chemicals¹⁴³ during the first three years after entry into force, and for Schedule 3 chemicals,¹⁴⁴ each State Party that transfers such chemicals to a state not party to the CWC must obtain from the recipient state a certificate pledging that they will not be used for prohibited purposes nor re-transferred. The certificate expresses the types and quantities of chemicals, their end uses, and the identities of the end users.

C. Options to Strengthen NPT Verification

Despite the many similarities between NPT safeguards and CWC declarations, these two record keeping and reporting schemes pursue

138. Verification Annex, *supra* note 24, pt. VI, ¶¶ 13, 17.

139. *Id.* pt. VII, ¶¶ 6-7.

140. *Id.* pt. VI, ¶¶ 3-6.

141. *Id.* pt. VII, ¶ 1 (for aggregate national data); *id.* pt. VII, ¶ 8 (for each declared plant site).

142. *Id.* pt. VII, ¶ 1.

143. *Id.* pt. VII, ¶¶ 31-32.

144. *Id.* pt. VIII., ¶¶ 26-27.

different goals through distinguishable mechanisms. Each scheme has distinct advantages for its unique non-proliferation task. The NPT identifies critical points where nuclear material could be diverted to weapons and employs a rigorous and highly specific accounting effort to detect and deter such diversion. The CWC throws a far larger net over the chemical industry so as to monitor many more substances and types of facilities but with far less specificity or rigor.

As already acknowledged, the NPT safeguards system was not designed to identify weapons-production activities that do not involve safeguarded material. While it would be inappropriate to argue that the CWC declaration scheme could replace NPT safeguards, the CWC sets forth the possibility of a wider data reporting scheme to enhance transparency which could augment detection of undeclared activities that undermine control efforts.¹⁴⁵ Such a mechanism could provide more information to the IAEA on a broader range of nuclear-related activities.¹⁴⁶ As the IAEA has itself recently recognized:

The capability of the IAEA to detect undeclared nuclear activities is in large measure dependent upon the information being made available to it. IAEA inspectors . . . must be directed to specific sites on the basis of information obtained by, or provided to, the IAEA. More information on a State's nuclear programme, and the proposed design of new plants, together with increased access for IAEA inspectors to operating records and to all locations within declared facilities, will contribute to greater confidence that nuclear materials and facilities are not being used for undeclared purposes.¹⁴⁷

145.

Increased transparency through expanded declarations would result in greater depth of knowledge of the fuel cycle, its dynamics and its constituent facilities and provide the opportunity to ascertain that the operation of facilities and the flow of nuclear material therein are consistent with the declared design objective and performance of the fuel cycle as a whole. The fundamental component of transparency would be a declaration by the State of the current status of its nuclear fuel cycle and associated nuclear activities and the provision of timely notifications of any planned changes in the number, purpose or mode of operation of the facilities comprising the fuel cycle, planned transfers of nuclear material and equipment, anticipated changes in the manner of usage of nuclear material and any other changes in its nuclear programme. The declaration could also include training and R&D activities, their locations and a specification regarding the manufacture and export of certain equipment and non-nuclear materials.

SAGSI Report, *supra* note 19, at 9.

146. "It is foreseen that the scope of the declaration and subsequent notifications would extend beyond the traditional confinement of nuclear material specifics and would be sufficiently comprehensive to enable the Agency to assess the mutual consistency of information received in respect of the entire nuclear programme." *Id.*

147. *Against the Spread of Nuclear Weapons*, *supra* note 123, at 16.

The CWC's proposed declarations system will compile extensive data on chemical activities so that the flow of potentially sensitive materials can be systematically charted from a known baseline. The IAEA could adopt, with reference to the CWC, an additional layer of record keeping and reporting applicable to materials or equipment that may be relevant to nuclear weapons production but are not currently covered by NPT safeguards. Expanded declarations may be a method to require NPT States to provide additional information related to nuclear capabilities supplemental to declarations of safeguarded materials.

These declarations would provide additional transparency regarding NNWS' nuclear activities and programs. By physically checking the information qualitatively for both *correctness* and *completeness*, the IAEA would have additional confidence that their efforts to trace those materials are comprehensive and that the NPT was not being violated by way of undeclared activities or sites. Furthermore, the CWC declarations scheme may be more effective in generating information regarding indigenous production which, if pursued as part of a clandestine weapons operation, may never trigger safeguards.

The most far-reaching lesson from the CWC declarations system would be to identify items relevant to a nuclear weapons capability ("nuclear-relevant items"), in addition to source or special fissionable material, and require NPT States to submit reports on the quantities used, applications, and their location. These reports need not be as precise as material accountancy for safeguarded nuclear material, but could entail requirements analogous to those applicable to Schedule 2 and 3 chemicals under the CWC. Arranging nuclear-relevant items on a series of graduated schedules and requiring regular declarations about them would generate considerable information as to activities "upstream" from where safeguards operate, thereby complicating clandestine diversion. Furthermore, since routine inspections take place at facilities possessing declarable items, increasing the breadth of reported information would thereby increase the number of declared facilities which would necessarily enlarge the routine inspection scheme, as discussed below.

A useful methodology would place materials on sequential schedules on the basis of a cost-benefit analysis that first measures necessity of production (an item's importance to a weapons capability accounting for substitutes) and its exclusivity of use (probability that an item's production is for a weapons-related purpose) and which then balances these

two measurements against the costs of generating and evaluating data.¹⁴⁸ The most expansive system of declarations would seek information about uranium mining and milling,¹⁴⁹ but this might be impractical.¹⁵⁰

It may be more relevant and efficient to expand a declarations scheme to include critical dual-use technologies relevant to the nuclear fuel cycle than to keep track of all nuclear materials.¹⁵¹ Focusing on the significant component elements of these technologies could be a logical and broadly inclusive basis for expanded declarations. For instance, declarations could be required with regard to high performance dual-use components and equipment relevant to the nuclear fuel cycle, as well as components of enrichment and reprocessing technologies relevant to an indigenous uranium mining and processing capability. The IAEA has suggested, in this regard, the desirability of information concerning the weight and size of the casks used in transporting irradiated fuel assemblies.¹⁵² Further from the nuclear fuel cycle, but no less relevant to a weapons capability, may be technologies associated with fashioning bomb cores and triggers. One analyst suggests policing of sales of very high speed rotors.¹⁵³

Alternatively, reporting requirements could focus on unique non-fissile materials such as high-alloy stainless-steel sheet and tubing or storage vessels or valves that can resist corrosion due to radioactivity.¹⁵⁴

148. Kellman, *supra* note 11, at 825 (1994).

149. Neither plutonium nor uranium-235 exists naturally in weapons-usable form. Plutonium may only be fabricated from uranium-238 in a nuclear reactor. Uranium-235 must be separated from natural uranium, most of which is uranium-238. Uranium enrichment raises the concentration of uranium-235 from approximately 0.7%, for use in light water power reactors to about 3%, and from there to as much as 93.5% for use in nuclear warheads. LEONARD S. SPECTOR, *GOING NUCLEAR 327-28* (1987).

150. Despite the impracticability of requiring information about mining and milling, safeguards apply only to uranium that is of suitable composition and purity to be enriched in an isotope separation plant or to be fabricated into fuel elements. By subjecting uranium that has not yet reached such suitability to declarations, the possibility of clandestine diversion before safeguards are applicable would be reduced. "One of the important possible diversion scenarios for [a light water] reactor is the undeclared irradiation of natural or depleted uranium, which is in addition to the possible diversion of declared fuel assemblies." *SAGSI Report, supra* note 19, at III-10.

151. For a thorough discussion of the technologies and equipment that could be relevant to detecting a nuclear weapons capability, see RICHARD R. PATERNOSTER, *LOS ALAMOS NAT'L LAB., NUCLEAR WEAPON PROLIFERATION INDICATORS AND OBSERVABLES 6* (1992); THOMAS B. COCHRAN ET AL., *U.S. NUCLEAR WARHEAD PRODUCTION 125-35* (1987).

152. After irradiation in a reactor, the fuel/target elements must be cooled in water storage pools to allow for the decay of short-lived fission products. This cooling time typically takes place at a holding facility adjacent to the chemical extraction plant. Shipping casks are required to transport the irradiated elements. See *SAGSI Report, supra* note 19, at III-10 & 11.

153. FAINBERG, *supra* note 18, at 19.

154. PATERNOSTER, *supra* note 151, at 5.

Accordingly, a reporting scheme that identifies other relevant materials might be appropriate. For instance, nearly all nuclear production reactors use deuterium (heavy water).¹⁵⁵ Additional declarations could apply to lithium-6, cadmium, boron, or beryllium which have essential roles in reactor processes.¹⁵⁶ It might also be useful to demand reports of electricity consumption which could reveal clandestine operations.¹⁵⁷

Even without expanding the range of declarable materials, NPT safeguards could require more information about currently safeguarded materials and facilities including, analogous to CWC declarations, broader statistical data on quantities used, data as to the identity of users and the purposes for the material, and more comprehensive information about the facility that uses or possesses the material. Analogously, declarations with regard to imports and exports of nuclear materials could be broadened to help address the threat resulting from international trade.¹⁵⁸ To implement some of these steps, the IAEA could track more closely the inter-state transfer of materials and equipment included on the Nuclear Supplier Group's "trigger list." This list includes sensitive items whose declaration to the IAEA might improve the overall effectiveness of safeguards and make the IAEA better able to assess and deter proliferation threats.¹⁵⁹

III. ROUTINE INSPECTIONS

The CWC routine inspection scheme can guide efforts to strengthen NPT verification of activities at currently safeguarded and newly-declared facilities. Of paramount significance to this analysis is that the CWC routine inspection scheme, relative to current NPT practices, is both more far-reaching in terms of what sites are to be inspected, and the CWC authorizes more potent inspection techniques.

The CWC's inspection scheme is more far-reaching than the NPT's because the CWC's declaration requirements apply broadly to more

155. Deuterium is used to slow down neutrons so as to prevent nuclear reactions from getting out of control. While some facilities accomplish this task with graphite, deuterium is more compact and efficient. See generally COCHRAN, *supra* note 151, at 140-43.

156. See also HARALD MÜLLER & R. KOKOSKI, *THE NON-PROLIFERATION TREATY: POLITICAL AND TECHNOLOGICAL PROSPECTS AND DANGERS IN 1990* 20-21 (1990). The authors note that safeguarding beryllium and lithium would present various difficulties, but do not comment on problems that may be associated with declaring their presence.

157. A full-scale program to manufacture nuclear material for a few bombs per year is estimated to require up to 200-400 megawatts of power. FAINBERG, *supra* note 18, at 21.

158. See MÜLLER & KOKOSKI, *supra* note 156, at 25-26.

159. See LEONARD S. SPECTOR & JACQUELINE R. SMITH, *CARNEGIE ENDOWMENT FOR INT'L PEACE, NUCLEAR EXPORTS: THE CHALLENGE OF CONTROL* (1990).

facilities and demand more data about more areas within those facilities. Like the CWC, the NPT subjects a facility to inspection if it possesses declared materials. Thus, the number of facilities where the IAEA could inspect may be expanded beyond those currently safeguarded by expanding declaration requirements, as discussed in Section 3, and all newly-declared facilities are subjected to on-site inspection. Furthermore, the IAEA could increase access within safeguarded facilities to areas beyond identified strategic points by requiring submission of more detail about additional facility operations. The crucial issue in this regard is: on what basis will broader or more intrusive inspections be triggered and how will facilities be selected for inspection?

Moreover, the CWC authorizes more potent inspection techniques to detect useful information and vests inspectors with broader powers. With reference to these enhanced capabilities, it may be possible to broaden the scope of inspections of declared facilities and amplify their overall efficacy by augmenting the IAEA's authority. The crucial issue in this regard is: what additional powers are appropriate and what may be inspected under this augmented power?

This section considers what guidance the CWC offers for (1) determining the frequency and intensity of inspections; and (2) strengthening the effectiveness of inspections. Significant components of the CWC routine inspection procedure with possible application to the NPT include:

- a "risk-based" approach to determine the frequency of inspections;
- streamlined procedures to designate inspectors, multiple entry/exit visas, and broad privileges and immunities for CWC inspection personnel;
- specified pre-inspection procedures such as: designated points of entry, provision for the use of non-scheduled aircraft, guaranteed transit to the inspection site, and logistical support to accommodate inspection personnel;
- clearly delineated inspection procedures, supplemented by an inspection manual and an inspection mandate with definitively authorized rights of access within the inspected facility; and
- broad rights to gather additional information, such as: (a) access to all relevant documents, (b) the ability to take photographs, (c) the right to interview facility personnel, (d) the right to have facility operations performed, and (e) the explicit right to undertake environmental monitoring.

A. Determining the Frequency and Intensity of Inspections

Expanding NPT record keeping and reporting requirements to parallel the breadth of the CWC's declaration requirements would subject many more facilities to inspection. Such expansion could drain resources: if all declared facilities are subject to routine inspections, the effort would be both impractical and would risk diluting the regime's detection capabilities as to undermine its efficacy. Therefore, implementing expanded declarations demands a rational method of selecting facilities for inspection — a method based on the risk they pose to the regime's object and purpose.

1. NPT

The NPT provides that States Parties must permit *ad hoc* and routine inspections (as well as special inspections, discussed in Section IV) to be carried out under the terms of their safeguards agreements. *Ad hoc* inspections are intended to verify the information in the initial report on safeguarded nuclear material, changes since the initial report, or the quantity and composition of nuclear material transferred out of or into a State Party.¹⁶⁰ The IAEA may make routine inspections to verify: a) that reports are consistent with records; b) the location, identity, quantity, and composition of all safeguarded nuclear material; and c) information on the possible causes of material unaccounted for, shipper/receiver differences, and uncertainties in records.¹⁶¹

Under safeguards agreements, the number, intensity, and duration of inspections must be kept to a minimum consistent with the IAEA's responsibilities. The maximum frequency and intensity¹⁶² of inspections of specified categories of facilities is based on a formula that considers: a) the quantity of nuclear material within or passing through such facilities; b) the form of nuclear material; c) the effectiveness and reliability of IAEA controls; d) the characteristics of the state's nuclear fuel cycle; and e) the state's international interdependence. The formula determines the expected "Maximum Routine Inspection Effort" (MRIE): the number of inspections, or the number of person-days of inspection, per year

160. INFCIRC/153, *supra* note 1, ¶ 71.

161. *Id.* ¶ 72.

162. Intensity is measured in terms of the duration of the inspection and the number of inspectors. When used in this Section, in reference to both the NPT and CWC, the term "intensity" does not refer to the inspection procedures to be applied or the level of intrusiveness of the inspection.

applied to each facility.¹⁶³ The frequency of IAEA inspections is related to "risk" in that the ease of using safeguarded material for a nuclear weapon is considered. The IAEA typically specifies in Subsidiary Arrangements its "Actual Routine Inspection Effort" (ARIE), which is smaller than the MRIE.¹⁶⁴

2. CWC

Following initial inspections to verify initial declarations and to help develop an inspection plan, the Technical Secretariat will conduct routine inspections of declared chemical facilities (facilities that produce, process, or consume Scheduled or specified quantities of "PSF" chemicals)¹⁶⁵ to verify that annual declarations are accurate. Routine inspections are intended to deter violations without hampering States Parties' economic or technological development,¹⁶⁶ and to compile sufficient accurate information to permit a high degree of accord among States Parties as to what specific conduct constitutes a violation. The precise purpose of routine inspections depends on the chemicals at the inspected facility. Inspections of Schedule 1 facilities will verify the accuracy of declared quantities of Schedule 1 chemicals.¹⁶⁷ Schedule 2 facilities will be inspected to determine that their activities comply with CWC obligations, that declarations are accurate, and that no Schedule 1 chemicals are present.¹⁶⁸ Inspections of Schedule 3 and "other" facilities will verify the accuracy of declarations and the absence of Schedule 1 chemicals.¹⁶⁹

The CWC explicitly specifies how facilities with scheduled chemicals are selected for inspection, as well as the inspections' intensity. Schedule 1 facilities must receive an initial inspection "promptly after the facility is declared" to verify the accuracy of information already provided, to render information to plan future verification activities, and to assist in the elaboration of required facility agreements.¹⁷⁰ For Sched-

163. INFCIRC/153, *supra* note 1, ¶¶ 78–81; *see also* Szasz, *supra* note 63, at 104. More specific guidelines for each type of facility are contained in the "1991–1995 Safeguards Criteria" of Nov. 21, 1990.

164. Some states, notably Japan and EURATOM states, have contended that the ARIE figures constitute the real maximum. James F. Keeley, *The International Atomic Energy Agency and the Non-Proliferation Treaty in INTERNATIONAL VERIFICATION ORGANIZATIONS* 183, 183–84 (E. Morris ed., 1991) (citing DAVID FISCHER & PAUL SZASZ, *SAFEGUARDING THE ATOM: A CRITICAL APPRAISAL* 61 (1985)); *see also* KEELEY, *supra* note 18.

165. CWC, *supra* note 24, art. VI, ¶¶ 3–6.

166. *Id.* art. VI, ¶¶ 10–11.

167. Verification Annex, *supra* note 24, pt. VI, ¶ 21.

168. *Id.* pt. VII, ¶ 15.

169. *Id.* pts. VIII, ¶ 17, IX, ¶ 14.

170. *Id.* pt. III, ¶¶ 1–3.

ule 1 facilities, the number, intensity, duration, timing and mode of subsequent inspections will be based on the facility's risk to the CWC's object and purpose as determined by the relevant chemicals at the facility, the facility's characteristics, and the nature of the activities carried out there.¹⁷¹

Since inspecting all Schedule 2 sites with a comparable level of effort is impossible and some facilities pose a greater potential for violation than others, the OPCW has elaborated additional risk-based criteria to determine the frequency and intensity of inspections at these facilities.¹⁷² During initial inspections,¹⁷³ the risk the facility poses to the CWC will be assessed in order to determine the frequency and intensity of future inspections.¹⁷⁴ Additional factors, such as the facility's compliance record, will be considered over time.¹⁷⁵ Under this approach, inspection frequency will be determined by the risk of the facility, according to the relevant chemicals at the facility site, the characteristics of the facility, and the activities carried out there.¹⁷⁶

Regarding chemicals at a facility, risk assessment is based on: (a) toxicity of the scheduled chemicals handled there; (b) quantity of sched-

171. *Id.* pt. VI, ¶ 23 (for single small scale facilities); *id.* pt. VI, ¶ 30 ("other" Schedule 1 facilities; rather than focusing on the relevant chemicals at the facility, the OPCW will focus on the quantities of the chemicals produced).

172. Because of their reduced risk for "breakout" activities, Schedule 3 facilities are not yet given the same attention. The Technical Secretariat must select these plant sites for inspection on a random basis through "appropriate mechanisms" (such as specially designed computer software) based on the following criteria: (a) equitable geographical distribution of inspections; and (b) the information on the declared plant sites available to the Technical Secretariat related to the relevant chemical, the characteristics of the plant site, and the nature of the activities carried out there. *Id.* pts. VII, ¶ 18, VIII, ¶ 14.

173. Within three years after the CWC's entry into force, each Schedule 2 plant site will receive an initial inspection during which a draft facility agreement for the plant site will be prepared unless the inspected State Party and the Technical Secretariat agree that it is not needed. Facilities declared after this period will receive an initial inspection within one year after production, processing, or consumption is first declared. *Id.* pt. VII. Schedule 3 facilities will not receive initial inspections.

174. To help determine the frequency and intensity of subsequent routine inspections, the OPCW has proposed that inspectors take the following criteria into account during the initial inspection: (a) toxicity of the scheduled chemicals and the end products produced with it; (b) quantity of the scheduled chemicals and their feedstock chemicals typically stored at the site; (c) plant production capacity; and (c) capability and convertibility for initiating production, storing and filling of toxic chemicals at the site. *Id.* pt. VII, ¶ 20; see also *Initial Report, supra* note 76, app. A, stating that the initial inspection of a Schedule 2 facility shall, *inter alia*, "undertake an initial assessment of the risk [the facility poses] to the object and purpose of the CWC."

175. *Expert Group on Chemical Industry Facilities: Third Report*, annex at 10, OPCW Doc. PC-VI/B/WP.2 (Jan. 28, 1994). Where the plant site undergoes significant changes that change the risk assessment, information will be updated through subsequent inspection.

176. See *Verification Annex, supra* note 24, pt. VII, ¶¶ 18-20; *Initial Report, supra* note 76, at 22, 24.

uled chemicals and their feed stocks stored at the site; (c) similarity of chemicals at the facility to Schedule 1 chemicals, as well as their lethal or incapacitating properties; and (d) whether the chemicals can be used as precursors for the final production stage of a Schedule 1 chemical.

The factors to determine risk related to the characteristics of the plant site include: (a) process area characteristics such as production capacity, presence of equipment capable of handling highly toxic materials, enclosed or hooded process equipment, and physical layout; (b) personnel considerations such as background and experience; (c) consistency of extant security measures with declared activities; (d) facility location, e.g., isolation or proximity to military installations; (e) safety equipment and procedures, particularly those related to protective clothing, decontamination equipment, and contamination treatment; (f) ease of converting the facility to CW production, storage, or filling uses; and (g) whether the facility is a dedicated multi-purpose facility.

The risk posed by the nature of activities carried out at the facility is determined by: (a) whether scheduled chemicals are produced, processed, or consumed there; and (b) which activities not related to declared Schedule 2 chemicals actually take place at the facility.

The proposed risk-based approach will not form a rigid methodology; the Technical Secretariat will interpret it on a state-by-state basis so as to preclude the prediction of exactly when a facility will be inspected. The applicability of these criteria to assess the risk of a CWC facility could be mitigated by prevailing industrial practices; environmental, health and safety legislation; and proximity to populations. States Parties in different parts of the world will likely adhere to widely varying standards, therefore the OPCW's risk-based assessment will consider the applicable political, social, economic, and environmental contexts.

The consistency between a facility's declarations and the inspection findings will be another factor to determine risk. Thus, perceived bad-faith efforts in honoring inspection rights could be a factor to determine inspection frequency and intensity. These criteria to determine inspection particulars for facilities must be applied in the least intrusive manner consistent with the overall verification objectives. In no event may the Technical Secretariat choose a plant site to be routinely inspected more than twice per calendar year.¹⁷⁷

177. Verification Annex, *supra* note 24, pt. VII, ¶¶ 21–22. Likewise, no Schedule 3 site will receive more than two routine inspections yearly. *Id.* pt. VIII, ¶ 15. A special formula limits the selection of Schedule 3 facilities to be inspected. The combined number of inspections of Schedule 3 and "other" chemical production facilities will be the lower of 3 plus 5% of the total number of such facilities declared by a State Party or 20 inspections. *Id.* pt. VIII, ¶ 16.

3. Options to Strengthen NPT Verification — Determining Frequency and Intensity of Inspections

The NPT and the CWC share some criteria to choose facilities for inspection. Each regime prioritizes the facilities that possess the most material that is most critical to a weapons capability. Each regime considers a facility's controls over that material. The difference between the two regimes is that, under the CWC, the Technical Secretariat may consider additional relevant factors. For example, to evaluate the plant site's characteristics, the Technical Secretariat could evaluate the skills and background of facility personnel or the facility's proximity to a military installation. Also, special consideration will be given to whether the facility is multi-purpose and whether it undertakes activities unrelated to declared chemicals. Finally, the CWC attempts to characterize the State Party's stability, although the salience of this consideration is questionable.

The CWC risk-based approach to determine inspection frequency and intensity could be relevant to new NPT verification measures, especially if more sites than those currently safeguarded are declared under the expanded declaration scheme discussed in Section II. IAEA inspections of facilities associated with expanded declarations (e.g., newly declared sites) could focus on capabilities that potentially indicate a clandestine NPT violation. A risk-based assessment would consider the presence of threshold quantities of declared substances (including safeguarded nuclear and other declared materials) and base the frequency and intensity of inspections on whether their activities and characteristics are multi-purpose and potentially relevant to a weapons program.

The key task is to develop criteria to select those facilities where an inspection will provide important information as to a State Party's nuclear program. A selection mechanism strictly linked to the quantity of safeguarded material will not necessarily devote ample inspection resources to sites that threaten an acute proliferation potential. While no regime can or should target sites for inspection on a discriminatory basis or in a manner designed to harass, adoption of broader selection criteria can enable the IAEA to concentrate inspections on those facilities most relevant to NPT verification objectives.

B. Strengthening the Effectiveness of Inspections

Increasing the overall effectiveness of inspections is an important priority regardless of whether more sites are inspectable pursuant to an

expanded verification scheme.¹⁷⁸ The CWC offers guidance in two respects. First, it clarifies the treatment of inspectors and removes bureaucratic and physical impediments to the performance of their duties. Second, the CWC specifically authorizes broader inspection access, allowing inspectors to pursue information with fewer restrictions and making the inspection more probative.

1. Inspector Issues

Verification will be more effective if inspectors can enter states and perform their duties with minimum impediment and maximum legal protections. This is especially relevant if the State Party is, for whatever reason, inhospitable. Therefore, the NPT and the CWC each have procedures with regard to: (1) designating inspectors; (2) issuing visas; (3) privileges and immunities; (4) providing amenities; and (5) entry and transport to the site.

a. NPT

Designations. The IAEA must inform each State Party of any proposed inspector, whom the State Party must accept or reject within 30 days. If the State Party accepts those persons, the Board of Governors may designate them as inspectors. Upon a State Party's rejection, which need not be explained, the Director-General must withdraw a designation and propose alternative designations.¹⁷⁹ If a State Party's repeated refusals to accept a designation impedes inspections, the IAEA Director-General may refer the matter to the Board of Governors with a "view to appropriate action."¹⁸⁰

The designation of IAEA inspectors has presented difficulties to the IAEA inspection regime. States frequently object to the designation of inspectors on political grounds (e.g., because the inspector is a national of a state that is not a party to the NPT or does not accept safeguards itself). Additionally, states have limited the number of inspectors they will

178. In theory, at least, if expanded declarations result in a broader class of declared and inspectable facilities, the approaches outlined below could be applied to these newly declared facilities.

179. The Director-General must inform a State Party if he, either on his own initiative or at the request of a State Party, withdraws the designation of an official as an inspector. INFCIRC/153, *supra* note 1, ¶ 85(d).

180. *Id.* ¶ 9. While the procedure for designating inspectors is the same for all types of inspections, some additional rules apply to *ad hoc* inspections related to initial reports. Inspectors must be designated within 30 days after entry into force of the national safeguards agreement. If this cannot be accomplished, inspectors will be designated on a temporary basis. *Id.* ¶ 85.

accept at a given time or have objected due to language requirements.¹⁸¹ These objections, which are sometimes spurious, delay an already lengthy designation process and allow states to exercise their right to reject inspectors as a means to hamper IAEA inspection efforts.¹⁸²

Visas. The NPT regime does little to define how and when inspectors are issued visas. A State Party must grant or renew, as quickly as possible, required visas for each inspector designated for it.¹⁸³ While some States Parties grant inspectors multiple-entry visas, other States Parties insist on single-entry visas or grant visas on a "special case" basis only. Uncooperative States can exploit the irregular manner of granting IAEA inspectors entry/exit visas, adding to the red tape and institutional hindrance of timely and effective inspection.

Privileges & Immunities. The 1959 Agreement on the Privileges and Immunities of the IAEA affords inspectors immunities only with respect to official functions under a safeguards agreement.¹⁸⁴ Thus, inspectors enjoy the normal immunities of other international officials, including freedom from arrest and freedom from legal process for actions taken in their official capacity. IAEA inspectors also enjoy the rights given to "experts on a mission" such as freedom from seizure of baggage, inviolability of papers, and the right to communicate with the IAEA through codes, couriers and sealed bags.¹⁸⁵

Amenities. Parties to the IAEA Statute may make available services, equipment, and facilities to assist the IAEA in fulfilling its objectives (which presumably includes safeguards activities).¹⁸⁶ Additionally, if inspectors require services available in the State Party in connection with inspections, including the use of equipment, the State Party must facilitate the "procurement" of such services and the use of such equipment by inspectors.¹⁸⁷

181. FISCHER, *supra* note 18, at 93 n.25. Under simplified designation procedures included in the Director-General's proposal to the Board of Governors in February 1988, State Parties can waive their right to approve individual inspector designations and accept the Board's approval of an inspector. However, not all State Parties have accepted these streamlined procedures.

182. The right to demand an inspector's withdrawal is likewise troublesome; this right could be used to pressure, or even banish, especially inquisitive inspectors. Szasz, *supra* note 63, at 102.

183. INFCIRC/153, *supra* note 1, ¶ 86.

184. *Id.* ¶ 10. For states not party to the 1959 agreement, the privileges and immunities to be extended should ensure that IAEA inspectors can discharge their functions under the safeguards agreement.

185. Szasz, *supra* note 63, at 107.

186. IAEA Statute, *supra* note 1, art. X.

187. INFCIRC/153, *supra* note 1, ¶ 88. States Parties will also be expected to provide inspectors with appropriate equipment for carrying out inspections and with suitable accommodation and transport. *The Agency's Inspectorate*, Annex ¶ 6, IAEA Doc. GC(V)/INF/39 (Aug.

Entry. Neither the NPT, INFCIRC/153, nor the IAEA Statute specifically address how an inspection team is to enter the inspected State Party, including the possibility of using non-scheduled aircraft, or transit of inspectors to the inspection site. However, a 1961 IAEA document provides that IAEA inspectors must use points of entry and departure and routes and modes of travel within the State Party as designated by it.¹⁸⁸

b. CWC

Designation. Within 30 days after CWC entry into force, the Technical Secretariat will inform States Parties of proposed inspectors. Each State Party must acknowledge receipt of the list and accept or reject each inspector but need not explain a rejection. A listed inspector will be deemed designated unless objection is received within 30 days. A rejected inspector may not participate in verification activities anywhere under a non-accepting State Party's jurisdiction or control.¹⁸⁹ However, a State Party that is notified of an inspection may not remove any designated inspector on that inspection team.

The Technical Secretariat will submit further proposals as necessary to supplement the original list and to designate replacement personnel. The State Party must accept enough designated inspectors to allow for their availability and rotation. If, in the Director-General's opinion, the non-acceptance of proposed inspectors hinders the Technical Secretariat's duties, the Director-General must refer the issue to the Executive Council.

For challenge inspections, the Director-General must specially designate inspectors from the list of those designated for routine inspections with due regard to selecting an inspection team on as wide a geographical basis as possible. A national of the requesting State Party or the inspected State Party cannot be a member of the inspection team.¹⁹⁰

Visas. Within 30 days of receipt of the inspectors list, each State Party must provide multiple entry/exit and/or transit visas, valid for at least two years, to enable each inspector to enter and to remain on its territory to carry out inspections.¹⁹¹

Privileges & Immunities. Inspectors are to be accorded privileges and immunities for the entire period they are on the inspected State Party's

28, 1961) [hereinafter *The Agency's Inspectorate*]. Apart from this reference to equipment, "service" is an undefined term.

188. *The Agency's Inspectorate*, *supra* note 187, at Annex ¶ 5.

189. This discussion also applies to inspection assistants. Procedures for the designation of inspectors are contained in the Verification Annex, *supra* note 24, pt. II, ¶¶ 1-9.

190. *Id.* pt. X, ¶¶ 1-2.

191. *Id.* pt. II, ¶ 10.

territory, and thereafter with respect to acts previously performed in the exercise of official functions.¹⁹² The CWC enumerates six privileges and immunities pursuant to the Vienna Convention on Diplomatic Relations¹⁹³ and two additional privileges not contained in the Vienna Convention¹⁹⁴ to which inspection personnel are entitled. Inspection team members "shall not engage in any professional or commercial activity for personal profit on the territory of the inspected State Party or Host State,"¹⁹⁵ and a State Party has redress in the event of abuse. If the inspected State Party claims an abuse of privileges and immunities, it and the Director-General will consult to determine if an abuse has occurred and, if so, how to prevent future abuses. The Director-General may expressly waive inspection team members' immunity from jurisdiction if immunity would impede the course of justice and that waiver will not prejudice CWC implementation.¹⁹⁶

Amenities. CWC inspectors must be provided with amenities during their stay in the inspected State Party's territory including: communication means, interpretation services, working space, lodging, meals and medical care.¹⁹⁷ Additionally, the inspection team must be allowed to communicate with the Technical Secretariat's headquarters using their own approved communications equipment and codes. The inspection team may communicate via two-way radio with personnel patrolling the perimeter and other team members.¹⁹⁸

192. *Id.* pt. II, ¶¶ 11, 15. A non-inspected State Party must accord the inspection team privileges and immunities when transiting its territory and must also grant privileges and immunities to the inspection team's papers, correspondence, samples, and equipment. *Id.* pt. II, ¶ 11(c-d).

193. These are: 1. inviolability of diplomatic agents — no liability for arrest or detention, and treatment with respect and prevention of any attack on his person, freedom or dignity; 2. inviolability of premises of diplomatic agents including the private residence of a diplomatic agent as well as the premises of the mission; 3. inviolability of papers and correspondence of diplomatic agents; 4. inviolability of samples and approved equipment; 5. immunity of diplomatic agents in regard to criminal jurisdiction and immunity from civil and administrative jurisdiction except in matters relating to: private immovable property, succession, and any professional or commercial activity outside official functions; and 6. exemption from dues and taxes, subject to certain exceptions. Verification Annex, *supra* note 24, pt. II, ¶ 11; *see also* Vienna Convention on Diplomatic Relations, Apr. 18, 1961, arts. 29–31, 34, 23 U.S.T. 3227, 3240–42, 500 U.N.T.S. 95, 110–14.

194. Exemption from customs duties or related charges, and currency and exchange privileges. Verification Annex, *supra* note 24, pt. II, ¶ 11(g-h).

195. *Id.* pt. II, ¶ 11(j). Furthermore, they "shall be obligated to respect the laws and regulations of the inspected State Party or host State and, to the extent that is consistent with the inspection mandate, shall be obligated not to interfere in the internal affairs of that State." *Id.* pt. II, ¶ 13.

196. *Id.* pt. II, ¶¶ 13–14.

197. *Id.* pt. II, ¶ 26.

198. *Id.* pt. II, ¶ 44.

Entry. The inspected State Party must ensure the inspection team's immediate entry into its territory. If the timeliness of inspections is important, but timely travel is impossible using scheduled commercial transport, the inspection team may use OPCW aircraft. The inspected State Party must provide certain amenities in that regard.¹⁹⁹ The inspected State Party must ensure the safe conduct of the inspection team and its equipment and supplies to the inspection site(s) within 12 hours from its arrival at the point of entry.²⁰⁰

c. Options to Strengthen NPT Verification — Empowering Inspectors

NPT inspections could be expedited if States Parties were required to accept inspectors approved by the IAEA Board of Governors.²⁰¹ The CWC process to designate inspectors is more streamlined than the NPT process. A CWC State Party may object to an inspector only on a timely basis and may not delay an inspection once noticed by objecting to a previously designated inspector.²⁰² Similarly, with regard to visas, the CWC two-year multiple entry/exit requirement, unlike the IAEA system where visas may be single entry only, enables inspectors to travel freely to and from inspected states; inspections can proceed without a State Party having opportunities to create delays by intentionally refusing to issue visas. A Board of Governors interpretation of INFCIRC/153 paragraph 86 to mandate that States Parties issue multiple entry/exit and transit visas for a fixed period of time (perhaps with a 2 year period as in the CWC) could help address this concern.²⁰³

While less immediately relevant to verifying compliance, the IAEA's grant of only functional privileges and immunities might hinder the effectiveness of inspections, particularly insofar as the inviolability of the official premises and living quarters of IAEA inspectors is not guaranteed. Without full diplomatic rights clearly spelled out, IAEA inspectors lack complete security and confidence when they perform their duties in new and uncertain circumstances. The CWC, in contrast, requires States Parties

199. *Id.* pt. II, ¶¶ 22–25.

200. *Id.* pt. II, ¶¶ 35–36.

201. This procedure has been suggested by the Director-General and has been accepted by about two fifths of those states receiving IAEA inspections. Consideration should be given to allowing States with "sensitive" plants in its nuclear fuel cycle to retain the right to reject inspectors. FISCHER, *supra* note 18, at 93, n.25. This is under consideration by the IAEA.

202. KRUTZSCH & TRAPP, *supra* note 95, at 301 n.9.

203. *The Relevance of Certain Aspects of the Chemical Weapons Convention to Efforts to Strengthen Agency Safeguards, United States Comments*, IAEA Doc. GOV/INF/680 (Feb. 1993) (presented to the US/EURATOM: Safeguards Technical Bilaterals, Washington, DC, July 26–27, 1993) [hereinafter *United States Comments*].

to extend full diplomatic immunity to its inspectors and provides its inspectors with greater privileges, going well beyond the functional immunity accorded IAEA inspectors.

The inspection team also requires support from the inspected State to carry out its duties. The CWC spells out precisely what support must be given to the inspection team. While similar provisions are contained in most, but not all, NPT Subsidiary Arrangements, the obligations concerning amenities are more clearly expressed under the CWC than under safeguards agreements or Subsidiary Arrangements.

The CWC also spells out in great detail how the OPCW may gain entry into the inspected State Party, including requirements to designate a point of entry and arrangements to use non-scheduled aircraft. By comparison, INFCIRC/153 safeguards contain no explicit provisions on these topics. The effectiveness of verification, especially short notice verification, can be significantly enhanced by specifying that the inspection team will be able to enter the inspected state and reach the inspection site safely and quickly. Moreover, obtaining States Parties' agreement in advance to these measures reduces the likelihood that even uncooperative states will use issues such as entry and transit to the inspection site to undermine inspection efforts. Recent experiences in Iraq and other inspections of recent NPT adherents have demonstrated the utility of such provisions.²⁰⁴

Finally, that the CWC includes detailed requirements in its organic instrument for entry and exit from the inspected State Party, transit to and from the inspection site, and logistical arrangements for inspectors is crucial. All CWC States Parties have agreed to these measures, and it can be expected that these detailed measures in the treaty are the minimum to be applied (subject only to minor modifications in facility agreements). By contrast, the NPT, the IAEA Statute, and INFCIRC/153 do not contain these detailed measures. The IAEA inspectorate is only entitled to negotiate these measures on a bilateral basis, at the discretion of the state to be inspected, and in light of the safeguards agreement with that state (including provisions found in the general part of Subsidiary Arrangements and the more detailed facility attachments). One option for the NPT, therefore, is that any future agreement forming the legal basis for extended verification measures could bind states to identical obligations with regard to the inspectorate (See Section V below).

204. *Id.* at 3.

2. Conduct of Inspections and Rights of Access

Inspections will be more effective if access to the site is streamlined and inspectors' powers are clearly specified. Both the NPT and the CWC address these matters, but CWC procedures are far more explicit. This subsection discusses the NPT and CWC procedures as to: (1) notification, (2) scope of access, and (3) environmental sampling.

a. NPT

Notification. The IAEA must notify a State Party prior to the inspectors' arrival at facilities or material balance areas.²⁰⁵ Some routine inspections can be carried out without advance notice in accordance with the principle of random sampling so long as the IAEA advises each State Party of its general program of announced and unannounced inspections, specifying the general period when inspections are foreseen. The IAEA should carry out unannounced inspections so as to minimize practical difficulties for facility operators and the State Party, and the State Party must make every effort to facilitate the inspectors' task.²⁰⁶

Scope of Access. While the IAEA is addressing this issue, the current scope of inspectors' access is limited. During *ad hoc* inspections, inspectors have access to: a) any location where the initial report or later inspections indicate that nuclear material is present, and b) to locations identified by the State Party related to a transfer of nuclear material.²⁰⁷ For routine inspections, access is limited to the strategic points²⁰⁸ specified in Subsidiary Arrangements and to records that must be kept under the national safeguards agreement. If a State Party believes that IAEA access should be limited due to unusual circumstances, it and the IAEA must arrange for the IAEA to discharge its safeguards responsibilities.²⁰⁹ If

205. One week's notice is required for *ad hoc* inspections to verify initial reports or subsequent changes. For *ad hoc* inspections related to transfers of nuclear material, the State Party must receive at least 24 hours notice. At least 24 hours notice is required for routine inspections and must include the names of inspectors and the facilities or material balance areas outside facilities to be inspected. INFCIRC/153, *supra* note 1, ¶ 83(a-b).

206. *Id.* ¶ 84.

207. *Id.* ¶ 76. These rules of access apply until the strategic points are identified in Subsidiary Arrangements. *Id.* ¶¶ 92(c), 95(c).

208. A strategic point is a location selected during examination of design information where, under normal conditions and combined with information from all "strategic points" taken together, the information necessary and sufficient for the implementation of safeguards measures is obtained and verified. A strategic point may include any location where key measurements related to material balance accountancy are made and where containment and surveillance are executed. *Id.* ¶ 116.

209. *Id.* ¶ 76(c-d).

access to further information or locations is necessary, the State Party and the IAEA may consult and, if necessary, invoke the process for special inspections.²¹⁰ During all inspections, inspectors must neither hamper nor delay the construction, commissioning, or operation of facilities, and must not affect the safety of facilities.²¹¹

Access to documents is limited during all safeguards inspections: IAEA inspectors may examine only accounting and operating records that a State Party must keep.²¹² The authority to take photographs is undefined; no mention is made of photographic equipment, but inspectors may use surveillance measures.²¹³ Current safeguards agreements do not explicitly grant IAEA inspectors the right to interview facility personnel. However, inspectors must be given access "at all times to all places and data and to any person,"²¹⁴ and the State Party must "direct all such persons under its control to co-operate fully with [IAEA] inspectors."²¹⁵ Whether these rights of access may be interpreted to include interviews of facility personnel is an open question, particularly in light of the more specific inspection procedures contained in INFCIRC/153 and safeguards agreements based on it.

Environmental Sampling. The objective of NPT sampling and analysis is to confirm that a State Party has not diverted safeguarded nuclear material for purposes not allowed by the treaty.²¹⁶ Sampling and analytical tools, as practiced, have been predicated on the need to "confirm declarations" and are used to determine the authenticity of a State Party's declared nuclear material.²¹⁷ NPT sampling has not been undertaken to detect the presence of undeclared, clandestine nuclear material *per se* because samples are generally collected inside material balance areas.²¹⁸

210. *Id.* ¶ 77. In the past, the consultation process has resulted in the IAEA gaining access only to areas of a facility to which the State Party consents.

211. *Id.* ¶ 87.

212. *Id.* ¶ 74(a). IAEA inspectors may examine all records kept pursuant to INFCIRC/153. *Id.* ¶¶ 51-58.

213. *Id.* ¶ 74(d).

214. IAEA Statute, *supra* note 1, art. XII(A)(6).

215. *The Agency's Inspectorate*, *supra* note 187, ¶ 9.

216. *See generally* IAEA SAFEGUARDS CRITERIA, 1991-1995 (1990) (on file with authors).

217. Nuclear safeguards sample collection and destructive analyses are usually conducted for "bias defect testing," which is used to ensure (at the time the IAEA conducts physical inventory and other verifications) that there have been no diversions involving the subtle removal or substitution of nuclear material from safeguarded items. Bias defect testing requires the most precise measurement techniques (e.g., mass spectrometry) to identify possible material alteration.

218. An exception is found in the Hexapartite Safeguards Project (HSP). Under this IAEA safeguards approach, limited-frequency, unannounced access is applied to gas centrifuge type uranium enrichment plants. In addition to satisfying IAEA nuclear material accountancy objectives, the HSP also provides an assurance of timely detection of the production of a

NPT sample collection followed by off-site analysis has been permitted only for specific locations within a material balance area of a declared facility. The IAEA inspection team has not been permitted to collect samples outside of these areas, although new measures are under discussion.

b. CWC

The CWC specifies different notice periods for different types of facilities.²¹⁹ Notice must provide information concerning: (a) type of inspection; (b) point of entry to be used; (c) date and estimated time of arrival at the point of entry; (d) means of arrival at the point of entry; (e) site to be inspected; (f) names of inspectors and inspection assistants; and (g) aircraft clearance for special flights, if appropriate.²²⁰

At the inspection site and before the start of the inspection, facility representatives must brief the inspection team, with the aid of maps and other documentation as appropriate, on the facility, the activities carried out there, safety measures, and administrative and logistical arrangements necessary for the inspection. This briefing must be kept to the minimum time necessary and may not exceed three hours.²²¹

The CWC grants inspectors the right to unimpeded access to the inspection site and to choose the items to be inspected.²²² The inspection team must have access to the areas of a Schedule 2 facility enumerated in the facility agreement.²²³ As a rule, access will include elements of the

significant quantity of uranium at an enrichment level higher than that declared. Thus, the HSP considers the possibility of clandestine nuclear material production at centrifuge plants. See F. Brown, *The Hexapartite Safeguards Project, A Review by the Chairman*, in 2 NUCLEAR SAFEGUARDS TECHNOLOGY 491, 491-503 (1983).

219. At least 24 hours notice is required for inspections of a Schedule 1 facility, including the single small-scale facility. Verification Annex, *supra* note 24, pt. III, ¶ 17. For inspections of Schedule 2 facilities, the inspected State Party must be notified at least 48 hours before the arrival of the inspection team at the plant site to be inspected. *Id.* pt. VII, ¶ 30. Inspections of Schedule 3 facilities, as well as "other" chemical production facilities, require that the inspected State Party be notified at least 120 hours before the inspection team arrives at the inspection site. *Id.* pts. VIII, ¶ (25), IX, ¶ 21.

220. *Id.* pt. II, ¶¶ 31-34. The inspected State Party must acknowledge notification within an hour of receiving it. If the inspected facility is located on another State Party's territory, both State Parties must be simultaneously notified in accordance with the above procedures.

221. *Id.* pt. II, ¶ 37.

222. The inspection team's activities and rights of access are governed by the CWC, the rules established by the OPCW, the Director-General's inspection manual, the inspection mandate, and facility agreements concluded between State Parties and the OPCW. Taking into account the guidelines developed and approved by the Conference of States Parties, the Technical Secretariat must develop detailed procedures to conduct inspections for inclusion in the inspection manual. *Id.* pt. II, ¶¶ 38-45.

223. The areas to be inspected may include: (a) areas where feed chemicals (reactants) are delivered or stored; (b) areas where manipulative processes are performed upon the reactants

common infrastructure of the plant site directly associated with the declared activities related to the Schedule 2 chemicals.²²⁴ While the inspection will focus on the plant(s) having Schedule 2 chemicals, broader access may be specified by the facility agreement for that plant site.²²⁵ The facility agreement may also specify other areas at the plant site where, in the case of anomalies, access may be granted using managed access procedures.²²⁶ The scope of access within a Schedule 3 facility is virtually identical except that there will be no facility agreement, unless requested by the inspected State Party.²²⁷

The CWC also provides a mechanism to grant inspectors access, during a routine inspection without having to resort to a challenge inspection, to buildings or structures at the site that would not otherwise be opened for verification.²²⁸ If the inspection team requests access to other parts of the facility not covered by the facility agreement in order to clarify an ambiguity, the inspected State Party must provide information

prior to addition to the reaction vessels; (c) feed lines as appropriate from the areas referred to above to the reaction vessels together with any associated valves, flow meters, etc.; (d) the external aspect of the reaction vessels and ancillary equipment; (e) lines from the reaction vessels leading to long- or short-term storage or to equipment further processing the declared Schedule 2 chemicals; (f) control equipment associated with any of the items under subparagraphs (a) to (e); (g) equipment and areas for waste and effluent handling; (h) equipment and areas for disposition of chemicals not up to specification. *Id.* pt. VII, ¶ 28.

224. *Initial Report*, *supra* note 76, at 1.

225. If agreed in the facility agreement, inspectors may have access beyond the declared Schedule 2 plant(s) and those elements of the common infrastructure of the plant associated with them, including: (a) undeclared plants having Schedule 2 chemicals in quantities below declaration thresholds; (b) plants at the plant site that have Schedule 1 chemicals below the declaration thresholds; (c) plants at the plant site that have Schedule 3 chemicals below the declaration thresholds; (d) plants at the plant site, linked with the declared Schedule 2 plant(s), which by virtue of their technological design, production profile and relation to the declared Schedule 2 plant may pose a risk to the object and purpose of the Convention. *Id.*

226. *Id.* The OPCW has elaborated model facility agreements for each type of declared facility, and Section 7 of those model agreements covers the conduct of inspections. A generic model facility agreement covers all declared facilities. Separate model provisions have been drafted for various sections of the facility agreements. *See* GENERIC TEXT ELEMENTS FOR MODEL FACILITY AGREEMENTS, *supra* note 76; DISCUSSION PAPER PREPARED BY THE SECRETARIAT: FACILITY SPECIFIC SECTIONS OF THE MODEL FACILITY AGREEMENT FOR SINGLE SMALL SCALE FACILITIES, SCHEDULE 1 FACILITIES, SCHEDULE 2 FACILITIES, AND SCHEDULE 3 FACILITIES, *supra* note 76.

227. Verification Annex, *supra* note 24, pt. VIII, ¶ 19.

228. This mechanism:

emerged rather late in the negotiations as a compromise between those States who wanted to limit the inspection to the declared Schedule 2 plant only, and those who wanted to avoid a situation in which an inspection team would, at larger plant sites, have to "jump from island to island" closing its eyes to the rest, in fact the major part, of the plant site.

and grant access to the inspection team.²²⁹ In addition to these specific measures, all CWC States Parties must, under Article VII, paragraph 7 “cooperate with the Organization in the exercise of all its functions and in particular to provide assistance to the Technical Secretariat.” Because the Technical Secretariat is entrusted with carrying out the CWC’s verification measures,²³⁰ States Parties must assist the Technical Secretariat in verifying compliance, which could presumably include providing access to areas of declared facilities that raise ambiguities.

Inspectors may interview any facility personnel in the presence of the inspected State Party’s representatives to establish necessary facts. The State Party can object to a question if it considers it irrelevant.²³¹ The inspection team may inspect documents and records that they deem relevant to the conduct of their mission.²³² Inspectors can also demand that representatives of the inspected State Party or the inspected facility take photographs.²³³ However, inspections should cause the least possible inconvenience or disturbance to the State Party and the inspected facility. Moreover, the inspection team must not operate the facility, must avoid unnecessary interference or delay to its operation, and must avoid affecting its safety.²³⁴

Environmental Sampling. Sample collection and chemical analysis during CWC inspections have two major objectives related to treaty compliance: (1) determination of the presence or absence of Scheduled chemicals, and (2) confirmation of the type and amount of Scheduled chemicals. Implicit in these objectives is the notion of verifying the completeness of declarations. Sampling and analysis, accordingly, are intended to confirm the absence of prohibited chemicals by testing for

229. Verification Annex, *supra* note 24, pt. VII, ¶ 25, explicitly invokes pt. II, ¶ 51, which provides that if ambiguities regarding an object or building within the inspection site are not resolved, the object or building can be photographed in order to clarify its purpose or function. Issues that cannot be resolved will be brought to the attention of the Technical Secretariat, and the ambiguity will be noted in the final inspection report.

230. CWC, *supra* note 24, art. VIII, ¶ 37.

231. Verification Annex, *supra* note 24, pt. II, ¶ 46. If the head of the inspection team objects and states the question’s relevance, the question will be provided in writing to the inspected State Party for reply. The inspection team may note in that part of the inspection report that deals with the inspected State Party’s cooperation any refusal to permit interviews or to allow questions to be answered and any explanations given. *Id.*

232. *Id.* pt. II, ¶ 47.

233. *Id.* pt. II, ¶ 48. The inspected State Party must make available the capability to take instant development photographic prints. The inspection team will determine whether photographs conform to their request and, if not, the inspected State Party may be required to take repeat photographs. *Id.*

234. If the inspection team considers it necessary, it may request the facility’s designated representative to carry out a particular operation. *Id.* pt. II, ¶ 40. See also CWC, *supra* note 24, art. VI, ¶ 10.

indications of noncompliance, such as traces of illicit chemicals or their degradation products.

The Verification Annex outlines provisions for sample collection by the Technical Secretariat during routine and challenge inspections.²³⁵ Amounts and identities of declared chemicals are to be checked; if the identity cannot be confirmed by indirect means, the inspectors can request that samples (either solid or liquid) be taken from bulk material and analyses be performed. The inspection team itself does not have the right to collect samples (unless so agreed in advance with the inspected State Party); it can only direct the collection thereof by the inspected State Party. This is to minimize the possibility that samples are collected for purposes not directly relevant to treaty verification. The inspected State Party may retain a portion of the original sample or may take a duplicate sample.

Chemical analyses during inspections can be performed using facility equipment, if inspectors supervise.²³⁶ Alternatively, inspectors can conduct analyses using inspection team equipment.²³⁷ Ideally, CWC verification equipment would be sensitive enough to identify Scheduled chemicals at sufficiently low concentrations, while not revealing confidential information not relevant to compliance (e.g., identification of non-Scheduled chemicals such as catalysts or additives).²³⁸ When analyzed on-site, the State Party has the right to be present. If the inspection team deems necessary, e.g., where on-site analysis is inconclusive, samples can be taken off-site to designated laboratories for more definitive analysis. The function of off-site laboratories will include analysis of authentic samples, development of analytical methods (for both off- and on-site analysis), preparation of reference compounds and standards, and training.²³⁹

235. Verification Annex, *supra* note 24, pt. II, ¶¶ 52–58. More detailed procedures for sampling and analysis to check for undeclared chemicals during initial inspection of Schedule 2 plants have been developed by the PTS. *Initial Report*, *supra* note 76, at 15.

236. Sample analysis is to be performed on-site where possible. *Initial Report*, *supra* note 76, at 15.

237. The Technical Secretariat may bring on-site whatever approved equipment it finds necessary to fulfill its verification requirements. The Secretariat shall maintain a list of approved equipment for use by the inspection team that meets defined technical specifications. *Expert Group on Equipment: Third Interim Report*, OPCW Doc. PC-VI/B/WP.4 (Jan. 28, 1994). The inspection team can make use of non-approved equipment at the inspection site if the inspected State Party agrees.

238. Current equipment considered for CWC inspections includes non-destructive evaluation gear (i.e., acoustic resonance spectrometer, ultrasonic pulse echo device, and isotopic neutral activation spectrometer) and on-site analytical equipment (including gas chromatograph-mass spectrometer, laser ranger finder, military agent detector kit, and infrared spectrometer). *Id.* at 20–22.

239. *Id.* at 10.

c. Options to Strengthen NPT Verification — Conduct of Inspections

The notice required prior to inspecting a declared facility is similar under both treaties; in fact, NPT routine inspections can be conducted with less notice than most CWC routine inspections. Yet, two aspects of CWC notification procedures deserve mention. First, the CWC stipulates what information the notification must contain, which can expedite the entire process, as well as notify the inspected state of what is to be inspected and how that inspection will proceed. Second, the notice required prior to a CWC routine inspection applies stricter notification requirements to the most worrisome facilities. Thus, facilities that pose a greater threat to the CWC's object and purpose, because they possess materials of greater risk, will have significantly less time to prepare for an on-site inspection.

The CWC requires the inspected State Party to brief the inspection team about the layout, activities, and other important information about the facility so that the team will have enough information about the facility to carry out an effective inspection. The NPT regime does not explicitly provide for pre-inspection briefings. Their occurrence is on an *ad hoc* basis without legal obligation, which creates potential problems for newly-declared sites.

The single greatest difference between the CWC and NPT routine inspection schemes is the degree of access granted to inspectors and the activities they can perform. For NPT safeguards inspections, IAEA inspectors are not permitted free access to all locations within a facility, but are strictly circumscribed by the strategic points identified and agreed to in the Subsidiary Arrangements and facility attachments. While the right to unimpeded access may be inferred from the IAEA Statute Article XII, access to that degree has never been exercised. That the CWC authorizes extensive access to facilities also offers the virtue of uniformity. The CWC specifies the minimum degree of access to be provided as a matter of right, and all States Parties must adhere to that standard. The NPT regime, by contrast, leaves important questions of access to be resolved in Subsidiary Arrangements and facility attachments; INFCIRC/153 only vaguely discusses inspectors' rights of access. As a result, NPT inspection procedures and scope of access vary among states; access beyond strategic points is, in practice, both *ad hoc* and subject to bilateral accord.

Inspector access as contemplated under the CWC is more penetrating, and therefore more likely to be effective, for four reasons. First, the CWC compels unimpeded access to verify compliance unless a facility agreement or managed access procedures narrow access. By contrast, the NPT does not allow, within the treaty itself, for access beyond strategic points. Second, while OPCW inspectors may not "free-lance" or "meander"

throughout a facility, the CWC provides a lengthy list of inspectable places, including the plant's common infrastructure. By contrast, IAEA inspectors have to move from strategic point to strategic point, effectively ignoring parts of a facility that may hold evidence of non-compliance.

Third, the CWC explicitly gives inspectors the right to interview facility personnel, take photographs during inspections, have facility operations performed, and obtain access to all documents that the inspection team deems relevant. While IAEA safeguards agreements neither explicitly permit nor prohibit inspectors from performing these functions, inspectors typically have not exercised them. Fourth, the CWC provides a mechanism, within the routine inspection scheme, for the inspection team to seek access beyond that provided in facility agreements. By contrast, IAEA access beyond strategic points can be pursued only by exiting the routine inspection scheme, entering consultations and, presumably, invoking a special inspection.

New environmental sampling and analysis measures associated with NPT extended access could provide important information relating to detection of undeclared nuclear material, activities, or facilities. An IAEA program for environmental sampling can benefit from several provisions of the as yet untested CWC program. Detecting isotopic anomalies in vegetation, sediment, water (particularly effluent related) and soil samples collected from investigated sites represents a credible NPT monitoring approach. Collecting samples from facility storage containers, process lines, and plant hardware could also help detect clandestine nuclear activities. An effective modality governing IAEA sampling would likely include numerous provisions covering permissible inspection equipment, sample collection, handling and transport, duplicate samples, disposition of unused sample material, and quality assurance. The CWC and subsidiary documents contain many of these provisions.

Greater rights of access to information and locations within declared sites would increase transparency and openness in country-wide safeguards activities. Extended access to declared facilities should be viewed in tandem with proposals for expanded declarations. Requirements to provide additional information are nearly meaningless unless supported by on-site inspections, both initial and periodic, to assess the verity of those declarations. Thus, as with the CWC, the primary purpose of extended access during routine inspections would be to verify the accuracy of declarations. Proposals for extended access to declared sites should be consistent with, if not defined by, the need to verify declared information.

IV. INSPECTIONS OF UNDECLARED ACTIVITIES AND FACILITIES

It may be necessary to investigate whether a site, declared or not, is in compliance. The IAEA is considering approaches to extending the

access of IAEA inspectors to enhance its ability to detect activities in areas beyond strategic points within declared facilities and at facilities not declared under safeguards agreements. Of principal concern to the IAEA are two recognized shortcomings in its safeguards arrangements:

- 1) detecting declared nuclear facilities or material used to carry out undeclared nuclear activities to an extent not covered by current safeguards activities; and
- 2) detecting undeclared nuclear material, facilities, or activities or an undeclared nuclear fuel cycle entirely separate from a State Party's declared facilities.²⁴⁰

The previous section's discussion of routine inspections considered methods to detect activities by requiring inspections of newly declared facilities (assuming adoption of a system of expanded declarations) or by increasing the scope of inspection access at safeguarded facilities. It was suggested that access could be extended by subjecting more facilities, and more areas within facilities, to declaration and inspection requirements.

This section, by contrast, considers how access can be extended to areas that are neither covered by current safeguards agreements nor declared under a new and expanded reporting scheme. This section discusses how investigation of non-compliance would require authority to inspect "anywhere" or at least without regard to whether a site, or an area within a site, is declared. Accordingly, SAGSI has explicitly recommended consulting the CWC challenge inspection mechanism in order for the IAEA to enter into agreements (ideally based upon a model arrangement) with States Parties as to the limits of extended access.²⁴¹ The CWC's concept of managed access is particularly relevant since overly broad access to undeclared facilities or areas might jeopardize confidential business information (e.g., trade secrets or proprietary information) and militarily sensitive information.²⁴²

A. *NPT*

There are two principal means to obtain access to unsafeguarded facilities and activities. First, the IAEA could invoke its "special inspection" authority. There is controversy as to whether a broad interpretation

240. *SAGSI Report*, *supra* note 19, at 6.

241. *Id.* at 7.

242. *Id.* at 7, app. II-9. "The basic regime for extended access should contain mechanisms under which confidentiality can be protected." Government of Australia, "Extended Access" *Safeguards Inspections: An Informal Discussion Paper* 5 (1993).

of the IAEA's special inspection rights permits special inspections of undeclared sites or whether States Parties may refuse to grant access to these sites. Second, SAGSI has suggested that "extended access" inspections of undeclared sites and undeclared areas within declared sites be implemented supplemental to the IAEA's right of special inspection.²⁴³ This approach, possibly pursuant to a new model arrangement between the IAEA and States Parties, could proceed with less firm evidence of non-compliance than required for special inspections.

1. Resolving Questions of Non-compliance under Current NPT Safeguards: Special Inspections

Under the current NPT regime, the only way to obtain access beyond strategic points in safeguarded facilities is through the special inspection process. Inspections are considered "special" if they are conducted in addition to the routine inspection schedule, or if they involve access to information or locations beyond the access typically provided for routine or *ad hoc* inspections.²⁴⁴ Comprehensive safeguards agreements permit the IAEA to make special inspections: a) to verify the information contained in special reports; or b) if the IAEA considers that information made available by the State Party, including its explanations and information obtained from routine inspections, is inadequate for the IAEA to fulfill its responsibilities.²⁴⁵

The Director-General has asserted, and the Board of Governors has reaffirmed, that its special inspection rights under comprehensive safeguards agreements are not limited to declared nuclear material and facilities; therefore, IAEA rights under safeguards agreements are not limited by a state's declarations.²⁴⁶ However, the special inspection mechanism has never been used to gain access to undeclared nuclear material, facilities, or locations.²⁴⁷

The Director-General is authorized to determine the need for, and call for, special inspections. A State Party may request the Board of Governors, under the Provisional Rules of Procedure, to consider any urgent

243. SAGSI Report, *supra* note 19, at 5.

244. INFCIRC/153, *supra* note 1, ¶ 77.

245. *Id.* ¶ 73.

246. See BUNN, *supra* note 100; Scheinman, *supra* note 102; see also INFCIRC/153, *supra* note 1, ¶ 106(b) (defining a "facility" as "[a]ny location where nuclear material in amounts greater than one effective kilogram is customarily used").

247. This authority has never been exercised because the IAEA has never been presented with sufficiently specific information to suggest that a special inspection was needed. A special inspection could be based on sources other than safeguards inspections. See Scheinman, *supra* note 123, at 73-74 (describing the types of information that will be required).

matter arising out of Article XII.A.6 of the IAEA Statute. Presumably, the Board may then request the Director-General to initiate a special inspection.²⁴⁸ Notice for special inspections must be provided as "promptly as possible" after the IAEA has consulted with the State Party as to the degree of access.²⁴⁹

Access for special inspections will be as agreed to in consultations between the State Party and the IAEA,²⁵⁰ and the IAEA can gain access to areas of a facility only with the State Party's consent. Disagreements over rights of access between the IAEA and the State Party are resolved as are other disputes over the interpretation and application of safeguards agreements. The State Party may request that the Board of Governors consider a question arising out of a dispute (including disputes over access). If the matter is not settled by negotiation or other agreed-to means, either party may request that the dispute be submitted to an arbitral tribunal — the decision of which is binding.²⁵¹

If urgent action by the State Party is essential to ensure that safeguarded materials have not been diverted, the Board may call upon the State Party to "take the required action without delay," regardless of whether the dispute settlement procedures described above have been invoked.²⁵² If the State Party still refuses, the Board of Governors may find that the IAEA is "not able to verify that there has been no diversion," and report the matter to the United Nations Security Council and General Assembly.²⁵³ Additionally, the IAEA Board of Governors may (1) curtail or suspend assistance, or (2) suspend the non-complying State Party from the exercise of the privileges and rights of IAEA membership.²⁵⁴

Some commentators have suggested that a State Party does not have the right to refuse access for a special inspection. Accordingly, special inspections may not be refused because the requirement to seek "agreement with the State" cannot "be read as permitting a State to deny the

248. See PROVISIONAL RULES OF PROCEDURE OF THE BOARD OF GOVERNORS, Rule 11(c) (on file with authors).

249. INFCIRC/153, *supra* note 1, ¶ 83(b). Notification of arrival will usually be part of the consultations. See *id.* ¶ 77.

250. *Id.* ¶ 77.

251. *Id.* ¶¶ 21–22.

252. *Id.* ¶ 18. If the Board determines that granting access to Agency inspectors to carry out a special inspection was essential to establishing that there had been no diversion, the State could possibly be required grant such access without delay.

253. IAEA Statute, *supra* note 1, art. XII(C). These UN bodies will presumably be able to take all measures available to them under the UN Charter, including finding that a State Party's non-compliance is a threat to international peace and security and invoking appropriate collective action under Chapter VII of the Charter. See Szasz, *supra* note 63, at 116.

254. IAEA Statute, *supra* note 1, art. XII(C).

Agency access to information or locations necessary for the Agency to fulfill its obligations under the safeguards agreement but rather as recognition of the practical necessity of working in cooperation with the State."²⁵⁵ Alternatively, states have an "obligation to satisfy the verification authority that all material and facilities that should be reported and placed under safeguards in fact have been."²⁵⁶ This concept is supported by the fact that refusal to grant access for special inspections triggers a dispute resolution process where ultimate authority rests with the United Nations Security Council.

2. "Extended Access" Inspections

SAGSI has elaborated a four step procedure to obtain "extended access" based on the concept that the IAEA has or should have the power to carry out extended access inspections even if it does not request a special inspection at undeclared facilities or at undeclared locations within declared facilities. The four steps are:

Information gathering whereby the IAEA would attempt to gather new types of information from various sources.²⁵⁷

Information evaluation whereby the IAEA would analyze information on a continuing basis to search for indications of undeclared facilities and activities.

255. See Lawrence Scheinman, *The Current Status of IAEA Safeguards in A NEW NUCLEAR TRIAD: THE NON-PROLIFERATION OF NUCLEAR WEAPONS, INTERNATIONAL VERIFICATION AND THE INTERNATIONAL ATOMIC ENERGY AGENCY* (David Fischer et al., eds., 1992).

256. Scheinman, *supra* note 102, at 44 n.15 (1992); see also INFCIRC/153, *supra* note 1, ¶ 3 ("The Agreement should provide that the Agency and the State shall co-operate to facilitate the implementation of the safeguards provided for therein.").

257. This information could include: the results of environmental monitoring techniques; publicly available information (including media reports); information on the import/export of non-nuclear material and equipment; information on the import, export, and production of nuclear material; safeguards and non-safeguards information already in the IAEA's possession; and information provided by States Parties (including intelligence information and information gathered by national technical means). *Against the Spread of Nuclear Weapons*, *supra* note 123, at 17-18. For a complete discussion of the relevance of these types of information or measures, see *SAGSI Report*, *supra* note 19, app. II; see also IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 24-25 (describing "Programme 93+2" Task 5 and procedures for identifying and evaluating potential information sources).

"Clarifying the authority for special inspections is one thing; having the information upon which to predicate a call for such an inspection is another." Scheinman, *supra* note 102, at 44. Recognizing this fact, the IAEA has already established formal procedures to obtain information about suspect activities in NPT State Parties (including a special office to receive intelligence from states, setting up a database of published reports on undeclared activities, and systematically collecting the "observations" of IAEA inspectors). *Correspondence: The IAEA and Its Special Inspections*, ORBIS, Fall 1992, at 600 (response of Leonard Spector to a letter to the editor from David Fischer).

Consultations with the State whereby the IAEA would seek clarification from the State to resolve anomalies, inconsistencies with reports, or other possible indications of non-compliance.²⁵⁸ The State Party could clarify or explain the inconsistency without implying a right to refuse extended access.²⁵⁹

Site Inspection whereby the IAEA could obtain extended access based on procedures elaborated in arrangements with the State or some other legal mechanism, under two types of scenarios:

1) extended access to all facilities, both declared and undeclared, on a random, unpredictable, and possibly short notice basis. There would be no suspicion associated with these inspections,²⁶⁰ and

2) if consultations fail and the IAEA decides not to request a suspicion-based, short notice extended access inspection of undeclared areas of a declared facility or an undeclared facility, the IAEA can request a special inspection. Because this inspection would be premised on a suspicion of non-compliance, it would be much closer to CWC challenge inspections or NPT special inspections.

As to the first type of inspection, the IAEA would provide the state with a reason for the inspection. One purpose for these inspections could be "demonstrating the viability of, and thereby building confidence in, the procedures and arrangements" for newly developed extended access inspections.²⁶¹ To implement this approach, the IAEA would require the discretion to decide which forms of data or information to verify as well as the frequency and time of verification, thus making verification as unpredictable as possible.²⁶²

258. See INFCIRC/153, *supra* note 1, ¶ 77. These consultations would be separate from the consultations required for special inspections under INFCIRC/153-type safeguards agreements. Access to sensitive forms of information and access can also be negotiated between the State Party and the IAEA.

259. *SAGSI Report*, *supra* note 19, app. II-8. In SAGSI's estimation, if consultations would negate the effectiveness of inspections, this step can be omitted. At the very least, there should be a time limit for the consultation process so as not to unnecessarily delay the verification process and afford violative states an opportunity to conceal their activities. GOVERNMENT OF AUSTRALIA, *supra* note 242, at 4.

260. SAGSI has suggested that the IAEA consider making arrangements with States Parties to implement these inspections.

261. See *SAGSI Report*, *supra* note 19, at 7, app. II-10.

262. "[C]ontrary to the traditional approach, where all verifications foreseen must, in fact, be made, it would be up to the Agency to decide which verifications to perform among the increased quantity of verifiable data." *SAGSI Report*, *supra* note 19, at app. III-5. The Government of Australia has criticized such random inspections, in the absence of suspicion,

The second type of inspection would require consultation but would be based on suspicion of non-compliance. If questions remain after consultation, SAGSI recommends that the IAEA carry out inspections at the source of the compliance concern. These inspections would differ from NPT special inspections in that the IAEA would have obtained the State's generic consent to access beyond that provided in comprehensive safeguards agreements. Access would be very broad, including all areas of a declared facility as well as access to any site that might have nuclear material.²⁶³ Evidence of undeclared activity, if found, would be reported to the Board, presumably so that further action could be taken.

These inspections would differ from special inspections in three significant ways: (1) inspection procedures should commence with short notice to the State Party in order to prevent cleanup of the site or removal of incriminating equipment; (2) states would not have the right to refuse inspections aimed at resolving questions of possible non-compliance (i.e., undeclared activities); and (3) the grounds for seeking an inspection would fall short of the evidence that would authorize a special inspection.²⁶⁴

B. The CWC Challenge Inspection Scheme

CWC challenge inspections are perhaps the most dynamic recent arms control initiative. Article IX contains procedures to deal with compliance problems. These procedures represent progressively stronger steps, up to and including a challenge inspection, by which a State Party can resolve doubts as to another State Party's non-compliance.

CWC challenge inspections are noteworthy in seven respects. First, in addition to a consultative process to resolve a concern, any State Party (not the OPCW) can request a challenge inspection; once requested, it must proceed unless three-quarters of the Executive Council rejects the request. Second, since a challenge inspection proceeds with regard to "doubts about compliance," it insinuates suspicion. Third, the challenged State Party cannot rightfully refuse an inspection, but limited exceptions

as "unproductive," expensive, and unlikely to uncover undeclared activities. GOVERNMENT OF AUSTRALIA, *supra* note 242, at 3.

263. SAGSI Report, *supra* note 19, at app. III-8. A different IAEA formulation for extended access, described in IAEA Doc. GC(XXXVIII)/17, *supra* note 19, at 19, asserts that increased transparency, which will be tested in field trials, requires increased physical access and increased access to information. Increased access does not involve "literally, 'any time, any place,' without notice" but does involve very broad access within and outside declared facilities and within other locations identified in expanded declarations. *Id.*

264. SAGSI Report, *supra* note 19, at app. II-8. The Australian Government has suggested that a refusal to grant extended access be treated as grounds for a special inspection under INFCIRC/153 national safeguards agreements. GOVERNMENT OF AUSTRALIA, *supra* note 242, at 4.

exist that may narrow its scope. Fourth, a challenge inspection can be of any place, whether a declared facility or not. Fifth, CWC inspectors have greater capabilities to carry out inspection activities, including explicit authority to conduct environmental sampling. Sixth, an extensive modality known as "managed access" protects confidential and sensitive information. Seventh, and most significantly, the procedures to invoke and conduct a challenge inspection, and the obligations on all involved parties, are explicitly enumerated. The CWC regulates the following important subjects: (a) designation of inspectors; (b) contents of the inspection request; (c) methods to define the inspection site's perimeter, including time frames; (d) securing the site, exit monitoring, perimeter activities; (e) rights and obligations of the inspected State Party and the inspection team with regard to access, including managed access; (f) duration of inspection; and (g) preparation of the final report.²⁶⁵

1. Requests for Clarification

If concerns arise about non-compliance, States Parties should try to settle the problem through direct consultation and cooperation. Upon request, each State Party must, within ten days, provide information to satisfy another State Party's doubts about compliance. Any such efforts to resolve doubts do not affect the requesting State Party's rights and obligations, including the right to request a challenge inspection.²⁶⁶ A State Party may also ask the Executive Council to obtain clarification from another State Party by 1) forwarding the request to the relevant parties, or 2) having the Director-General establish a group of experts. If doubts remain, a State Party may request a special session of the Executive Council to consider the matter and recommend appropriate measures. If, after 60 days, the matter still has not been resolved, a State Party may request a special session of the Conference of States Parties to recommend measures to resolve the situation.²⁶⁷

2. Invoking Challenge Inspections

Each State Party may request an on-site challenge inspection, conducted by an inspection team designated by the Director-General, of any location in the territory or under the jurisdiction or control of another State

265. For a full list of the activities undertaken during a challenge inspection, see *Initial Report*, *supra* note 76, att. 1 (Illustrative List of Activities in Challenge Inspection).

266. CWC, *supra* note 24, art. IX, ¶¶ 2-3.

267. *Id.* art. IX, ¶¶ 3-7.

Party.²⁶⁸ The right to request a challenge inspection is independent of the above-discussed procedures for clarifying doubts through direct consultation and cooperation procedures. In significant contrast to the NPT, therefore, a CWC State Party (not the OPCW) can initiate a challenge inspection simply on the basis of its own doubts about another State Party's compliance. The requesting State Party must keep its request within the scope of the CWC and provide "all appropriate information on the basis of which the concern has arisen,"²⁶⁹ including specification of the CWC's relevant provisions and identification of the site to be inspected. The challenge inspection may be stopped only if three-quarters of the Executive Council deem the request frivolous (the concerns are minor irregularities or excessively technical), abusive (the concerns are artificial or intended to harass), or clearly beyond the CWC's challenge inspection provisions.²⁷⁰ The requested State Party may not refuse the inspection.

3. Inspectors

The inspectors eligible for challenge inspections are those already designated for routine inspections, thus avoiding additional financial burden and offering the necessary qualification, experience, skill and training. The Director-General will specially designate the identity and number of inspectors for each challenge inspection. Nationals of the requesting and the inspected State Party may not be inspectors.²⁷¹ The requesting State Party may, however, send an observer if the inspected State Party agrees. If the inspected State Party refuses, that fact must be recorded in the final report. The observer will have the same rights of arrival and access to the inspection site as the inspection team, and shall be kept informed and make recommendations as to the conduct of the inspection. In addition, the inspected State Party must provide necessary amenities for the observer.²⁷²

4. Preparations for a Challenge Inspection

The Director-General must notify the inspected State Party and the Executive Council of the inspection site's location not less than 12 hours

268. *Id.* art. IX, ¶ 8. Article IX conspicuously does not authorize the OPCW to invoke a challenge inspection.

269. Verification Annex, *supra* note 24, pt. X, ¶ 4(d).

270. CWC, *supra* note 24, art. IX, ¶ 17; *see also* KRUTZSCH & TRAPP, *supra* note 95, at 189-91.

271. Verification Annex, *supra* note 24, pt. X, ¶¶ 1-2.

272. CWC, *supra* note 24, art. IX, ¶ 12; Verification Annex, *supra* note 24, pt. X, ¶¶ 53-56. The observer is also entitled to basically the same privileges and immunities as members of the inspection team. *Id.* pt. II, ¶ 16.

before the inspection team's planned arrival at the point of entry. The requesting State Party must designate this site as specifically as possible by providing a site diagram that specifies the requested perimeter.²⁷³ The inspected State Party must transport the inspectors to the final perimeter within 24 hours if the site is a declared facility or 36 hours if it is an undeclared facility.²⁷⁴

If the inspected site is undeclared, the CWC contains an intricate process to determine its final perimeter.²⁷⁵ Upon its arrival at the perimeter, the inspection team may secure the site and begin perimeter activities, including: identifying vehicular exits, making traffic logs, taking photographs, video-recording exits and exit traffic, using appropriate monitoring instruments, taking samples, and conducting additional activities as agreed with the inspected State Party. These procedures may continue for the inspection's duration, but may not unreasonably hamper or delay the facility's normal operation.²⁷⁶

5. Conduct of a Challenge Inspection

The inspected State Party must make every reasonable effort to demonstrate its compliance with the CWC. To this end, it must provide access within the perimeter on a managed access basis (as discussed below) within 108 hours after the inspection team's arrival at the point of entry. If requested, the inspected State Party may provide aerial access to the inspection site.²⁷⁷ Following a safety and logistical briefing, the inspection team must prepare an initial inspection plan.²⁷⁸

The extent of access varies depending on the type of facility. For declared facilities with facility agreements, access must be unimpeded within the agreed boundaries. For declared facilities without facility agreements, access will be negotiated according to the CWC's general

273. Verification Annex, *supra* note 24, pt. X, ¶¶ 4-7, 10.

274. *Id.* pt. X, ¶¶ 13-15.

275. The requesting State Party must specify the requested perimeter, subject to enumerated conditions. If that perimeter is acceptable to the inspected State Party, it becomes the final perimeter. If the inspected State Party objects, it may specify an alternative perimeter within 24 hours from the inspection team's arrival at the point of entry. The inspection team and the inspected State Party will negotiate the final perimeter in two phases: at the point of entry and at the alternative perimeter. If no agreement is reached within 72 hours of the arrival of the inspection team at the site, the alternative perimeter will be designated as the final perimeter. *Id.* pt. X, ¶¶ 8, 16-21.

276. *Id.* pt. X, ¶¶ 23-31.

277. *Id.* pt. X, ¶¶ 38-40. Aerial access complements ground access to the inspection site and is not an alternative to it. KRUTZSCH & TRAPP, *supra* note 95, at 487.

278. Verification Annex, *supra* note 24, pt. X, ¶¶ 32-34.

inspection guidelines.²⁷⁹ Access must be granted to the greatest degree “taking into account any constitutional obligations [the State Party] may have with regard to proprietary rights or searches and seizures.”²⁸⁰ Those limitations may not be invoked to conceal evasion of CWC obligations nor to engage in prohibited activities; if invoked, the inspected State Party must make every reasonable effort to provide alternative means to clarify the non-compliance concern that generated the challenge inspection.

Procedures are expressly provided for collecting samples as are the constraints associated with their analysis and disposition. At declared facilities with facility agreements, sampling outside the final perimeter is subject to managed access. The inspection team may request the inspected State Party to collect samples from within the final perimeter in the presence of inspectors, or the inspectors may collect samples directly if the inspected State Party consents.²⁸¹ Analysis of samples collected during challenge inspections under managed access is restricted “to the presence or absence of chemicals listed in Schedules 1, 2, and 3 or appropriate degradation products” that would indicate noncompliance.²⁸² Under provisions for securing the site and monitoring exits, inspectors may take wipe, air, soil, and effluent samples outside the site.²⁸³ Sample analysis and use of “chemical evidence equipment” are permitted as part of monitoring vehicular traffic exiting the secured challenge inspection site.²⁸⁴

While challenge inspections are relatively unconstrained, the inspection team may use only those methods necessary to provide sufficient relevant facts to clarify the non-compliance concerns. The inspection team cannot seek nor document information clearly unrelated to the compliance concerns. It should conduct the inspection in the least intrusive manner possible, proceeding to more intrusive procedures only as it deems necessary.²⁸⁵

279. *Id.* pt. X, ¶ 51.

280. *Id.* pt. X, ¶ 41.

281. *Id.* pt. II, ¶ 52.

282. *Id.* pt. X, ¶ 48(e).

283. *Id.* pts. II, ¶¶ 52–58, X, ¶ 36.

284. *Id.* pt. X, ¶¶ 24, 27. Entering traffic as well as personnel passenger vehicles exiting the site cannot be monitored. *Id.* pt. X, ¶ 30. Part XI of the Annex, dealing with allegations of use of chemical weapons, as with Part X on challenge inspections, permits sample taking, including samples from environmental media of air, soil, vegetation, water, and snow. In investigations of alleged use, the detailed procedures and protections associated with managed access and delineation of a perimeter would not apply. Sample taking in alleged use, however, would draw on the general inspection rules pertaining to sampling.

285. *Id.* pt. X, ¶¶ 44–45.

6. Protection of Confidential Information During Challenge Inspections/Managed Access

"Managed access" is an important process to limit the scope of certain activities performed during challenge inspections in order to protect sensitive equipment, information, or areas unrelated to chemical weapons.²⁸⁶ Accordingly, an inspected State Party may take measures necessary to protect sensitive installations and prevent disclosure of confidential information, including: (a) removal of sensitive papers from office spaces; (b) shrouding sensitive displays, stores, and equipment; (c) shrouding sensitive equipment, such as computer or electronic systems; (d) logging off computer systems and turning off data indicating devices; (e) restriction of sample analysis to detect the presence or absence of chemicals listed in Schedules 1, 2, and 3 or appropriate degradation products; (f) using random selective access techniques whereby the inspectors may select a given percentage or number of buildings of their choice to inspect — the same principle can apply to the interior and content of sensitive buildings; and (g) in exceptional cases, giving only individual inspectors access to certain parts of the inspection site.²⁸⁷

The inspected State Party must reasonably try to provide alternative means to clarify the possible non-compliance that generated the challenge inspection. Furthermore, it must reasonably try to demonstrate to the inspection team that any object, building, structure, container, or vehicle to which full access is not granted, or which is protected in the above manner, is not used for purposes related to the non-compliance concerns. This may be accomplished by means of, *inter alia*: (a) partial removal of a shroud or environmental protection cover, at the discretion of the inspected State Party; (b) a visual inspection of the interior of an enclosed space from its entrance; or (c) other methods.²⁸⁸ Regardless of the limitations negotiated at this stage, if the inspection team finds evidence of non-compliance, it will not be bound to the managed access agreement.²⁸⁹

7. Post-Inspection Activities

The inspection must not exceed 84 hours unless the inspected State Party agrees to an extension. Upon completion of the inspection, the

286. *Id.* pt. X, ¶ 47.

287. *Id.* pt. X, ¶ 48.

288. *Id.* pt. X, ¶¶ 49–50.

289. KRUTZSCH & TRAPP, *supra* note 95, at 491.

inspection team and the observer must leave the inspected State Party's territory in the minimum time possible.²⁹⁰

The inspection team's report will summarize its activities and findings, particularly with regard to the concerns regarding CWC non-compliance that prompted the request. It must also assess the degree of access and cooperation granted to them. A draft report, subject to the provisions of the CWC Confidentiality Annex, will be circulated to the requesting State Party, the Executive Council, and the inspected State Party. The inspected State Party may identify information unrelated to chemical weapons that, due to its confidentiality, should not be circulated outside the Technical Secretariat. A final report is due within 30 days of the completion of the challenge inspection.²⁹¹

The Executive Council must then address whether any non-compliance has occurred, whether the request has been within the scope of the CWC, and whether the challenge inspection request was abusive. The Executive Council may take further appropriate actions to ensure CWC compliance or may make specific recommendations to the Conference.²⁹² The Conference will take the necessary measures, including restricting or suspending a State Party's rights and privileges under the CWC, or may recommend collective measures even to the point of referring the matter to the United Nations.²⁹³

C. Options to Strengthen NPT Verification — Investigating Non-Compliance

The CWC provides numerous options that the IAEA may wish to exercise as part of its special inspection authority or include in a model arrangement for extended access.

1. Explicit Consultation and Clarification Procedures

Providing an opportunity for a satisfactory diplomatic resolution of a compliance concern is an important component of investigating compliance. The CWC's consultation and clarification procedures permit States Parties to address their differences, either bilaterally or with the OPCW's help, before resorting to a challenge inspection. While the NPT allows for

290. Verification Annex, *supra* note 24, pt. X, ¶¶ 57–58.

291. CWC, *supra* note 24, art. IX, ¶ 21; Verification Annex, *supra* note 24, pt. X, ¶¶ 59–61.

292. For instance, if the inspection request is subsequently deemed abusive, the Executive Council will examine whether the requesting State Party should bear some of the inspection's costs. CWC, *supra* note 24, art. IX, ¶¶ 22–25.

293. *Id.* art. XII, ¶¶ 2–4.

a process of consultation for special inspections, the appropriate modalities are not explicit, rendering that process less amenable to fact-finding than the CWC process. The IAEA could allow States Parties and the IAEA to address possible compliance concerns which might avert politically damaging accusations and could provide an avenue for resolution without the intrusion of special or extended access or inspections.

2. State Party Invocation of Inspections

The CWC empowers each State Party to call for a challenge inspection on its own authority. In contrast to the IAEA, the OPCW does not have express authority to invoke a challenge inspection, although the Executive Council can prevent it by a three-quarters vote. While full NPT adoption of the CWC's invocation process may be inappropriate and should not limit the IAEA's authority to call for a special inspection, empowering individual states to initiate the special or extended access inspection process may strengthen the regime by giving States Parties a greater stake in membership.

CWC challenge inspections are, by definition, accusatory and will likely stigmatize the challenged State Party. The same can be said of NPT special inspections. Indeed, special inspections may create even greater turmoil than a challenge inspection because the consequences of a clandestine nuclear weapons program are so grave. As formulated, "extended access" inspections will not necessarily insinuate wrongdoing. This departure from the CWC approach may be preferred, and the IAEA might consider a less accusatory format given the sensitive political environment that surrounds NPT inspections.

3. Non-refusable Special Inspections

CWC States Parties may not refuse a challenge inspection of a facility, declared or otherwise. While some commentators have claimed that non-refusability applies to NPT special inspections, past practice indicates that States Parties have had the right to refuse special inspections.²⁹⁴ The IAEA could include an obligation to accept inspections in any future verification arrangements. This idea already has support: "In no circumstances would the State have the right to refuse inspections aimed at the resolution of questions about possible undeclared activities."²⁹⁵

294. See FISCHER, *supra* note 18, at 72-73.

295. SAGSI Report, *supra* note 19, at app. II-8.

4. Right of Access to Undeclared Sites

The most innovative, and controversial, aspect of challenge inspections is the OPCW's explicit right of access to "any facility or location." While the IAEA has claimed a right of access to undeclared sites under the NPT's special inspection procedures, national safeguards agreements do not explicitly grant it. Even if the IAEA has this right, it can be invoked only pursuant to consultations whereas the CWC requires States Parties to grant access. This capability to investigate sites even if not safeguarded or declared is crucial to discovering clandestine operations that are wholly outside a State Party's network of declared nuclear processes. To protect states against harassment, if the IAEA considers a similar capability, CWC mechanisms for Executive Council rejection of frivolous or bogus requests, coupled with the threat of requiring a requesting State to pay the costs of bogus inspections, could be a model.

5. Specification of Inspection Procedures and Powers of Inspectors

The CWC specifies procedures and grants inspectors powers that the NPT could emulate, including: requirements for a detailed inspection request; a means to define the inspection perimeter; activities related to securing the site (e.g., inspecting vehicles and monitoring traffic); and perimeter activities (e.g., taking samples from various media). While these specific powers are appropriate to the exigencies of a challenge inspection, it might be logical to consider adoption of the CWC's inspection powers for challenge inspections in light of the options for strengthening routine inspections discussed in Section III.

6. Increased Protection of Confidential Information

The CWC's procedures for managed access negotiations and to protect confidential information offer important lessons for limiting the scope of access that may be transferable to the NPT context. Because of the sensitivity of inspecting nuclear-related facilities, NPT States Parties subject to special or "extended access" inspections would appreciate, if not demand, inclusion of a credible plan to limit access that protects confidential information irrelevant to the verification task. States may be less likely to resist inspection of undeclared sites if confidential information is adequately protected. Presumably, protection of confidential information is a suitable subject for special inspection consultations, yet an obligatory plan to limit exposure of this information is absent in safeguards agreements. The IAEA could consider how managed access-type procedures could enhance the acceptability of additional inspection

measures, thereby increasing the cooperation from States Parties and improving the effectiveness of extended access verification. Consultations prior to extended access inspections could take cognizance of sensitive information, and the State Party and the IAEA could negotiate access to the facility or information such that confidentiality is not compromised.

7. Specification of Special Inspection Procedures and Powers

A crucial distinction between CWC challenge inspections and NPT special inspections (as well as contemplated "extended access" inspections) is that the CWC explicitly specifies at great length what activities may be undertaken, by whom, and with what limitations. NPT procedures to be followed during special inspections are not elaborated to nearly the degree of CWC challenge inspections. Arguably, IAEA inspectors have similar rights and powers, but the lack of strict rules undermines confidence that compliance concerns can be efficiently and even-handedly investigated. If new arrangements are negotiated, the IAEA could adopt the CWC approach by clearly defining the range of facilities that can be inspected and the procedures to be followed. This specificity would not limit inspection activities but would provide the aegis for greater flexibility.

V. CONCLUSION: LEGAL IMPLEMENTATION OF NEW APPROACHES

The discovery of would-be proliferants and the emergence of sub-state actors with nuclear ambitions highlights the need to strengthen the detection and prevention capabilities of nuclear non-proliferation mechanisms. Accordingly, the IAEA should be properly equipped and authorized to confirm compliance with NPT safeguards obligations and to identify states that threaten international security. The IAEA has acknowledged this imperative and has initiated an extensive plan of action. Due to experiences with Iraq and North Korea, the IAEA has proposed several mechanisms to improve the efficacy of comprehensive safeguards. This article has discussed an important element of that plan — enhancing the IAEA's capability to detect illicit activities and facilities through application of some of the verification techniques provided by the recently concluded CWC.

Comparison of the NPT and the CWC reveals three underlying principles that deserve special note. First, both regimes share a nearly identical overall approach to verification, each consisting of three elements:

- a scheme of record keeping and reporting of critical materials which forms the verifiable basis of the regime;

- a system of initial and routine inspections of plant sites and locations therein that are declared to have those critical materials; and
- a mechanism to permit inspections of sites that raise compliance concerns.

Second, despite employing the same verification methodology, the NPT and the CWC regimes have distinctive verification objectives due mainly to differences in the materials and activities of concern. The result is a remarkably stringent system of material accountancy under the NPT and broad-based declaration and inspection requirements under the CWC.

Third, this article has stressed that, with respect to every element of verification, the CWC is much more explicit and comprehensive in setting out specific requirements and inspector powers. This clear enumeration of rights and obligations in a single document contrasts sharply with the NPT regime where critical requirements are split among multiple, legally significant documents, often with less clarity and detail. This lack of specificity has not hindered IAEA verification efforts in heavily industrialized States Parties with no nuclear weapons aspirations. However, States Parties less agreeable to the IAEA's non-proliferation mandate can and may seize upon ambiguity to hinder verification.

This discussion has revealed numerous areas where the CWC's verification scheme might be instructive, resulting in a lengthy list of options and alternatives to improve NPT safeguards. Specifically, the options for the NPT suggested by the CWC are: (1) establish an expanded declarations scheme to apply to a greater number of substances, equipment, and activities than are currently subject to comprehensive safeguards; (2) elaborate a routine inspection scheme to cover these newly declared facilities and additional activities within safeguarded facilities, including a risk-based modality to determine the frequency and intensity of these inspections; (3) strengthen the effectiveness of routine inspections at currently safeguarded facilities and at newly declared sites by addressing inspector issues and enlarging the scope of inspections; and (4) establish a suspicion-based inspection scheme to gain access to undeclared sites, using either current special inspection authority or pursuant to a newly-formed scheme for extended access.

A. Methods of Implementation

It is appropriate to briefly consider three methods to implement these new approaches from the CWC in the NPT context. First, the IAEA could pursue new measures by interpreting its authority under INFCIRC/153 safeguards agreements, but without reopening those agreements. Second,

the IAEA Board of Governors could, under its statutory authority, mandate new measures beyond those currently embodied in INFCIRC/153. Third, new measures could be adopted by negotiating a new, supplemental arrangement for verification measures without changing or reopening INFCIRC/153 safeguards agreements.

1. Interpret INFCIRC/153 Safeguards Agreements

Existing NPT safeguards agreements based on INFCIRC/153 may authorize implementation of various new measures. Provisions for enhancing verification with respect to designation of inspectors, logistic and other support, and privileges and immunities clearly may be implemented by a Board of Governors interpretation of INFCIRC/153 paragraphs 9, 10, 85 and 86.²⁹⁶ Through similar logic, it may be possible for a Board of Governors directive to require better preparation for inspections through enhanced notification requirements, more precise stipulation of entry and transportation mechanisms, and even pre-inspection briefings. These options, which do not go to the core of the verification scheme, are consistent with the existing structure; therefore, their implementation may be permissible through the IAEA's discretionary authority.

Extending the scope of IAEA access, by contrast, may be less appropriate for implementation through a directive pursuant to INFCIRC/153. Mandating an expanded declarations scheme and, concomitantly, extending required routine inspections to newly declared facilities and additional activities within safeguarded facilities might exceed the IAEA's heretofore recognized unilateral authority under INFCIRC/153. Similarly, an extensive environmental monitoring program at locations other than already-safeguarded strategic points may require a new agreement. However, the IAEA could commence a scheme for expanded declarations or access that could establish a precedent for those procedures which, over time, could become an accepted exercise of NPT safeguards authority.

INFCIRC/153 national safeguards agreements contain a consultation mechanism that may enable inspectors to conduct "special inspections" of areas in addition to the access allowed for routine inspections.²⁹⁷ While most recent commentary indicates support for a broad reading of the power to inspect undeclared sites, such authority necessarily remains subject to the consultative process that ultimately falls back upon the

296. See *United States Comments*, *supra* note 203.

297. The IAEA "may make inspections in addition to the routine inspection effort . . . and may obtain access in agreement with the State to information or locations in addition to the access specified . . . for *ad hoc* and routine inspections." INFCIRC/153, *supra* note 1, ¶ 77.

dispute resolution mechanisms in paragraphs 21 and 22 of INFCIRC/153. Accordingly, the IAEA may already have the right, subject to consultation, to seek access to undeclared areas within safeguarded sites and to undeclared sites pursuant to INFCIRC/153.

2. Apply Measures Under the IAEA Statute

The IAEA Statute could be interpreted to permit the Board of Governors to mandate verification measures without renegotiating the IAEA Statute, the NPT, or individual safeguards agreements. Article III (A)(5) of the IAEA Statute provides in relevant part:

A. The Agency is authorized:

5. To establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State's activities in the field of atomic energy.

Furthermore, Article XII (A)(6) of the Statute provides in relevant part:

A. With respect to any Agency project, or other arrangement where the Agency is requested by the parties concerned to apply safeguards, the Agency shall have the following rights and responsibilities to the extent relevant to the project or arrangement:

6. To send into the territory of the recipient State or States inspectors who shall have access at all times to all places and data to any person who by reason of his occupation deals with materials, equipment, or facilities which are required by this Statute to be safeguarded, as necessary . . . to determine whether there is compliance with any conditions prescribed in the agreement between the Agency and the State or States concerned.

The question arises as to how, in light of these provisions, the IAEA may implement any of the new approaches found in the CWC. Article XII(A)(6) bestows on the IAEA extensive inspection authority to verify the agreements over which the IAEA has jurisdiction.²⁹⁸ However, the

298. See FISCHER, *supra* note 18, at 72. In particular, section 7 of INFCIRC/153 may condition safeguards agreements on States Parties' commitment to "establish and maintain a

extent of the IAEA's power to implement new measures solely by resort to the authority of its Statute is limited by the requirement that such authority may be exercised only with regard to any IAEA project or safeguards arrangement. Because the IAEA interprets a safeguards agreement as an "agreement" under Article XII(A)(6), this inspection right can be read to be available to verify compliance under a safeguards agreement.²⁹⁹ The point here is that additional access can be "relevant" to the arrangement even if it is not specifically authorized under that arrangement.

The key legal question raised by the possibility that Article XII(A)(6) can be invoked to justify new measures is how it coexists with the inspection provisions of safeguards agreements negotiated pursuant to INFCIRC/153. One view holds that INFCIRC/153 "whittles down" the IAEA's authority to verify compliance. In this formulation, Article XII(A)(6) has, in effect, been defined to permit only the specific types of inspection provided in the safeguards agreements negotiated under INFCIRC/153.³⁰⁰ However, if Article XII(A)(6) can be interpreted as being legally unaffected by subsequent safeguards agreements, then this verification authority can be regarded as independent of the *ad hoc*, routine, and special inspections provided for in safeguards agreements under INFCIRC/153.³⁰¹ A consequence of this conclusion might be that the IAEA Board of Governors could prescribe additional verification measures without amending existing safeguards agreements or negotiating new verification arrangements.³⁰²

No clear answer exists to this question. The strongest legal argument in favor of broad Article XII(A)(6) authority is that its plain meaning is

system of accounting for and control of all nuclear material subject to safeguards." See generally BUNN, *supra* note 100.

299. See *Strengthening of Agency Safeguards*, att. 1, at 5 n.3, IAEA Document, GOV/2554 (Nov. 12, 1991).

300. See Szasz, *supra* note 63, at 105-06.

301.

One possible approach to [the question of access during IAEA inspections] would be for the Board of Governors to issue an interpretation of the relevant provisions of INFCIRC/153, stipulating that nothing in a safeguards agreement can derogate from the rights a State grants to the IAEA when that State ratifies, and hence undertakes as a treaty obligation, the IAEA Statute.

United States Comments, *supra* note 203, at 3.

302. Cf. *The Agency's Inspectorate*, *supra* note 187, which includes extensive inspection authority in article III, ¶ 9 of its Annex, but which specifies at paragraph 3 that these provisions "are not mandatory." Presumably, absent such a limitation, analogous arrangements could be made so.

expansive and grants extremely intrusive inspection authority³⁰³ to the IAEA.³⁰⁴ However, the IAEA has never invoked its statutory authority to conduct verification activities besides those specified in safeguards agreements,³⁰⁵ and, thus, the meaning may be more constrained than it appears.³⁰⁶ Moreover, since Article XII(A)(6) only speaks to the right of inspection, the extent to which it authorizes a new scheme of expanded declarations is unclear. It only provides that inspectors may have access to places, data, and persons to verify "conditions prescribed in the agreement." To the extent that expanded declarations would constitute those underlying conditions, they must be authorized elsewhere — perhaps in the safeguards agreements themselves or pursuant to a new arrangement.

With respect to current safeguards agreements, Article XII(A)(6) could authorize new measures for designating, processing, protecting, or supporting IAEA inspection teams. It could also justify more specific preroutine inspection procedures, such as more informative inspection notices and more explicit inspector transport requirements. Similarly, Article XII(A)(6) could authorize an environmental sampling program. Finally, if expanded declarations are implemented through a new arrangement rather than under existing safeguards agreements, a broad interpretation of Article XII(A)(6) might even authorize a more extensive routine inspection system to verify those expanded declarations, including access to newly declared areas in safeguarded facilities or to newly declared facilities.

3. New Model Arrangements

Negotiating a new arrangement or an optional protocol to INFCIRC/153 safeguards agreements to implement various of the verification measures discussed in this article may have several benefits. First, arrangements may be necessary for any measures that the IAEA lacks the

303. An issue requiring further analysis is how to implement Article XII(A)(6) inspections at sites that are neither safeguarded nor newly declared consistent with the special inspection procedures in INFCIRC/153.

304. See Vienna Convention on the Law of Treaties, May 23, 1969, art. 31(1), 155 U.N.T.S. 331, 8 I.L.M. 679. The United States has not ratified this treaty.

305. Furthermore, if the negotiating record for the NPT or for national safeguards agreements indicates that the IAEA reached understandings with various States Parties that the only inspections permitted would be those specified in national safeguards agreements, it would tend to establish that any ambiguity should be resolved against application of Article XII(A)(6) inspection authority. "The major industrial non-nuclear-weapon states, whose ratification of the NPT was essential if it was to be a meaningful treaty, did not want to give foreign inspectors the right to roam around freely on their territory." FISCHER, *supra* note 18, at 72.

306. See Vienna Convention on the Law of Treaties, *supra* note 304, art. 31(3).

unilateral authority to mandate. Second, a new arrangement negotiated between the IAEA and States Parties, based on a comprehensive model arrangement that can be presented to all States Parties and to which States Parties consent in advance, could provide for a clearly defined and non-refusable set of verification measures, including those discussed herein. Third, if a new arrangement is successfully implemented by numerous States Parties, its requirements will become standard IAEA practice which could be applied to less cooperative States Parties that have not agreed to the new arrangement. Such a document would have to build on and avoid contradiction with existing INFCIRC/153 safeguards agreements, and its elaboration should include the participation of as many States Parties as possible to enhance its acceptability.

B. Areas of Further Inquiry

This article has not explicitly recommended any single course of action, but it suggests the merits of analyzing some issues more in-depth and developing a framework for their implementation. Substantial work remains on many of the important elements of the IAEA's and SAGSI's plan for improving safeguards. While this article has attempted to lend contours and greater understanding to many of the IAEA's or SAGSI's proposals, and has addressed the benefits and pitfalls of adopting particular methodologies, details critical to their implementation have not yet been addressed.

For example, with respect to the concepts of "expanded declarations" and enhancing the breadth and effectiveness of the NPT routine inspection regime, several questions remain unanswered. What relevant non-nuclear materials should be subject to new declaration requirements? What types of dual-use technologies should be declared? What newly declared items or facilities should be subject to routine inspections? Which CWC-like inspection procedures and techniques to increase inspectors powers and access are most suitable for the NPT? This article has also analyzed CWC challenge inspection requirements with reference to the IAEA's stated objective of obtaining access to undeclared activities and facilities through the principle of "extended access." However, adopting such a complex scheme, given all of its political and practical implications, requires more thorough analysis. Important issues concerning the adaptability of managed access procedures to the NPT context, the financial implications of maintaining an "extended access" capability, and the additional powers to be granted inspectors, among others, must be addressed.

It is also important to note that implementing new NPT verification measures has potential legal consequences that require examination. The legal implications of extensive and intrusive verification activities have

already been thoroughly analyzed in regard to the CWC, and implementation measures have been suggested to mitigate any possible transgressions of protected rights.³⁰⁷ In adopting analogous verification activities under the NPT, potential legal hurdles should be considered. The most pressing set of legal problems derives from the possibility that NPT inspections, currently limited to a small number of government-owned or highly regulated private facilities, could take place at many more sites, including some commercial facilities that are less regulated.

If the NPT regime implements new measures resembling the CWC's more penetrating verification activities, then intrusive inspections of newly declared privately operated commercial facilities (in addition to government-operated or extraordinarily regulated installations) could threaten protected privacy rights. The right to personal privacy is universally acknowledged, and virtually every nation's laws explicitly protect it.³⁰⁸ Commonly, privately-owned regulated entities must tolerate on-site inspections to verify that they comply with their legal obligations so long as an inspection proceeds with a search warrant issued by a judge or administrator.³⁰⁹ Yet, the CWC does not — and presumably new NPT measures would not — countenance such a requirement. While IAEA inspectors presumably will give advance notice to representatives of the State Party, this notice will not necessarily be extended to the owner or operator of a private facility subject to inspection.

307. See generally B. KELLMAN, D. GUALTIERI, E. TANZMAN, AND W. GRIMES, MANUAL FOR NATIONAL IMPLEMENTATION OF THE CHEMICAL WEAPONS CONVENTION (1993) [hereinafter CWC MANUAL]; Kellman, Tanzman, Gualtieri, and Bassiouni, *A Comparative Study of the Legal Implementation of the Chemical Weapons Convention in Foreign Jurisdictions* (DNA-TR-93-59) (1993).

308.

This right appears in the European Convention on Human Rights, the Inter-American Human Rights system, the United Nations Norms and Standards, and the African Charter on Human and Peoples' Rights. Article 12 of the United Nations Universal Declaration of Human Rights provides "No one shall be subject to arbitrary interference with his privacy, family, home or correspondence, no[r] to attacks upon his honor and reputation." Similarly, Article 17 of the International Covenant on Civil and Political Rights provides "No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, no[r] to unlawful attacks o[f] his honor and reputation."

See CWC MANUAL, *supra* note 307, at 57.

309. Various justifications exist for subjecting industries to administrative regulation and inspection, including the promotion of public health, taxation and fiscal matters, safety, security, and morality. For example, industries that pollute or impact the environment are typically subject to regulation and inspection. Similarly, many countries require inspections of facilities that handle hazardous substances. Notably, industries related to arms production and defense are typically subject to inspections.

The potential dilemma for States Parties is that any legal limit to NPT inspections, including a requirement for a search warrant, could impede NPT verification and thereby contravene its requirements. A search warrant requirement could impermissibly delay inspectors or limit the scope of inspections in a manner inconsistent with the new measures. In some states, requiring warrants could raise the possibility that NPT inspection requests may be denied altogether. To ameliorate the potential difficulties, new NPT inspections of commercial facilities, like those under the CWC,³¹⁰ should be incorporated into the system of administrative regulation that, in many states, subjects industrial facilities to inspections while protecting privacy rights in a way that does not obstruct effective verification.³¹¹

Verification activities pursuant to either the CWC or the NPT also present several situations that could threaten confidential business information (CBI), including trade secrets and other proprietary business-related data. This is a primary concern of industries worried that arms control reporting obligations and on-site inspections may result in CBI loss.³¹² Many of the same technologies that comprise nuclear weapons also have important commercial applications; control of these dual use technologies demands the regulation of highly competitive, leading industries that have invested massively in research and development. Retaining the technical knowledge that is the fruit of that investment is essential to these firms in order to recoup their investment and make a profit.

Most nations legally protect CBI, although the source of that protection varies. Many countries recognize CBI as property that the government cannot take without due process of law and unless just compensation is paid to the owner.³¹³ In general, protection of CBI depends upon the

310. Compare CWC, *supra* note 24, art. VII, ¶ 1 ("Each State Party shall, in accordance with its constitutional processes, adopt the necessary measures to implement its obligations under this Convention.") with INFCIRC/153, *supra* note 1, ¶ 3 ("The Agreement should provide that the Agency and the State shall co-operate to facilitate the implementation of the safeguards provided for therein.") and with IAEA Statute, *supra* note 1, art. IV(C) ("The Agency is based on the principle of the sovereign equality of all of its members, and all members, in order to ensure to all of them the rights and benefits resulting from membership, shall fulfill in good faith the obligations assumed by them in accordance with this Statute.").

311. CWC MANUAL, *supra* note 307, at 62, 99-101.

312. CBI includes any information that gives its holder a commercial advantage because it is not widely known to competitors or the general public. CBI can consist of either technical or non-technical forms of information, including formulas, patterns, compilations, programs, devices, methods, techniques, drawings, processes, financial data, price codes, customer lists, economic studies, cost reports, and bookkeeping methods. See Kellman, *supra* note 83.

313. CWC MANUAL, *supra* note 307, at 74-75. Unlike patents, copyrights, and trademarks, domestic statutes often do not recognize CBI. In the absence of statutory protection, CBI is protected under a patchwork of legal doctrines. In nations where CBI is not specifically recognized as property, its unauthorized disclosure may be prohibited by laws relating to

careful handling of the information by its owner and those obligated to maintain its confidentiality.³¹⁴ States Parties can take some basic precautions to limit CBI disclosure during verification activities. Disclosure of information could be limited to the bare minimum required by the NPT regime, taking care not to unnecessarily transmit confidential information to the IAEA. Second, governments could enact domestic statutes to preserve the confidentiality of CBI and forbid all disclosures not statutorily authorized.

C. Concluding Observations

This article focuses on how IAEA verification authority may be extended to apply to: more materials and technologies, more areas within already safeguarded facilities, more sites currently not covered by national safeguards agreements, and sites that are not declared under national safeguards agreements nor under expanded declarations.

Implementing substantial changes to the NPT regime (such as creating an “expanded declarations” scheme, increasing the amount of routine inspections, or adopting “extended access” inspections) will, as discussed above, probably require an extensive and detailed arrangement between the IAEA and States Parties. An indispensable step in that process is the drafting of a model arrangement similar to INFCIRC/153, ideally with the participation of as many States Parties as possible. Analytical work should begin as to which options and alternatives should be included in any such arrangement.

Transcending all of this article’s technical detail is the principle that the process of improving NPT safeguards must begin by identifying the norms of verification that have been incorporated into the international law of weapons control. This article contends that the CWC stands currently at the pinnacle of this law. With respect to nearly every aspect of verification, the CWC comprehensively sets out specific requirements and inspection powers. This clear enumeration of rights and obligations is a progressive step toward international law-making and suggests the importance of specifying the IAEA’s and the State Party’s rights and obligations under any NPT arrangement that may be developed. For twenty-five years, the NPT regime has kept a lid on the spread of nuclear

contracts, unfair competition, breach of a confidential relationship, or torts. There is no time limit to CBI protection; as long as the owner can maintain its secrecy, CBI will be given legal protection.

314. *Id.* at 75. CBI can be protected by physical means or through contracts that establish binding confidential relationships. CBI will not receive legal protection if its owner voluntarily discloses it to someone not obligated to maintain its secrecy. In addition, CBI is not protected from legitimate independent discovery (*e.g.*, by means of reverse engineering).

weapons through a combination of technological barriers, political restraints, and luck. Now it is incumbent to endow the NPT with the certainty and power of law.

