2014

What Would Zero Look Like? A Treaty for the Abolition of Nuclear Weapons

David A. Koplow
Georgetown University Law Center, koplow@law.georgetown.edu

45 Geo. J. Int'l L. 683-781 (2014)

WHAT WOULD ZERO LOOK LIKE? A TREATY FOR THE ABOLITION OF NUCLEAR WEAPONS

DAVID A. KOPLOW*

ABSTRACT

Nuclear disarmament—the comprehensive, universal, and permanent abolition of all nuclear weapons, pursuant to a verifiable, legally binding international agreement—has long been one of the most ambitious, controversial, and urgent items on the agenda for arms control. To date, however, most of the discussion of "getting to zero" has highlighted the political, military, technical and diplomatic dimensions of this complex problem, and there has been relatively little attention to the legal requirements for drafting such a novel treaty.

This Article fills that gap by offering two proposed agreements. The first, a non-legally-binding framework accord, would be designed for signature relatively soon (e.g., in 2015) to re-commit states to the goal of nuclear elimination and to energize their concerted individual and collective action on a set of prescribed steps in pursuit of it. The second, a legally-binding document, would be concluded at some point in the more distant future, when states had accomplished great reductions in their current nuclear arsenals and were ready, at last, to plunge forward to true abolition.

The Article describes the conditions necessary for the further articulation of these two novel agreements, and the text of each instrument carries numerous annotations that identify competing options, describe the negotiating range, and illuminate the drafter's choices. The hope is that something novel can be gained—fresh insights can be suggested, and new questions can be raised (even if answering them remains elusive)—by advancing the dialogue about nuclear disarmament to the concrete stage of treaty drafting.

---

* Professor of Law, Georgetown University Law Center. The author gratefully thanks Robert (Bodie) Stewart and Kirsten A. Harmon for their extraordinarily careful and persistent research assistance; Dean William M. Treanor; participants in the Georgetown Law summer faculty research workshop; students in my "Issues in Disarmament: Proliferation and Terrorism" Seminar; and the following individuals who responded to my questions, commented upon prior drafts of this article, or otherwise generously assisted in its preparation: James M. Acton, Barry Blechman, James E. Goodby, Thomas Graham, Jr., Jonathan Granoff, Michael J. Mazarr, Christopher E. Paine, Steven Pifer, and Alyn Ware.

"Where there is no vision, the people perish." Proverbs 29:18

I. INTRODUCTION

The vision of abolishing nuclear weapons—a goal to be achieved through a comprehensive, permanent, verifiable, and legally binding treaty—has been vigorously pursued with the Biblical objective of preventing the people around the world from perishing. This stunning image has become one of the most prominent, urgent, and controversial items on the contemporary international disarmament agenda, but the world today is so far from "getting to zero" that it is difficult, at our current heavily-armed, mutually-suspicious vantage point, even to imagine what such a profoundly different regime would look like.

Nuclear disarmament is also an idea that has experienced radical oscillations in attention, interest, and legitimacy. The goal of prohibiting nuclear weapons is as old as nuclear devices themselves, but the whole notion had long been derided as hopelessly idealistic or utopian, unfit for the deliberations of serious people and powerful countries. That dismissiveness, however, was suddenly punctured on January 4, 2007, when four of the most "realistic" senior U.S. statesmen—George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn—

published a provocative essay, entitled "A World Free of Nuclear Weapons" in the *Wall Street Journal*.[1] In that short piece, the Gang of Four upended the skeptics and inaugurated an outpouring of supportive reports and analyses, "me too" opinion columns from sympathetic converts to the cause of nuclear abolition, and endorsements by the President of the United States and by the Security Council of the United Nations.

To date, however, the wellspring of publication has been relatively heavy on the policy, strategy, technology, and military aspects of the question of nuclear abolition and relatively light on the legal dimension. This Article therefore posits that something additional can be gained—further insights can be achieved and additional questions can be posed, even if answering them remains puzzling—by advancing the dialogue to the stage of treaty drafting. The bulk of the Article, therefore, consists of two heavily annotated proposed international agreements (one intended for adoption relatively soon, the other for the distant future) describing in more concrete detail what a "zero regime" could look like.

The Article proceeds with the following structure: After this Introduction, Part II provides four elements of necessary background, including: (a) an abbreviated history of the concept of eliminating nuclear weapons, noting the erratic development, adoption, abandonment, and resurrection of the audacious idea; (b) an exploration of the fact that most of the countries of the world, including the United States, are already constrained by an important international legal obligation to pursue the objective of nuclear disarmament "in good faith"; (c) a survey of the world's existing nuclear arsenals, highlighting the clear and present dangers of proliferation and terrorism; and (d) an accounting of the contributions, but also the inadequacy, of historical and contemporary arms control efforts, including the Strategic Arms Limitation Treaties (SALT), the Strategic Arms Reduction Treaties (START) and an alphabet soup of other accords.

Part III then highlights several of the most difficult substantive issues emerging from the treaty-drafting exercise. Challenges such as: (a) the appropriate definition of "zero"; (b) the arrangements for verification and enforcement of the regime; (c) the articulation of the plausible series of intermediate stages on the road to abolition; and (d) important collateral questions such as the resolution or at least amelioration

1. George P. Shultz, William J. Perry, Henry A. Kissinger & Sam Nunn, *A World Free of Nuclear Weapons*, WALL ST. J., Jan. 4, 2007, at A15 [hereinafter 2007 Op Ed].

of a range of vexing regional security issues are examined. The draft treaty texts cannot, at this point, offer definitive solutions, but may at least serve to highlight and clarify future challenges.

Parts IV and V present the heart of the matter: proposed texts for a Zero Agreement and a Zero Treaty. The first instrument would be a non-legally binding framework accord that could be adopted by participating states soon—perhaps in 2015—to re-commit themselves publicly, authoritatively, and collectively to the goal of nuclear elimination and to energize action on a prescribed pathway of specified steps in dedicated pursuit of that bold objective. The second document would be legally binding; it is intended for that point in the future when the countries of the world will have reduced their nuclear arsenals to very low levels and will have undertaken the other necessary precursor steps, so they will be ready, at last, to plunge forward to true abolition. The Zero Treaty is, necessarily, somewhat speculative—it will rely upon still undetermined technology and barely-imaginable political rapprochements to create more favorable conditions for accommodation, verification, and enforcement. For each document, the article presents a proposed text together with numerous annotations that highlight obvious and subsurface problems, explain the drafter's choices, and suggest alternative formulations.

Finally, Part VI presents some conclusions and recommendations. The animating spirit for this effort is derived from a metaphor relied upon repeatedly by the Gang of Four, who liken the nuclear abolition exercise to undertaking to climb a distant mountain, when the top of the peak is now shrouded by clouds. From our current lowly starting point, we can only vaguely discern the shape of the summit, and we cannot ascertain what will be the most suitable path to scale it, how long it will take to ascend, or what severe challenges will have to be overcome *en route.* But we are determined to go forward, and we are dedicated to finding a route that will, somehow, empower eventual success.

Two special acknowledgements must be inserted. First, the author participated, under the leadership of retired ambassadors James E. Goodby and Thomas Graham, Jr., in a remarkable drafting exercise culminating in a high-level Joint Enterprise Workshop convened by George Shultz and William Perry at the Hoover Institution at Stanford University, July 25-26, 2012. Many of the issues articulated in this article and its draft documents were vetted at that conference, and the analysis was immensely improved thereby. Participants at that workshop, of course, are not responsible for what follows (still less for any errors or

omissions) and may not endorse the contents or concepts of this article, but they provided many important and useful insights.

Second, the author gratefully acknowledges the pioneering contributions of the one prior model for drafting a treaty in this area. An international consortium of legal, technical, and diplomatic experts, assembled by the Lawyers' Committee on Nuclear Policy, drafted a detailed and highly innovative Model Nuclear Weapons Convention (NWC) in 1997. The draft was submitted by Costa Rica to the United Nations, revised and updated in 2007, and distributed in 2008 by U.N. Secretary General Ban Ki-moon in his Five Point Proposal for Nuclear Disarmament as a starting point for multilateral negotiations.[2] The materials contained in the current article differ significantly from the Model NWC (most prominently, in presenting two proposed documents, not just one) but the author has benefited greatly from consulting that first effort to articulate an operational legal text on point.

II. THE BACKGROUND FOR ZERO

As a preliminary matter, this section addresses, in turn, the (a) historical, (b) legal, (c) military, and (d) political dimensions of the pursuit of nuclear abolition. In the interest of space, each discussion is necessarily truncated, but the swelling literature regarding the elimination of nuclear weapons provides ample resources for further exploration.[3]

---

2. MERAV DATAN ET AL., SECURING OUR SURVIVAL (SOS): THE CASE FOR A NUCLEAR WEAPONS CONVENTION: THE UPDATED MODEL CONVENTION ON THE PROHIBITION OF THE DEVELOPMENT, TESTING, PRODUCTION, STOCKPILING, TRANSFER, USE AND THREAT OF USE OF NUCLEAR WEAPONS AND ON THEIR ELIMINATION (2007) [hereinafter NUCLEAR WEAPONS CONVENTION or NWC], *available at* http://www.disarmsecure.org/pdfs/securingoursurvival2007.pdf; U.N. General Assembly, Letter dated 31 October 1997 from the Chargé d'affaires a.i. of the Permanent Mission of Costa Rica to the United Nations addressed to the Secretary General, U.N. Doc. A/C.1/52/7 (Nov. 17, 1997), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=A%2FC.+1%2F52%2F7&Lang=E; U.N. General Assembly, Letter dated 17 December 2007 from the Permanent Representatives of Costa Rica and Malaysia to the United Nations addressed to the Secretary-General, U.N. Doc. A/62/650 (Jan. 17, 2008) (conveying updated text of NWC); Ban Ki-Moon, Secretary-General, Address to the East-West Institute: The United Nations and Security in a Nuclear-Weapon-Free World (Oct. 24, 2008), *available at* http://www.un.org/apps/news/infocus/sgspeeches/search_full.asp?statID=351 (citing the Secretary-General's Five Point Proposal on Nuclear Disarmament).

3. PHILIP TAUBMAN, THE PARTNERSHIP: FIVE COLD WARRIORS AND THEIR QUEST TO BAN THE BOMB (2012); GETTING TO ZERO: THE PATH TO NUCLEAR DISARMAMENT (Catherine McArdle Kelleher & Judith Reppy eds., 2011) [hereinafter GETTING TO ZERO]; REYKJAVIK REVISITED: STEPS TOWARD A WORLD FREE OF NUCLEAR WEAPONS (George P. Shultz et al. eds., 2008) [hereinafter REYKJAVIK REVISITED]; ELEMENTS OF A NUCLEAR DISARMAMENT TREATY (Barry M. Blechman & Alexander K. Bollfrass eds., 2010); CULTIVATING CONFIDENCE: VERIFICATION, MONITORING, AND ENFORCEMENT FOR A

A. *The History of Zero*

Even some of the scientists instrumental in the Manhattan Project, which centered on the development of atomic bombs during World War II, contemporaneously questioned whether the human species was capable of intelligently coping with the massive power then being unleashed, and almost immediately after the horror of Hiroshima and Nagasaki, populations around the world galvanized into political efforts to "ban the bomb."[4] The new United Nations General Assembly devoted its very first resolution to the question of abolishing nuclear weapons, unanimously establishing an Atomic Energy Commission on January 24, 1946, and referring to it the urgent mission of developing specific proposals "for the elimination from national armaments of atomic weapons and of all other major weapons adaptable to mass destruction," and "for effective safeguards by way of inspection and other means to protect complying States against the hazards of violations and evasions."[5]

The most prominent early public expression of U.S. willingness to surrender its monopoly over nuclear weapons was the Baruch Plan, presented to the United Nations in June 1946. Under that remarkable structure, all existing atomic bombs would be destroyed and an international organization would succeed to all information and functions related to atomic energy—but only after the establishment of a strict

---

WORLD FREE OF NUCLEAR WEAPONS (Corey Hinderstein ed., 2010) [hereinafter CULTIVATING CONFIDENCE]; ABOLISHING NUCLEAR WEAPONS: A DEBATE (George Perkovich & James Acton eds., 2009) [hereinafter DEBATE], *available at* http://carnegieendowment.org/files/abolishing_nuclear_weapons_debate.pdf.

4. INTERNATIONAL ARMS CONTROL: ISSUES AND AGREEMENTS 68 (John H. Barton & Lawrence D. Weiler eds., 1976) [hereinafter ARMS CONTROL I] (noting that some of the nuclear weapons designers had advocated using the device only in a "demonstration" event, rather than dropping it on Japanese cities); Peter R. Lavoy, *The Enduring Effects of Atoms for Peace*, ARMS CONTROL TODAY, Dec. 2003, *available at* http://www.armscontrol.org/print/1430 (noting that Danish physicist Niels Bohr and U.S. nuclear weapons program leader Robert Oppenheimer tried to convince U.S. and British officials, even before the end of World War II, that international control of nuclear weaponry was essential); INTERNATIONAL ARMS CONTROL: ISSUES AND AGREEMENTS 45-47 (Coit D. Blacker & Gloria Duffy eds., 2d ed. 1984) [hereinafter ARMS CONTROL II] (discussing public attitudes about nuclear weapons); John P. Holdren, *Getting to Zero: Is Pursuing a Nuclear-Weapon-Free World Too Difficult? Too Dangerous? Too Distracting?* (Belfer Ctr. for Sci. & Int'l Aff., Discussion Paper 98-24, 1998), *available at* http://belfercenter.ksg.harvard.edu/files/disc_paper_98_24.pdf.

5. Establishment of a Commission to Deal with the Problems Raised by the Discovery of Atomic Energy, G.A. Res. 1, ¶¶ 5(c)-(d), U.N. Doc. A/Res/1 (Jan. 24, 1946), *available at* http://daccess-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/032/52/IMG/NR003252.pdf?OpenElement.

system of controls and immediate condign punishment for violations.[6] The Soviet Union curtly rejected the Baruch Plan, apprehending it as a tool for Western espionage and domination, and insisting (in argumentation that echoes eerily into our own era) that the international control system should be effectuated only *after* the United States had dissolved its extant nuclear inventory and that any sanctions for violations should be imposed only by the Security Council (where Moscow retained a veto).[7]

The Cold War and its mutual suspiciousness then precluded any meaningful dialogue on nuclear weapons restraints through the 1950s. Partisans feuded inconclusively over whether any interim or partial measures of arms control could be concluded independently, as circumstances might permit, or would have to be inextricably linked to a pre-conceived overarching comprehensive program of universal arms control (soon known by the abbreviation GCD, for "general and complete disarmament"). During the 1960s and 1970s and into the 1980s, there was little talk about, and no appreciable progress toward, the ultimate desiderata, and "serious people" rarely engaged in meaningful security consultation on that aspiration.[8]

---

6. ARMS CONTROL I, *supra* note 4, at 71 (insisting that effective international controls and sanctions could be created step-by-step, in successive stages, and that the United States would divulge its nuclear secrets incrementally, in a corresponding sequence); Leneice N. Wu, *The Baruch Plan 1946-1949*, *in* 2 ENCYCLOPEDIA OF ARMS CONTROL AND DISARMAMENT 771 (Richard Dean Burns ed., 1993).

7. JOZEF GOLDBLAT, ARMS CONTROL: A GUIDE TO NEGOTIATIONS AND AGREEMENTS 30-32 (1994); ALVA MYRDAL, THE GAME OF DISARMAMENT: HOW THE UNITED STATES AND RUSSIA RUN THE ARMS RACE 73-76 (1976) (stressing the concept of "condign punishment" – swift and certain response to any violation of the disarmament agreements); David Holloway, *The Vision of a World Free of Nuclear Weapons*, *in* GETTING TO ZERO, *supra* note 3, at 18-19; *The Acheson-Lilienthal & Baruch Plans*, 1946, U.S. DEP'T OF STATE, http://history.state.gov/milestones/1945-1952/baruch-plans\ (last visited Mar. 20, 2014) (discussing the series of early U.S. nuclear disarmament proposals).

8. George Perkovich & James Acton, *Abolishing Nuclear Weapons*, ADELPHI, no. 396, 2008, at 69 (commenting that after the 1940s "[t]he total elimination of nuclear arsenals almost disappeared from the international agenda until after the Cold War."); Myrdal, *supra* note 7, at 77-84, 297-99, 304-05 (criticizing the "propaganda game" the superpowers played with their respective disarmament proposals, arguing "[t]his is the way disarmament was, and is, continually torpedoed."); Alessandro Corradini, *General and Complete Disarmament*, *in* 2 ENCYCLOPEDIA OF ARMS CONTROL AND DISARMAMENT 1041 (Richard Dean Burns ed., 1993); Randy Rydell, *Nuclear Disarmament and General and Complete Disarmament*, *in* THE CHALLENGE OF ABOLISHING NUCLEAR WEAPONS 227 (David Krieger ed., 2009) (describing the history and implications of the concept of GCD); Randy Rydell, *Advocacy for Nuclear Disarmament: A Global Revival?*, *in* GETTING TO ZERO, *supra* note 3, at 28-29. *But see* Jimmy Carter, President of the United States, Inaugural Address (Jan. 20, 1977), *available at* http://www.bartleby.com/124/pres60.html (declaring that "we will move this year a step toward ultimate goal—the elimination of all nuclear weapons from this Earth").

A sudden, completely unforeseen—and wholly temporary—revival of interest in nuclear disarmament occurred at the October 11-12, 1986 summit meeting between U.S. President Ronald Reagan and Soviet General Secretary Mikhail Gorbachev in Reykjavik, Iceland. There, the two leaders—abandoning their respective cadres of national security advisors and running far beyond the anticipated modest agenda for the conference—came within a hair's breadth of reaching an historic agreement to utterly eliminate their respective nuclear arsenals. At the last minute, such a tectonic shift eluded the leaders' grasp, however, and its exact parameters—its precise content and timetable, the provisions for verification and enforcement, etc.—were never specified or reduced to draft text.[9] Still, the Reykjavik "bolt from the blue" resonates through the international arms control community even today, empowering advocates of nuclear elimination to ponder what might have happened and emboldening them to contemplate its reprise.[10]

Other insistent voices also helped sustain the goal of nuclear abolition. India's Prime Minister Rajiv Gandhi, for example, presented his vision to the U.N. General Assembly in 1988.[11] High-level international congresses—notably the 1996 Canberra Commission on the Elimination of Nuclear Weapons[12] and the 2006 Blix Commission on Weapons of Mass Destruction[13]—likewise kept the flame of disarmament alive.

---

9. TAUBMAN, *supra* note 3, at 248-70 (describing the Reykjavik summit); David Holloway, *The Vision of a World Free of Nuclear Weapons*, *in* GETTING TO ZERO, *supra* note 3, at 20-22.

10. *See, e.g.*, IMPLICATIONS OF THE REYKJAVIK SUMMIT ON ITS TWENTIETH ANNIVERSARY (Sidney D. Drell & George P. Shultz eds., 2007); REYKJAVIK REVISITED, *supra* note 3; Thomas Blanton & Svetlana Savranskaya, *Reykjavik: When Abolition Was Within Reach*, ARMS CONTROL TODAY, Oct. 2011, *available at* http://www.armscontrol.org/act/2011_10/Reykjavik_When_Abolition_Was_Within_Reach.

11. INFORMAL GROUP ON PRIME MINISTER RAJIV GANDHI'S ACTION PLAN FOR A NUCLEAR-WEAPONS-FREE AND NONVIOLENT WORLD ORDER 1988 (RGAP 88), REPORT OF THE INFORMAL GROUP ON RGAP 88 (Aug. 20, 2011), *available at* http://www.pugwashindia.org/images/uploads/Report.pdf; Manpreet Sethi, *Identifying Principles for a Nuclear Weapons-Free World: The Rajiv Gandhi Action Plan as a Relevant Guide*, *in* 2 NUCLEAR ABOLITION FORUM, MOVING BEYOND NUCLEAR DETERRENCE TO A NUCLEAR WEAPONS FREE WORLD 23 (Rob van Riet ed., 2013).

12. CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, REPORT (1996), *available at* http://www.dfat.gov.au/publications/security/canberra-commission-report/cc_report1.html.

13. WEAPONS OF MASS DESTRUCTION COMMISSION (BLIX COMMISSION), WEAPONS OF TERROR: FREEING THE WORLD OF NUCLEAR, BIOLOGICAL AND CHEMICAL ARMS (2006), *available at* http://www.blixassociates.com/wp-content/uploads/2011/02/Weapons_of_Terror.pdf; *see also* NWC, *supra* note 2, at 25-26 (identifying salient international advocates for nuclear abolition from 1995 to 2006); CANBERRA COMMISSION, *supra* note 12, at 32-33 (noting international authorities supporting nuclear abolition); STEERING COMM, OF THE PROJECT ON ELIMINATING WEAPONS OF MASS DESTRUCTION, AN AMERICAN LEGACY: BUILDING A NUCLEAR-WEAPON-FREE WORLD (1997); ROBERT D.

Still, it is no exaggeration to claim that the commitment to nuclear disarmament had faded through the decades, almost to the point of extinction. Its occasional invocation felt largely ritualistic; it became basically devoid of impact on day-to-day national security policy and international negotiations. Hard-headed officials and their counterparts among the non-governmental cognoscenti simply ignored this objective and focused on other seemingly more tractable and proximate arms control issues. The goal of nuclear abolition had not been formally abandoned; it had just been overlooked for so long that it no longer hovered on the agenda for contemporary international action.[14]

Suddenly, however, the "Gang of Four" revivified the concept. This remarkable ad hoc assemblage consisted of George P. Shultz (Republican), Secretary of State in the Reagan administration, from 1982 to 1989;[15] William J. Perry (Democrat), Secretary of Defense in the Clinton administration, from 1994 to 1997;[16] Henry A. Kissinger (Republican), Secretary of State during the Nixon and Ford administrations, from 1973 to 1977;[17] and Sam Nunn (Democrat), chairman of the Senate Foreign Relations Committee from 1987 to 1995.[18] They are among the most prominent, authoritative, mainstream leaders on U.S. foreign and national security policy, with deep roots in the theory and practice of cold war strategy and diplomacy; individually—and certainly collectively—they command respect from across the U.S. and global national security community. When these four leaders speak in unison, others need not necessarily agree, but they have to pay attention—the mere act of endorsement by these elder statesmen guaranties that the concept of nuclear abolition can no longer be blithely dismissed as unrealistic, utopian, or impractical.

The Gang of Four—assisted and prodded by a cadre of senior associates who are themselves enormously prominent within the national security community, even if they are not quite "household names,"

GREEN, FAST TRACK TO ZERO NUCLEAR WEAPONS (1999), *available at* http://www.ippnw.org/pdf/fast-track-to-zero-nuclear-weapons.pdf; Holdren, *supra* note 4.

14. *See* TAUBMAN, *supra* note 3, at 287 (reporting that for most nuclear experts in 2000, the idea of nuclear disarmament "bespoke a flaky idealism and profound ignorance about the realities of the nuclear age"); Frank Blackaby, *Introduction and Summary*, *in* NUCLEAR WEAPONS: THE ROAD TO ZERO 1, 6 (Joseph Rotblat ed., 1998) (noting that governments simply ignored recommendations to proceed toward nuclear disarmament).

15. *See* TAUBMAN, *supra* note 3, at 4.

16. *See id.* at 5.

17. *See id.* at 4.

18. *See id.* at 5.

such as Max Kampelman,[19] Sidney Drell,[20] and James Goodby[21]—rattled the nuclear priesthood with their January 4, 2007 op-ed.[22] They then persistently followed that initial broadside with additional salvos, also published in the *Wall Street Journal*, in 2008,[23] 2010,[24] 2011,[25] and 2013,[26] attracting renewed attention and a virtual "who's who" of bipartisan endorsers.[27]

Mikhail Gorbachev was an early ally, penning his own supportive column in the *Wall Street Journal* in January 2007;[28] similar expressions soon came from prominent defense officials in the United Kingdom, Italy, Germany, and elsewhere.[29] Of course, opposition voices were also

---

19. *See id.* at xii.

20. *See id.* at 16.

21. *See id.* at 20.

22. 2007 Op Ed, *supra* note 1 (endorsing "setting the goal of a world free of nuclear weapons and working energetically on the actions required to achieve that goal").

23. George P. Shultz, William J. Perry, Henry A. Kissinger & Sam Nunn, *Toward a Nuclear-Free World*, WALL ST. J., Jan. 15, 2008, at A13 [hereinafter 2008 Op Ed] (expressing concern about "a nuclear tipping point," due to the accelerating spread of nuclear weapons, and outlining specific steps to reverse the dangers; introducing the metaphor likening pursuit of nuclear disarmament to climbing a distant mountain).

24. George P. Shultz, William J. Perry, Henry A. Kissinger & Sam Nunn, *How To Protect Our Nuclear Deterrent*, WALL ST. J., Jan. 20, 2010, at A17 [hereinafter 2010 Op Ed] (stressing the need to maintain the safety, security, and reliability of weapons stockpiles, while pursuing arms control efforts to reduce and eliminate them).

25. George P. Shultz, William J. Perry, Henry A. Kissinger & Sam Nunn, *Deterrence in the Age of Nuclear Proliferation*, WALL ST. J., Mar. 7, 2011 [hereinafter 2011 Op Ed] (proposing a movement toward a safer and more secure form of deterrence that does not rely primarily upon nuclear weapons).

26. George P. Shultz, William J. Perry, Henry A. Kissinger & Sam Nunn, *Next Steps in Reducing Nuclear Risks: The Pace of Nonproliferation Work Today Doesn't Match the Urgency of the Threat*, WALL ST. J., Mar. 5, 2013 [hereinafter 2013 Op Ed] (outlining four areas requiring urgent attention, including securing nuclear materials, increasing the time for making critical decisions, pursuing additional measures of arms control, and enhancing verification capabilities).

27. 2008 Op Ed, *supra* note 23 (noting that the Gang of Four had received indications of support from many former senior U.S. government officials, including Madeleine Albright, Richard V. Allen, James A. Baker III, Samuel R. Berger, Zbigniew Brzezinski, Frank Carlucci, Warren Christopher, William Cohen, Lawrence Eagleburger, Melvin Laird, Anthony Lake, Robert McFarlane, Robert McNamara and Colin Powell).

28. Mikhail Gorbachev, *The Nuclear Danger*, WALL ST. J., Jan. 31, 2007 (asserting that "[w]e must put the goal of eliminating nuclear weapons back on the agenda, not in some distant future, but as soon as possible.").

29. TAUBMAN, *supra* note 3, at 338; Perkovich & Acton, *supra* note 8, at 183; Manmohan Singh, Prime Minister of India, Inaugural Speech at the International Conference on a Nuclear Weapons Free World: Towards a World Free of Nuclear Weapons (Jun. 9, 2008), *available at* http://pmindia.nic.in/speech-details.php?nodeid=665; Götz Neuneck, *Is a World without Nuclear Weap-*

emphatically expressed, including those of Harold Brown (Secretary of Defense in the Carter administration),[30] James Schlesinger (Secretary of Defense under Presidents Nixon and Ford)[31] and Richard Perle (Assistant Secretary of Defense under President Reagan).[32] But a cottage industry of "zero" advocacy quickly sprang up, with a dramatic flow of books,[33] articles,[34] speeches,[35] and movies;[36] two non-governmental organizations[37] adopted "getting to zero" as their pri-

---

ons Attainable? Comparative Perspectives on Goals and Prospects, *in* GETTING TO ZERO, *supra* note 3, at 43, 46-54 (identifying spokespersons from Poland, Norway, France, Sweden, Belgium and elsewhere contemporaneously endorsing the concept of nuclear disarmament).

30. Harold Brown & John Deutch, *The Nuclear Disarmament Fantasy*, WALL ST. J., Nov. 19, 2007, *available at* http://www.wagingpeace.org/articles/2007/11/26_brown_article_responses.php (arguing that "the goal, even the aspirational goal, of eliminating all nuclear weapons is counterproductive" and "there is no realistic path to a world free of nuclear weapons").

31. *See* TAUBMAN, *supra* note 3, at 14 (quoting Schlesinger's 2010 speech stating that "[t]he dividing line between vision and hallucination is never very clear.").

32. Richard Perle, *Yes, Nukes: The Global Zero Utopia*, WORLD AFFAIRS J., Mar. 10, 2011, *available at* http://www.aei.org/article/foreign-and-defense-policy/defense/yes-nukes-the-global-zero-utopia/; Kim R. Holmes, *How Barack Obama's Vision of a Nuclear-Free World Weakens America's Security: Deconstructing the "Road to Zero"*, HERITAGE FOUND. (Sept. 10, 2010), http://www.heritage.org/research/lecture/how-barack-obama-s-vision-of-a-nuclear-free-world-weakens-america-s-security; Douglas J. Feith, Frank J. Gaffney, James A. Lyons & R. James Woolsey, *Obama's "Nuclear Zero" Rhetoric Is Dangerous*, WASH. POST, Mar. 29, 2013; James Jay Carafano, *The Road to Zero: Keeping Swords, Building Ploughshares*, HERITAGE FOUND. (Aug. 20, 2009), http://www.heritage.org/research/commentary/2009/08/the-road-to-zero-keeping-swords-building-ploughshares.

33. SIDNEY D. DRELL & JAMES E. GOODBY, A WORLD WITHOUT NUCLEAR WEAPONS: END-STATE ISSUES (2009) [hereinafter END-STATE ISSUES]; IMPLICATIONS OF THE REYKJAVIK SUMMIT ON ITS TWENTIETH ANNIVERSARY (Sidney D. Drell & George P. Shultz eds., 2007); REYKJAVIK REVISITED, *supra* note 3; GETTING TO ZERO, *supra* note 3; CULTIVATING CONFIDENCE, *supra* note 3; RUSSIA AND THE DILEMMAS OF NUCLEAR DISARMAMENT (Alexei Arbatov et al. eds., 2012).

34. *See, e.g.*, Ivo Daalder & Jan Lodal, *The Logic of Zero: Toward a World Without Nuclear Weapons*, FOREIGN AFF., Nov.-Dec. 2008, at 80-95; Christopher Ford, *A New Paradigm: Shattering Obsolete Thinking on Arms Control and Nonproliferation*, ARMS CONTROL TODAY, Nov. 2008; DEBATE, *supra* note 3; Michael Krepon, *Ban the Bomb, Really*, 3 The AM. INTEREST, no. 3, Jan.-Feb. 2008, at 88; 2 NUCLEAR ABOLITION FORUM, MOVING BEYOND NUCLEAR DETERRENCE TO A NUCLEAR WEAPONS FREE WORLD (Rob van Riet ed., 2013); JAMES M. ACTON, LOW NUMBERS: A PRACTICAL PATH TO DEEP NUCLEAR REDUCTIONS (2011), *available at* http://carnegieendowment.org/files/low_numbers.pdf.

35. *See* TAUBMAN, *supra* note 3, at 458 (listing speeches related to nuclear disarmament after the Gang of Four Op Ed columns). Notably, during the 2008 presidential election campaign, both Barack Obama and John McCain formally endorsed the concept of nuclear disarmament. *Id.* at 335, 342-43.

36. *Id.* at 340 (describing "Countdown to Zero" and "Nuclear Tipping Point").

37. *Id.* at 338-40 (noting shared goals, but different approaches by—and some tension between—the Nuclear Threat Institute (headed by Sam Nunn) and Global Zero (headed by Bruce Blair, Matt Brown and Barry Blechman)); *see also* Randy Rydell, *Advocacy for Nuclear*

mary mandate.[38]

The most important endorsement came from President Barack Obama, in his celebrated April 5, 2009 speech in Prague.[39] There, citing the persistent and growing dangers of nuclear warfare, the imperative of avoiding any insidious "fatalism" about the inevitability of further proliferation, and the special responsibility of the United States, as the only country ever to have used nuclear weapons in combat, he declared:

> So today, I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons. I'm not naive. This goal will not be reached quickly—perhaps not in my lifetime. It will take patience and persistence. But now we, too, must ignore the voices who tell us that the world cannot change. We have to insist, "Yes, we can."[40]

Six months later, Obama chaired a heads-of-state session of the U.N. Security Council (the first time a U.S. president had done so) and led the advocacy in support of the unanimous adoption of resolution

---

Disarmament: A Global Revival?, *in* GETTING TO ZERO, *supra* note 3, at 30-32 (identifying numerous public and private sector "recent initiatives" aimed at nuclear disarmament).

38. In 2012, the International Campaign to Abolish Nuclear Weapons reported that its survey of governmental positions regarding a proposed new treaty to ban nuclear weapons revealed that 146 countries supported the immediate commencement of negotiations leading to such a treaty, 22 were "on the fence," and 26 opposed. TIM WRIGHT, TOWARDS A TREATY BANNING NUCLEAR WEAPONS: A GUIDE TO GOVERNMENT POSITIONS ON A NUCLEAR WEAPONS CONVENTION (2012).

39. Barack Obama, President of the United States, Speech in Prague, Czech Republic (Apr. 5, 2009), *available at* http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/ [hereinafter Prague Speech]. The concept was also endorsed in the April 2010 Nuclear Posture Review Report, the Department of Defense's top-level "roadmap for implementing President Obama's agenda for reducing nuclear risks to the United States, our allies and partners, and the international community." U.S. DEPT. OF DEFENSE, NUCLEAR POSTURE REVIEW REPORT (2010). In a section entitled "Looking Ahead: Toward a World Without Nuclear Weapons," the NPR Report concludes that "[t]he long-term goal of U.S. policy is the complete elimination of nuclear weapons. At this point, it is not clear when this goal can be achieved" and that "[t]he conditions that would ultimately permit the United States and others to give up their nuclear weapons without risking greater international instability and insecurity are very demanding . . . . Clearly, such conditions do not exist today. But we can—and must—work actively to create those conditions." *Id.* at 45-49.

40. Prague Speech, *supra* note 39; *see also* Barack Obama, President of the United States and Dmitry Medvedev, President of the Russian Federation, Joint Statement, Apr. 1, 2009, *in* END-STATE ISSUES, *supra* note 33, at 1-2 (committing both countries to achieve a nuclear weapons free world).

1887.[41] In it, the Security Council, "[r]esolving to seek a safer world for all and to create the conditions for a world without nuclear weapons,"[42] and "[r]eaffirming that proliferation of weapons of mass destruction, and their means of delivery, constitutes a threat to international peace and security,"[43] called upon parties to the 1968 Nuclear Non-Proliferation Treaty (NPT)[44] to pursue the treaty-specified negotiations in good faith on nuclear arms reduction and disarmament, and similarly called on NPT non-parties to join that endeavor.[45]

To conclude this chronology on a downbeat note, it must be observed that the momentum for taking meaningful steps toward the elimination of nuclear weapons has faded in 2011-2013. The advocates have not changed their minds or abandoned the enterprise, but no new major accomplishments have been recorded, and no new groundswell of additional political support has emerged—indeed, there has been retrograde movement, with a renewed emphasis on nuclear weapons and revivified nuclear postures.[46] Whether this faltering signals that the wave of enthusiasm for zero has already crested, or whether it is merely a temporary pause before even greater political and popular support emerges, will soon be tested.

B. *The Law of Zero*

The lodestar for legal analysis of nuclear weapons is the Nuclear Non-Proliferation Treaty,[47] arguably the most important arms control

---

41. S.C. Res. 1887, U.N. Doc. S/RES/1887 (Sept. 24, 2009).

42. *Id.* at 1.

43. *Id.*

44. Treaty on the Non-Proliferation of Nuclear Weapons, Jul. 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161 [hereinafter NPT].

45. S.C. Res. 1887, *supra* note 41, ¶ 5.

46. *See* 2013 Op Ed, *supra* note 26 (observing that "[t]he continuing risk posed by nuclear weapons remains an overarching strategic problem, but the pace of work doesn't match the urgency of the threat."); Ward Wilson, *The Myth of Nuclear Necessity*, NUCLEAR ABOLITION FORUM, no. 2, 2013, at 1 (noting that "the abolition movement seems stalled."); George Perkovich, DO UNTO OTHERS: TOWARD A DEFENSIBLE NUCLEAR DOCTRINE 2 (2013), *available at* http://carnegieendowment.org/files/do_unto_others.pdf; William J. Perry, *My Personal Journey at the Nuclear Brink*, EUR. LEADERSHIP NETWORK (June 17, 2013), *available at* http://www.europeanleadershipnetwork.org/my-personal-journey-at-the-nuclear-brink-by-bill-perry_633.html (commenting that "in 2011 that progress and forward momentum [toward dealing with the nuclear legacy of the cold war] began to stall out and even reverse").

47. NPT, *supra* note 44.

agreement in history. This instrument constitutes a grand bargain between the "nuclear weapon states" (NWS) (a set identical to the five permanent members (the P5) of the U.N. Security Council)[48] and the "non-nuclear weapon states" (NNWS) (i.e., everyone else).[49] The NPT rests upon three related "pillars": non-proliferation (the NNWS pledge never to manufacture or otherwise acquire nuclear weapons[50]); disarmament (the NWS commit to measures of arms control, as elaborated below[51]); and peaceful uses of nuclear energy (all parties without discrimination retain the right to pursue the full array of non-military applications of nuclear energy, subject to international safeguards to prevent diversion of the materials, facilities and expertise into weapons programs[52]).

Of special interest in this context is article VI of the NPT, which contains the fundamental commitment (levied upon the NWS and NNWS alike) regarding the disarmament pillar:

> Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control.[53]

Article VI therefore constitutes a bold, explicit, and relatively clear-cut international law commitment, binding upon the treaty's 189

48. In the NPT, "a nuclear-weapon State is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to January 1, 1967." NPT, *supra* note 44, art. IX.3. This includes the United States, the Soviet Union/Russia, the United Kingdom, France, and China.

49. Regarding the history, structure, importance, and challenges of the NPT, see ARMS CONTROL I, *supra* note 4, at 288-309. *See also* William Epstein, *The Non-Proliferation Treaty and the Review Conferences 1965 to the Present*, *in* 2 ENCYCLOPEDIA OF ARMS CONTROL AND DISARMAMENT 855 (Richard Dean Burns ed., 1993); ARMS CONTROL II, *supra* note 4, at 148-72; REVIEWING THE NUCLEAR NONPROLIFERATION TREATY (Henry Sokolski ed., 2010), *available at* http://www.strategicstudies institute.army.mil/pubs/display.cfm?pubID=987; REBUILDING THE NPT CONSENSUS (Michael May ed., 2007).

50. NPT, *supra* note 44, art. II.

51. *Id.* art. VI.

52. *Id.* art IV.

53. *Id.* art. VI; *see* Scott D. Sagan, *Good Faith and Nuclear Disarmament Negotiations*, *in* DEBATE, *supra* note 3, at 203-12.

parties[54] (virtually all the states in the world except India, Israel, North Korea[55] and Pakistan—each of which possesses nuclear weapons), obligating them to pursue nuclear disarmament in good faith.

Nevertheless, controversy has always surrounded the NPT, especially regarding insistent claims by several NNWS that the NWS have been insufficiently zealous and successful in their obligatory pursuit of nuclear disarmament, and have thereby perpetuated the "discriminatory" structure of the NPT.[56] Particularly in 1995, when the treaty was "extended" beyond its original twenty-five year duration, the "have-not" countries extracted renewed commitments from the "have" states to accelerate their pursuit of zero; at the 2000 NPT Review Conference, that renewal of vows was captured in a series of specified "practical steps."[57]

The International Court of Justice (ICJ), the judicial organ of the United Nations,[58] was drawn into the fray when the General Assembly requested an advisory opinion regarding the legality of the threat or use of nuclear weapons.[59] In a 1996 decision correctly characterized as being both pathbreaking in its articulation of legal principles and confounding in its circumlocution and indecision, the ICJ determined,

---

54. *Treaty on the Nonproliferation of Nuclear Weapons*, UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS, http://www.un.org/disarmament/WMD/Nuclear/NPT.shtml (last visited Nov. 10, 2013).

55. *Arms Control and Proliferation Profile: North Korea*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/northkoreaprofile (last updated Apr. 2013) (noting that North Korea had joined the NPT, then withdrew from it in 2003; the United Nations Security Council has ordered North Korea to return to the treaty, but it has not done so).

56. Ramesh Thakur, *The Desirability of a Nuclear Weapon Free World*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS 74, 83-85 (1996) (arguing that "[t]he NPT is discriminatory, is seen as discriminatory, and will be progressively delegitimised unless there is continual movement towards nuclear disarmament."); Waheguru Pal Singh Sidhu, *India and Nuclear Zero*, *in* GETTING TO ZERO, *supra* note 3, at 224, 232 (noting that India's longstanding critique of the NPT includes its discriminatory nature); Thomas Graham, Jr., *NPT Article VI Origin and Interpretation*, *in* REBUILDING THE NPT CONSENSUS, *supra* note 49, at 45, 51-61.

57. THOMAS GRAHAM, JR., DISARMAMENT SKETCHES: THREE DECADES OF ARMS CONTROL AND INTERNATIONAL LAW 257-93 (2002); *2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons: Final Document*, NPT/CONF.2000/28 (Parts I and II), *available at* http://www.armscontrol.org/act/2000_06/docjun.

58. U.N. Charter art. 92; Statute of the International Court of Justice art. 1, June 26, 1945, 3 Bevans 1179.

59. Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 226 (July 8) [hereinafter ICJ Advisory Opinion on Nuclear Weapons]; *see* Dean Granoff & Jonathan Granoff, *International Humanitarian Law and Nuclear Weapons: Irreconcilable Differences*, 67 BULL. OF THE ATOMIC SCIENTISTS, no. 6, 2011, at 53; Charles J. Moxley, Jr., John Burroughs, & Jonathan Granoff, *Nuclear Weapons and Compliance with International Humanitarian Law and the Nuclear Non-Proliferation Treaty*, 34 FORDHAM INT'L L.J. 595 (2011).

inter alia, that: (a) nuclear weapons were governed by the same law of armed conflict principles applicable to all other weapons;[60] (b) all parties to the NPT are bound by the article VI commitment not only to pursue nuclear disarmament in good faith, but to successfully conclude their negotiations and achieve the desired result;[61] (c) the widespread, severe, and long-lasting effects of nuclear weapons mean that their use is "scarcely reconcilable" with the legal requirements of proportionality and avoidance of civilian casualties;[62] and (d) nevertheless, the court could not definitively conclude that all possible uses of nuclear weapons would be illegitimate—such as firing against an isolated military target far removed from civilian areas, or in an instance where a nation's very survival depended upon the application of such overwhelming force.[63]

C. *The Military Aspect of Zero*

The current "box score" of global holdings of nuclear weapons is somewhat complex because it must differentiate states that currently possess nuclear weapons, states that formerly possessed them, states with considerable current potential to develop them, and other nuanced categories. The NPT acknowledges five of its parties as long-time NWS possessors of nuclear weapons: China, France, Russia, the United Kingdom, and the United States.[64] In addition, three non-NPT states

---

60. ICJ Advisory Opinion on Nuclear Weapons, *supra* note 59, ¶ 105 (2) C and D (unanimously concluding that the provisions of the UN Charter and of international humanitarian law apply to the threat or use of nuclear weapons).

61. *Id.* ¶ 105 (2) F (unanimously).

62. *Id.* ¶ 95.

63. *Id.* ¶ 105 (2) E (by seven votes to seven, with the president of the court casting the deciding vote).

64. *See Arms Control and Proliferation Profile: China*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/chinaprofile (last updated July, 2013); *Arms Control and Proliferation Profile: France*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/franceprofile (last updated July, 2013); *Arms Control and Proliferation Profile: Russia*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/russiaprofile (last updated July, 2013); *Arms Control and Proliferation Profile: United Kingdom*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/ukprofile (last updated July, 2013); *Arms Control and Proliferation Profile: United States*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/unitedstatesprofile (last updated July, 2013). *See also Country Profile: China*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/china/nuclear/ (last updated Feb., 2013); *Country Profile: France*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/france/nuclear/ (last updated Aug., 2013); *Country Profile: Russia*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/russia/nuclear/ (last updated Aug., 2013); *Country Profile: United Kingdom*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/united-kingdom/nuclear/ (last updated July, 2013); *Country Profile: United States*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/united-states/ (last updated July, 2013).

have overtly tested and produced nuclear weapons: India, North Korea, and Pakistan.[65] Israel, another NPT non-party, is widely credited with a nuclear weapon inventory, but it has not publicly acknowledged that status.[66]

In addition, a handful of other states formerly possessed nuclear weapons. When the U.S.S.R. dissolved in 1991, some of its massive nuclear arsenal was suddenly "inherited" by successor states Belarus, Kazakhstan, and Ukraine; after difficult negotiations, each of those new republics shipped the nuclear warheads back to Russia.[67] South Africa is a special case of "rollback": the apartheid regime had secretly constructed a small nuclear weapons stockpile in the 1980s, but then dismantled it and the weapons infrastructure, shortly before the institution of majority rule in the country.[68] In addition, several states, including Cuba, Czechoslovakia, East and West Germany, Italy, South Korea, and Turkey, have allowed one of the superpowers to base nuclear weapons on their territories, under secret arrangements that may have afforded the host some degree of influence over any

65. *See Arms Control and Proliferation Profile: India*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/indiaprofile (last updated July, 2013); *Arms Control and Proliferation Profile: North Korea*, ARMS CONTROL ASS'N, *supra* note 55; *Arms Control and Proliferation Profile: Pakistan*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/pakistanprofile (last updated July, 2013); *Country Profile: India*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/india/nuclear/ (last updated June, 2013); *Country Profile: North Korea*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/north-korea/nuclear/ (last updated Sept., 2013); *Country Profile: Pakistan*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/pakistan/nuclear/ (last updated July, 2013); *see generally* Waheguru Pal Singh Sidhu, *India and Nuclear Zero*, *in* GETTING TO ZERO, *supra* note 3, at 224-42.

66. *See Arms Control and Proliferation Profile: Israel*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/israelprofile (last updated July, 2013) (noting that Israel is considered to have a substantial nuclear arsenal, although it has not officially acknowledged any, and maintains that it "will not be the first country to introduce nuclear weapons into the Middle East"); *Country Profile: Israel*, NUCLEAR THREAT INST, http://www.nti.org/country-profiles/israel/nuclear/ (last updated Aug., 2013); *see generally* Avner Cohen, *Israel's Nuclear Future: Iran, Opacity, and the Vision of Global Zero*, *in* GETTING TO ZERO, *supra* note 3, at 187-205.

67. *See Country Profile: Belarus*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/belarus/ (last updated Aug., 2013); *Country Profile: Kazakhstan*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/kazakhstan/nuclear/ (last updated Feb., 2013); *Country Profile: Ukraine*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/ukraine/nuclear/ (last updated Feb., 2013).

68. *See Country Profile: South Africa*, NUCLEAR THREAT INST. http://www.nti.org/country-profiles/south-africa/nuclear/ (last updated July, 2013); REBUILDING THE NPT CONSENSUS, *supra* note 49, at 151.

potential use.[69]

The next category would embrace states that have pursued a nuclear weapons capability with some degree of vigor and some measure of success, without (at least yet) completing the program. Iran is currently the country most precariously poised on the threshold of acquiring a nuclear weapons capacity;[70] Syria[71] and Libya[72] are similar relatively recent examples. Going somewhat further back in time, Argentina, Brazil, South Korea, and several others would fit the description.[73] Moreover, there are several states that could probably develop nuclear weapons in short order—they possess the indigenous intellectual, physical, economic, and other resources—but they have as a policy and legal matter rejected that avenue. Perhaps forty countries—Australia, Canada, Germany, Japan, Sweden, Switzerland, and many other NATO members—would be characterized this way.[74]

Finally, it must be acknowledged that just about any state potentially could be implicated in the acquisition of nuclear weapons or their critical components. Hypothetically, almost any location on earth could be utilized (with the active collaboration of the relevant government, or perhaps without its knowledge) by another state for secretly

---

69. Rose Gottemoeller, *Eliminating Short-Range Nuclear Weapons Designed to Be Forward Deployed*, *in* REYKJAVIK REVISITED, *supra* note 3, at 107, 155 (depicting U.S. short-range nuclear weapons deployed in seven European countries in 2005).

70. *See* ARMS CONTROL ASSOCIATION, BRIEFING BOOK: SOLVING THE IRANIAN NUCLEAR PUZZLE (Sept. 2013), *available at* http://www.armscontrol.org/system/files/ACA_Iran_Briefing_Book_Update_September_2013_0.pdf; *Country Profile: Iran*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/iran/nuclear/ (last updated Sept., 2013); Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 255-70.

71. *Arms Control and Proliferation Profile: Syria*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/syriaprofile (last updated Sept. 2013); *Country Profile: Syria*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/syria/nuclear/ (last updated June 2013).

72. *Country Profile: Libya*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/libya/nuclear/ (last updated Feb. 2013); Peter Crail, *Libya Adds New Pieces to Its Nuclear History*, ARMS CONTROL TODAY, Oct. 2008.

73. *Country Profile: Argentina*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/argentina/ (last updated Aug. 2012); *Nuclear Threat Institute, Country Profile: Brazil*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/brazil/ (last updated Aug. 2012); *Country Profile: South Korea*, NUCLEAR THREAT INST., http://www.nti.org/country-profiles/south-korea/nuclear/ (last updated Sept. 2013).

74. *IIGG Report Card Nuclear Nonproliferation: Background*, COUNCIL ON FOREIGN RELATIONS 1, 2 (Apr. 2013), http://www.cfr.org/thinktank/iigg/reportcard/PDFs/CFR%20Nuclear%20Nonproliferation%20Report%20Card%20Backgrounder.pdf; *Nuclear Materials Security Index*, NUCLEAR THREAT INITIATIVE 1, 20 (Jan. 2014), http://ntiindex.org/wp-content/uploads/2014/01/2014-NTI-Index-Report1.pdf.

hiding a weapon or components or undertaking other key actions.[75] An area beyond the jurisdiction of any country—such as the high seas or Antarctica—could likewise be exploited.[76] So a disarmament treaty's verification regime would have to be of universal application.

An additional set of definitional and taxonomic points must also be briefly addressed. The term "nuclear weapon" is itself ambiguous. Sometimes, that designator embraces both of the two indispensable elements: the nuclear explosive component (a missile warhead, artillery shell, bomb, etc.) and the "delivery vehicle" (the missile, projectile, aircraft, etc. that is used to transport the explosive to its target); sometimes, "weapon" refers only to the explosive. Usually (including in this article), discussion about eliminating nuclear weapons focuses principally upon the explosives, but any comprehensive treaty must also address the question of retention, limitation, or modification of nuclear-capable delivery systems.[77]

Nuclear-armed delivery systems are often categorized by the mission they are assigned or the range they are capable of reaching; the vocabulary is not well standardized, but the customary three tiers are: "strategic" (consisting of inter-continental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers,

---

75. Countries have frequently tested their nuclear weapons outside their home territories, on the high seas, or within the boundaries of another state. *Nuclear Testing Tally*, ARMS CONTROL ASS'N, http://www.armscontrol.org/factsheets/nucleartesttally (Feb. 2013). Concealing a nuclear weapon, or conducting nuclear weapons-related activities, on the territory of another state without its knowledge would be highly problematic, but it might not be impossible in some circumstances.

76. Regarding an alleged (but not confirmed, and not authoritatively attributed to any specific country) nuclear weapon test explosion in the South Atlantic in 1979, see Carey Sublette, *Report on the 1979 Vela Incident*, NUCLEAR WEAPON ARCHIVE (Sept. 1, 2001), *available at* http://nuclearweaponarchive.org/Safrica/Vela.html; *1979 South Atlantic "Flash" Is Consistent with a Nuclear Explosion, According to Newly Declassified Energy Department Documents*, INST. FOR SCI. AND INT'L SEC. (ISIS) (Mar. 2001), *available at* http://www.isis-online.org/publications/southafrica/03012001%20press%20release%20on%20flash.html; E.M. Jones, R.W. Whitaker, H.G. Horak & J.W. Kodis, *Low-Yield Nuclear Explosion Calculations: The 9/22/79 Vela Signal*, INST. FOR SCI. AND INT'L SEC. (ISIS) (May 1982), *available at* http://www.isis-online.org/publications/southafrica/lanl%20doc.pdf.

77. *See* NOTBURGA K. CALVO-GOLLER & MICHEL A. CALVO, THE SALT AGREEMENTS: CONTENT, APPLICATION, VERIFICATION 29-32 (1987) (discussing definitions of terms used in SALT I); DEBATE, *supra* note 3, at 54. Sometimes, analysts speak of three components: the explosive unit (consisting of one or more nuclear devices inside a radiation case); the "nuclear warhead system" (in which the encased weapon is integrated into a deliverable gravity bomb, artillery shell, missile re-entry vehicle, or other mechanism); and the delivery system (a ballistic missile, bomber, submarine, or other carrier).

with ranges generally exceeding 5500 kilometers);[78] "intermediate," "theater," or "medium-range";[79] and "tactical" or "battlefield" (with ranges generally under 500 kilometers).[80] Furthermore, weapons may be classified as "deployed" (i.e., in operational status); "non-deployed" (including systems that are undergoing repair or maintenance); "reserve" (not mated to a delivery system, but available in principle for a return to deployed status); "retired" (removed from the active-duty stockpile, with no intention of being maintained in operational condition); and "awaiting disassembly" (in the queue for dismantling—a status that can linger for years, depending on the availability of appropriate facilities).[81]

At a deeper level of detail, nuclear disarmament advocates must address the "components" of a nuclear weapon—if a treaty regime

---

78. *See* Treaty Between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, U.S.-Russ., Protocol, Part 1, ¶¶ 23, 37, 77, Apr. 8, 2010, S. TREATY DOC. No. 111-5 [hereinafter New START] (defining strategic nuclear weapons covered by the treaty); AMY F. WOOLF, CONG. RESEARCH SERV., RL33640, U.S. STRATEGIC NUCLEAR FORCES: BACKGROUND, DEVELOPMENTS, AND ISSUES 9-28 (Oct. 22, 2013).

79. *See* Treaty Between the United States of America and the Union of Soviet Socialist Republics On the Elimination of Their Intermediate-Range and Shorter-Range Missiles, U.S.-U.S.S.R., art. II.5,6, Dec. 8. 1987, 27 I.L.M. 84 (entered into force Jun. 1, 1988) [hereinafter INF Treaty]; STEVEN PIFER & MICHAEL E. O'HANLON, THE OPPORTUNITY: NEXT STEPS IN REDUCING NUCLEAR ARMS 81-112 (2012).

80. Dakota S. Rudesill, *Regulating Tactical Nuclear Weapons*, 102 GEO. L.J. 99, 108 (2013); Steven P. Andreasen, *Verifying Reductions and Elimination of Tactical Nuclear Weapons*, *in* CULTIVATING CONFIDENCE, *supra* note 3, at 213-28; Rose Gottemoeller, *Eliminating Short-Range Nuclear Weapons Designed to Be Forward Deployed*, *in* REYKJAVIK REVISITED, *supra* note 3, at 107-57; Viktor Esin, *Tactical Nuclear Weapons: Their Modern Military Role and Arms Control Proposals*, and Steven Pifer, *Nonstrategic Nuclear Weapons, Policy and Arms Control; Issues for the United States, NATO and Russia*, *in* NATURAL RESOURCES DEFENSE COUNCIL, FROM MUTUAL ASSURED DESTRUCTION TO MUTUAL ASSURED STABILITY: EXPLORING A NEW COMPREHENSIVE FRAMEWORK FOR U.S. AND RUSSIAN NUCLEAR ARMS REDUCTIONS 57, 64 (2013), *available at* http://www.nrdc.org/nuclear/files/NRDC-ISKRAN-Nuclear-Security-Report-March2013.pdf.

81. *See* U.S. DEPT. OF DEFENSE, *Fact Sheet: Increasing Transparency in the U.S. Nuclear Stockpile* (May 3, 2010), http://www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency__FINAL_w_Date.pdf (defining the "nuclear stockpile" as including "active" warheads (including strategic and non-strategic weapons maintained in an operational, ready-to-use configuration, as well as weapons that could be available for deployment in a short time, and spares) and "inactive" warheads (maintained at a depot in non-operational status); a "retired" warhead has been removed from its delivery vehicle, is not functional, and is in a queue for dismantlement; a "dismantled" warhead has been reduced to its component parts); U.S. DEPT. OF DEFENSE, NUCLEAR MATTERS HANDBOOK 36-43 (2011), *available at* http://www.acq.osd.mil/ncbdp/nm/nm_book_5_11/index.htm(describing composition of U.S. nuclear weapons stockpile); New START, *supra* note 78, Protocol, Part 1, ¶¶ 12-17, 47-52 (differentiating "deployed" from "non-deployed" weapons). Other countries may not use the same categories or vocabulary.

requires "destruction" of a nuclear weapon, may a state nonetheless retain some disassembled pieces of the device, and if so, what are the appropriate accountable constituent elements? The phenomenon of "dual capability" is a persistent problem here—many of the same substances, equipment, facilities and knowledge that are essential to producing and sustaining nuclear weapons are also relevant to a full range of benign applications across the civilian economy.[82]

The most important, unique ingredient in a nuclear explosive device is the fissile material—the highly-enriched uranium or plutonium that undergoes the fission reaction providing the massive amounts of explosive energy. The NWS have produced enormous inventories of fissile material—officially undisclosed, but estimated at 1,440 tons of highly enriched uranium and 485 tons of plutonium[83]—some of which is adaptable not only for weapons, but also for use in nuclear power plants, naval reactors, nuclear medicine, isotopic thermal generators (for deep space missions), and other benign applications. Monitoring those secret mountains of hazardous radioactive elements will be a critical challenge; the International Atomic Energy Agency currently considers only twenty-five kilograms of highly enriched uranium, or eight kilograms of plutonium, to be a "significant quantity," approximating the minimum amount supposedly needed for a first-generation nuclear weapon, and therefore justifying the closest scrutiny.[84]

---

82. Regarding dual capability of nuclear materials, equipment and technology, see NUCLEAR SUPPLIERS GROUP, *Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Materials, Software, and Related Technology*, http://www.nuclearsuppliersgroup.org/A_test/01-eng/09-guide.php?%20button=91 (last visited Nov. 10, 2013). *See also* Int'l Atomic Energy Agency [IAEA], *Communications Received from Certain Member States Regarding Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Materials, Software and Related Technology*, IAEA Doc. INFCIRC/254/Rev.7/Part 2a (Mar. 20, 2006), *available at* http://www.iaea.org/Publications/Documents/Infcircs/2006/infcirc254r7p2.pdf. Many of the ingredients of a nuclear weapon, such as the neutron reflector, are unique for this purpose and would not be suitable for many other functions; however, some components, such as the casing, the power supply, the fusing and arming systems, the altimeters, and the parachutes, might be more adaptable for some conventional weapons or for selected civil industrial purposes.

83. *See Fissile Material Cut-Off Treaty (FMCT) at a Glance*, ARMS CONTROL ASS'N (Aug. 2013), http://www.armscontrol.org/factsheets/fmct; *see also* INTERNATIONAL PANEL ON FISSILE MATERIALS, GLOBAL FISSILE MATERIAL REPORT 2013 8, 11 (2013), *available at* http://fissilematerials.org/library/gfmr13.pdf [hereinafter FISSILE MATERIAL PANEL] (estimating 2012 global stocks of highly enriched uranium at 1380 tons (plus or minus 125 tons) and of plutonium at 495 tons (plus or minus 10 tons).

84. *See Limits to the Safeguard System*, INT'L ATOMIC ENERGY AGENCY (IAEA), http://www.iaea.org/Publications/Booklets/Safeguards/pia3810.html (last visited Nov, 10, 2013) (IAEA focuses on the approximate quantity of material necessary to manufacture a nuclear weapon—about 25kg of

Importantly, the disassembly of a nuclear weapon is not necessarily irrevocable; a crucial element in a zero regime would be procedures to guard against reconstitution of a weapons capacity that had apparently been eliminated. As long as a country retains the essential building blocks and knowledge, it has an inherent capability for reassembly, as well as for new construction "from scratch."[85] The function of the legal regime, therefore, would be to ensure that any such nuclear renaissance would not be swift or secret.[86]

Conceptually, a major issue in the strategic design of the verification apparatus is how far "backwards" it must extend into the production cycle for a nuclear weapon. That is, would it be sufficient for the future stability of the regime to ensure only the "first level" —the internationally monitored disassembly all nuclear weapons and the secure storage or destruction of the components? Or must the control system also intrude more deeply into the production process, ensuring the disassembly of those critical components, together with international scrutiny of the storage or destruction of the resulting subcomponents? Or, in pursuit of still greater long-term reliability, would the treaty mechanism have to apply safeguards to all the facilities at which weapons components and subcomponents are manufactured, processed, and assembled for various purposes, including purposes far removed from nuclear weaponry?[87]

Finally, nuclear weapons require a considerable physical infrastructure: laboratories to design and develop the weaponry; sites to conduct explosive developmental and proof testing; specialized installations to assemble and maintain the devices; and military institutions to

---

highly enriched uranium or 8kg of plutonium); Christopher E. Paine, Thomas B. Cochran & Robert S. Norris, *Technical Realities Confronting Transition to a Nuclear Weapon Free World*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 109, 119-23 (criticizing the IAEA's calculation of significant quantities).

85. Perkovich & Acton, *supra* note 8, at 102-104.

86. Simultaneously, the control system for a disarmament regime would have to ensure against diversion of nuclear materials from permitted peaceful nuclear applications, such as electricity generation.

87. The author is indebted to Chris Paine for this insight, as well as for the illustration of the application of the problem in Syria today, regarding chemical weapons. There, the international community seeks to preclude any future availability of chemical weapons, by destroying the existing arms, the precursor chemicals that could be combined to create new weapons, and the relevant production and handling facilities. *See also* Holdren, *supra* note 4; SIDNEY D. DRELL & RAYMOND JEANLOZ, *Nuclear Deterrence in a World Without Nuclear Weapons*, *in* DETERRENCE: ITS PAST AND FUTURE 99-129 (George P. Shultz et al. eds., 2011).

deploy the weapons and train the operators—all of which have possible implications for a treaty-drafting exercise.[88]

Within those parameters, assessments vary about the current nuclear weapons holdings of individual countries, as intense secrecy usually surrounds all aspects of states' nuclear arms. By some estimates, the United States has about 7,700 intact nuclear weapons, including 4,700 "stockpiled" weapons (about 1,700 deployed strategic weapons, 500 tactical weapons, and 2,500 weapons in reserve storage) and about 3,000 "retired" weapons.[89] Russia is generally credited with about 8,500 total weapons, of which about 4,480 are currently in the stockpile (fewer deployed strategic weapons than the United States, but many more tactical weapons).[90] Estimates for China (250),[91] France (300)[92] and the United Kingdom (225)[93] are less detailed. The indications for

88. Christopher E. Paine, Thomas B. Cochran & Robert S. Norris, *The Arsenals of the Nuclear Weapons Powers*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 8, 28 (identifying major nuclear infrastructure elements—including assembly/disassembly plants, plutonium production reactors, uranium enrichment plants, and chief design labs—for each of the P5); DEBATE, *supra* note 3, at 53-54.

89. Hans M. Kristensen & Robert S. Norris, *Global Nuclear Weapons Inventories, 1945-2013*, 69 BULL. OF THE ATOMIC SCIENTISTS, no. 5, 2013, at 75-77 (estimating U.S. inventory at 4,650 stockpiled nuclear weapons (including 2,150 deployed) and 3,000 retired). The United States has retained nearly 20,000 plutonium "pits" (the core of a nuclear weapon) and 5,000 canned subassemblies (the "secondaries" in thermonuclear weapons). *Id.* at 78-79; *see also Nuclear Weapons: Who Has What at a Glance*, ARMS CONTROL ASS'N (Apr. 2013), http://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat; Woolf, *supra* note 78; *New START Treaty Aggregate Numbers of Strategic Offensive Arms*, U.S. DEP'T OF STATE (Oct. 1, 2013), *available at* http://www.state.gov/t/avc/rls/215000.htm; *Fact Sheet: U.S. Nuclear Modernization Programs*, ARMS CONTROL ASS'N, (January 2014), https://www.armscontrol.org/factsheets/USNuclearModernization; Hans M. Kristensen and Robert S. Norris, *US Nuclear Forces, 2014*, 70 BULL. OF THE ATOMIC SCIENTISTS no. 1, 2014, at 85, *available at* http://thebulletin.org/2014/january/us-nuclear-forces-2014.

90. Kristensen & Norris, *supra* note 89, at 76, 79 (noting that Russia has 4,480 nuclear weapons in the stockpile (including 1,800 deployed) and 4,000 retired); PAVEL PODVIG, IFRI SEC. STUDIES CTR., RUSSIA'S NUCLEAR FORCES: BETWEEN DISARMAMENT AND MODERNIZATION (2011).

91. Kristensen & Norris, *supra* note 89, at 79 (noting predictions that the Chinese nuclear arsenal is likely to increase); DEBATE, *supra* note 3, at 27.

92. Kristensen & Norris, *supra* note 89, at 79 (noting that France intends to reduce its arsenal to slightly fewer than 300); *see generally* Venance Journe, *France's Nuclear Stance: Independence, Unilateralism, and Adaptation*, *in* GETTING TO ZERO, *supra* note 3, at 124-48; DEBATE, *supra* note 3, at 26.

93. Kristensen & Norris, *Global Nuclear Weapons Inventories*, *supra* note 89, at 79 (also noting that the United Kingdom plans to reduce its stockpile to 180 warheads, of which 120 will be operationally available and 40 deployed); *see generally* Ian Anthony, *British Thinking on Nuclear Weapons*, *in* GETTING TO ZERO, *supra* note 3 at 102-23; DEBATE, *supra* note 3, at 26.

the non-NPT members are even more speculative: India (110),[94] Israel (80),[95] North Korea (fewer than 10)[96] and Pakistan (120).[97] By all calculations, the current global population of nuclear weapons is far lower than at earlier times—at its peak, in 1967, the United States possessed 31,000 weapons;[98] the zenith for the Soviet Union, in 1986, was over 40,000.[99] However, this downward trend may now be ending with the United States, France, and the United Kingdom seemingly intending to make only modest reductions in the future, and the other states on an upward trajectory.[100]

Non-state actors may be relevant to the story here, too. Unlike chemical or biological weapons, which might be home-brewed by a dedicated, well-funded terrorist organization,[101] construction of an indigenous nuclear weapon, beginning with the production of the requisite fissile material, is beyond the reach of entities other than those affiliated with sophisticated states.[102] But a technically competent non-state actor with access to plutonium or highly-enriched uranium could plausibly have the capability to assemble an effective improvised nuclear device with significant explosive power. Theft or donation of a quantity of fissile material from a failing or rogue state may be assessed as unlikely, but perhaps it is not as implausible as it should be; the specter of the world's most deadly weapons in the hands of the world's most violent actors therefore provides both a strong motivation for

---

94. Kristensen & Norris, *supra* note 89, at 80 (noting that Indian and Pakistani nuclear weapons are thought to be held in central storage, not operationally deployed).

95. *Id.* at 80.

96. *Id.* at 80 (noting that North Korea has not yet demonstrated that it has operationalized any nuclear weapons); Frank Valliere, *Enforcement Scenario: North Korea, in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 271-91.

97. Kristensen & Norris, *Global Nuclear Weapons Inventories, supra* note 89, at 80.

98. *Id.* at 78; FISSILE MATERIAL PANEL, *supra* note 83, at 50-58.

99. Kristensen & Norris, *Global Nuclear Weapons Inventories, supra* note 89, at 78.

100. *Id.*

101. *See* RICHARD DANZIG ET. AL., CTR. FOR A NEW AMERICAN SEC. AUM SHINRIKYO: INSIGHTS INTO HOW TERRORISTS DEVELOP BIOLOGICAL AND CHEMICAL WEAPONS (2011), *available at* http://www.cnas.org/files/documents/publications/CNAS_AumShinrikyo_Danzig_1.pdf (analyzing how a Japanese cult developed biological and chemical weapons for terrorist purposes).

102. Andrew Mack, *Nuclear 'Breakout': Risks and Possible Responses*, in CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 208, 217 ("Terrorist organizations do not have the scientific, technological, material or financial resources needed to produce fissile material."). *But see* Harold A. Feiveson, *Civilian Nuclear Power in a Nuclear-Weapon-Free World, in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 57, 70 (suggesting that a sophisticated sub-state group could construct a crude nuclear weapon).

pursuit of zero and a highly stressing set of conditions that a viable nuclear disarmament regime must satisfy.[103]

D. *The Politics of Zero*

In pursuit of safety and security, the world's leading countries—especially the United States and the Soviet Union/Russia, which have always possessed the lions' share of the nuclear inventories—have negotiated a series of canonical, but only partially successful, bilateral, plurilateral, and multilateral nuclear arms control treaties. This sequence provides the edifice upon which any nuclear disarmament agreements would be constructed; it can be organized into three components.

1. Bilateral U.S.-U.S.S.R. Agreements

The oscillations of cold war, détente and contemporary politics have generated a sputtering stream of major nuclear arms control agreements, beginning in the SALT I (1972) negotiations,[104] which spawned two ground-breaking accords, the Anti-Ballistic Missile (ABM) Treaty[105] (which sharply restricted defensive systems intended to shoot down incoming nuclear warheads) and the Interim Agreement on Strategic Offensive Arms[106] (which essentially froze then-current inventories of ICBM and SLBM launchers). Both documents have terminated. The SALT II Treaty[107] (1979), which would have continued the arms control process, failed to gain the consent of the U.S. Senate, and therefore never entered into force. The Intermediate Nuclear Forces

---

103. *See* 2010 Op Ed, *supra* note 24 ("We face a very real possibility that the deadliest weapons ever invented could fall into dangerous hands."); NWC, *supra* note 2, at 118-19 (discussing terrorist use of nuclear weapons).

104. CALVO-GOLLER & CALVO, *supra* note 77; ARMS CONTROL II, *supra* note 4, at 219-254; Thomas Graham, Jr., *NPT Article VI Origin and Interpretation*, *in* REBUILDING THE NPT CONSENSUS, *supra* note 49, at 34-49; Woolf, *supra* note 78.

105. Treaty Between The United States Of America And The Union Of Soviet Socialist Republics On The Limitation Of Anti-Ballistic Missile Systems, U.S.-U.S.S.R., May 26, 1972, 23 U.S.T. 3435 (entered into force Oct. 3, 1972) (U.S. withdrew Dec. 13, 2001) [hereinafter ABM Treaty].

106. Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, May 26, 1972, U.S.-U.S.S.R., 23 U.S.T. 3462 (entered into force Oct. 3, 1972) [hereinafter SALT I].

107. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms, U.S.-U.S.S.R., June 18, 1979, S. Treaty Doc. No. 96-1 (1979) (not in force) [hereinafter SALT II].

(INF) Treaty[108] (1987), banning land-based missiles of intermediate and shorter range, is of indefinite (i.e., permanent) duration.[109]

The subsequent START I Treaty[110] (1991) inaugurated actual reductions in U.S. and Soviet deployed strategic nuclear weapons (in contrast to merely capping their increases). It expired in 2009.[111] A successor START II[112] (1993) was negotiated and signed but never brought into force. The Strategic Offensive Arms Reduction Treaty[113] (SORT or Moscow Treaty) (2002) was a very brief document, built upon START I, which further reduced the number of operationally-deployed strategic nuclear warheads each party was allowed; it was superseded and terminated in 2011.[114] The New START Treaty (2010) is the currently-applicable bilateral strategic nuclear arms control instrument; it limits each party to 1,550 deployed warheads (counted in such a way that many are excluded from the official tally) and 700 operational delivery systems by 2018.[115] As of this writing, no follow-on U.S.-Russia nuclear arms control negotiations are under way, with Moscow having repeatedly rebuffed U.S. overtures.[116]

---

108. INF Treaty, *supra* note 79.

109. *But see* Josh Rogin, *U.S. Knew Russia Violated Intermediate-Range Nuclear Forces Treaty*, DAILY BEAST (Nov. 26, 2013), http://www.thedailybeast.com/articles/2013/11/26/u-s-knew-russia-violated-intermediate-range-nuclear-forces-treaty.html#url=/articles/2013/11/26/u-s-knew-russia-violated-intermediate-range-nuclear-forces-treaty.html (asserting that Russia may be interested in terminating the INF Treaty, and may be in violation of it).

110. Treaty Between the United States of America and the Union of Soviet Socialist Republics On the Reduction and Limitation of Strategic and Offensive Arms, U.S.-U.S.S.R., Jul. 31, 1991, S. Treaty Doc. 102-20 (1991) [hereinafter START I].

111. *Id.* art. XVII.2 (specifying a 15 year duration); *START I Fact Sheet*, ARMS CONTROL ASSOCIATION, http://www.armscontrol.org/factsheets/start1 (last visited Mar. 25, 2014).

112. Treaty Between the United States of America and the Union of Soviet Socialist Republics On the Further Reduction and Limitation of Strategic and Offensive Arms, U.S.-U.S.S.R., Jan. 3, 1993, S. Treaty Doc. 103-1 (1993) [hereinafter START II].

113. Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions, U.S.-Russ., May 24, 2002, S. Treaty Doc. No. 107-8 (2002) [hereinafter SORT].

114. New START, *supra* note 78, art. XIV.4.

115. *Id.* art. II.

116. RIA Novosti, *Russia Skeptical Over Obama's New Nuclear Reduction Proposal*, ATOM INFO.RU (June 20, 2013), http://www.atominfo.ru/en/news3/c0422.htm (Russian officials react negatively to U.S. proposal to pursue further bilateral cuts in strategic weapons); President Barack Obama, Remarks at the Brandenburg Gate—Berlin, Germany, (June 19, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/19/remarks-president-obama-brandenburg-gate-berlin-germany (proposing U.S.-Russia nuclear weapons reductions).

2. Regional Nuclear Weapons Free Zone Treaties

In a series of local initiatives, the NNWS countries in several distinct geographic regions have united to foreclose any incipient nuclear arms races. The first of these, applicable to Latin America and the Caribbean,[117] also attracted the participation of the NWS through a series of protocols in which they pledged to respect the nuclear weapons-free nature of the zone. It has been followed by cognate agreements regarding the South Pacific,[118] South East Asia,[119] Central Asia,[120] and Africa,[121] which have entered into force, but are still somewhat works-in-progress in terms of full zonal state and P5 participation.[122] A similar zone has been proposed for the Middle East.[123]

3. Global Treaties Related to Nuclear Weapons

In addition to the NPT, the world has crafted a series of specialized accords that regulate nuclear weapons in various respects. The Limited

---

117. Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean, Feb. 14, 1967, 634 U.N.T.S. 326 (entered into force Apr. 22, 1968) [hereinafter Treaty of Tlatelolco].

118. South Pacific Nuclear Free Zone Treaty, Aug. 6, 1985, 1445 U.N.T.S. 177, 24 I.L.M. 1440 (1985) (entered into force Dec. 11, 1986) [hereinafter Treaty of Rarotonga].

119. Treaty on the Southeast Asia Nuclear Weapon Free Zone, Dec. 15, 1995, 35 I.L.M. 635 (1996) (entered into force Mar. 27, 1987) [hereinafter Bangkok Treaty].

120. Treaty on a Nuclear-Weapon-Free Zone in Central Asia, Sept. 8, 2006 (entered into force Mar. 21, 2009), *available at* http://disarmament.un.org/treaties/t/canwfz [hereinafter CANWFZ].

121. Treaty on the Nuclear-Weapon-Free Zone in Africa, Apr. 11, 1996, 35 I.L.M. 698 (1996) [hereinafter Pelindaba Treaty].

122. *Nuclear-Weapon-Free Zones*, UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS, http://www.un.org/disarmament/WMD/Nuclear/NWFZ.shtml (last visited Mar 24, 2014); *Nuclear-Weapon-Free Zones (NWFZ) at a Glance*, ARMS CONTROL ASSOCIATION, http://www.armscontrol.org/factsheets/nwfz (last visited Mar. 24, 2014); *Nuclear Weapons Free Zones*, NUCLEAR FILES.ORG, http://nuclearfiles.org/menu/library/treaties/nuclear-free-zones/trty_nuclear-free-zone-index.htm (last visited Nov. 12, 2013).

123. *WMD-Free Middle East Proposal at a Glance*, ARMS CONTROL ASSOCIATION (Jul. 2013), http://www.armscontrol.org/factsheets/mewmdfz (last visited Mar. 24, 2014); Daryl G. Kimball, *Toward a WMD-Free Middle East*, ARMS CONTROL TODAY, Nov. 2012, at 4; A WMD-FREE ZONE IN THE MIDDLE EAST: REGIONAL PERSPECTIVES (Paolo Foradori & Martin B. Malin eds., 2013), *available at* http://belfercenter.ksg.harvard.edu/files/dp_2013-09.pdf; *see also* Daryl G. Kimball, *Mongolia Recognized as Nuclear-Free Zone*, ARMS CONTROL TODAY, Oct. 2012 (the P5 have acknowledged Mongolia as a nuclear weapons free "zone" on its own).

Test Ban Treaty (LTBT)[124] (1963) prohibits test explosions of nuclear weapons except in deep underground chambers, where the radioactive contaminants could be safely contained. The LTBT has attracted 126 parties.[125] The Outer Space Treaty[126] (1967), now joined by 101 states,[127] includes a prohibition against placing nuclear weapons in orbit or installing them on the moon or other celestial bodies.[128]

The Comprehensive Nuclear Test Ban Treaty (CTBT)[129] (1996) extends the LTBT by banning nuclear tests in all environments, including underground, thereby arresting further development of additional nuclear weapons capabilities. By its terms, the CTBT will not enter into force until ratified by 44 designated countries, several of which (including the United States and China) have persistently failed to do so.[130] Although the immediate prospects for prompt effectuation of this treaty are not bright, it is hard to imagine advanced progress toward nuclear disarmament until that is accomplished.[131]

---

124. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water, Aug. 05, 1963, 480 U.N.T.S. 43, 14 U.S.T. 1313, 2 I.L.M. 889 (1963) (entered into force Oct. 10, 1963) [hereinafter Limited Test Ban Treaty or LTBT].

125. *Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water*, UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS (UNODA), http://disarmament.un.org/treaties/t/test_ban (last visited Nov. 12, 2013).

126. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205, 6 I.L.M. 386 (1967) (entered into force Oct. 10, 1967) [hereinafter Outer Space Treaty or OST].

127. *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS (UNODA), http://disarmament.un.org/treaties/t/outer_space (last visited Nov. 12, 2013).

128. Outer Space Treaty, *supra* note 126, art. IV.

129. Comprehensive Nuclear Test-Ban Treaty, Sept. 10, 1996, 35 I.L.M. 1439 (1996) (not in force) [hereinafter CTBT].

130. *Id.* art. XIV, annex 2; *See Comprehensive Nuclear Test Ban Treaty*, UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS (UNODA), http://disarmament.un.org/treaties/t/ctbt (last visited Nov. 12, 2013) (listing which required states have not yet ratified the treaty); OLA DAHLMAN, JENIFER MACKBY, SVEIN MYKKELTVEIT & HEIN HAAK, DETECT AND DETER: CAN COUNTRIES VERIFY THE NUCLEAR TEST BAN 13-20 (Springer 2011) (surveying prospects for ratification of the CTBT in the states whose membership is necessary for the treaty to enter into force); JONATHAN MEDALIA, CONG. RESEARCH SERV., RL 33548, COMPREHENSIVE NUCLEAR-TEST-BAN TREATY: BACKGROUND AND CURRENT DEVELOPMENTS (2013).

131. *See also* Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor, and in the Subsoil Thereof art. 1, Feb. 11, 1971, 955 U.N.T.S. 115, 10 I.L.M. 145 (1971) (entered into force May 18, 1971) [hereinafter Seabed Arms Control Treaty] (prohibiting the emplacement of nuclear weapons on the ocean floor); Antarctic Treaty art. V, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71 (entered into force Jun. 23, 1961) (prohibiting nuclear explosions in Antarctica).

Finally, one other element on the multilateral nuclear arms control agenda must be noted. A Fissile Material Cutoff Treaty (FMCT) would constitute an agreement to bar the production of additional highly enriched uranium and plutonium for weapons; it could also include accounting of past production of the critical isotopes and more stringent controls upon stockpiles. FMCT has long been high on the list of arms control priorities; however, its pursuit has been persistently stifled by international political discord.[132] Overcoming those frustrations would be an essential precondition for nuclear disarmament. For purposes of the draft treaty documents below, it is assumed that—somehow—a viable cutoff treaty will eventually be developed in the years to come.[133]

III. THE BIGGEST ISSUES

Negotiators and drafters of the instruments designed to pursue nuclear disarmament will be compelled to confront a daunting array of challenges. Several of these choice-points are identified in multiple footnotes attached to the Zero Agreement and Zero Treaty in the subsequent sections of this article, but a few are so important and complex that further textual elaboration is required. This section will first describe the eleven characteristics necessary for an adequate elimination regime and will then continue by illuminating the critical problems of: (a) the definition of "zero"; (b) verification and enforcement of compliance; (c) timing and the negotiating process; and (d) collateral measures.

A. *Key Characteristics for a Valid Elimination Process*

Just as important as clarifying what the documents *will* attempt to incorporate is the articulation of what they will *not* undertake to do. In particular, the enterprise is decidedly not about "unilateral" or "immediate" disarmament, despite the (sometimes deliberate) mischaracter-

132. *Fissile Material Cut-Off Treaty (FMCT) at a Glance*, *supra* note 83; *U.N. Chief Acknowledges Staff Doubts About Disarmament Forum*, GLOBAL SECURITY NEWSWIRE (Jan. 22, 2014), http://www.nti.org/gsn/article/un-chief-airs-hopes-deadlocked-disarmament-forum/?mgs1=d157euvx6c.

133. *See Fissile Material Cut-Off Treaty (FMCT) at a Glance*, *supra* note 83; James M. Acton, *Fissile Materials and Disarmament: Long-term Goals, Short-term Steps*, *in* GETTING TO ZERO, *supra* note 3, at 245-59; PIFER & O'HANLON, *supra* note 79, at 162-74; Robert J. Einhorn, *Controlling Fissile Materials Worldwide: A Fissile Material Cutoff Treaty and Beyond*, *in* REYKJAVIK REVISITED, *supra* note 3, at 279-311.

izations that too often proliferate.[134] Instead, the following provides a list of eleven key characteristics that a valid nuclear weapons elimination process must possess; it comprises the metrics against which the feasibility and acceptability of a new treaty package would have to be judged and is reflected in the preambles of the draft documents in Parts IV and V.

1. *Global.* A zero agreement regime would ultimately have to be universal, covering (with varying degrees of intensity based upon the potential non-compliance risk they present) all countries and all physical environments in the world. Obviously, the states possessing nuclear weapons, as well as the states with advanced civil nuclear industries (and therefore the latent capacity to produce nuclear weapons relatively quickly), would have to be early participants. In addition, almost any country (as well as the high seas, outer space, and other locations outside the jurisdiction of any state) could potentially serve as a site for clandestine evasions of the treaty. Therefore, all would have to be subject, within some reasonable time period, to inclusion in the verification and enforcement regime. The various states need not participate immediately or in an equal or identical fashion, but proponents of abolition have repeatedly stressed that getting to zero will have to be a fully multilateral "joint enterprise."[135]
2. *Comprehensive.* The agreement would have to embrace all types of nuclear explosive devices, regardless of size, age, type, or status as deployed, non-deployed, retired, or otherwise, and regardless of the asserted purpose or function of the explosive.[136] In addition, the critical components of nuclear weap-

134. Perkovich & Acton, *supra* note 8, at 16 (dismissing the "mistaken[] fear" that nuclear disarmament means "unilateral" disarmament).

135. Max M. Kampelman & Steven P. Andreasen, *Turning the Goal of a World without Nuclear Weapons into a Joint Enterprise, in* REYKJAVIK REVISITED, *supra* note 3, at 429-47; James Goodby, *A World Without Nuclear Weapons Is a Joint Enterprise*, ARMS CONTROL TODAY, May 2011, at 23.

136. Consideration of the purpose or function of a nuclear explosive device is relevant here in connection with the notion of "peaceful nuclear explosions" (PNEs). For many years, enthusiasts imagined that explosive nuclear power could be safely and inexpensively harnessed for civil engineering purposes, such as to excavate a canal or construct an underground storage chamber. For that reason, Article V of the NPT preserves for NNWS non-discriminatory access to PNE services. NPT, *supra* note 44, art. V. More recently, however, the ardor for PNEs has dampened, and the CTBT bans them as technologically indistinguishable from weapons tests. CTBT, *supra* note 129, art. I; NINA TANNENWALD, THE NUCLEAR TABOO: THE UNITED STATES AND THE NON-USE OF NUCLEAR WEAPONS SINCE 1945 268-73 (2007).

ons, delivery systems, and supporting infrastructure assessed as having either a unique or a very strong identification with nuclear weapons design, engineering, production or maintenance would have to be brought inside the monitoring and control regime.

3. *Timely.* The process of climbing the mist-covered mountain will doubtless require many years; the world should start now, by re-affirming the goal, and by undertaking immediate steps in pursuit of it. It is impossible today to specify a reliable timetable for completion of the enterprise, and there may be pauses along the way,[137] but taskmasters should hold the world community to a persistent effort.
4. *Balanced.* The sequence of steps in pursuit of nuclear disarmament should elicit appropriate contributions from each state. The cavalcade toward nuclear weapons elimination may include some temporary asymmetries, as different states undertake independent actions that have no exact corollary in other countries, but all should share the burdens and risks.
5. *Predictable.* The progression toward a world free of nuclear weapons should be fully transparent, so all participants can see where they stand vis-à-vis other states, and what steps are coming next, with no surprises.
6. *Secure.* Each stage in the progression toward nuclear abolition must itself be stable; the legitimate security interests of each participant must be safeguarded at all times, and no state should be unduly exposed or even temporarily jeopardized at any interim point.
7. *Verifiable.* The agreements would have to incorporate structures and functions that would enable parties to be confident that their neighbors were complying with the obligations. Insistence upon "perfect" verification would be unrealistic, but when dealing with such decisive weapons participants must know that militarily-significant cheating would be detected in sufficient time to enable an effective response. Although earlier arms control treaties have established many useful precedents for effective verification, significant advances in observation technology and in the sovereign acceptability of intrusive inspections will be required for a zero

137. *See* PIFER & O'HANLON, *supra* note 79, at 176 (discussing the idea that there might be temporary pauses at "base camps" along the pathway up the mountain).

regime, with monitoring algorithms and political accommodations that we cannot now specify and can only barely imagine.

8. *Enforceable.* If a violation is detected, the international community must be capable of mounting a timely, effective response. Again, the current impoverished array of legal tools—economic sanctions, diplomatic retaliation, action through the U.N. Security Council, or self-help under the aegis of the Vienna Convention on the Law of Treaties[138]—is inadequate. New international political and legal realities—including the possibility of the use of military force—will have to be developed both to deter and to respond to any "breakout" attempts.
9. *Sustainable.* The nuclear disarmament regime must be sufficiently robust to be able to withstand the inevitable disruptions that accompany international politics. The abolition of nuclear weapons cannot depend upon an idealistic vision of a conflict-free world, but must be capable of surviving all manner of temporary (and even severe) perturbations.
10. *Irreversible.* One exceptional challenge is to make the zero regime permanent, perpetually guarding against the unwarranted resurrection of nuclear weapons. A special aspect of this problem, considered further *infra*, is the possibility that one of the most effective national responses to one country's cheating on the treaty obligations (e.g., Country X begins to re-create its nuclear weapons, or is found to have secretly retained some of its original stockpile) would be for other states to likewise re-constitute portions of their own earlier weapons (e.g., Country Y quickly returns to building its own offsetting nuclear force). Such a response—if done quickly, effectively and proportionally—might cancel any benefit that the cheater had hoped to attain, and thereby deter any such wayward moves in the first place. But that form of self-help retaliation is a challenge to the notion of a "permanent" eradication of nuclear weapons, and raises the discomfiting scenario of a dangerous "race to re-arm."
11. *Legally-binding.* To be weighty and reliable, the ultimate Zero Treaty to abolish nuclear weapons must have the force of law, as article VI of the NPT already does. Non-legally-binding and

138. Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331, 8 I.L.M. 679 (*entered into force* Jan. 27, 1980) [hereinafter VCLT].

unilateral national steps, such as an initial Zero Agreement, can play a useful supporting role along the way.

B. *Four Key Stumbling Points*

With those predicates, therefore, the remainder of this section scrutinizes four key stumbling points that the nuclear disarmament process must find a way to overcome.

1. Definition of "Zero"

Everyone—especially lawyers—must recognize the importance of definitions in any viable legal instrument. For a complex arms control agreement, in particular, clarity about what is being regulated, in what way, is essential; definitions often perform a great deal of the substantive work of the document. Sometimes, these definitions are explicit: the Chemical Weapons Convention's article II, for example, contains fourteen frequently-consulted definitions that establish the scope and content of the obligations, and the CWC's Verification Annex adds a further twenty-six points to the lexicon.[139] START I was even more painstaking; its Definitions Annex comprises no fewer than 124 terms.[140] In a Zero Agreement and Zero Treaty, the terms may not be separately designated in the same way, but a meeting of the minds is essential regarding precisely which items, activities, and facilities are to be outlawed, regulated, or excluded from the scope of the agreement.

In this connection, skeptics are fond of arguing that, as a practical matter, the elimination project is doomed to failure because "nuclear weapons cannot be un-invented."[141] They stress that even if all extant nuclear devices could somehow be identified, corralled and destroyed, the ability to construct replacements could not be eradicated, because

---

139. Convention on the Prohibition of the Development, Production, Stockpiling and use of Chemical Weapons and on their Destruction art. II, Jan. 13, 1993, S. TREATY DOC. NO. 103-219, 1974 U.N.T.S. 317 [hereinafter CWC] (this article contains twelve paragraphs, the last of which defines three separate terms); *id.* at Verification Annex, Part I.

140. START I, *supra* note 110, Definitions Annex. New START, which was designed both to extend and simplify the original accord, contains definitions of ninety terms. New START, *supra* note 78, Protocol, Part 1.

141. TAUBMAN, *supra* note 3, at 288 (quoting former National Security Advisor Brent Scowcroft saying "to me, the basic problem is that you cannot disinvent nuclear weapons"); *see also* Perkovich & Acton, *supra* note 8, at 11 (arguing that many technologies cannot be un-invented, but have nevertheless been effectively prohibited); Mack, *supra* note 102, at 208; NWC, *supra* note 2, at 140-41 (arguing that even if the knowledge about how to construct a nuclear weapon cannot be eradicated, the necessary infrastructure can be controlled).

the key ingredients could be quickly and quietly re-assembled and the know-how will persist in the human memory. Nuclear technology, after all, is old technology; the basics have long been de-classified and proliferated.[142]

There is an important element of truth in those contentions, but, as discussed further below, the perpetual ability to re-create a nuclear weapons capability is not only a *danger,* it is also an important *safeguard* in a zero regime. The possibility that a country, imperiled by a rival's "breakout" violation of the Zero Treaty, could undertake to establish or re-establish a small offsetting nuclear stockpile of its own constitutes a continuance of a "deterrence" regime—a dangerous and delicate relationship, to be sure, but not one fatal to the aspirations of abolitionists.

The phenomenon of "dual capability," noted above, also complicates the treaty-makers' task. Some weapons-related materials—the fissile uranium and plutonium, most prominently—are simply too precious to eliminate; they can be of immense value in generating electric power, in medicine, in agriculture, and in a host of other benign applications. The challenge is to preclude the future weapons functions while fostering the ubiquitous peaceful purposes; simple destruction or permanent warehousing would be unsuitable.[143]

Those inescapable physical, technological, and economic facts therefore require that the Zero Treaty achieve clarity about what activities, equipment, and materials are either banned or included in the regime under strict, verifiable standards governing their avowed peaceful uses. In particular, how close to a nuclear weapons capability

---

142. John P. Holdren, *Management of Surplus Nuclear Explosive Materials, in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 241, 242 (arguing that it is difficult to acquire nuclear explosive materials, but "the knowledge of how to use these materials to make (at least) crude nuclear weapons is very widely available, that is, available to virtually any country and to many subnational groups.").

143. The primary weapons isotopes of uranium and plutonium have very long half-lives and will not decay on any human timescale. They can, however, be rendered relatively unusable for weapons, by down-blending (to dilute their explosive potential) or by mixing with contaminants. *See id.* at 247-50; Perkovich & Acton, *supra* note 8, at 51; Christopher E. Paine, Thomas B. Cochran, & Robert S. Norris, *Practical Interim Steps Toward Nuclear Weapons Elimination and a Fissile Material Control Regime for Nuclear Weapon States, in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 99, 107 (noting that the United States has chosen a "spent fuel standard" as the criterion for disposition of excess plutonium, meaning that plutonium recovered from weapons should be rendered as difficult to retrieve as it is from spent civil reactor fuel); NWC, *supra* note 2, at 130-32 (discussing final disposition of fissile materials); Matthew Bunn, *Transparent and Irreversible Dismantlement of Nuclear Weapons, in* REYKJAVIK REVISITED, *supra* note 3, at 205-27.

will states be allowed to hover, and for how long?[144]

One approach to resolution of this conundrum lies in the consideration of the key "components" of a nuclear weapon, each of which may require its own regulatory regime.[145] For this purpose, the primary constituents of a nuclear weapon include:

(a) fissile material, principally the highly-enriched uranium and plutonium, together with tritium or other "boosters" that enhance the chain reaction;

(b) specialized, conventional high explosives that initiate fissile core compression;

(c) the electronics package that symmetrically detonates the high explosive;

(d) the carbon fiber aeroshell (the missile re-entry vehicle) or aerodynamic gravity bomb casing/tail assembly that takes a warhead through the atmosphere to its target and contains the systems that arm and initiate the firing sequence; and

(e) the ballistic missile, bomber, cruise missile or other delivery system that transports the warhead or bomb from the launcher to or near its intended target.

In the proposed draft agreements, countries would be allowed to retain access to appropriate quantities of fissile material for civilian applications, under strict international monitoring; the anticipated Fissile Material Cutoff Treaty would likely establish some form of international ownership, operation, or regulation of the sensitive materials and other key components of the fuel cycle. The proposed Zero Treaty contemplates that even the fissile material recovered from

144. *See* Christopher E. Paine, Thomas B. Cochran, and Robert S. Norris, *International Arrangements for the Transition to a Nuclear Weapon Free World*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 141 (evaluating eight possible "end states" for a nuclear disarmament process, in which participants would be subject to different types of ongoing limitations).

145. *See* END-STATE ISSUES, *supra* note 33, at 25-26 (describing the components of a nuclear weapon as including: "safety-certified advanced fusing and firing systems with permissive action links that must receive an authorized, pre-set code in order to initiate implosion of the metal primary pits; neutron generators; the high explosives that squeeze the nuclear-explosive material to critical densities to start the fission chain reaction; parts that control radiation flow; and gas-transfer boost systems with supplies of tritium gas that require regular replenishment"); Steve Fetter & Ivan Oelrich, *Verifying a Prohibition on Nuclear Weapons*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 27, 42 (describing the key components of a nuclear weapon as including the fissile "pit" and non-nuclear elements such as "conventional explosives, arming, fusing, and firing systems, and structural elements."). Other relevant equipment includes radar fusing, batteries, and radar altimeters.

disassembled nuclear weapons would gradually be turned over to the appropriate international authority. But for some period of time, a country that was surrendering its NWS status would be allowed to retain a small secure stockpile of recovered weapons-grade fissile material, subject to tight international monitoring.

The retention of other critical chemical and electronic components—especially those that are most suitable only for nuclear weapons, without important alternative uses in the civilian economy—would be constrained even further. As these elements are extracted from nuclear weapons during the dismantling process, they would be reliably counted and impounded; most would be promptly destroyed under international inspection. The state would be allowed to retain only a limited inventory of such items for a limited period of time, under conditions that would preclude them from being quickly or secretly reunited into a weapon, but that would enable their reassembly in response to another state's violation.[146]

Likewise, the delivery systems would have to be strictly controlled. Many missiles, aircraft and other hardware are dual-capable—they can, with relatively modest refurbishment, be configured (or at least jury-rigged) to transport either nuclear or conventional weapons. As a practical matter, however, some weapons categories have been traditionally allocated exclusively to either a nuclear or a conventional mission. ICBMs and SLBMs, for example, are so expensive that they have been reserved essentially for nuclear missions.[147] Conversely, short-range systems now exclusively carry conventional ordnance; devices such as nuclear artillery, torpedoes, and land mines are mostly artifacts of the remote past, at least for the leading nuclear players.

The following draft Zero Treaty, therefore, proposes to abolish ICBMs and SLBMs at the same time as their nuclear payloads, but to allow retention of shorter-range ballistic and cruise missiles, as well as dual-capable aircraft, provided they are converted to conventional-only missions. It must be acknowledged that any such "conversion" is only imperfectly reliable—an advanced state could probably figure out a relatively expeditious way to re-adapt a conventional-armed bomber,

---

146. It might be useful to differentiate between "disassembly" of a nuclear weapon (which could involve separation of the "nuclear explosives package" from the supporting non-nuclear components such as radars, altimeters, batteries, and fuzing and arming systems) and "dismantlement" of the nuclear explosive package (which would separate the fissile pit from the high explosive implosion mechanism).

147. *See* PIFER & O'HANLON, *supra* note 79, at 66-68 (discussing possible application of ICBMs for conventional prompt global strike missions).

for example, to perform a reinvigorated nuclear mission in an emergency—but perhaps even this partial safeguard has some value.[148]

In a similar fashion, the draft Zero Treaty posits the gradual elimination or conversion of key elements of the "nuclear weapons complex." Facilities at which nuclear weapons have been designed and tested, for example, would need case-by-case regimens.[149] The Nevada Test Site,[150] for instance, and its counterparts in other countries, would be closed to nuclear weapons activities of any kind, and closely monitored; any equipment optimized for nuclear testing there would be destroyed and any existing tunnels or unused boreholes would be plugged or collapsed. Nuclear weapons laboratories, such as Sandia, Los Alamos, or Lawrence Livermore,[151] pose a more subtle problem—they would certainly continue to perform other important (and highly classified) national security work, but would have to be subject to sufficient inspection to ensure that they were no longer in the business of designing, preparing, inspecting, or refining nuclear weapons. Facilities that have been used in the past to assemble nuclear weapons are likely to be the same sites employed for disassembly, so they will have to remain functional (and closely monitored) through the disarmament phase.[152] Plants that process uranium, such as the Y-12 installation in

148. *See* CWC, *supra* note 139, art. V.12-13, Verification Annex, Part V, Sec. D (discussing conversion of chemical weapons production facilities to serve other purposes); New START, *supra* note 78, art. VI, Protocol Part 3 (conversion of strategic weapons and facilities).

149. Paine, Cochran, & Norris, *Arsenals*, *supra* note 88, at 28 (listing major nuclear weapons infrastructure elements for NWS); FISSILE MATERIAL PANEL, *supra* note 83, at 24-25 (listing uranium enrichment and plutonium reprocessing plants around the world); James Leonard, *Verification Arrangements*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 156, 160 (noting that a party might temporarily "mothball" a facility (retaining an ability to restore it quickly to functionality), but eventually destruction or conversion would be required); NWC, *supra* note 2, at 142-46 (noting the conversion of nuclear infrastructure assets).

150. This site, larger than the state of Rhode Island, has been used for decades for nuclear tests and multiple other purposes; it is now known as the Nevada National Security Site. *Nevada National Security Site*, U.S. DEPT. OF ENERGY, http://www.nv.energy.gov/about/nts.aspx (last visited Apr. 17, 2013).

151. Judith Reppy, *Nuclear Zero at the Weapons Laboratories*, *in* GETTING TO ZERO, *supra* note 3, at 260-82; *see Offices*, U.S. DEPT. OF ENERGY, http://energy.gov/offices#Labs%20&%20Technology%20Centers (listing national laboratories) (last visited Nov. 13, 2013); LAWRENCE LIVERMORE NATIONAL LABORATORY, https://www.llnl.gov/; LOS ALAMOS NATIONAL LABORATORY, http://www.lanl.gov/index.php (last visited Nov. 13, 2013); SANDIA NATIONAL LABORATORIES, http://www.sandia.gov/ (last visited Nov. 13, 2013).

152. Leonard, *supra* note 149, at 158.

Oakridge, Tennessee, would also have to be dealt with on an individual basis.[153]

In this regard, therefore, even the eventual Zero Treaty would retain a vestige of the "discriminatory" nature of the NPT. The NWS (which could then be re-stylized as the "former NWS" or the "provisional NNWS," or less elegantly as the "countries that are in the process of eschewing their NWS status") would as a practical matter remain more capable of re-constituting their prior nuclear weapons capability than a typical NNWS would be of creating a nuclear weapon from scratch. Even when all nuclear weapons were eliminated, countries would, for a time, be asymmetrically positioned regarding their retention of residual stocks of weapons-related components and therefore in their lingering capability to craft a new nuclear weapon on short notice. Some would therefore refer to even this far-reaching proposal as establishing a "virtual zero," rather than an "absolute zero" regime.[154] At some future point, perhaps, even these vestigial nuclear weapons-related components and infrastructure would be required to be eliminated, further leveling the playing field.

2. Verification and Enforcement

Verification and enforcement are actually two discrete questions, but they are related and both incessantly confound and energize the analysis of nuclear disarmament. "Verification," in this context, generically refers to the processes of detecting, monitoring, characterizing, and interpreting the behavior of another state, assessing that conduct against the requirements of an arms control accord, and reaching judgments about compliance or non-compliance. "Enforcement," the logically sequential step, is the process of responding to another party's exposed violation of an agreement, by compelling the other party to comply, punishing it for the violation, or offsetting any advantage it might have hoped to gain from its deviant practice. In each instance,

---

153. *See* Ralph Vartabedian, *Estimate for Uranium Facility Goes from $600 Million to $11.6 Billion*, L.A. TIMES (Sept. 24, 2013), http://articles.latimes.com/2013/sep/24/nation/la-na-bomb-factory-20130925 (cost of refurbishing the only U.S. facility that melts, casts, and machines bomb-grade uranium has soared to nineteen times the original estimate).

154. NWC, *supra* note 2, at 28 (citing Stansfield Turner); Marvin Miller, *Verification Arrangements*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 181, 186-87; David Holloway, *Further Reductions in Nuclear Forces*, *in* REYKJAVIK REVISITED, *supra* note 3, at 1, 23 (discussing "virtual deterrence," in the absence of any deployed nuclear weapons).

the objectives include deterrence of cheating by ensuring that any militarily significant violation will be reliably detected in sufficient time to enable the innocent states to effectuate a sufficient response—altering their own postures to deny any appreciable gain to the violator or effectively compelling remedial behavior by that delinquent.

Both verification and enforcement are essential ingredients in an effective arms control regime.[155] Of course, the standard of accomplishment cannot reasonably be one of "perfection"—there will always be some chance that a determined, well-funded, and clever violator could temporarily escape detection of some trivial breach of an obligation or that an obdurate rogue could withstand outside pressure to conform. But the appropriate standard of "effective" or "adequate" oversight is whether participants could have sufficiently high confidence that any potential militarily-significant "breakout" attempt would be ferreted out in sufficient time to enable the other parties to mount appropriate, effective counter-moves.[156]

Of course, as the stakes go up, the stresses on the verification and enforcement mechanisms also rise. That is, when a treaty regulates non-nuclear weapons that may be heinous, but inherently less decisive on the battlefield, perhaps less rigor in the supervisory functions is tolerable. Likewise, when a nuclear weapons limitation agreement aims to achieve only modest reductions, leaving each side with immense residual inventories, the "balance of power" may remain robust, unperturbed by any marginal cheating. But when an agreement pursues deeper cuts in nuclear arsenals—and, *a fortiori*, when it seeks to eradicate nuclear weapons altogether—the margin for tolerating undetected or uncorrected breaches is reduced accordingly.

The Zero Treaty, therefore, will demand verification and enforcement mechanisms far beyond any measures that have been negotiated and implemented—or even seriously contemplated—today. The future system will require intrusions into installations and activities of sovereign states far surpassing the contemporary state of the art; today's Chemical Weapons Convention, New START Treaty, and CTBT only barely outline the types of data reporting, on-site inspection, dispute-resolution, and compliance mechanisms that must be conceived and

155. ARMS CONTROL VERIFICATION: THE TECHNOLOGIES THAT MAKE IT POSSIBLE (Kosta Tsipis et al. eds., 1986); Fetter & Oelrich, *supra* note 145.

156. Articulation of this now-familiar standard of adequate verification is attributed to arms negotiator Paul Nitze, as the "Nitze criterion." *See* Fetter & Oelrich, *supra* note 145, at 29.

instituted.[157]

The outlines of any such verification and enforcement routines are only barely imaginable in 2014. We can speculate about the possible configuration of treaty rights and responsibilities, but new monitoring modalities will have to be invented and new political relationships will have to evolve in order to make them operational and effective. A great deal of the time and energy between now and the adoption and implementation of a nuclear elimination accord will have to be devoted to the process of crafting these new anti-breakout devices, institutions and arrangements.[158]

The draft Zero Agreement and Zero Treaty, therefore, only sketch these provisions in the broadest of strokes. Regarding verification, they identify certain generic categories of monitoring methodologies—the traditional "national technical means" of verification, as well as new

---

157. CULTIVATING CONFIDENCE, *supra* note 3; John Freeman, *The Experience of the Chemical Weapons Convention: Lessons for the Elimination of Nuclear Weapons*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 117-47.

158. Rose Gottemoeller, Acting Under Sec'y for Arms Control and Int'l Security, Remarks in Helsinki, Finland on Arms Control in the Information Age: Harnessing "Sisu" (Aug. 29, 2012), http://www.state.gov/t/us/197056.htm29, 2012), http://www.state.gov/t/us/197056.htm (emphasizing U.S. Department of State's search for creative new concepts for verification of arms control treaties); *2013 Innovation in Arms Control Challenge: What Information Technology Tools and Concepts Can Support Future Arms Control Inspections?*, U.S. DEPT. OF STATE (July 22, 2013), https://www.innocentive.com/ar/challenge/9933381 (sponsoring a competition to design improved mechanisms for arms control treaty verification); *see also* Alexei Arbatov, *Uneasy Synergism: Disarmament, Verification and US-Russian Politics*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 252 (suggesting that improved political relations can enable greater verification powers, and conversely that the trust engendered by successful arms control agreements can reciprocally foster better political relations); NWC, *supra* note 2, at 112 (arguing that the disarmament process should emphasize incentives for compliance, rather than mechanisms for enforcement); *id.* at 158-73 (discussing principles and demands of verification); Raymond J. Juzaitis & John E. McLaughlin, *Challenges of Verification and Compliance within a State of Universal Latency*, *in* REYKJAVIK REVISITED, *supra* note 3, at 159-203; Edward Ifft, *Monitoring Nuclear Warheads*, *in* REYKJAVIK REVISITED, *supra* note 3, at 229-42; Alexander K. Bollfrass, *Breaking Out of Zero: Would Cheating Be Worth the Risk?*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 209-53; Rebecca Bornstein, *Enforcing a Nuclear Disarmament Treaty*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 149, 151-55 (stressing parties' positive incentives to comply with a nuclear disarmament treaty); Barry Blechman, *Why We Need to Eliminate Nuclear Weapons—And How to Do It*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 1, 17-18; DEBATE, *supra* note 3, at 49-77, 99-115; Paul C. White, *Nuclear Disarmament Verification: Issues and Possibilities*, *in* REBUILDING THE NPT CONSENSUS, *supra* note 49, at 237; NUCLEAR WEAPONS: THE ROAD TO ZERO (Joseph Rotblat ed., 1998); James Fuller, *Verification on the Road to Zero: Issues for Nuclear Warhead Dismantlement*, ARMS CONTROL TODAY, December 2010, *available at* http://www.armscontrol.org/act/2010_12/%20Fuller.

multilateral complements;[159] submission of detailed relevant national data to a global information bank; routine on-site inspection; installation of "black box" sensors and seals; expanded concepts for "societal verification";[160] and challenge on-site inspection. Likewise, regarding enforcement, the proposed documents simply identify the relevant categories of mechanisms—diplomatic measures, invocation of legal institutions, economic sanctions, criminal prosecutions, and military operations—without detailing precisely what those procedures could eventually include. A great deal of creative and energetic analysis has been poured into the problems of verification and compliance, and more will be needed.[161]

Regarding the mechanisms for enforcement of the commitments, two particular features of the future scheme deserve special consideration. First, the reference to "military measures" in the enforcement section conceals a major legal and political quandary. That is, under modern international law, a state (or a collection of states) is generally authorized to employ armed force across international boundaries only if it is acting in self-defense or pursuant to authori-

---

159. The term "national technical means of verification" refers to mechanisms such as photoreconnaissance satellites, long-distance seismometers, and sophisticated radars, which are operated by one country to gather data relevant to assessment of another state's compliance with its obligations under an arms control treaty. These devices generally operate outside the territory of the targeted country, and do not require (very much) cooperation or support from within. "Multilateral technical means of verification" would be similar types of apparatus operated collectively by a consortium of countries. *See generally* AMY F. WOOLF, CONG. RESEARCH SERV., R41201, MONITORING AND VERIFICATION IN ARMS CONTROL (Dec. 23, 2011); *Arms Control Verification*, DEFENSE THREAT REDUCTION AGENCY, http://www.dtra.mil/missions/ArmsControlVerification/ArmsControlVerificationHome.aspx (last visited Nov. 13, 2013); *Verification of Nuclear Arms Control and Disarmament Treaties*, NUCLEAR AGE PEACE FOUNDATION, http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/arms-control-disarmament/verification/index.htm (last visited Feb. 23, 2014); GRAHAM JR., *supra* note 57, at 37, 51-53, 58-59; New START, *supra* note 78, art. X.

160. The concept of "societal verification" refers to mechanisms for enlisting private individuals, NGOs, and civil society in all countries in monitoring and "whistleblowing" capacities to provide greater transparency. The concept is not new, but the modern technology of social media will provide additional, currently-unforeseeable opportunities for additional insights. *See* Frank Blackaby, *Societal Verification*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 264; Leonard, *supra* note 150, at 161; Miller, *supra* note 155, at 185-86; NWC, *supra* note 2, at 172-73; Nima Gerami, *Attracting a Crowd: What Societal Verification Means for Arms Control: The US Response*, BULLETIN OF THE ATOMIC SCIENTISTS, May 1, 2013, at 14.

161. *See* Perkovich & Acton, *supra* note 8, at 47-49 (outlining one "standard model" concept for verifying the destruction of nuclear weapons under a treaty); *id.* at 83-97 (regarding options for enforcement); Christopher E. Paine, Thomas B. Cochran, & Robert S. Norris, *Techniques and*

zation from the U.N. Security Council.[162] That short statement of the law, of course, conceals a great deal of subtle and imprecise jurisprudence, but the critical point here is that even a neighbor's significant violation of a major arms control treaty—including perhaps even a rival state's breaching the Zero Treaty and starting to re-establish a prohibited nuclear weapons arsenal—might not justify an immediate, unilateral preemptive military strike designed to interrupt that re-armament. Unless the facts were clear, and the threatened state (or the collection of treaty parties generally) could reasonably interpret the mere act of violation to constitute an "imminent" threat, thereby justifying an act of "anticipatory self-defense," or if it could win an endorsement from the Security Council, categorizing the nuclear breakout as a "threat to the peace," it would ordinarily not be lawful for another state to vindicate its treaty rights via first-strike military means.

While it is possible that the permanent veto-wielding members of the Security Council would be united in a determined response to the threat of a new nuclear arms race, there can be no guaranty that all five would always interpret the situation identically. But if a military strike is not legal, and if other economic and diplomatic response mechanisms are insufficient to abort the danger posed by the rogue state's violation of the Zero Treaty, what is to be done? Perhaps the United States or some other self-appointed enforcer of the treaty would undertake to violate international law by launching a military strike necessary to sustain international security and make the treaty system work—but it is not very satisfying to rest such an important treaty regime upon animplicit assumption of extra-legal responses.[163] But what other mecha-

---

Procedures for Verifying Nuclear Weapons Elimination, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 167; Miller, *supra* note 154; Leonard, *supra* note 149; Fetter & Oelrich, *supra* note 145; CANBERRA COMMISSION, *supra* note 12, at 74-98.

162. U.N. Charter, *supra* note 58, art. 42 (use of force pursuant to decision of the Security Council), art. 51 (actions in self-defense).

163. Compare, for example, with the ongoing debates in international law and policy regarding the propriety of military action, without a self-defense rationale or the authorization of the U.N. Security Council, under the rubric of "humanitarian intervention" or "responsibility to protect." Some authorities argue that such extraordinary measures, intended to prevent or interrupt mass atrocities, would be "illegal but legitimate"; others find that categorization unsatisfying. *See* Jane Stromseth, *Rethinking Humanitarian Intervention: The Case for Incremental Change*, *in* HUMANITARIAN INTERVENTION: ETHICAL, LEGAL AND POLITICAL DILEMMAS 232 (J.L. Holzgrefe & Robert O. Keohane eds., 2003); INDEPENDENT INTERNATIONAL COMMISSION ON KOSOVO, THE KOSOVO REPORT: CONFLICT, INTERNATIONAL RESPONSE, LESSONS LEARNED 4 (2000); Kenneth Ander-

nisms could be crafted to put military muscle reliably and lawfully behind the agreement?[164]

The second, related consideration builds upon the "self-help" remedy noted above. That is, because nuclear weapons cannot be "uninvented," some inherent residual capacity will always remain—especially the (former) NWS would have an important ability to resurrect their erstwhile nuclear weapons by re-assembling retained components. This implicit enforcement option could play an important stabilizing role, if the Zero Treaty's verification mechanisms were sufficiently muscular to sound a timely and authoritative alarm whenever a State X was beginning the process of violating the obligations by moving toward a renewed nuclear weapons capability. State Y could then be legally authorized to respond in like manner, temporarily suspending its own treaty commitments as a necessary and proportionate response to the prior violation, adroitly reestablishing its own offsetting nuclear force, and restoring a balance of power.[165]

Of course, the integrity of that mechanism relies upon several disquieting uncertainties. Would State Y be able to re-build quickly enough to overcome State X's head start? Would State X know that the detection and response mechanisms were so stringent, or might it gamble that it could succeed with a covert violation for long enough to obtain a meaningful military edge? Might Y's information about X be somewhat ambiguous, or based upon classified sources that it was reluctant to disclose in public—and might it be strategically wise for Y to begin its offsetting re-armament crash course in secret, not alerting

---

son, *Legality of Intervention in Syria in Response to Chemical Weapon Attacks*, 17 AM. SOC'Y OF INT'L L. INSIGHTS, no. 21, Aug. 30, 2013.

164. Harald Müller, *Enforcement of the Rules in a Nuclear Weapons-Free World*, *in* CULTIVATING CONFIDENCE, *supra* note 3, at 33-66; NWC, *supra* note 2, at 109-10 (noting that both the United Nations Security Council and General Assembly could play roles in enforcement of a nuclear disarmament treaty; rejecting suggestions that the process could include turning over to the United Nations a small number of nuclear weapons to use in an enforcement action against a breakout attempt); Barry Blechman, *Why We Need to Eliminate Nuclear Weapons—And How to Do It*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 17; Rebecca Bornstein, *Enforcing a Nuclear Disarmament Treaty*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 149-66; Alexander Bollfrass, *An International Reserve Force*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 167-78; DEBATE, *supra* note 3, at 104-05, 118-20; Ernesto Zedillo, *The Role of International Institutions in the Disarmament Process*, *in* DEBATE, *supra* note 3, at 287, 290.

165. *See* TAUBMAN, *supra* note 3, at 362-63 (noting that while, at first blush, the notion of any possible reconstitution of nuclear weapons "seems a double cross to pure abolitionists," it provides a necessary, realistic safeguard); Mack, *supra* note 102, at 221. The possibility of reconstitution also implies that important elements of the current "deterrence" regime will continue to operate into

X about the detection and counter-measures? Would incipient little nuclear arms races of this sort proliferate under a Zero Treaty, and would they be even more dangerous and nerve-wracking than the current fully nuclear-armed structures? How would a self-help regime of this sort operate when there are not just two potential arms racers, but multiple states Z, as well?

An important part of the solution to the riddle about the need for vast improvements in the verification and enforcement routines was suggested by Jonathan Schell, writing in *Foreign Affairs* in 2000.[166] He submitted that the then-current paradigm of U.S.-Russia (or, today, P5and broader) mutual suspicion and a relatively blasé attitude about proliferation would have to be replaced as outmoded. If the superpowers awoke to the realization that effective abolition of nuclear weapons was so profoundly in their respective national self-interests, and if they appreciated that air-tight verification and enforcement were indispensable to the safety and reliability of the regime, they would inevitably change their attitudes about intrusive inspections, rigorous implementation, and the whole concept of "openness." They would abandon much of the paranoia about sovereign privacy and get much more serious about proliferation, effective verification and enforce-

---

the indefinite future, and it further carries the danger of incipient little "reconstitution races," mimicking the arms races of the cold war. *See* END-STATE ISSUES, *supra* note 33, at 24; Perkovich & Acton, *supra* note 8, at 102-06; *see also* JONATHAN SCHELL, THE FATE OF THE EARTH: THE ABOLITION 181-231 (critiquing the concept of nuclear deterrence); Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 156-57 (discussing possible suspension of treaty obligations in the event of another party's breach); PIFER & O'HANLON, *supra* note 79, at 191-97 (discussing reconstitution of weapons arsenals); Christopher A. Ford, *Nuclear Weapons Reconstitution and its Discontents: Challenges of "Weaponless Deterrence,"* *in* DETERRENCE: ITS PAST AND FUTURE 131-215 (George P. Shultz, Sidney D. Drell, & James E. Goodby eds., 2011).

Other "self-help" legal remedies may also be applicable. In response to a "material breach" of a treaty, an innocent party may generally suspend or terminate its counter-performance of treaty obligations. VCLT, *supra* note 138, art. 60. The doctrine of "countermeasures" may produce a similar result, enabling a state aggrieved by another state's violation of a legal obligation, to respond by temporarily suspending its own performance in a timely, proportional fashion, intending to drive the first state back into compliance. *See* Art. 22 and commentary *in Draft Articles on Responsibility of States for Internationally Wrongful Acts*, [2001] 2 Y.B. INT'L L. COMM. 2 at 75, *available at* http://legal.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf.

166. Jonathan Schell, *The Folly of Arms Control*, 79 FOREIGN AFF. 22, Sept.-Oct. 2000; *see also* Perkovich & Acton, *supra* note 8, at 97 (arguing that if the leadership in just three countries—the United States, Russia and China—became fully committed to nuclear disarmament, then the concept could be made to work).

ment, insisting that all potential loopholes for cheating be conclusively foreclosed. They would simply not allow any other state—one of their erstwhile "clients," a neutral, or a rogue regime—to retain a nuclear weapons capacity that they were abandoning themselves.[167] We cannot know today whether such epiphanies will actually occur among the P5, the other nuclear weapons possessing states, and the many other relevant players, but the progress toward the zero accords will have to foster such an evolution.

3. Timing and the Negotiating Process

In their first *Wall Street Journal* piece, the Gang of Four skillfully articulated the necessary linkage between two essential components of the progression toward zero, calling for commitment to both the big-picture "vision" of a nuclear weapons-free world and the small-picture immediate "steps" necessary to pursue it. They wrote, "Without the bold vision, the actions will not be perceived as fair or urgent. Without the actions, the vision will not be perceived as realistic or possible."[168]

One immediate implementation question concerns the appropriate forum within which the Zero negotiations on both "vision" and "steps" would optimally occur. There are many possibilities here, none of which commands automatic assent.[169] The Conference on Disarmament (CD) is the UN-affiliated body that has been the primary venue for elaborating numerous prior arms control accords, including the NPT, CWC and CTBT.[170] Alas, the CD has fallen into desuetude,

---

167. As Schell explains, once the leading states had committed themselves to nuclear abolition and taken serious steps toward that goal, they "would possess an implacable will, based on the most elemental national interest," to ensure that all other states were pursuing the same path, "and they would possess the wherewithal to do it—including, certainly the resolve and means to defeat and overthrow" any regime that was resisting. SCHELL, *supra* note 165, at 44.

168. 2007 Op Ed, *supra* note 1; *see also* TAUBMAN, *supra* note 3, at 349 (quoting Obama national security advisor Gary Samore's statement noting that "'[t]he most important thing is the marriage between a vision and practical steps, because if you just announce the vision of abolishing nuclear weapons, then that can be seen as naïve, and even dangerous'" and that "'[t]he most important thing that the four horsemen did was to conceive of a strategy that combined a vision, a long-term vision with short-term practical steps that were achievable.'").

169. *See* NWC, *supra* note 2, at 29-35.

170. *See* U.N. Office at Geneva, Disarmament: An Introduction to the Conference, http://www.unog.ch/80256EE600585943/(httpPages)/BF18ABFEFE5D344DC1256F3100311CE9?OpenDocument (last visited Feb. 23, 2014).

blocked by political discord and unable—for more than fifteen years—to engage in productive treaty-developing labor.[171] A series of freestanding, ad hoc negotiating conferences could be convened instead—such processes generated the 1997 Ottawa agreement on anti-personnel land mines[172] and the 2008 Oslo agreement on cluster munitions.[173] Perhaps the NPT could supply the umbrella beneath which the negotiators convene, led by the P5 or by a sympathetic and symbolic leader such as Japan. The United Nations (the General Assembly or any of several subsidiary bodies) could also function as host, as it recently did for the 2013 Arms Trade Treaty.[174] Finally, perhaps the Nuclear Security Summit process could be converted from its sole focus on retrieving and improving the security of nuclear weapons-usable materials to consider a broader disarmament agenda.[175] The draft ZeroAgreement and Zero Treaty are agnostic regarding these procedural questions, not specifying any particular vehicle for conducting the negotiations. Likewise, the number and identities of the states directly participating in the negotiations remains an important variable "to be determined."

A second frequently-asked question is "How long will all this take?" In 2006, 125 countries voted in favor of a U.N. General Assembly resolution calling for immediate commencement of nuclear disarmament negotiations,[176] and the Zero Agreement presented here follows that

171. *See* Tom Z. Collina, *UN Body Forms Group to Break Deadlock*, ARMS CONTROL TODAY (Sept. 2013), http://www.armscontrol.org/act/2013_09/UN-Body-Forms-Group-to-Break-Deadlock (lack of consensus has prevented the CD from agreeing to a work plan for the past 16 years).

172. Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, Sept. 18, 1997, 2056 U.N.T.S. 241, 36 I.L.M. 1507 (1997) (entered into force Mar. 1, 1999) [hereinafter Ottawa Convention].

173. Convention on Cluster Munitions, May 30, 2008, CCM/77, *available at* http://www.clustermunitionsdublin.ie/pdf/ENGLISHfinaltext.pdf [hereinafter CCM].

174. Daryl G. Kimball, *The Arms Trade Treaty at a Glance*, ARMS CONTROL TODAY (July 2013), http://www.armscontrol.org/factsheets/arms_trade_treaty).

175. The Nuclear Security Summit process was inaugurated by President Obama to focus international attention on the need to safeguard sensitive nuclear materials and sites against the danger of terrorism and to rally heads of governments to undertake immediate and long-term unilateral and collective actions to redress the vulnerabilities. The first Summit meeting was held in Washington, D.C. in 2010; the second in Seoul, South Korea in 2012; the third (and presumably final) in The Hague, The Netherlands in March 2014. *See* NUCLEAR SECURITY SUMMIT, https://www.nss2014.com/en (last visited Mar. 20, 2014).

176. G.A. Res. 61/83, U.N. Doc. A/RES/61/83 (Dec. 18, 2006), *available at* http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/61/83&Lang=E.

animating spirit. Beyond that prompt starting point, however, the viability and utility of crafting a specific timetable for getting to zero are debatable. In the 1950s and 1960s, activists boisterously championed the concept of a "time-bound" progression toward general disarmament, insisting that states should, in one swoop, specify the whole series of intermediate agreements (including restrictions on chemical, biological, and conventional forces, as well as nuclear) and specify a "due date" for each.[177] More recently, Rajiv Gandhi's 1988 proposal for nuclear disarmament likewise sought to convert the aspiration into concrete terms, by establishing a deadline of 2010.[178] The Global Zero Action plan[179] does likewise, and the 2007 Model Nuclear Weapons Convention includes options for specific scheduling.[180]

As these proposed schedules for arms control agreements were continuously frustrated, others became wary about the virtue of publishing specific (or even quite general) timetables. President Obama's open-ended articulation represents just about the full extent that many observers are willing to go, saying only, "This goal will not be reached quickly—perhaps not in my lifetime."[181] In that spirit, the proposed Zero Agreement and Zero Treaty do not include projected timetables.

---

177. ARMS CONTROL II, *supra* note 4, at 94-116; MYRDAL, *supra* note 7, at 108-110; Nuclear Files: Project of the Nuclear Age Pace Foundation, *McCloy-Zorin Accords* (Sept. 20, 1961), *available at* http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/arms-control-disarmament/mccloy-zorin-accords_1961-09-20.htm (establishing principles for progress, in stages, toward general and complete disarmament).

178. GANDHI'S ACTION PLAN, *supra* note 11, Annex I, at 186, (identifying three stages for the progression toward nuclear elimination, with complete nuclear disarmament being reached in 2010); *see also id.* at 133-40 (identifying several other contemporary disarmament proposals, many of which specify projected dates for getting to zero).

179. The current iteration of the Global Zero Action Plan contemplates four phases of nuclear reductions, getting to complete abolition in 2030. *Get the Facts*, GLOBAL ZERO, http://www.globalzero.org/get-the-facts/GZAP (last visited Feb. 23, 2014)).

180. NWC, *supra* note 2, at 68-84 (citing articles VII-XII, presenting "phases" of progress toward zero, without specifying target dates); *see also* Barry Blechman, *Why We Need to Eliminate Nuclear Weapons—And How to Do It*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 17; Rebecca Bornstein, *Enforcing a Nuclear Disarmament Treaty*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 23 (presenting a timeline for the progression to nuclear disarmament); Cathleen Fisher, *The Phased Elimination of Nuclear Weapons*, *in* NUCLEAR WEAPONS: THE ROAD TO ZERO 39, 49-51 (Joseph Rotblat ed., 1998) (discussing the debate about whether it is useful to establish a deadline date).

181. Obama, Prague Speech, *supra* note 39.

The notion is that the process could commence soon, with the aspirational Zero Agreement signed in, say, 2015, and the participants would thereafter press forward with all deliberate speed, reflecting both the urgency of their mission and the criticality of getting the job done right.

Those draft documents do, however, preserve a related point, in carving out a space for the articulation of a new diplomatic infrastructure necessary to goad the world community toward zero. Two new creatures would emerge. First, under the Zero Agreement, a Contact Group would be established. This informal collection of leading countries would steer the rest of the participating states forward, publicizing the ongoing efforts, urging the reluctant to participate, and convening biennial "review conferences" at the head-of-government level that would assess progress and problems. The Contact Group would be small (e.g., fifteen states), led by the P5, and include a representative sampling of diverse, interested and politically effective countries.[182]

Second, the Zero Treaty would elicit a new, formal multilateral institution, captioned here as the Zero Treaty Organization (ZTO). Like its counterparts established under the Chemical Weapons Convention[183] and the Comprehensive Test Ban Treaty,[184] this body wouldbe charged with operating the treaty, conducting the inspections and other verification and enforcement operations under it, and resolving issues about compliance. The ZTO could be established by the Zero Treaty, or even before it, to help pave the way for its negotiation and entry into force. A now-common variation is for the negotiators to conclude both the permanent treaty and an associated interim agreement on immediate "provisional application" of key provisions, includ-

182. Possible models for the Contact Group could be the Non-Proliferation and Disarmament Initiative, a collection of activist countries in the field, and the "Open Ended Working Group," established by the U.N. General Assembly to discuss nuclear arms control initiatives outside the Conference on Disarmament. *See* George Perkovich, *Reducing the Role of Nuclear Weapons: What the NPDI Can Do*, THE CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, Nov. 27, 2012, *available at* http://carnegieendowment.org/files/Perkovich-Diminshing NuclearWeapons.pdf; Taking Forward Multilateral Nuclear Disarmament Negotiations, G.A. Res. 67/56, U.N. Doc. A/Res/67/56 (Jan. 4, 2013); Tom Z. Collina, *Disarmament Consensus Eludes UN*, ARMS CONTROL TODAY, November 2013, *available at* http://www.armscontrol.org/print/6030.

183. CWC, *supra* note 139, art. VIII.

184. CTBT, *supra* note 129, art. II.

ing the establishment of a "preparatory commission," complete with a "provisional secretariat" to facilitate final preparations for entry into force and full operation of the main treaty.[185]

The ZTO would consist of three organs: an Assembly (responsible for overall policy direction, in which each party to the treaty is a member); an Executive Council (a smaller group—perhaps thirty to forty members—responsible for day-to-day decisions); and a Secretariat (the professional staff). The proposed Zero Treaty largely follows the CWC and CTBT models in this area, suggesting institutional and operational arrangements that are certainly important for the regime, and not very different from those precedents. For the sake of brevity, the full panoply of standard institutional arrangements is not specified in the draft.[186]

4. Collateral Measures

Finally, there is an array of associated issues that the makers of the draft Zero Agreement and Zero Treaty will have to ponder. Even if ultimately these points are largely invisible in the final texts, they may be the subject of important "side agreements" or intermediate accords that help make the progression toward nuclear elimination seem safer and more feasible.

For example, in many intensely contested regions of the world, incentives for the possession or pursuit of nuclear weapons cannot be divorced from contentious neighbors' adversarial security postures ona host of longstanding political issues and irritants. It is almost impossible to imagine nuclear abolition in South Asia, the Middle East or Northeast Asia, for example, without some significant amelioration of existing regional tensions. The hope is that the affected states may be able to contextualize today's embedded problems and recognize that join-

185. CWC, *supra* note 139; Resolution Establishing the Preparatory Commission for the Organization for the Prohibition of Chemical Weapons, Jan. 13-15, 1993, Legal Series PC-OPCW 1, 1994 [hereinafter Paris Resolution]; CTBT, *supra* note 129; Resolution Establishing the Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization and Text on the Establishment of a Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization, Nov. 19, 1996, CTBT/MSS/RES/1 [hereinafter Resolution Establishing CTBT Preparatory Commission].

186. *See* Alexander K. Bollfrass, *Governance of a Nuclear Disarmament Treaty*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 179-208.

ing the long-term aspirations of the Zero Agreement can facilitate, not conflict with, efforts at regional stability.

Conclusion of a Zero Treaty does not require the lion to lie down with the lamb—severe international problems and military competition are likely to survive forever. Nor does it require the *deus ex machina* of an all-powerful world government.[187] But getting to zero does require the participants to achieve the important insight that possession of nuclear weapons impedes, rather than assists, reconciliation of their legitimate security interests. Progress toward nuclear abolition, therefore, need not assume that the current array of regional troublespots can all be quickly *resolved,* but it does require that they at least *abate,* in the sense that the participants are willing to proceed in their competition without the presence of nuclear weapons—still a tall order. The Zero Agreement will incorporate the participating states' commitment to address these various regional predicaments, and outside states' willingness to promote non-nuclear rapprochement.[188]

In the same vein, countries cannot reasonably contemplate abolition of their nuclear weapons without pondering the roles, missions, and capabilities of their non-nuclear forces. For the United States—surrounded by friendly neighbors and ocean buffers, possessing unmatched weapons technology and logistics capabilities, and boasting superb fighting units—the prospect of a world that could resort "only" to conventional warfare would be most welcome. But for other star-crossed countries an imbalance in non-nuclear capabilities may create unwelcome exposure, and international peace and stability cannot long tolerate important security vulnerabilities or asymmetries. Creating the conditions for the elimination of nuclear weapons will therefore require addressing constraints upon general purpose conventional forces as well, even if we cannot today outline what the simultaneous solution may look like or how (if at all) it would be reflected in treaty text.[189]

---

187. Paine, Cochran & Norris, *supra* note 144, at 154.

188. *See* Jonathan Dean, *Global and Regional Security in a Nuclear Weapon Free World, in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 196, 202-05; Jack F. Matlock, Jr., *Regional Animosities and Nuclear Weapons Proliferation, in* REYKJAVIK REVISITED, *supra* note 3, at 399-424.

189. *See* Perkovich & Acton, *supra* note 8, at 16 (arguing that the prohibition of nuclear weapons will not "make the world safe for conventional war among major powers."); Dennis M. Gormley, *American Conventional Superiority: The Balancing Act, in* GETTING TO ZERO, *supra* note 3, at 317-43.

Defenses against nuclear attack—including anti-missile and anti-aircraft systems, as well as civil defense programs—pose a similar puzzle. On one hand, effective defenses could conceivably stabilize nuclear abolition, by raising the threshold for a militarily-successful breakout and helping to ensure that even a successful treaty violator would still face formidable obstacles in making effective use of its illegal, unilateral nuclear capability. Especially if the potential aggressor's arsenal were small (surely much smaller than the ICBM, SLBM, and bomber fleets maintained by the United States and Russia today) even a modest interception capability could blunt a threatened attack, frustrating the violator's malign purpose. On the other hand, an efficacious defense before abolition has been accomplished could also provide a shield for aggression, enabling a bad actor to strike a vicious first blow, confident that it could largely protect itself from any disorganized, hasty retaliation.

The question of missile defense is particularly fraught today, as some in the United States pursue anti-missile technology with a fetishist's zeal, and as the Russian leadership claims, perhaps unreasonably, to find the capabilities inherent in the emerging U.S. programs threatening to it. When both sides dig in their heels so rigidly, the immediate prospects for arms control are dim; even more ambitious undertakings, such as nuclear abolition, will have to deal with (or dodge) this question sooner or later.[190]

Finally, this succession of treaties may have to address the topic of "sweeteners" in a serious way. The scope of a modern arms control agreement often extends somewhat beyond the specific question of reductions or limitations on weaponry, and this political reality may well apply to several of the steps on the path to nuclear elimination, too. One of the three main pillars of the NPT, for example, concerns each party's "inalienable right" to pursue nuclear energy for peaceful

190. *See* Ria Novosti, *Russia Skeptical Over Obama's New Nuclear Reduction Proposal*, *supra* note 116 (Russian officials rebuff U.S. proposal to pursue further bilateral cuts in strategic weapons, while United States is developing a missile defense system); Ria Novosti, *Nuclear Arms Reduction Deals to Become Multilateral—Lavrov*, ATOMINFO.RU (June 22, 2013), http://www.rianovosti.com/world/20130622/181811968.html (same); PIFER & O'HANLON, *supra* note 79, at 113-38 (discussing missile defense issues); Christopher A. Ford, *Nuclear Weapons Reconstitution and its Discontents: Challenges of "Weaponless Deterrence"*, *in* DETERRENCE: ITS PAST AND FUTURE 131, 157-60 (George P. Shultz, Sidney D. Drell & James E. Goodby eds., 2011); John Pike, *Ballistic Missile Defense: Enduring Questions*, *in* NUCLEAR WEAPONS: THE ROAD TO ZERO, *supra* note 14, at 191-212.

purposes, and many NNWS parties vigorously complain that the advanced civil nuclear technology holders have failed to fulfill their end of the bargain about facilitating "the fullest possible exchange of equipment, materials and scientific and technological information"[191] for those ends. The Chemical Weapons Convention similarly contains obligations relating to "the fullest possible exchange of chemicals, equipment and scientific and technical information"[192] relating to peaceful applications of chemistry and to the removal of undue restrictions on international trade in chemicals—and, once again, many economically disadvantaged states resent the crabbed implementation of those provisions.

The draft Zero Agreement and Zero Treaty accordingly contemplate that sweeteners of some sort may be necessary to help induce countries to join in the effort to eliminate nuclear weapons. In principle, no state should need to ask, "What's in it for me?" regarding nuclear abolition—the improved safety and security for the entire planet should be sufficient incentive for all to participate. But some states—who have never possessed or pursued nuclear weapons, but who might nonetheless be required to submit to intrusive and expensive verification procedures—may need more persuasion about the value of joining the instruments. Accordingly, some textual acknowledgement, similar to that of the NPT, about sharing the peaceful benefits of nuclear energy, could be appropriate.

IV. DRAFT ZERO AGREEMENT

This section offers a draft text, with annotations, presenting one picture of what the next or initial step on the road to nuclear disarmament might look like: a non-legally-binding instrument through which the participating states confirm (or, for most of them, re-confirm) their commitment to the ultimate objective and their determination to take immediate steps in pursuit of it. This "framework" document, reifying the concept of getting to zero, could be negotiated and signed relatively soon, perhaps in 2015, in conjunction with the next Review Conference for the NPT.

---

191. NPT, *supra* note 44, art. IV. Article V of the NPT likewise promised that the anticipated benefits of "nuclear explosions for peaceful purposes" would be made available to NNWS on a non-discriminatory basis and at a low fee. Feiveson, *supra* note 102, at 57-76.

192. CWC, *supra* note 139, art. XI.

Zero Agreement[193]

For the Elimination[194] of Nuclear Weapons

The Participating States,[195]

(PP1[196]) *Determined* for the sake of all mankind to create the conditions for a world without nuclear weapons;[197]

(PP2) *Desiring* to take prompt, effective steps in a joint enterprise in pursuit of that goal;[198]

---

193. Some arms control agreements have adopted "neutral" or descriptive titles, which serve well to advertise the contents of the instrument, but forego any effort at retaining a "popular name" or catchy title. For example, the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction is routinely referred to as the "Chemical Weapons Convention," CWC, *supra* note 139. In contrast, the "Comprehensive Nuclear Test Ban Treaty" avoids a mouthful of words, and adopts the language that has long been associated with CTBT, *supra* note 128. Alternatively, some treaties are informally named after the city in which they are concluded or signed, such as the Ottawa Convention on land mines, *supra* note 172. This draft follows the approach of designating a simple, evocative, colloquial title.

194. Again, there is a rhetorical choice here, among words such as "elimination," "prohibition," and "abolition." Some advocates favor the term "abolition," while others avoid the seemingly religious or messianic zeal that might connote. *See* Holdren, *supra* note 4; CWC, *supra* note 139 (using "prohibition"); Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Apr. 10, 1972, 1015 U.N.T.S. 163, 11 I.L.M. 309 (1972) (entered into force Mar. 26, 1975) [hereinafter BWC] (using "prohibition"). Some might perceive a nuance of content difference, with "prohibition" describing a "legal" action and "elimination" referring to the physical act of destroying the devices; *cf.* Catherine McArdle Kelleher, *Introduction*, *in* GETTING TO ZERO, *supra* note 3, at 1, 5 (likening the campaign for nuclear disarmament to the earlier global efforts to eradicate smallpox or slavery).

195. The term "Participating State" is used instead of a term such as "party," reflecting the fact that this document is not legally binding. *See Guidance on Non-Binding Documents*, U.S. DEPT. OF STATE, http://www.state.gov/s/l/treaty/guidance/ (last visited Feb. 23, 2014).

In this iteration of the text, the specific Participating States are not identified by name; the document is drafted as being open for signature by all states. An alternative is to identify (by name or by defining characteristics) a collection of perhaps twenty to forty key states that would be invited to join this Zero Agreement.

196. The preambular paragraphs are provisionally numbered in this draft and in the Zero Treaty, for convenience. In the final version of the documents, numbers would be deleted from the preambles, but retained in the operative paragraphs.

197. Conceptually, this Zero Agreement would be designed to help "create the conditions for" a world free of nuclear weapons; the following Zero Treaty would help effectuate the transition from a world with few nuclear weapons to a world with none.

198. This document contemplates two types of follow-on actions by individual states or groups of states. First, it outlines an anticipated series of interim, legally-binding agreements that would incrementally but definitively reduce nuclear weapons stockpiles around the world and contribute to nuclear disarmament in other ways. Second, it includes an Annex, in which

(PP3) *Anticipating* that a systematic series of agreements will be developed, and cooperative reciprocal unilateral actions will be undertaken by many states,[199] in the coming years to approach that goal in a manner that is global, comprehensive, timely, balanced, predictable, secure, verifiable, enforceable, sustainable, irreversible, and legally-binding;[200]

(PP4) *Fearing* that the catastrophic power of nuclear weapons cannot be contained in either space or time, and has the potential to destroy all civilization, to devastate the entire ecosystem of the planet, and to jeopardize the survival of the human race;[201]

(PP5) *Believing* that as long as nuclear weapons exist, the possibility of their proliferation and use cannot be forever precluded, and thus they will continue to pose the most extreme threat to all humanity;[202]

---

individual states would offer non-legally-binding unilateral measures (colloquially referred to as "house gifts") that they were prepared to take immediately, to jump start the process. The concept of a "joint enterprise" stresses that many (or all) states will have to play roles in pursuit of nuclear disarmament; the task can be led by, but is not the exclusive responsibility of, the United States, Russia, and the other NWS.

199. The anticipated unilateral actions undertaken individually by concerned states (such as the proposals suggested in the Annex) would be "cooperative" and "reciprocal," in the sense that each participant would take notice of the offerings of the others, and each would be encouraged to match (or even to leapfrog) the steps of the most progressive. But since individual countries are positioned asymmetrically with respect to current civil and military nuclear programs, the steps would not be identical and could not be exactly uniform. The steps would be "unilateral," in the sense of not being legally binding, and not necessarily being the product of sustained negotiation or dialogue.

200. This list of defining (and somewhat overlapping) adjectives is the "mantra" of conditions that a durable zero undertaking would have to meet; the ultimate objective is a regime that is: global (or universal) (applicable to all countries and all places on, under, and above Earth); comprehensive (covering all types of nuclear explosive devices and components, regardless of type or status); timely (not indefinitely delayed—although this document does not attempt to identify a specific timetable); balanced (calling for appropriate, corresponding actions from each state); predictable (allowing all states to see where the process is leading at each stage); secure (not jeopardizing any state or group of states at any point in the process); verifiable (to prevent secret cheating); enforceable (to respond effectively to violations); sustainable (not subject to fatal disruptions from temporary perturbations); irreversible (or permanent) (to ensure against the return of nuclear weapons); and legally-binding (to bring the full weight of international law in support of the institution). *See supra* text accompanying notes 134-38.

201. This rhetoric is adapted from the ICJ Advisory Opinion on Nuclear Weapons, *supra* note 59, ¶ 35.

202. In addition to the possibility of deliberate use of a nuclear weapon, the specter of accidental or mistaken use cannot be ruled out. *See* Jonathan Granoff, *The Process of Zero*, 26 WORLD POLICY J. 85, 86-88 (2009), *available at* http://gsinstitute.s3.amazonaws.com/assets/gsi/docs/WPJ_2009.pdf (recounting examples of accidents and false alarms regarding nuclear weapons).

(PP6) *Affirming* that all human life is sacred, and that all members of the human family have the equal, inalienable right to life, liberty, peace, security and dignity;[203]

(PP7) *Underscoring* the legal obligation contained in Article VI of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control";[204]

(PP8) *Reaffirming* the statement of "Principles and Objectives for Nuclear Non-Proliferation and Disarmament," adopted at the 1995 Conference on the Review and Extension of the Non-Proliferation Treaty;[205]

(PP9) *Commending* the recognition, in the Final Document of the 2000 Review Conference of the Non-Proliferation Treaty, of "an unequivocal undertaking" by the states possessing nuclear weapons to accomplish the total elimination of their nuclear arsenals, through implementation of a series of "practical steps" and of the applicability of the principle of irreversibility in nuclear disarmament;[206]

---

203. *Cf.* NWC, *supra* note 2, at 46 (citing Preamble, ¶ 4).

204. This Article VI obligation applies to all parties to the NPT—NWS and NNWS alike—but does not apply to non-parties to the NPT (India, Israel, North Korea, and Pakistan). Note that Article VI goes even beyond nuclear disarmament, by including a commitment to pursue "general and complete disarmament." Some states may object to repetition of this far-distant goal, even in a preamble, while others may insist that this objective not be overlooked, although this instrument deals only with nuclear weapons. *See* David S. Jonas, *General and Complete Disarmament: Not Just for Nuclear Weapons States Anymore*, 43 GEO. J. INT'L. LAW 587 (2012).

205. Principles and Objectives for Nuclear Non-Proliferation and Disarmament, Federation of American Scientists, NPT/CONF.1995/32/DEC.2 (April 17-May 12, 1995), *available at* http://www.fas.org/nuke/control/npt/text/prin_obj.htm.

It is possible that the four non-NPT states may object to so many preambular paragraphs referencing and drawing upon the work product of NPT meetings.

206. The Final Document from an NPT Review Conference is not, in itself, legally binding, but it represents a commitment by the NWS to take actions that are necessary to sustain the NPT and the non-proliferation enterprise. This passage is quoted from the Arms Control Association, *2000 NPT Review Conference Final Document*, ARMS CONTROL ASSOCIATION (Apr. 24-May 19, 2000), *available at* http://www.armscontrol.org/act/2000_06/docjun (discussing Article VI and Preamble, ¶¶ 8-12, 15, regarding "practical steps" in implementation of Article VI, steps #5 and #6).

(PP10) *Noting* that the Final Document of the 2010 Review Conference of the Non-Proliferation Treaty affirmed that "all States need to make special efforts to establish the necessary framework to achieve and maintain a world without nuclear weapons" and called, *inter alia*, for discussion of "policies that could prevent the use of nuclear weapons and eventually lead to their elimination."[207]

(PP11) *Recalling* Resolution 1(I) of the United Nations General Assembly, adopted unanimously on January 24, 1946, calling for proposals "for the elimination from national armaments of atomic weapons," and the many subsequent resolutions of the General Assembly also calling for the elimination of nuclear weapons;[208]

(PP12) *Recalling also* the Final Document of the United Nations General Assembly's First Special Session on Disarmament in 1978, which recognized the imperative of removing the threat of nuclear weapons and halting and reversing the nuclear arms race until the total elimination of nuclear weapons and their delivery systems has been achieved;[209]

(PP13) *Emphasizing* the determination of the United Nations Security Council, as expressed in its Resolution 1887 of September 24, 2009, "to seek a safer world for all and to create the conditions for a world without nuclear weapons, in accordance with the goals of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), in a way that promotes international stability, and based on the principle of undiminished security for all";[210]

(PP14) *Recalling* the Advisory Opinion of the International Court of Justice of July 8, 1996, in which it affirmed that the threat or use of nuclear weapons would generally be contrary to the rules of interna-

---

207. 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, May 2010, *Final Document: 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons*, I.B.iii and Action 5(d), NPT/CONF.2010/50 (Vol. I) (May 3-28, 2010), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=NPT/CONF.2010/50.

208. Establishment of a Commission to Deal with the Problems Raised by the Discovery of Atomic Energy, *supra* note 5. There are a great many General Assembly resolutions calling for abolition of nuclear weapons; this citation to the very first such resolution has particular salience, but others could be cited, too.

209. The United Nations General Assembly has convened four "Special Sessions on Disarmament"; this annotation refers to paragraph 20 of the final resolution of the first such conclave. G.A. Res. S-10/2, ¶ 20, U.N. GAOR, 10th Special Sess., Supp. No. 4, U.N. Doc. A/S-10/4, at 3 (May 23-Jun Jun 30, 1978), *available at* http://www.un.org/disarmament/HomePage/SSOD/A-S-10-4.pdf.

210. S.C. Res. 1887, *supra* note 41, at 1.

tional law applicable in armed conflict, and in particular the principles and rules of humanitarian law;[211]

(PP15) *Concluding* that the financial,[212] social, environmental, medical,[213] intellectual, and psychological burdens of developing and maintaining nuclear weapons are an intolerable waste of human and material resources;

(PP16) *Judging* that urgent progress toward nuclear disarmament can facilitate resolution of regional security issues, and conversely that amelioration of those regional tensions can also assist in advancing the progress toward global elimination of nuclear weapons;[214]

(PP17) *Appreciating* the value of nuclear energy for diverse peaceful purposes in electrical power generation, medicine, and other fields, when conducted under appropriate and effective international safeguards;[215]

(PP18) *Assessing* that the creation and operation of additional international diplomatic mechanisms can effectively contribute to the advancement of the pursuit of nuclear disarmament;[216] and

(PP19) *Applauding* the contributions to global peace and stability

---

211. I.C.J. Advisory Opinion on Nuclear Weapons, *supra* note 59, ¶ 105(2)E.

212. By some estimates, the United States has spent $7.5 trillion on nuclear weapons and their delivery systems since the onset of the nuclear age. David Krieger, *The Challenge of Abolishing Nuclear Weapons, in* THE CHALLENGE OF ABOLISHING NUCLEAR WEAPONS 3, 9 (David Krieger ed., 2009); *see also* BROOKINGS INSTITUTION, ATOMIC AUDIT: THE COSTS AND CONSEQUENCES OF U.S. NUCLEAR WEAPONS SINCE 1940 3 (Stephen I. Schwartz ed., 1988), *available at* http://www.brookings.edu/research/books/1998/atomic (estimating the cost of the nuclear arsenal at $5.5 trillion through 1998); Dana Priest, *Aging U.S. Nuclear Arsenal Slated for Costly and Long-Delayed Modernization*, WASH. POST, Sept. 15, 2012, http://www.washingtonpost.com/world/national-security/us-nuclear-arsenal-is-ready-for-overhaul/2012/09/15/428237de-f830-11e1-8253-3f495ae70650_story.html.

213. *See* NWC, *supra* note 2, at 120-25 (surveying the adverse health and environmental consequences of producing and testing nuclear weapons); JOHN LORETZ, INTERNATIONAL PHYSICIANS FOR THE PREVENTION OF NUCLEAR WAR, ZERO IS THE ONLY OPTION: FOUR MEDICAL AND ENVIRONMENTAL CASES FOR ERADICATING NUCLEAR WEAPONS (2010), *available at* http://nuclear-zero.org/.

214. *See supra* text accompanying notes 187-88 (regarding the role of regional security issues in getting to zero).

215. This paragraph acknowledges the "dual use" nature of much nuclear material, equipment, facilities, and technology; the task of preserving and enhancing the peaceful applications while eradicating the weapons functions is among the biggest challenges for the regime. *See supra* text accompanying notes 82-86 & 143-54. In contrast, the NWC discourages the use of nuclear power for energy production. NWC, *supra* note 2, at 132-33.

216. *See supra* text accompanying notes 182-86 (regarding the creation of a modest new diplomatic infrastructure to promote progress toward nuclear disarmament).

accomplished by numerous treaties in force or pending that deal with nuclear weapons, nuclear weapon free zones, chemical weapons, biological weapons, and other instruments;[217]

Have agreed as follows:

1. The Participating States confirm that a world without nuclear weapons is desirable and attainable,[218] and that they are under a moral and legal obligation[219] to pursue it promptly and vigorously. Participating states will[220] do everything in their power to cooperate in creating the conditions necessary for the global, comprehensive, timely, balanced, predictable, secure, verifiable, enforceable, sustainable, irreversible, and legally-binding elimination of all nuclear weapons.[221]

2. All Participating States that have not yet done so should in the near future join the 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction; the 1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction; and the 1996 Comprehensive Nuclear Test Ban Treaty. All Participating States will promote universal adherence and observance of these instruments.[222]

---

217. The agreement could identify by name, or categorically, some of the various bilateral nuclear arms control treaties, such as New START, *supra* note 78; START I, *supra* note 110, and the INF Treaty, *supra* note 79; the various regional Nuclear Weapon Free Zone treaties and protocols, *supra* notes 118-122; and major multilateral agreements dealing with non-nuclear weapons, such as the CWC, *supra* note 139; the BWC, *supra* note 194; and others.

218. This passage confirms that the goal of nuclear disarmament is both desirable and attainable, thereby expressing the participants' commitment to uniting the two elements of the ideal and the practical.

219. NPT parties are under a legal obligation, pursuant to Article VI, to pursue nuclear disarmament; all states share the moral imperative to seek that objective.

220. This Zero Agreement, like most non-legally-binding documents, generally uses the verbs "will" or "should," to describe participants' intentions, rather than "shall," which is customary for a legally-binding document such as the Zero Treaty. The Zero Agreement likewise avoids phrases such as "undertake to" or "commit to," which would be more appropriate in the Zero Treaty.

221. This sentence repeats the "mantra" from preambular paragraph 3.

One specialized issue here concerns the concept of "peaceful nuclear explosions" (PNEs), *supra* note 136. The Zero Treaty would have to prohibit PNE devices because they could be used to circumvent the ban on nuclear weapons. This coverage could be ensured by including the somewhat cumbersome term "nuclear weapons and other nuclear explosive devices" throughout the text; more likely, a suitable "definition of terms" section would ensure that PNEs are covered.

222. Here, the Zero Agreement endorses the leading existing multilateral arms control agreements, including the BWC, CWC, and CTBT. It uses the more general term "join," instead of

3. The Participating States will support the development, adherence and observance of regional nuclear weapon free zone treaties and their associated protocols and will urge eligible states to participate fully in those regimes.[223]

4. Each Participating State that possesses nuclear weapons will immediately[224] cap[225] the total number of its nuclear weapons and undertake additional measures of transparency regarding its nuclear weapons programs.[226]

5. The Russian Federation and the United States of America will promptly and urgently enter into negotiations and conclude an agreement for the further reduction of their nuclear weapons, with the goal of reducing their current total inventories by approximately fifty percent.[227]

"ratify," since the BWC and CWC are no longer open for signature, and any newcomers would join those treaties by accession, rather than ratification. BWC, *supra* note 193, art. IX.1; CWC, *supra* note 140, art. XVIII.; CTBT *supra* note 129, art. XII. The BWC and CWC have attracted wide, but not universal, adherence; the CTBT has not yet entered into force, lacking ratification by the United States, China, and other essential participants.

The Zero Agreement could also endorse the NPT and urge the remaining non-parties to join that treaty, too—but doing so might be politically offensive to India, Israel, North Korea, and Pakistan, who might be inclined against this Zero Agreement, if affiliating with it required them to abandon their longstanding antipathy to the NPT.

223. This paragraph echoes preambular paragraph 19, in supporting the creation and implementation of new and existing regional nuclear weapon free zone arrangements, which are of special interest to nuclear disarmament. *See supra* text accompanying notes 117-123.

224. Alternatives would be to institute this provision at a (soon) fixed time, at a point when specified other reductions had already occurred, or "as soon as possible." In particular, the sequencing of events specified in paragraphs 4 and 5 may be problematic—will other states institute caps on their nuclear weapons before, or only after, the United States and Russia have undertaken the next step in their bilateral reductions?

225. This provision is sometimes referred to as a "freeze" on national weapons stockpiles, but the better concept is to impose a "cap" or ceiling on those inventories, which would allow a state to reduce its weapons. This paragraph would also allow a state, for now, to continue to produce new nuclear weapons (for example, to replace defective or obsolete devices) as long as there was at least a one-for-one offsetting elimination of existing devices. Routine maintenance of nuclear weapons would also be permitted for as long as the devices exist.

226. The (unspecified) transparency measures would be designed to enhance other states' abilities to determine with high confidence the numbers and characteristics of each participating state's existing nuclear weapons inventories, as a precursor to later verified reductions.

227. This paragraph elicits a successor to the 2010 New START, *supra* note 78, which imposes a series of limitations upon various categories of U.S. and Russian nuclear weapons, to be effectuated by 2018. The proposal here calls upon those two countries to move forward aggressively with additional limitations now, rather than waiting until 2018 approaches. The target of a fifty percent reduction in weapons is intentionally somewhat vague, in leaving for those two states the potentially difficult and controversial questions of "counting rules" and other provisions

6. Thereafter, the People's Republic of China, the French Republic, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, and the United States of America will enter into five-party negotiations[228] with the goal of achieving deep reductions in their respective nuclear weapons stockpiles in a balanced and progressive fashion.[229] They may implement these agreed reductions in stages.[230] They will seek to achieve as soon as possible the lowest possible levels of nuclear weapons, retaining no more than 100 weapons each.[231]

7. Simultaneously, those five states will enter into negotiations with the Republic of India, the State of Israel, the Democratic People's Republic of Korea, and the Islamic Republic of Pakistan,[232]

---

to incorporate both deployed and non-deployed weapons, as well as dealing with both strategic and shorter-range systems. *See supra* text accompanying notes 104-116; *see also* David Holloway, *in* REYKJAVIK REVISITED, *supra* note 3, at 1-31 (arguing that the process of moving toward nuclear disarmament must begin with Russia and the United States); Pan Zhenqiang, *Abolishing Nuclear Weapons: Why Not Outlaw Them First?*, *in* DEBATE, *supra* note 3, at 249, 253 (asserting that as "[f]irst among unequals, the United States and Russia must lead.").

228. Although China, France and the United Kingdom currently possess many fewer nuclear weapons than do the United States and Russia, before long, the current bilateral (U.S.-Russia) structure of nuclear arms control will have to transform into a plurilateral negotiation, incorporating all the P5). *See* Ria Novosti, *Russia Skeptical Over Obama's New Nuclear Reduction Proposal*, *supra* note 116 (Russian officials insist that other NWS will have to participate in the next round of nuclear weapons reductions); RIA Novosti (Jun. 22, 2013), *supra* note 189 (same); PIFER & O'HANLON, *supra* note 79, at 178-81 (multilateralizing arms control).

229. It is possible that an initial round of negotiations would not provide for equal numbers of nuclear weapons for all five states, but before long, asymmetries would have to be ironed out.

230. Alternatively, these "stages" could be overtly identified and the numbers and dates could be spelled out in the text, but that would seem to import a level of specificity beyond our current abilities to foresee the acceptable arrangements and timing. *Cf.* Paine, Cochran, and Norris, *International Arrangements*, *supra* note 143, at 149-52 (outlining three stages and fifteen steps toward nuclear elimination); Leonard, *supra* note 143 (describing four phases).

231. Achieving a common ceiling of 100 nuclear weapons for each state would require substantial reductions by all five participants, while still preserving for each the deterrence structure of a devastating nuclear capability. *See* Benjamin Friedman, Christopher Preble, & Matt Fay, *The End of Overkill? Reassessing U.S. Nuclear Weapons Policy*, CATO INSTITUTE (2013), *available at* http://object.cato.org/sites/cato.org/files/pubs/pdf/the_end_of_overkill_wp_web.pdf. *But see* Keith Payne et. al., *Minimum Deterrence: Examining the Evidence*, NATIONAL INSTITUTE FOR PUBLIC POLICY (2013), *available at* http://www.nipp.org/Final%20for%20Distro%207.17.pdf.

232. This paragraph focuses on the four states that are not party to the NPT and that therefore retain a legal right to possess nuclear weapons. (*But see* the special legal obligations applicable to North Korea, *supra* notes 55 & 56.) The paragraph does not deal with Iran or any other state that might be thought to be illicitly pursuing a nuclear weapon or the capability to build one; those states are all currently NNWS parties to the NPT.

Under the phrasing of this paragraph, the negotiations do not have to engage India, Israel,

with the goal of capping, reducing and eliminating the respective nuclear weapons stockpiles of those four states.[233] These negotiations may proceed in stages, including via regional or other groups, as well as bilaterally, plurilaterally, and multilaterally.[234]

8. Thereafter, the relevant states[235] will enter negotiations to reduce their nuclear weapons stockpiles to zero. These negotiations will include all nuclear weapons, irrespective of range, type, age, size, mode of delivery, or status as deployed, non-deployed, reserve, retired, stored, awaiting disassembly, or otherwise, and regardless of whether the device is intended for peaceful or military uses.[236]

9. All Participating States will support and encourage these negotiations and endeavor to promote their success.[237]

10. Each Participating State possessing nuclear weapons will revise its war plans to eliminate any requirement for a capability to launch weapons on short notice; remove its nuclear weapons from high alert status;[238] and maintain its missile warheads in peacetime without

---

North Korea, and Pakistan participating around the same table or signing the same instrument. All of the P5 would help facilitate agreements with these four states.

233. A special difficulty here is posed by the fact that longstanding Israeli policy is to neither confirm nor deny the existence of the nuclear weapons stockpile that it is widely credited with possessing. *See supra* note 66.

234. These four states might not reduce their holdings of nuclear weapons all the way to zero while the P5 retain as many as 100 weapons each. This Zero Agreement does not have to specify the exact sequence of the respective national cuts.

235. It is undetermined who would participate in the negotiation of the Zero Treaty. Surely the P5 and the four non-NPT states would have to be included. Perhaps "all" states would join the negotiation, because they would all have to be part of the Zero Treaty regime. But perhaps a smaller group, led by the states that possess nuclear weapons or the capability to build them relatively quickly (or by some larger, but still not universal group), would conduct the principal negotiations, with the others being pressed to accept the resulting document more or less as drafted. *See supra* text accompanying notes 169-75.

236. Different states may use different categories to describe their nuclear weapons holdings; this provision is intended to ensure that the instrument does not accidentally exclude any weapons just because they are not currently in the "stockpile," or because they are accounted in some arcane non-deployed status.

This provision is also intended to cover both military weapons and so-called "peaceful nuclear explosions." *See supra* text accompanying notes 137 & 222.

237. Although only a handful of states will possess nuclear weapons that would be destroyed pursuant to the Zero Treaty, the verification and enforcement provisions would require universal application, so the Zero Treaty will need to have global coverage.

238. "De-alerting" means relaxing the stringent requirement for being able to use a weapon (especially an ICBM) on very short notice. This can be accomplished by internal procedures, or can be made more visible and reliable through adoption of measures such as "turning off power to missiles, decoupling warheads from missiles, immobilizing missile silo lids, and discontinuing

targeting coordinates and flight paths inserted into missile guidance computers.[239] Each state will maintain the highest standards of safety and security over its nuclear weapons, components, and facilities.[240] Any nuclear weapons permanently removed from delivery systems will be verifiably disassembled into their constituent elements or stored in conditions and under monitoring arrangements that would preclude them from being quickly or secretly restored to an operational condition.[241]

---

launch-on-warning systems." NWC, *supra* note 2, at 60, 127-29; *see* Alexei Arbatov, *Dealerting Nuclear Forces: A Substitute or Supplement to Disarmament?*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 303; Paine, Cochran, & Norris, *Practical Interim Steps*, *supra* note 142, at 99, 102; Bruce G. Blair, *De-Alerting Strategic Forces*, *in* REYKJAVIK REVISITED, *supra* note 3, at 47. The United States has already removed many nuclear weapons from alert status, but an estimated 1800 U.S. and Russian warheads are still on high alert on missiles ready to fire within five to fifteen minutes. Kristensen & Norris, *Global Nuclear Weapons Inventories*, *supra* note 89, at 76; Hans M. Kristensen & Matthew McKinzie, *De-Alerting Nuclear Forces*, BULL. OF THE ATOMIC SCIENTISTS, June 19, 2013, http://www.thebulletin.org/de-alerting-nuclear-forces; Hans M. Kristensen & Matthew McKinzie, Institute for Disarmament Research, *Reducing Alert Rates of Nuclear Weapons*, UNDIR/2012/6, http://www.unidir.org/files/publications/pdfs/reducing-alert-rates-of-nuclear-weapons-en-307.pdf; Christopher A. Ford, *Playing for Time on the Edge of the Apocalypse: Maximizing Decision Time for Nuclear Leaders*, *in* DETERRENCE: ITS PAST AND FUTURE 217-77 (George P. Shultz, Sidney D. Drell & James E. Goodby eds., 2011). Different states may have different vocabularies, procedures, and categories for alert status.

239. The United States and Russia have already re-targeted many, but not all, of their nuclear weapons to aim at unpopulated ocean areas; these targeting codes may be altered again relatively rapidly. KRISTENSEN & MCKINZIE, *De-Alerting Nuclear Forces*, *supra* note 238; Kristensen & McKinzie, *Reducing Alert Rates of Nuclear Weapons*, *supra* note 238; Ford, *supra* note 238, at 244. Different states may have different categories and different vocabularies for their targeting codes and practices.

240. The participating states might additionally undertake to "cooperate" in increasing the safety and security of their respective nuclear weapons stockpiles. For example, the United States has provided Russia with considerable assistance in materials protection, control and accounting under the Nunn-Lugar Cooperative Threat Reduction program. *See* WMD, THE LUGAR CENTER, http://www.thelugarcenter.org/pages/wmd-nonproliferation (last visited Mar. 20, 2014); Bonnie Jenkins, *Adapting to the Times: The Evolution of U.S. Threat Reduction Programs*, ARMS CONTROL TODAY, (Jan./Feb. 2011), http://www.armscontrol.org/act/2011_01-02/Jenkins; Alan Heyes, *The Global Partnership on WMD: A Work in Progress*, ARMS CONTROL TODAY (Apr. 2013), https://www.armscontrol.org/act/2013_04/The-Global-Partnership-on-WMD-A-Work-in-Progress; EMILY MELLA, PARTNERSHIP FOR GLOBAL SECURITY, POLICY UPDATE, REPORTED ACCOMPLISHMENTS OF SELECTED THREAT REDUCTION AND NONPROLIFERATION PROGRAMS BY AGENCY FOR FISCAL YEAR 2012 (Aug. 2013). But states often jealously guard the secrecy of their nuclear weapons infrastructures, and may be reluctant to solicit outside involvement; moreover, a tight reading of the NPT would inhibit anything that could be construed as NWS assistance to another state's nuclear weapons program.

241. The Zero Agreement does not establish a timetable or sequence for the events described in paragraphs 10-14; some of these developments will occur incrementally and simultaneously, in support of the negotiation and implementation of the agreements to achieve deep multilateral cuts in nuclear weapons stockpiles.

11. Each Participating State will destroy or convert to other purposes all systems it possesses that were specially designed for the delivery of nuclear weapons.[242] For systems that are capable of both delivering nuclear weapons and performing other functions, the Participating State will modify the system, to the fullest extent possible, to minimize its capability for delivering nuclear weapons.[243]

12. Each Participating State will destroy or convert to other purposes any facilities and equipment specially designed or intended for[244] conducting nuclear weapons tests at all the sites under its jurisdiction or control[245] that have been used or are primarily intended for the testing of nuclear weapons. It will collapse, permanently fill, or otherwise seal any existing boreholes or tunnels within the boundaries of such sites that could be employed for nuclear weapons tests or that contain radioactive debris from a prior test.[246]

---

242. This provision posits that the Zero Treaty would require the elimination of all dedicated strategic nuclear delivery systems (such as ICBMs and SLBMs); an alternative would permit a party to retain a small residual arsenal of these devices, in the event that reconstitution of a nuclear weapons capability becomes lawful (as in response to another party's violation of the Zero Treaty). The Zero Agreement contemplates that the elimination or conversion of these dedicated delivery systems would commence promptly, but not necessarily be completed until the Zero Treaty became effective.

243. Some bilateral U.S.-Russia nuclear arms control agreements have developed procedures for converting a dual-capable delivery system (such as a long-range bomber) to enable it to perform only a non-nuclear mission, and for reliably tagging it or otherwise making a converted asset observably different from the original. *See* START I, *supra* note 110, Protocol on Procedures Governing the Conversion or Elimination of Items Subject to the Treaty; New START, *supra* note 78, Protocol, Part III. But conversion of a strategic nuclear delivery system to other purposes may not be reliably irrevocable. That is, perhaps a bomber that was adapted to perform a non-nuclear mission could relatively easily and quickly be jury-rigged to deliver a nuclear weapon, too, in an emergency.

244. The Zero Agreement would not regulate all items that are "used for" or "necessary for" nuclear weapons testing activities, because such a standard would capture too many pedestrian facilities and equipment of no special interest in this context—e.g., a dormitory at a test site, where technicians sleep while preparing a test explosion, or a bulldozer, shovel or hammer used in routine construction activities there. A standard of "primarily" or "specially designed for" may be more suitable, albeit vague.

245. Use of the term "jurisdiction and control" is intended to include all of a country's national territory as well as any other locations outside its territory where it exercises actual authority. *See* CWC, *supra* note 139, art. I.2,4.

246. The CTBT, which prohibits nuclear weapons test explosions, does not require shuttering or repurposing of the sites where its parties have conducted nuclear tests, but the Zero

13. Each Participating State that possesses nuclear weapons or an advanced civil or military nuclear program[247] will contribute to the cooperative development of the conditions for the elimination of nuclear weapons by undertaking the following actions:[248]

a. ceasing the chemical separation or isotopic enrichment of fissile material intended for use in weapons or in excess of civilian needs;

b. enhancing the effectiveness of international and domestic controls over fissile material;

c. accepting and fully implementing the Additional Protocol with the International Atomic Energy Agency;[249] and

d. exchanging data regarding the past production, consumption, transfer, disposition, loss, and possession of fissile material.[250]

14. The Participating States will negotiate and promptly conclude a comprehensive, legally-binding treaty to regulate the production, possession, transfer, storage, use, handling, and disposal of fissile material.[251] This treaty will include the creation of additional reliable international controls over facilities for the mining, extraction, concentration, conversion, enrichment, fuel fabrication, separation, processing, and use of fissile material, the storage and disposal of spent fuel, and any reprocessing of fuel. The treaty will

---

Agreement and Zero Treaty should do so, to further constrain a state's ability to violate the basic prohibitions. NWC, *supra* note 2, at 114-15.

247. The Zero Agreement or its negotiating history will have to clarify which states are considered to possess "advanced civil or military nuclear programs," and are therefore subject to more intense monitoring. The roster of such states could grow or shrink over time. *See* CTBT, *supra* note 129, Annex 2 (listing 44 states with advanced civil nuclear programs).

248. Again, the Zero Agreement does not specify *when* these various steps are to be undertaken; presumably the sequencing would be a matter of intense ongoing international bargaining.

249. The Additional Protocol is a legal instrument providing the International Atomic Energy Agency reinforced authority to implement safeguards and conduct inspections to protect against the diversion of nuclear materials to weapons purposes. Many, but not all, states have concluded such agreements with the IAEA. *See* FACTSHEETS AND FAQS: IAEA SAFEGUARDS OVERVIEW: COMPREHENSIVE SAFEGUARDS AGREEMENTS AND ADDITIONAL PROTOCOLS, INT'L ATOMIC ENERGY AGENCY, http://www.iaea.org/Publications/Factsheets/English/sg_overview.html (last visited Feb. 18, 2014); THE 1997 IAEA ADDITIONAL PROTOCOL AT A GLANCE, ARMS CONTROL ASSOCIATION (Oct. 2013), http://www.armscontrol.org/factsheets/IAEAProtoco.Ass'n (last updated Feb. 2014).

250. Many of the commitments in this paragraph would become legally binding pursuant to an FMCT, *supra* text accompanying note 132.

251. Efforts to negotiate a FMCT have been repeatedly thwarted for more than a decade, but some way around that impasse will have to be developed. *See supra* text accompanying notes 132-133.

establish an international nuclear fuel bank to ensure reliable,non-discriminatory access to supplies of nuclear fuel and other materials for peaceful purposes under the auspices of the International Atomic Energy Agency and preclude diversion of those materials for weapons purposes. The treaty will also include an obligation to account for past production, consumption, transfer, disposition, and loss of nuclear materials to the maximum extent possible.[252]

15. In support of these negotiations and initiatives, the Participating States will meet to discuss, develop, cooperatively test, and implement the key elements of a highly effective worldwide verification system to ensure adequate monitoring of compliance with the ultimate obligation to destroy all nuclear weapons. This verification system will include multiple components such as: national and multilateral technical means of verification;[253] routine on-site inspection;[254] submission of relevant data to a global database;[255] reliable sensors, tags, and seals;[256] societal verifi-

252. Some past production of fissile material can no longer be adequately accounted for; some quantities may remain permanently "lost" in various states' systems, due to poor record-keeping and inventory control. But the FMCT will have to obligate parties to conduct forensic accounting procedures to the maximum extent possible. *See* PERKOVICH & ACTON, *supra* note 8, at 53-57 (calling for "nuclear archeology," to discern past national production of uranium and plutonium); TAUBMAN, *supra* note 3, at 51 (noting that neither the United States nor Russia can account fully for all the nuclear materials it has produced); FISSILE MATERIAL PANEL, *supra* note 83, at 82-89 (suggesting nuclear archeology); Paine, Cochran, & Norris, *Techniques and Procedures, supra* note 160, at 170-71; James M. Acton, *Fissile Materials and Disarmament: Long-term Goals, Short-term Steps, in* GETTING TO ZERO, *supra* note 3, at 245, 250.

253. *See supra* note 159 (discussing national technical means of verification).

254. "Routine on-site inspection" refers to procedures through which inspectors from one state, or from an international organization, are permitted to enter another state and conduct data-gathering operations relevant to an assessment of compliance with an arms control treaty. In some modern arms control arrangements, these occur with great frequency, becoming a systematic, relatively non-problematic feature of the operation of the treaty. *See* CWC, *supra* note 139, art. IV.3, 5, Verification Annex; New START, *supra* note 78, art. XI, Protocol, Part V.

255. Several arms control treaties require parties to declare specified categories of information regarding their holdings of regulated weapons or to contribute on an ongoing basis to an exchange of treaty-relevant data. *See, e.g.*, CWC, *supra* note 139, art. III (requiring declarations regarding possession of chemical weapons, production facilities and other items); New START, *supra* note 78, art. VII and Protocol Part Two.

256. Sensors, tags and seals can be used to preclude or detect tampering with inspectors' equipment or to ensure that observed items are reliably counted. *See, e.g.*, New START, *supra* note 78, Annex on Inspection Activities, section VI.

cation;[257] and challenge on-site inspection.[258] The verification system will be sufficiently rigorous and intrusive that Participating States will have confidence in its ability to detect, identify, attribute, and substantiate violations within the time required to mount effective responses.[259]

16. In support of these negotiations and initiatives, the Participating States will meet to discuss and develop specific plans and proposals for the international legal and institutional components of a highly effective worldwide enforcement system that would both deter and ensure an adequate response to any violation of the ultimate obligation to destroy all nuclear weapons. This enforcement system will include multiple components such as: diplomatic measures, resort to the institutions of international law, punitive economic measures, criminal prosecution, and military measures. The enforcement system will be sufficiently rigorous and powerful that Participating States will have confidence in its ability to deter violations, punish violators, negate the effects of any violation, and ensure that violations do not result in military or other gains.[260]

---

257. *See* Perkovich & Acton, *supra* note 8, at 65-67 (explaining that societal or civil society monitoring makes the entire community responsible for helping to verify treaty compliance. There could be legal obligations to report treaty violations, and protection for whistleblowers. With modern technology, the possibilities for accurate and timely detection and communications expand; while this process may be most applicable in open, democratic societies, even a small number of dissidents in an authoritarian regime could make a difference). *See supra* text accompanying note 160.

258. "Challenge on-site inspection" refers to procedures through which a suspicious state or an international organization is authorized to conduct extraordinary, short-notice data-gathering activities inside a target state, when doubts have emerged regarding compliance with the treaty. The procedures for initiation of such an intrusive inspection, and the rights, functions, and equipment to be exercised by the inspectors require painstaking negotiation. *See, e.g.*, CWC, *supra* note 140, art. IX, Verification Annex, Parts X, XI; CTBT, *supra* note 129, art. IV.D, Protocol Part II; *see also* DEBATE, *supra* note 3, at 65-67.

259. There is admittedly some circularity in this paragraph: It asserts that countries will have confidence in the efficacy of the verification system because the verification system will be constructed in a way that gives countries confidence. But at this point, it may be the best that can be done—the future verification system for the Zero Treaty will depend heavily upon improved monitoring technologies and revised attitudes toward transparency that we cannot today fully specify. One of the primary functions of the Zero Agreement will be to begin the process through which states will develop and negotiate agreements about new verification technologies and political relationships that will give substance to these claims. *See supra*, text accompanying notes 155-61.

260. Again, an effective enforcement system for the Zero Treaty, enabling it to rise to the rigid standards of success identified here, remains to be conceptualized, developed, negotiated, and instituted. The availability of "military measures" is a key component here—it is far from clear

17. In support of these negotiations and initiatives, the Participating States will create an international organization competent to operate the verification and enforcement systems, to promote effective implementation of the treaty to destroy their nuclear weapons, and to resolve disputes that might arise under it.[261]

18. As states dismantle their nuclear weapons, the components will be irreversibly altered in form or content, permanently converted to purposes unrelated to nuclear weapons, or held in secure storage under conditions that preclude their being quickly or secretly reassembled into weapons.[262] All such operations will be conducted pursuant to verification by the international organization and in accordance with the highest standards for security, safety of people and protection of the environment.[263]

19. The Participating States will cooperate in the research and development of alternative nuclear fuel cycles that serve peaceful purposes and present stronger barriers to potential exploitation for nuclear weapons. As such technologies become available and economically viable, the Participating States will promote their adoption and use on a non-discriminatory basis.[264]

---

how the parties can empower a reliable, effective military response to a violation in a manner consistent with Article 2(4) of the U.N. Charter and the veto power of the P5 in the Security Council. *See supra* text accompanying notes 162-67.

261. The new international organization would be similar to the CWC's OPCW and the CTBT's CTBTO; it may have some special relationship to the IAEA. The organization could be created in the Zero Treaty, or could be established prior to conclusion of that accord, in order to help facilitate its negotiation and entry into force. *See supra* text accompanying notes 183-86.

262. *See supra* text accompanying note 145 (describing the accountable "components" of a nuclear weapon).

263. This provision is similar to that of the CWC, pursuant to which each party "during transportation, sampling, storage and destruction of chemical weapons, shall assign the highest priority to ensuring the safety of people and to protecting the environment." CWC, *supra* note 139, art. IV.10.

264. Some analysts believe that an alternative nuclear fuel cycle based on thorium, rather than uranium, might provide competitively priced electrical power, with less utility for weapons purposes. *See Thorium fuel cycle—Potential benefits and challenges*, INT'L ATOMIC ENERGY AGENCY, IAEA-TECHDOC 1450 (May 2005), http://www-pub.iaea.org/MTCD/publications/PDF/TE_1450_web.pdf; *Thorium*, WORLD NUCLEAR ASS'N (Nov. 16, 2013), http://www.world-nuclear.org/info/Current-and-Future-Generation/Thorium/; Roger Harrabin, *Thorium Backed as a "Future Fuel,"* BBC NEWS (Oct. 31, 2013) http://www.bbc.co.uk/news/science-environment-24638816. This may also be a place where "sweeteners" of various sorts may be useful to

20. The Participating States will develop and implement new and expanded security guaranties or other types of security relationships that might be extended to states potentially jeopardized by future conflicts, to assist in creating the conditions for a world without nuclear weapons.[265]

21. The Participating States will devote their energies to the easing of regional tensions and to the resolution of regional conflicts so all states may achieve their legitimate security interests as they create the conditions for a world without nuclear weapons.[266]

22. All Participating States will promote this Zero Agreement and the agreements that are developed pursuant to it, and will encourage all states to participate in the relevant negotiations and to accept the obligations of the relevant agreements.

23. Participating States offer the unilateral voluntary undertakings, attached as Annex 1 to this document, as examples of immediate steps they will initiate to facilitate progress toward the elimination of nuclear weapons. The Participating States will encourage all states to continue and expand their contributions to this roster and to fulfill their commitments under it.[267]

---

help induce states to join the process, such as offering them economic assistance, technology sharing, or development aid. Alternatively, perhaps that set of bargaining chips would be deferred to the Zero Treaty. *See supra* text accompanying notes 192-93 (discussing possible sweeteners).

265. Two types of security guaranties have been contemplated: a "negative security assurance" is a promise by an NWS that it will not use nuclear weapons against an NNWS (provided, for example, that the NNWS fulfills its non-proliferation commitments); a "positive security assurance" is a commitment by an NWS that it will come to the aid of an NNWS that is attacked by another state with nuclear weapons (again, possibly subject to specific conditions or limitations). The NWS have each provided various versions of these assurances; the NNWS have sought stronger statements, subject to fewer caveats. *See Negative Security Assurances*, REACHING CRITICAL WILL, http://www.reachingcriticalwill.org/resources/fact-sheets/critical-issues/5442-negative-security-assurances; *U.S. "Negative Security Assurances" at a Glance*, ARMS CONTROL ASS'N (Sept. 2012), http://www.armscontrol.org/factsheets/negsec; *Negative Security Assurance Audiences*, CENTER FOR STRATEGIC & INT'L STUDIES (Jan. 2010), http://csis.org/blog/negative-security-assurance-audiences; John Freeman, *The Experience of the Chemical Weapons Convention: Lessons for the Elimination of Nuclear Weapons*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 125 (comparing the assurances offered as part of the Chemical Weapons Convention).

266. *See supra* text accompanying notes 187-88 (regarding regional security issues).

267. The "house gifts" listed in Annex 1 could include both procedural undertakings (e.g., a commitment to enter into negotiations on future reductions) and unilateral substantive offerings (e.g., a pledge to immediately reduce the country's numbers of weapons or their alert status, or to increase the transparency of its stockpiles.) Broadly speaking, they constitute

24. The Participating States will continuously monitor the implementation of this Zero Agreement and will meet at two-year intervals at the head of government level[268] to review its progress and to consider additional measures necessary to promote its objectives. Participating States XXX will serve as a Contact Group, to facilitate accomplishment of these objectives.[269]

25. This Zero Agreement is not legally binding, but it represents a solemn undertaking by the Participating States on a matter of the greatest international importance and urgency. It is open for signature by all states,[270] and will remain open for signature indefinitely.[271]

Done, at (place), this (date)

Signatures of Participating States:

"confidence-building measures," or "transparency, security, and confidence-building measures," even without being legally binding.

Many states participating in the 2010 Nuclear Security Summit tendered comparable house gifts; reportedly, ninety percent of those voluntary commitments were fulfilled within two years. COUNCIL ON FOREIGN RELATIONS, *IIGG Report Card*, *supra* note 74; MICHELLE CANN, KELSEY DAVENPORT & MARGARET BALZA, ARMS CONTROL ASS'N AND PARTNERSHIP FOR GLOBAL SECURITY, REPORT: THE NUCLEAR SECURITY SUMMIT: ASSESSMENT OF NATIONAL COMMITMENTS, Mar. 20, 2012, http://www.armscontrol.org/files/ACA_NSS_Report_2012.pdf; MICHELLE CANN, KELSEY DAVENPORT & SARAH WILLIAMS, ARMS CONTROL ASS'N AND PARTNERSHIP FOR GLOBAL SECURITY, THE NUCLEAR SECURITY SUMMIT: PROGRESS REPORT, July 2013, http://www.armscontrol.org/files/Nuclear_Security_Summit_Report_2013.pdf; *see also* CANBERRA COMMISSION, *supra* note 12, at 52-65 (identifying immediate, reinforcing, and final steps in the progression toward nuclear disarmament).

268. The Nuclear Security Summits have been convened biennially at the head of state or head of government level. *See 2012 Seoul Nuclear Security Summit: Key Facts*, https://www.nss2014.com/sites/default/files/documents/key_facts_on_the_2012_seoul_nuclear_security_summit.pdf.

269. Alternatively, the Zero Agreement could create more "diplomatic infrastructure," to facilitate pursuit of the Zero Treaty, such as a permanent staff, annual meetings, and a research and publication program. In this version, the ongoing "Contact Group" (likely comprising the P5 and a handful of like-minded other leading states) would be charged with continuous responsibilities to promote the objectives on a day-to-day basis.

270. As noted above, an alternative concept would be to specify that only particular states would join this Zero Agreement, or that only particular states would participate in the negotiations, but other states would still be invited to sign. *See supra* text accompanying notes 195 & 235.

271. Because this document is non-legally-binding, it does not require any of the usual treaty "boilerplate" provisions regarding entry into force, amendment, withdrawal, registration, official languages, etc., that will be included in the Zero Treaty, art. XI, *infra*, text accompanying notes 379-92.

Annex 1: Immediate Unilateral Undertakings by Individual Participating States

[Examples of cooperative, reciprocal, voluntary "house gifts" that could be offered by one or more states, individually or in collaboration:][272]

– A declaration that fissile material removed from newly-dismantled nuclear weapons will not be used in new nuclear weapons; that fissile material from civil nuclear programs will not be used in nuclear weapons; that no newly produced fissile material will be used in nuclear weapons; and that the International Atomic Energy Agency is invited to monitor implementation of these commitments on a permanent basis.

– A declaration of the state's total inventory of highly enriched uranium and plutonium.

– A declaration of the state's holdings of nuclear warheads and delivery vehicles.

– A declaration of the state's nuclear infrastructure facilities.

– A commitment to develop and use an agreed standard format to make public declarations of current and past national fissile material production and holdings.

– Creation of procedures for international monitoring of the secure storage of nuclear weapons designated for dismantlement, to confirm that such weapons and the fissile material they contain are not reintroduced into weapons stockpiles.

– Institution of additional transparency measures at sites where nuclear weapon test explosions have been conducted.

– An invitation, by states that currently conduct inspections of each other's nuclear forces, to allow third-country officials to join actual or practice inspections as observers.

– Expansion of the monitoring operations established under the Open Skies Treaty, through acceptance of additional types of sensors,

---

272. *See generally* FISSILE MATERIAL PANEL, *supra* note 83, at 28-38, 59-70 (suggesting numerous possible declarations and procedures).

the institution of overflights in additional geographic areas, the reduction of advance notification of overflights, the reduction or elimination of exclusion zones, and/or the use of repeated or continuous overflights by remotely piloted aircraft.[273]

– A declaration by a state possessing nuclear weapons that it will not be the first to break the current moratorium on nuclear testing.

– A declaration by a state possessing nuclear weapons that it will not be the first to use a nuclear weapon in combat.[274]

– A declaration by a state that expands, or makes more legally binding, its offer of security assurances.

– A declaration that a state will cap at current levels its nuclear weapons stockpiles and/or a declaration that it will not build any new nuclear weapons.

– Removal of specified numbers of nuclear warheads from their delivery vehicles.

– Confirmed irreversible dismantlement of specified numbers of nuclear warheads or delivery vehicles.

– A declaration that codes for directing nuclear weapons to specific targets have been (or will be) altered to aim only at unpopulated ocean areas, or removed altogether from missile guidance computers and henceforth will not be stored there in peacetime.

– Revision of war plans to reduce or eliminate any requirement for a capability to launch weapons on short notice.[275]

---

273. Treaty on Open Skies, Mar. 24, 1992, S. Treaty Doc. No. 102-37 (1992) [hereinafter Open Skies Treaty]. Under the Open Skies Treaty, parties agree to allow reciprocal aerial overflights of their territories by foreign aircraft equipped with photographic and other sensors that gather military-related data in order to build confidence that no hostile or threatening activities are underway.

274. *See* Daniel Ellsberg, *Roots of the Upcoming Nuclear Crisis*, *in* THE CHALLENGE OF ABOLISHING NUCLEAR WEAPONS 45, 52-53 (David Krieger ed., 2009) (listing 25 occasions from 1948 to 2008 when the United States threatened or considered the first use of nuclear weapons).

275. U.S. DEP'T OF DEFENSE, *Report on Nuclear Employment Strategy of the United States, Specified in Section 491 of 10 U.S.C.* (June 19, 2013), http://www.defense.gov/pubs/ReporttoCongresson USNuclearEmploymentStrategy_Section491.pdf; Press Release, The White House, Fact Sheet: Nuclear Weapons Employment Strategy of the United States (June 19, 2013), *available at* http://

– Establishment of regional forums to promote security and cooperation for a world without nuclear weapons.

– Creation of a national commission to compile a thorough history of the state's nuclear weapons program and collect supporting evidence.

– Convening a multilateral group of national experts to develop improved measures for monitoring and verifying the possession and elimination of fissile material and nuclear weapons.

– Convening a multilateral group of national experts to develop effective enforcement measures and mechanisms appropriate for a world without nuclear weapons.

– Convening a multilateral group of national experts to consider appropriate provisions for a world without nuclear weapons regarding the possible retention of fissile material by the states that currently possess nuclear weapons or by all states, either as a temporary hedge against treaty violations or permanently.

V. DRAFT ZERO TREATY

This section attempts to peer even further into the future, to imagine the political and legal structures that would be suitable for assisting states in making the final ascent from a world with low levels of nuclear weapons held by a few states to the summit of a world free of nuclear weapons altogether. The proposed draft accord is necessarily quite speculative; it would be shaped in important respects by the experience—likely to be protracted over many years—in implementing the goals of the Zero Agreement, and it would depend upon new monitoring technologies or modalities for verification of compliance and new political accommodations to permit robust transparency and enforcement activities that are scarcely conceivable today.

Unlike the preceding Zero Agreement, this Zero Treaty[276] would be legally binding; it would be joined, sooner or later, by all states.

---

www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states (announcing that the United States will "examine and reduce the role of launch under attack in contingency planning").

276. There is no legal significance in the vocabulary of "agreement" versus "treaty." Under the VCLT, *supra* note 138, art. 2.1, the nomenclature of an instrument does not affect its status.

Zero Treaty
For the Elimination of Nuclear Weapons[277]

The States Parties[278] to this Treaty,

(PP1)[279] *Determined* for the sake of all mankind to end forever the scourge of nuclear weapons;

(PP2) *Convinced* that a global, comprehensive, timely, balanced, predictable, secure, verifiable, enforceable, sustainable, irreversible, and legally-binding[280] treaty constitutes the most effective and reliable mechanism for achieving that objective;

Here, the different terms are used for the two documents simply to differentiate them for ease of reference.

277. The following discussion assumes that by the time the world is ready for negotiation and conclusion of this Zero Treaty, the following crucial conditions will have been satisfied:

(a) the CTBT will be in force;

(b) a comprehensive FMCT will have been negotiated and brought into force;

(c) the United States and Russia will have negotiated and implemented one or more new agreements achieving deep cuts in their respective nuclear weapons arsenals (including strategic and shorter-range weapons, both deployed and non-deployed), reaching very low levels of retained weapons and incorporating new, more intrusive verification mechanisms;

(d) China, France, and the United Kingdom will have joined the reductions process, implementing deep cuts in their respective nuclear weapons arsenals and accepting intrusive verification;

(e) India, Israel, North Korea and Pakistan will have joined the reductions process, eliminating or implementing deep cuts in their respective nuclear weapons arsenals and accepting intrusive verification;

(f) Iran and all other states will have either abandoned their nuclear weapons aspirations and capabilities or agreed to restrict their nuclear weapons arsenals to very low levels and accept intrusive verification;

(g) all other states will have supported the process and no new states will have begun to pursue nuclear weapons; and

(h) regional tensions (in the Middle East, South Asia, Northeast Asia and elsewhere) will have greatly abated, to the extent that affected states accept that possession or possible possession of nuclear weapons does not support their legitimate security objectives. *Cf.* Paine, Cochran, and Norris, *International Arrangements*, *supra* note 144, at 141-42 (listing interim steps that would be assumed to be in place to create the conditions for nuclear weapons elimination).

278. Unlike the non-legally-binding Zero Agreement, this legally-binding document uses the term "party" rather than "participating state."

279. The preamble to a treaty is not generally considered legally operative, as the main text is, but can be instrumental in interpretation of the treaty, as reflecting the parties' "object and purpose."

280. This paragraph repeats the mantra from the Zero Agreement, preambular paragraph 3, *supra*, text accompanying note 200.

(PP3) *Believing* that the time is finally ripe for achieving the complete abolition of nuclear weapons, which has for decades been fervently desired by people around the world;

(PP4) *Redeeming* the pledge contained in Article VI of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control";[281]

(PP5) *Aware* that the use of nuclear weapons would have devastating consequences for mankind[282] and that as long as nuclear weapons exist, the possibility of their use cannot be forever precluded;

(PP6) *Affirming* that all human life is sacred, and that all members of the human family have the equal, inalienable right to life, liberty, peace, security and dignity;[283]

(PP7) *Welcoming* the contributions made by a series of agreements and unilateral actions by many countries that have created the conditions for achieving a world without nuclear weapons;[284] and

(PP8) *Inspired* by the vision of a world forever free of nuclear weapons;

Have agreed as follows:[285]

---

281. In addition to citing Article VI of the NPT, the preamble to the Zero Treaty could also contain quotations from various NPT review conferences. The provisions from the 1995, 2000 and 2010 conferences, as cited in preambular paragraphs 8-10 of the Zero Agreement, will mostly be "old news" by that time.

282. Regarding the effects of even a single nuclear explosion, and the consequences of a general nuclear war, see SCHELL, *supra* note 166, at 3-96. *See also* THE EFFECTS OF NUCLEAR WEAPONS (Samuel Glasstone & Philip J. Dolan eds., 3d ed., 1977), *available at* http://www.fourmilab.ch/etexts/www/effects/; OFFICE OF TECHNOLOGY ASSESSMENT, THE EFFECTS OF NUCLEAR WAR (May 1979), *available at* http://www.fas.org/nuke/intro/nuke/7906/http://www.fas.org/nuke/intro/nuke/7906/.

283. *Cf.* NWC, *supra* note 2, at 46 (citing pmbl. ¶ 4).

284. The preamble could include here citations to some of the important interim agreements that created the progression from the initial Zero Agreement to this Zero Treaty, such as the CTBT, FMCT, and nuclear weapon free zone agreements.

285. One or more protocols or annexes (not drafted here) may be appended to the Zero Treaty to provide additional details of the specifications for implementation, inspections, definitions, etc. *Cf.* CWC, *supra* note 139; New START, *supra* note 78.

Article I
Fundamental Obligations[286]

1. Each Party to this Treaty shall[287] never, under any circumstances:[288]
   a. Develop,[289] test, produce, acquire, possess, retain, stockpile, deploy or transfer[290] nuclear weapons or their components, except as specified in Article II;
   b. Use, threaten to use, or engage in any military or other preparations to use[291] nuclear weapons;
   c. Develop, test, produce, acquire, possess, retain, stockpile, deploy or transfer delivery vehicles for nuclear weapons, except as specified in Article II; or
   d. Assist, encourage, collaborate with, participate with,[292] or induce, in any way, anyone to engage in any activity prohibited to a Party under this Treaty.

---

286. *Cf.* NWC, *supra* note 2, at 48 (citing article I); CTBT, *supra* note 129, art. I ("Basic Obligations"); CWC, *supra* note 139, art. I ("General Obligations").

287. Unlike the Zero Agreement, the Zero Treaty, as a legally-binding document, uses the mandatory verb "shall," instead of "will" or "should," and it refers to "Parties" instead of "Participating States."

288. The language of "never, under any circumstances" is subject to the qualification that reconstitution of a nuclear weapon inventory could in some circumstances be a key, allowable response to an illegal "breakout" attempt by another Party.

In contrast, the CWC, which uses similar language, was intended "to bind states parties not to acquire and use chemical weapons even if attacked by hostile states with such weapons." THOMAS GRAHAM, JR. AND DAMIEN J. LAVERA, CORNERSTONES OF SECURITY 1168 (2003) (also interpreting the BWC in the same absolutist fashion).

289. As with prior arms control agreements, this provision does not attempt to regulate "research," defined as activity that occurs in a library or laboratory, where the capabilities for verification of compliance would be too difficult, and where the problem of dual capability is most pronounced. In contrast, the NWC does ban nuclear weapons related research. NWC, *supra* note 2, at 48 (citing article I(1)(g)).

290. This string of prohibitory verbs combines terms from CWC, *supra* note 139, art. I; CTBT, *supra* note 129, art. I; and elsewhere.

291. The language of "engage in any military preparations to use" comes from the CWC, *supra* note 139, art. I.1(c); this text adds a prohibition on "other" types of preparations. *See* NWC, *supra* note 2, at 48 (citing article I(1)(a)(b)). The negotiating history of the treaty would have to make clear that activities such as the continued possession of components of disassembled nuclear weapons, as permitted by the Zero Treaty, would not constitute prohibited "preparations to use."

292. Prior treaties prohibit actions that would "assist, encourage, or induce" behavior incompatible with the agreement; this proposed text adds "collaborate with" and "participate

2. Each Party shall destroy all the nuclear weapons that it owns or possesses, or that are located at any place under its jurisdiction or control.[293]
3. Each Party shall destroy or convert to permitted purposes[294] all the delivery vehicles for nuclear weapons that it owns or possesses, or that are located at any place under its jurisdiction or control.
4. Each Party shall destroy or convert to permitted purposes all the facilities and equipment that it owns or possesses, or that are located at any place under its jurisdiction or control, that have been used or principally designed or intended for use in the research, testing, manufacturing, storage, processing, maintenance, or elimination of nuclear weapons or components.[295] The following designated facilities and locations shall be subject to special monitoring: [list, by country, particularly important sites or buildings that have performed significant nuclear weapon-related work and will be verifiably destroyed or converted to other purposes; specialized monitoring arrangements will be developed for each and described in an annex.][296]

---

with" to capture coordinated planning and operational activities that might not otherwise be covered. *See* CWC, *supra* note 139, art. I.1(d); Ottawa Convention, *supra* note 172, art. 1.1(c); Oslo CMC, *supra* note 173, art. 1.1(c). The CTBT prohibits "causing, encouraging, or in any way participating in" the conduct of a nuclear explosion, CTBT, *supra* note 129, art. I.2.

293. The Chemical Weapons Convention also deals with weapons that are "abandoned" on the territory of another state; that scenario seems unlikely with nuclear weapons. CWC, *supra* note 139, art. I.3. The CTBT requires parties to "prohibit and prevent" nuclear weapons tests at locations under their jurisdiction and control; following that model, the Zero Treaty could prohibit and prevent possession of nuclear weapons, but since this draft requires destruction of nuclear weapons at all locations under a party's jurisdiction and control, the "prohibit and prevent" language would seem redundant. CTBT, *supra* note 129, art. I.1.

294. Some prior agreements use the term "activities not prohibited"; the term "permitted purposes" here aims at the same concept, but avoids a double negative. But it is noteworthy that under international law, treaties do not usually "permit" activities—a state is considered inherently free to undertake any activities that are not specifically prohibited by law. *See* CWC, *supra* note 139, art. II.9, VI.

295. At some suitable point in the negotiation process, each state would be required to declare or list all its relevant facilities, and other states could contest whether additional sites should be added to the roster, to ensure that all appropriate locations were covered.

296. The Treaty could list here particular sites or installations that would require special monitoring. *See, e.g.*, the Savannah River Site and Y-12 National Security Complex (used for producing radioactive materials for nuclear weapons), Pantex Plant (for assembling and refurbishing nuclear weapons), and Kansas City Plant (for producing or procuring non-nuclear components). *See Our Locations*, NAT'L NUCLEAR SEC. ADMIN. (NNSA), http://nnsa.energy.gov/aboutus/

5. All destruction, closure, conversion, maintenance, storage, transportation, and other operations required by the Treaty shall be monitored by the Organization.[297] In conducting these operations, each Party shall assign the highest priority to ensuring security, safety of people and protection of the environment.[298] Destruction and conversion operations shall be completed no later than seven years after the entry into force of this Treaty.[299]

---

ourlocations (last visited Feb. 18, 2014); LISBETH GRONLUND, ERYN MACDONALD, STEPHEN YOUNG, PHILIP E. COYLE, III & STEVE FETTER, MAKING SMART SECURITY CHOICES: THE FUTURE OF THE U.S. NUCLEAR WEAPONS COMPLEX 64-79 (2013), *available at* http://www.ucsusa.org/assets/documents/nwgs/nuclear-weapons-complex-report.pdf; Nuclear Matters Handbook, *supra* note 81, at 93-102; Geoff Brumfiel, *Laser Lab Shifts Focus to Warheads*, 491 NATURE 159, Nov. 7, 2012, *available at* http://www.nature.com/news/laser-lab-shifts-focus-to-warheads-1.11745 (National Ignition Facility at Lawrence Livermore Laboratory will direct more attention to weapons work). It could be quite time-consuming to negotiate, on a case-by-case basis, the applicable monitoring procedures for each site, but that would be preferable to attempting to negotiate a one-size-fits-all monitoring plan, which would inevitably have to be adapted to the unique circumstances at each location. *See* Paine, Cochran & Norris, *Techniques and Procedures*, *supra* note 160, at 174-77 (discussing monitoring requirements for specific types of facilities).

297. The Treaty will need to establish an extensive set of procedures governing the operations of the Organization in monitoring the parties' destruction of nuclear weapons and in conducting inspections to ensure that no hidden stockpiles remain or are being created. These procedures will likely be based upon those of the CWC, *supra* note 139, Verification Annex; the CTBT, *supra* note 129, Protocol; and New START, *supra* note 78, Protocol. But new technologies and political relationships will have to evolve in order to support the much greater intrusiveness necessary for effective verification of the Zero Treaty.

Here, the fundamental concept is that the each state will retain national control over the regulated items, subject to international (or reciprocal) monitoring; an alternative would be to vest partial or even total control over some components in the international organization.

298. The requirement to assign highest priority to ensuring the safety of people and to protecting the environment is drawn from the CWC, *supra* note 139, art. IV.10. *See* NWC, *supra* note 2, at 130-32.

299. Alternatively, negotiators could determine that the deadline for completing destruction operations should be shorter or longer than seven years, depending on political conditions of the time and on how many nuclear weapons were still in national stockpiles. The Zero Treaty could also include a detailed timetable, corresponding to the several interim deadlines established in the CWC's "order of destruction," with specified percentages of national stockpiles to be destroyed within two, five, seven, and ten years. CWC, *supra* note 139, Verification Protocol, Part IV(A), ¶ 17. The Zero Treaty will be dealing with much smaller numbers of items than the CWC, which regulated the disposition of over 70,000 tons of chemical agent, but destruction of nuclear weapons is a challenging and time-consuming task.

The Zero Treaty might also make provision for destruction "as soon as possible, but in no case later than XX years" regarding any nuclear weapons that were not known to exist at the time the Treaty enters into force, but were discovered subsequently. However, the vigorous verification and transparency measures to be implemented before the Zero Treaty is concluded should mean that there would be no lingering unknown "hidden" weapons.

6. Each Party shall, in accordance with its constitutional processes, adopt the necessary measures to implement its obligations under this Treaty, including:

   a. Prohibiting natural and legal persons anywhere on its territory or at any other place under its jurisdiction or control from undertaking any activity prohibited to a Party under this Treaty, including by enacting or expanding penal legislation;[300]
   b. Prohibiting natural and legal persons having its nationality from undertaking any activity prohibited to a Party under this Treaty anywhere, including by enacting or expanding penal legislation;
   c. Concluding appropriate agreements to extradite to another Party persons to be prosecuted for actions inconsistent with this Treaty;[301] and

---

The timetable for converting or destroying delivery vehicles and the buildings and other facilities that constitute the nuclear weapons infrastructure could be set to match the seven-year period for elimination of nuclear weapons; alternatively, it could be extended, depending on how many such items and sites remain at the time the Zero Treaty is concluded and on whether parties wish to convert or to destroy them. The Treaty could specify a date, or could leave that to case-by-case determination through the Organization.

300. Paragraphs 6a and 6b are adapted from CWC, *supra* note 139, art. VII.1, to prevent circumvention of the treaty obligations imposed upon states, by requiring the states to extend similar obligations, in the form of penal legislation, to their nationals and throughout their territories. The treaty could go further and declare that actions inconsistent with the treaty constituted international crimes (suitable for prosecution in an international tribunal) or crimes of universal jurisdiction (suitable for prosecution by any state, regardless of the location of the act or the nationality of the actor). These prohibitions could apply both to persons and to corporations and other entities. *See* NWC, *supra* note 2, at 49, 66-68 (citing articles I(5), VI, VII(1)-(2)); Rome Statute of the International Criminal Court art. 1, Jul. 17, 1998, UN Doc. A/CONF. 183/9, 2187 UN.T.S. 90; 37 I.L.M. 1002 (1998) (entered into force Jul. 1, 2002) [hereinafter Rome Statute] (treaty creating the International Criminal Court, with jurisdiction to prosecute "the most serious crimes of international concern."). For a discussion regarding universality jurisdiction, see RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES § 404 (1987) (discussing the small category of offenses "recognized by the community of nations as of universal concern," enabling any state to assert jurisdiction).

The Zero Treaty could also require each party to designate a National Authority, to serve as the focal point for domestic implementation measures and for communications and liaison with the Organization. *See* CWC, *supra* note 139, art. VII.4; CTBT, *supra* note 129, art. III.4.

301. *See* NWC, *supra* note 2, at 68 (citing article VII(2)).

d. Adopting appropriate measures to protect persons providing to the Organization information regarding actions related to or inconsistent with this Treaty.[302]

Article II
Permitted Activities

1. A Party[303] may retain[304] and maintain[305] components[306] for a limited number[307] of nuclear weapons, provided that:

---

302. This provision is designed to promote adequate protection for whistleblowers, who alert the Organization to prohibited actions, and who might otherwise be subject to retaliation by governments, employers or others. *See* NWC, *supra* note 2, at 66, 72 (citing articles VI(1)(b), VII(C)).

303. In this draft, "any" Party would be allowed to hold these components of nuclear weapons; an alternative would confine that right to only those countries that had previously (and legally) possessed nuclear weapons (i.e., the P5 and the four non-NPT states). As drafted, the provision might allow and encourage some "proliferation" of nuclear weapons components, as some current NNWS might decide to build small stockpiles of weapons components for the first time as a hedge against another country's violation of the Zero Treaty. On the other hand, the alternative concept would perpetuate an unpopular "discriminatory" aspect of the NPT.

304. The Zero Treaty could further restrict a party's right to retain components of nuclear weapons by limiting the maximum quantity of such items that could be held and/or by establishing a progressive timetable under which the party must reduce or eliminate its holdings.

The concept of "retaining" these components implies that a party would be allowed to "extract" them from intact nuclear weapons that it was destroying but perhaps not be allowed to "create" new components from scratch. The drafters of the Zero Treaty could be explicit about this by allowing or prohibiting new manufacturing of components.

The provisions of this article would have to apply, *mutatis mutandis*, to the components of nuclear weapons that were dismantled prior to the entry into force of the Zero Treaty as well as to those disassembled under it.

305. The Zero Treaty could include a definition of the sorts of "maintenance" activities a party would be permitted to undertake regarding these components. If so, it could define a distinction between maintenance, testing, repair, refurbishment, remanufacturing, etc.

306. The Zero Treaty will need to define the critical "components" being regulated. Notionally, these could include: (a) the fissile material (extracted from the uranium or plutonium "pit" or "physics package"); (b) the shaped chemical high explosive; and (c) the "electronics package" of detonator charges. Different types of weapons might include different critical components. *See supra* text accompanying note 145.

307. The Zero Treaty could specify here the specific quantities of various components that parties would be allowed to retain.

a. All components shall be held in safe and secure conditions in declared storage facilities;[308]
b. All components shall be permanently tagged and continuously monitored;[309]
c. No storage facility shall contain all the components necessary to create a nuclear weapon;[310]
d. Any movement or reassembly of components shall not be conducted quickly or secretly, and not for more than one weapon at a time;[311] and
e. Ten years after this Treaty enters into force, the Parties shall evaluate whether the right to hold components shall be further restricted or prohibited.[312]

2. A Party may withdraw components from a storage facility for destruction or for use in applications unrelated to nuclear weapons,[313] provided that:

---

308. The Zero Treaty, or decisions of the Organization implementing it, will need to establish standards for the safety and security of the storage facilities and the procedures for making the required national declarations. The Zero Treaty could require the storage sites to be publicly declared, or they could be disclosed in confidence to the Organization.

309. A critical challenge for the Zero Treaty's verification arrangements will be to design a system allowing reliable monitoring of these components without providing the monitors with too much information about the party's design of nuclear weapons.

310. In addition, the Zero Treaty could require that facilities storing the components of nuclear weapons should be located at some substantial distance apart to further reduce the possibility for quick, secret reconstitution. *Cf.* START I Treaty, *supra* note 110, art. IV.11 (requiring at least 100 km separation between certain ICBMs, launchers, and other related equipment). For "two-stage" nuclear weapons, the Zero Treaty could specify a degree of physical separation of the two types of explosive devices.

311. The Zero Treaty or its implementing procedures could specify how rapid and transparent the potential re-constitution process could be by defining, for example, how many subcomponents each nuclear weapon must be broken down into, how far apart the components must be held, what physical impediments might block access to the storage facilities, whether the party would have to announce publicly whenever it was handling, moving, or reassembling components, whether permission would be required from the Organization prior to any movement of components, and whether the party would need to invite observers from the Organization to monitor the process. Perhaps the timetable required for reconstituting weapons could be gradually further stretched out over the life of the Zero Treaty.

312. The parties could decide—such as at a review conference for the Zero Treaty—to amend the Treaty to restrict or prohibit the right to hold components. Alternatively, the Treaty could specify at the outset that a party's rights in this regard should automatically expire after a set period of time.

313. Probably, the main component that a party might be interested in converting to peaceful purposes would be the fissile material. It is possible that by the time the world gets close

a. The component shall be destroyed or irreversibly converted into a form unsuitable for use in a nuclear weapon; or
b. The component shall remain tagged and subject to continuous[314] monitoring.

3. A Party may retain delivery systems for nuclear weapons, provided that:

   a. No inter-continental ballistic missiles or submarine-launched ballistic missiles shall be retained;[315]
   b. All retained delivery systems shall be dedicated exclusively to purposes other than the delivery of nuclear weapons; any features specially related to the delivery of nuclear weapons shall be removed or converted to other purposes; and the delivery system shall remain subject to inspection;[316] and

---

to concluding a Zero Treaty, countries will already have extracted sufficient quantities of any components from nuclear weapons that were disassembled and destroyed in prior years, so they would have little need to re-use any further components from the last remaining nuclear devices, and those items could be consigned to permanent storage or destruction.

314. In some applications, perhaps, periodic, rather than continuous, monitoring, or monitoring of a statistical sampling would be sufficient and less burdensome.

315. This provision is grounded on the proposition that the short flight times of ICBMs and SLBMs make them uniquely threatening and on the fact that they have been traditionally allocated almost exclusively to nuclear missions, with little if any role in conventional warfare.

An alternative would be to allow the retention of a limited number of ICBMs or SLBMs and making them available for delivery of nuclear or conventional weapons in response to another state's illegal breakout activity. This limited number could be reduced over time. If any ICBMs or SLBMs may be retained, the Treaty will also need to address the extent to which those weapons may be maintained, refurbished, remanufactured, etc. The Zero Treaty could also allow a party to convert these missiles to peaceful purposes, such as in launching space vehicles.

Another alternative would be to require elimination of ballistic (and cruise) missiles of shorter ranges, too—at least any such systems that had ever been tested or deployed with nuclear weapons. *Cf.* NWC, *supra* note 2, at 84 (citing article XII requiring destruction of heavy bombers, ballistic missile submarines, and ground-launched cruise missiles as well as ICBMs and SLBMs).

316. Prior U.S.-U.S.S.R. (and Russia) treaties have included provisions for the conversion of nuclear delivery systems such as long-range bombers, to non-nuclear missions. *See* START I, *supra* note 110, Protocol on Procedures Governing the Conversion or Elimination of Items Subject to the Treaty; New START, *supra* note 78, Protocol, Part III. In the absence of frequent inspection, however, such conversion may not be reliably irreversible.

Again, an alternative would be to allow the retention of a limited number of nuclear-capable bombers and other delivery systems, making them available for delivery of nuclear weapons if another state has illegally reconstituted its nuclear weapons. This limited number could be reduced over time.

c. No new systems designed for the delivery of nuclear weapons shall be developed, tested or deployed,[317] and no system designed for purposes other than delivery of nuclear weapons shall be tested in a nuclear weapons mode.[318]

Article III
Definitions[319]

1. "Nuclear weapon" means any device that is capable of releasing nuclear energy in an essentially uncontrolled manner and that has a group of characteristics that are largely appropriate for use for warlike purposes, regardless of whether the device is intended for warlike or peaceful purposes. The term includes weapons that are deployed, non-deployed, inactive, on reserve, retired, awaiting destruction, and in any other status.[320]
2. "Component" of a nuclear weapon means any constituent element of a nuclear weapon.[321]
3. "Destroy" means to disassemble, denature, deform, disable, incapacitate, or render in an essentially irreversible way into a form unsuitable for weapons purposes.[322]

---

317. This provision would require a definition of what counts as a "new" system as opposed to a modification of an existing type. *Cf.* SALT II, *supra* note 107, at art. IV.9 (associated Agreed Statements and Common Understandings) (allowing each side to deploy one new type of ICBM, and defining "new" for this purpose).

318. *Cf.* ABM Treaty, *supra* note 105, arts. II.1, VI (restricting the testing of interceptor missiles and radars "in an ABM mode"); Standing Consultative Commission Agreed Statement, U.S.-U.S.S.R., Nov. 1, 1978, *available at* http://www.fas.org/nuke/control/abmt/text/abm_agr.htm (further defining the term). The Zero Treaty cannot refer to testing "with" nuclear weapons because under the Zero Treaty there would be no nuclear weapons to test with.

319. *Cf.* NWC, *supra* note 2, at 50 (citing article II presenting eighty definitions).

320. The first sentence of this definition is adapted from the Treaty of Tlatelolco, *supra* note 117, art. 5. This definition is designed to capture so-called "peaceful nuclear explosion" devices, as well as weapons, and to capture all nuclear weapons regardless of their status. *See supra* text accompanying notes 78-81, 137, 222 & 307.

321. For this purpose, the main components of a nuclear weapon would be the fissile material, the high explosive detonator, and the electronics, although numerous other items are relevant. *See supra*, text accompanying notes 145 & 306 (regarding components of a nuclear weapon).

322. This definition is based on the CWC's definition of "destruction of chemical weapons." CWC, *supra* note 139, Verification Annex, Part IV(A), ¶ 12. The notion is that an actor who was attempting to construct a new nuclear weapon would not be materially advantaged by having access to destroyed components of a previous weapon; the task would be essentially as difficult, expensive, and time-consuming as starting from scratch. *See* GRONLUND ET AL., *supra* note 296,

4. "Delivery system" means any mechanism that has been developed, tested, or deployed for, or is capable of, transporting a nuclear weapon to a target.

Article IV
Nuclear Weapons and Delivery Systems

1. Each Party shall declare, upon entry into force of the Treaty for it, and annually thereafter, all the nuclear weapons and components it owns or possesses or that are located at any place under its jurisdiction or control, and shall provide to the Organization its plan for destroying or converting them.[323]
2. Each Party shall declare, upon entry into force of the Treaty for it, and annually thereafter, all the delivery systems for nuclear weapons it owns or possesses or that are located at any place under its jurisdiction and control, and shall provide to the Organization its plan for destroying or converting them.
3. The declaration shall specify the location, characteristics, condition, storage procedures, and destruction or conversion method and timetable for each item, on a standard form developed by the Organization.[324]

---

at 52-55 (process for verifiably dismantling nuclear weapons); START I, *supra* note 110, Protocol on Procedures Governing the Conversion or Elimination of the Items Subject to the Treaty (describing procedures for eliminating strategic delivery vehicles); *Dismantlement Fact Sheet*, NATIONAL NUCLEAR SECURITY ADMINISTRATION (Feb. 11, 2013), http://www.nnsa.energy.gov/mediaroom/factsheets/dismantlement-0 (describing procedures for dismantling nuclear weapons).

323. For most states, this provision would require simply a declaration that it possessed no nuclear weapons, but even a state that had allowed another state to base nuclear weapons on its territory would be required to declare that fact. *Cf.* NWC, *supra* note 2, at 58 (citing article III collecting into one article all the required declarations).

324. The Organization—or a provisional precursor to it—will have to be operational even before the Zero Treaty enters into force to accomplish the preparation of suitable standardized forms for reporting required data.

Article V
Nuclear Weapon Test Sites

1. Each Party shall declare, upon entry into force of the Treaty for it, all sites at which it has conducted nuclear weapon test explosions,[325] and provide to the Organization its plan for completing the actions required by this article.[326]
2. Each Party shall close[327] or convert to purposes unrelated to nuclear weapons all its declared nuclear weapon test sites[328] and submit them to continuous monitoring.
3. Each Party shall collapse, fill, or permanently seal all emplacement boreholes and tunnels at such sites.[329]
4. Each Party shall destroy or convert to other purposes and submit to continuous monitoring all equipment or facilities[330] specially designed for purposes of conducting nuclear weapon tests.[331]

---

325. Some countries have conducted nuclear tests outside their own national territory; in those instances, two states would have to collaborate to fulfill the obligations of this article. Similar collaboration was required to implement provisions of the INF Treaty, *supra* note 79, Memorandum of Understanding Regarding the Establishment of the Data Base for the Treaty Between the Union of Soviet Socialist Republics and the United States of America on the Elimination of Their Intermediate Range and Shorter-Range Missiles, U.S.-U.S.S.R. (Dec. 8, 1987), *available at* http://www.fas.org/nuke/control/inf/text/inf3.htm [hereinafter INF MOU] (identifying U.S. bases in Germany, the Netherlands, Italy and elsewhere subject to inspection by the Soviet Union) and the CWC, *supra* note 139, Verification Annex, Part II, ¶¶ 19-21 (establishing procedures for conducting an inspection of a chemical facility owned by one state but located in the territory of another state).

326. The Treaty could specify a required deadline for completing the various actions required by this article. Some (such as collapsing any remaining emplacement tunnels) could probably be accomplished quickly, while others (such as converting sites and equipment to permitted purposes) could require quite a bit of time, at least for some locations.

327. True "closure" of a large area, such as the Nevada National Security Site, may not be practical; more likely, such locations would be "converted" to other purposes, which could include military activities not connected to nuclear weapons. *See Nevada National Security Site, supra* note 150 (regarding Nevada National Security Site).

328. This text would require that a country could not conduct even "permitted" nuclear weapons-related activities at a test site. It may be more "efficient" to allow such activities to be conducted at a former test site, but perhaps the history of that location should override efficiency.

329. This provision would effectively lengthen the time required before a party could conduct a nuclear weapon test.

330. Alternatively, the text could list the specific items of equipment and facilities that would be subject to intense regulation.

331. The monitoring could be accomplished by cameras and other mechanical sensors, by roving or permanent observers, or otherwise, according to the characteristics of the particular site.

5. Each Party shall remove from the site or render unrecoverable or unusable any residual fissile material that has remained from previous testing.[332]

Article VI

Nuclear Weapon Laboratories, Facilities and Personnel[333]

1. Each Party shall declare, upon entry into force of the Treaty for it, all laboratories and related facilities or sites at which it has conducted nuclear weapon-related research, development, fabrication, production, maintenance, or testing activities,[334] and provide to the Organization its plan for completing the actions required by this article.[335]
2. Each Party shall close or convert to purposes unrelated to nuclear weapons all such laboratories, facilities and sites and submit them to continuous monitoring.[336] A converted laboratory, facility or site shall be rendered no more capable of being re-converted to nuclear weapons purposes than is any other comparable laboratory, facility or site used for peaceful purposes.[337]
3. No Party shall construct new laboratories, facilities or sites for purposes of nuclear weapon-related research, development, fabrication, production, maintenance, or testing.[338]

---

332. *See* EBEN HARRELL & DAVID E. HOFFMAN, HARV. KENNEDY SCH. BELFER CTR., PROJECT ON MANAGING THE ATOM, PLUTONIUM MOUNTAIN: INSIDE THE 17-YEAR MISSION TO SECURE A DANGEROUS LEGACY OF SOVIET NUCLEAR TESTING (2013) (describing the dangers of recoverable plutonium at abandoned Soviet nuclear test site).

333. *Cf.* NWC, *supra* note 2, at 82 (citing article XI).

334. Most such locations are well-known, so making the declaration would not be burdensome, but there might be a need to specify more precisely which types of locations are to be included in the declaration and to create procedures for challenging another party's omission of a location that should have been listed.

335. Again, the Treaty could specify deadlines for completing each of these types of actions.

336. Continuous monitoring of national weapons laboratories is likely to pose special problems, since they will continue to conduct sensitive national security work unconnected to nuclear weapons; intrusive monitoring risks revealing national security and proprietary information.

337. This provision is adapted from CWC, *supra* note 139, art. V.14, designed to ensure that a party does not retain any special advantage from a converted nuclear weapons asset.

338. This provision includes a prohibition even on undeclared "defensive" nuclear weapons-related research and other functions. In contrast, some other treaties do not categorically prohibit activities that are not directed at producing offensive weapons. *See* CWC, *supra* note 139, art. II.9(b) (permitting chemical weapons activities that are related to protection against chemical

4. Each Party shall destroy or convert to other purposes and submit to continuous monitoring all equipment specially designed for purposes of nuclear weapon-related research, development, fabrication, production, maintenance, or testing.
5. The following designated facilities and locations shall be subject to special monitoring: [list, by country, particularly important laboratory buildings or items of equipment that have performed significant nuclear weapon-related work and will be eliminated or converted to other purposes; specialized monitoring arrangements will be developed for each and described in an annex.][339]
6. Each Party shall declare all individual scientists, technicians and researchers who participated in nuclear weapon-related research, development, fabrication, production, maintenance, or testing activities at any time in the previous ten years, and shall report annually on a standardized form the professional activities of each.[340] For any declared person who has been involved

---

weapons), and the BWC, *supra* note 194 art. I.1 (allowing biological weapons related actions undertaken for "prophylactic, protective or other peaceful purposes").

339. The Treaty could list here particular laboratory facilities that would require special monitoring. *See, e.g.*, *DARHT A Critical Component of Stockpile Stewardship*, NATIONAL SECURITY SCIENCE, http://www.lanl.gov/science/NSS/issue2_2010/story2.shtml (describing the Dual-Axis Radiographic Hydrodynamic Test Facility); *Pulsed High-Energy Radiographic Machine Emitting X-Rays*, http://www.active-duty.com/MW_PHERMEXhighEnergyWpns.htm (describing PHERMEX facility at the Los Alamos Laboratory); U.S. DEPT. OF ENERGY, OFFICE OF THE INSPECTOR GENERAL, INSPECTION REPORT: ACCOUNTABILITY AND CONTROL OF EXPLOSIVES AT LAWRENCE LIVERMORE NATIONAL LABORATORY'S HIGH EXPLOSIVES APPLICATIONS FACILITY, INS-O-13-06 (Sept. 2013), *available at* http://energy.gov/sites/prod/files/2013/10/f3/INS-O-13-06.pdf (discussing the HEAF explosives research facility at Lawrence Livermore); GRONLUND ET AL., *supra* note 296, at 30; NAT'L NUCLEAR SEC. ADMIN., SUMMARY OF EXPERIMENTS CONDUCTED IN SUPPORT OF STOCKPILE STEWARDSHIP (2013), *available at* http://nnsa.energy.gov/sites/default/files/nnsa/2013-10-29%20Quarterly%20SSP%20Experiment%20Summary-FY13-4Q%20final.pdf (describing nuclear weapons-related activities at national laboratories using variety of sophisticated machines and equipment). As noted above, regarding other facilities in the nuclear weapons complex, it could be quite time-consuming to negotiate, on a case-by-case basis, the applicable monitoring procedures for each laboratory and associated site, but that would be preferable to attempting to negotiate a one-size-fits-all monitoring plan, which would inevitably have to be adapted to the unique circumstances at each location. *See* Paine, Cochran & Norris, *Techniques and Procedures*, *in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 175-78 (discussing monitoring requirements for specific types of facilities).

340. The concept here is to monitor the professional activities (the whereabouts and "whatabouts") of anyone who, in the previous ten years, had participated in nuclear weapon-related activities (perhaps confined to those who had devoted a substantial percentage of their professional activity to that sort of enterprise). The content and level of detail of the reports

in any way in nuclear weapon-related activities in the previous year, the reporting shall be particularly detailed.[341]

Article VII
The Organization[342]

1. The Parties hereby establish the Zero Treaty Organization, to assist them in achieving the object and purpose of this Treaty, to ensure effective implementation of its provisions, including those for international verification and enforcement of compliance with it, and to provide a forum for consultation and cooperation.
2. The Organization shall consist of the Assembly, the Executive Council, and the Secretariat.
3. The costs of the Organization's activities shall be paid annually by Parties in accordance with the United Nations scale of assessments, adjusted to take into account differences in membership between the United Nations and the Organization.[343]
4. The Organization shall establish procedures for cooperation, consultation, fact-finding, and resolution of disputes.[344]

---

remain to be worked out; a standard reporting format would be developed. The results of the reporting might be held as confidential information within the Organization. There might be a procedure through which the Organization or a party could suggest that another party should also report on additional specified individuals.

341. This provision would not prohibit or regulate the person's activities or livelihood, but would require reporting about them.

342. This draft is based upon the models of the CWC, *supra* note 139, art. VIII, and the CTBT, *supra* note 129, art. II. It would eventually have to be greatly expanded, to deal with numerous critical structural and administrative questions, such as the powers, procedures, and functions of each organ; the composition of the Executive Council; and the privileges and immunities of the organization and its staff members. These matters are not specified in this draft because they are lengthy and—although important—they are not unique to the functioning of the Zero Treaty. *Cf.* NWC, *supra* note 2, at 70, 86 (citing articles VIII, XIV).

343. This provision is comparable to CWC, *supra* note 139, art. VIII.7, and CTBT, *supra* note 129, art. II.9.

344. The Zero Treaty will probably include a lengthy section regarding procedures for enabling and requiring the parties to cooperate through the Organization in resolving ambiguous situations and settling disagreements. Again, these are not specified here because of their length and familiarity. *See* CWC, *supra* note 139, arts. IX, XII, XIV; CTBT, *supra* note 129, arts. V, VI; *see also* NWC, *supra* note 2, at 86 (citing article XIV).

Article VIII
Verification[345]

1. The verification system for this Treaty shall include:
   a. Declarations of relevant past and present data by each Party;[346]
   b. National and multinational technical means of verification;[347]
   c. Installation of tamper-proof tags and seals or other inventory-control devices on nuclear weapon-related components, items, canisters and facilities;[348]
   d. Installation of remote and on-site radioactivity and other sensors providing high-quality, authenticated, real time data to the Organization;[349]

---

345. The verification mechanisms will have to be a major portion of the eventual Zero Treaty. At present, the CWC, CTBT, and New START represent the "state of the art" in arms control verification; they include provisions that are as robust, diverse, and effective as countries have to date been willing and able to negotiate. But the Zero Treaty will demand much more far-reaching inspection powers, running well beyond current experiences and capabilities; it will require new monitoring, communications, and data processing technologies and new political relationships to tolerate a higher degree of intrusions than have yet been contemplated. It is therefore premature to offer detailed drafting suggestions here. *See supra* text accompanying notes 155-61; *cf.* NWC, *supra* note 2, at 63 (citing article V).

346. *Cf.* CWC, *supra* note 139, art. III; New START, *supra* note 78, art. III.8; INF Treaty, *supra* note 79, art. IX; INF MOU, *supra* note 325; *see* Paine, Cochran & Norris, *Techniques and Procedures, in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 168-71 (use of verified data declarations and exchanges in treaty monitoring).

347. *See supra* note 159 (explaining NTM and MTM); *cf.* CTBT, *supra* note 129, art. IV.5,6; New START, *supra* note 78, art. X; ABM Treaty, *supra* note 105, art. XII. *See* Paine, Cochran & Norris, *Techniques and Procedures, in* CANBERRA COMMISSION ON THE ELIMINATION OF NUCLEAR WEAPONS, BACKGROUND PAPERS, *supra* note 56, at 167-68 (role of NTM in verifying compliance with nuclear elimination requirements).

Perhaps the parties will also create additional multilateral verification programs, such as an international satellite monitoring agency. *See* U.N. Secretary-General, *The Implications of Establishing an International Satellite Monitoring Agency*, A/AC.206.14 (1983), *available at* http://www.un.org/disarmament/HomePage/ODAPublications/DisarmamentStudySeries/PDF/SS-9.pdf; Bhupendra Jasani, *International Satellite Monitoring Agency—Has the Time come for Its Establishment?* (Feb. 10, 2003), *available at* http://esarda2.jrc.it/db_proceeding/mfile/P_2003_Como_2-10-jasani-040130.pdf; Mort Canty et al., *Treaty Monitoring, in* REMOTE SENSING FROM SPACE: SUPPORTING INTERNATIONAL PEACE AND SECURITY 167, 168 (Bhupendra Jasani et al. eds., 2009).

348. *See, e.g.*, New START, *supra* note 78, at Fourth Agreed Statement (authorizing the use of tamper-proof seals on the weapons bays of certain deployed heavy bombers).

349. For comparison, the CTBT specifies that a variety of types of automated, high quality internationally-controlled monitoring stations shall be established in the territories of its parties,

e. Routine or continuous monitoring overflights by aircraft of the Organization;[350]
f. Interdiction of traffic (on road, rail, sea and air) by the Organization to inspect for and seize contraband;[351]
g. Unimpeded, systematic, routine on-site inspection;[352]
h. Taking and analysis of samples[353]
i. Public sources and societal verification, including via social media;[354]
j. The right of the Organization to interview any person confidentially, to take sworn testimony, to mandate the production of documents and materials, and to provide protection to cooperating individuals;[355] and
k. Challenge on-site inspection, including full, immediate access to confirm compliance with the Treaty.[356]

---

including seismological, radionuclide, hydroacoustic and infrasound sensors. CTBT, *supra* note 129, art. IV.16, Protocol.

350. This type of monitoring could be similar to that undertaken pursuant to the Open Skies Treaty, *supra* note 273, but could provide broader geographic coverage, additional suites of sensors, and more frequent overflights, including perhaps continuous observation by drone aircraft. The aircraft might be owned and operated by the Organization or by individual parties.

351. This type of monitoring could be similar to that undertaken pursuant to the Proliferation Security Initiative. *See Proliferation Security Initiative*, DEPT. OF STATE, http://www.state.gov/t/isn/c10390.htm (last visited Mar. 20, 2014). The parties to the Zero Treaty would provide their consent, pursuant to designated procedures, allowing the Organization to intercept suspicious traffic.

352. Many arms control treaties have provided different types of programs for routine on-site inspection, with varying kinds of powers for the inspectors. *See, e.g.*, INF Treaty, *supra* note 79, art. IX, Protocol on Inspections (permitting up to twenty inspections per year and continuous monitoring at the portals of key facilities for thirteen years); CWC, *supra* note 139, Verification Annex, Part X, ¶¶ 46-52 (presenting the procedures for "managed access," to balance the interests of inspectors and the inspected state and facility); New START, *supra* note 78, art. XI, Protocol, Part V (specifying two different types of inspections, totaling eighteen inspections per year). The inspections under the Zero Treaty would be much more demanding and intrusive; inspectors would need much more than the current exercise of managed access.

353. Inspectors could seek environmental samples of air, soil, water, flora, and fauna, as well as materials or wipes from facilities of interest and biological samples from humans. *Cf.* CWC, *supra* note 139, Verification Annex, Part II, ¶¶ 52-58; CTBT, *supra* note 129, Protocol, ¶¶ 69.d, h.

354. *See supra* note 160 (regarding societal verification).

355. The Organization should have quasi-judicial legal power to exercise jurisdiction inside the territory of parties and to protect and reward whistleblowers. *Cf.* NWC, *supra* note 2, at 66, 68-69 (citing articles VI(1)(b), VII(C)); *see also* Perkovich & Acton, *supra* note 8, at 64 (underscoring the value of interviews of key personnel).

356. "Routine" inspection is undertaken on a regular basis, such as to confirm the accuracy of a state's declared data, without any suspicion of violation; in contrast, a "challenge" inspection would be initiated when concerns have arisen about non-compliance. Provisions for requesting

2. The Organization shall sponsor collaborative research into improved and additional sensors and verification techniques. As these become available, they shall be considered for implementation by the Organization on an expedited basis.[357]
3. The Organization shall promptly make available to each Party all the information collected through the Treaty's verification system, together with suitable analysis.[358]
4. Each Party shall fully cooperate with the Organization in all verification activities.[359]
5. All verification activities shall be limited to the subject matter of this Treaty and shall be carried out with full respect for the sovereignty of states and in the least intrusive manner possible, consistent with the effective and timely accomplishment of their objectives. Each Party and the Organization shall refrain from any abuse of the right of verification.[360]
6. No Party shall interfere with the verification operations of the Treaty or with national or multinational technical means of verification of any Party operating in accordance with international law. No Party shall engage in concealment activities that impede verification of compliance with the Treaty.[361]

---

and conducting a challenge inspection may require detailed elaboration in the negotiations and treaty text. *See* CWC, *supra* note 139, art. IX.8-25, Verification Annex, Part X; CTBT, *supra* note 129, art. IV.D, Protocol Part II.

357. Verification is never a "finished" product; the parties will have to continuously seek to refine and upgrade their capabilities. This provision is based on CTBT, *supra* note 129, art. IV.11.

358. Prompt circulation of data collected by the verification system will enable each party to make its own judgments about others' compliance; analysis by the Organization will assist in interpretation of the data. CTBT, *supra* note 129, art. IV.9.

The Treaty would also need provisions regarding the possibility that parties may provide to and receive from the Organization sensitive information that should not be made public. *See* CWC, *supra* note 139, Annex on the Protection of Confidential Information; CTBT, *supra* note 129, art. II.7.

359. This provision is based on CTBT, *supra* note 129, art. IV.3.

360. This provision is based on CTBT, *supra* note 129, art. IV.2. Although the content of the paragraph is correct, alternatively, it could be deleted, in recognition of the fact that the Zero Treaty will require a transformation in states' attitudes regarding secrecy, such that they would no longer be as protective against intrusive inspections.

361. Provisions of this sort have become standard for arms control agreements, with slight variations. *See, e.g.*, CTBT, *supra* note 129, art. IV.5,6; New START, *supra* note 78, art. X.

Article IX
Enforcement[362]

1. The enforcement system for this Treaty shall include:
   a. Diplomatic measures;[363]
   b. Legal measures;[364]
   c. Economic measures;[365]
   d. Law enforcement measures;[366] and
   e. Military measures.[367]
2. If a Party believes that another Party may have violated the Treaty, it may:

---

362. As with verification, the Zero Treaty will have to be path-breaking regarding enforcement provisions. Existing arms control treaties provide a variety of mechanisms for consultations, exchanges of information, and discussions in treaty organs to resolve concerns about compliance. *See, e.g.*, CWC, *supra* note 139, arts. XII, XIV; CTBT, *supra* note 129, arts. V, VI. But the Zero Treaty will require the creation of much more vigorous and powerful mechanisms for response to treaty violations. These will have to be the most demanding and innovative portions of the Zero Treaty, eclipsing the accomplishments of current negotiators, in ways we cannot currently discern. *See supra* text accompanying notes 162-67.

363. Diplomatic measures could include unilateral and collective political pressure, as well as actions through regional organizations and the United Nations General Assembly.

364. Legal measures could include exercise of rights under the VCLT, *supra* note 139, and resort to the International Court of Justice and the United Nations Security Council, as well as to the organs of the Zero Treaty Organization. *See* Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 156-58.

365. Economic sanctions and related restrictions could be imposed by one or several countries, by the United Nations Security Council, or by the organs of international economics, such as the World Bank or International Monetary Fund. *See* Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 158-60.

366. The Zero Treaty requires each party to enact penal legislation prohibiting its nationals and other real and legal persons from engaging in activities that would be prohibited to the state. *See supra* note 301; Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 157. The International Criminal Court, *supra* note 300, could also play a role in law enforcement operations.

367. The single most vexing point regarding enforcement of the Zero Treaty concerns the question of what, if any military measures may be applicable in response to a serious violation. The United Nations Security Council, of course, has the power to authorize or require the exercise of force in response to a threat to the peace, UN Charter, *supra* note 58, art. 39. But the Security Council may be blocked by the exercise or threat of a P5 veto. An individual state or group of states may conclude that another party's illegal effort to break out of the Zero Treaty justified action (such as a military strike against the sites at which the violating country was re-assembling or storing its illicit nuclear weapons) as an exercise of national self-defense, even without Security Council endorsement, but this judgment could be legally and factually problematic. *See supra* text accompanying notes 162-64; Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 160-62.

a. Exercise the Treaty's provisions for consultations and dispute resolution;[368]
b. Use the good offices of the Secretariat to facilitate a resolution;[369]
c. Bring the matter to the attention of the Executive Council and the Assembly, which may impose sanctions under the Treaty;[370]
d. Bring the matter to the attention of the United Nations Security Council, the United Nations General Assembly, or the International Court of Justice;[371] and
e. Terminate or suspend, in whole or in part, its performance of its obligations under this Treaty, in proportional response to the violation.[372]

---

368. *See, e.g.*, CWC, *supra* note 139, arts. IX, XIV; CTBT, *supra* note 129, arts. IV.C, V, VI.

369. *See, e.g.*, CWC, *supra* note 139, art. IX.3; CTBT, *supra* note 129, art. IV.31, V.2.

370. *See, e.g.*, CTBT, *supra* note 129, art. IV.32. This draft contemplates that the Organization itself, as well as individual parties acting on their own, could reach an official judgment about whether a party had violated the treaty, and the Executive Council or Assembly could respond to the breach with collective sanctions or other penalties. Alternatively, the treaty could reserve those powers exclusively for the individual states.

371. *See, e.g.*, CTBT, *supra* note 129, art. VI.2, VI.4; CWC, *supra* note 139, arts. XII, XIV.

372. The idea here is that if Country X perceives that Country Y is violating the obligation not to re-assemble or otherwise possess a nuclear weapon, then Country X may likewise disregard the constraint—without obtaining any consensus or approval from the Treaty bodies or the UN Security Council. This "self-help" mechanism may be an appropriate and necessary component of the enforcement regime, pursuant to traditional international law standards regarding an innocent party's response to another party's material breach, VCLT, *supra* note 138, art. 60. But it does pose additional problems here: (a) It is in some tension with the bold commitment in Article I "never, under any circumstances" to possess a nuclear weapon; (b) It is a remedy that would not be equally available to all parties—the former NWS would be in a much better position to reconstitute their former nuclear weapons—so this avenue perpetuates some of the discriminatory character of the NPT; and (c) It retains in the Zero Treaty a measure of the current practice of nuclear deterrence, perhaps in an even more precarious form. *See supra* text accompanying notes 165-67.

An additional quandary is whether Country X would have to publicly and immediately declare its termination or suspension. That is, in some circumstances it might be advantageous to conceal the fact that X has detected Y's violation and is moving to counter-act it. But that approach would implicate X in its own secret breach of the Zero Treaty.

This draft of the Zero Treaty contains two "escape hatches" from the obligation not to possess nuclear weapons: this provision for suspension or termination in the case of another party's breach, and the later provision in art. XI.7 for withdrawal due to supreme national interests. *See infra,* text accompanying notes 384-86. The withdrawal option is even broader than the current article, because it contemplates a party's ability to escape the Treaty for reasons unconnected to another party's breach (such as the possession of a nuclear weapon by a non-state actor, or other

Article X
Security Relationships

1. The Parties shall develop and implement comprehensive, legally binding security assurances as safeguards against the threat or use of nuclear weapons.[373]
2. The Parties shall develop procedures, institutions, and additional measures to assist in the resolution of regional security problems in a manner that promotes the legitimate security interests of all participants, without recourse to the possession, threat or use of nuclear weapons.[374]
3. The Parties shall cooperate and provide assistance in the development of defenses against nuclear weapons.[375]
4. The Parties shall develop procedures, institutions, and additional measures to reduce conventional weaponry and military budgets.[376]

---

conditions that might be thought to jeopardize the party's supreme security interests.) But the withdrawal clause requires ninety days advance notice before the action is effective.

373. The traditional topic of "security assurances"—both "negative" and "positive"—may play a useful role in creating the conditions for nuclear disarmament. These assurances will have less salience in a world free of nuclear weapons, but may have some continuing relevance. *See supra*, text accompanying notes 265. *Cf.* BWC, *supra* note 194, art. VII (parties undertake to assist a party endangered by another state's violation of the treaty); CWC, *supra* note 139, art. X (establishing provisions for assistance and protection against chemical weapons); John Freeman, *The Experience of the Chemical Weapons Convention: Lessons for the Elimination of Nuclear Weapons*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 125-26; Rebecca Bornstein, *Enforcement Scenario: Iran*, *in* ELEMENTS OF A NUCLEAR DISARMAMENT TREATY, *supra* note 3, at 155; Frank Blackaby, *Introduction and Summary*, *in* NUCLEAR WEAPONS: THE ROAD TO ZERO, *supra* note 14, at 10-11 (arguing that the NWS "speak with forked tongues" when they offer non-legally-binding security assurances). The new security assurances might be included in the Zero Treaty; alternatively, they might be concluded before or after it enters into force.

374. Construction of a world free of nuclear weapons does not require the complete "resolution" of intractable regional problems, but it does require the various protagonists to agree that possession or pursuit of nuclear weapons would be unnecessary (indeed, harmful) to advancement of their respective legitimate national security goals. *See supra*, text accompanying notes 187-88.

375. The question of defenses against nuclear weapons (including missile defense, air defense, and civil defense) will have to be addressed long before the Zero Treaty is concluded, but some provision dealing with those topics may be in order. New START acknowledges that the relationship between offenses and defenses becomes even more important as offenses are reduced. New START, *supra* note 78, pmbl ¶ 8. *See supra* text accompanying note 190.

376. As nuclear weapons are eliminated, the question of conventional forces will rise to even greater prominence. *See supra* text accompanying notes 187-89.

5. The Parties shall cooperate and provide assistance, as necessary, to improve the safety and security of any retained nuclear weapons components.[377]
6. Each Party shall cooperate in, facilitate, provide assistance in, and have the right to participate in, the fullest possible exchange of equipment, material, and scientific and technological information concerning the development of nuclear energy for peaceful purposes. The Parties shall not maintain any restrictions incompatible with the obligations undertaken in this Treaty that would restrict or impede trade and the development and promotion of scientific and technological knowledge concerning the development of nuclear energy for peaceful purposes. Each Party shall review its existing national regulations in the field of trade to ensure that they are consistent with the object and purpose of the Treaty.[378]

Article XI
Final Provisions[379]

1. This Treaty shall be open for signature by all states indefinitely.
2. This Treaty shall be subject to ratification by signatory states according to their respective constitutional processes.
3. This Treaty shall enter into force 180 days after the deposit of instruments of ratification by all states possessing nuclear weapons and fifty other states.[380] For any state depositing an

---

377. The United States has provided considerable assistance over the years to Russia and other states regarding materials protection, control and accounting, to safeguard nuclear weapon-related materials. *See* THE LUGAR CENTER, *supra* note 240 at; Jenkins, *supra* note 240; Heyes, *supra* note 240; MELLA, *supra* note 240.

378. This provision is based on CWC, *supra* note 139, arts. X.3, XI.2(c)-(e), and NPT, *supra* note 44, art. IV.2. *See supra*, text accompanying notes 191-92 (regarding sweeteners).

379. These provisions are traditionally split into several separate articles; they are combined here simply for convenience. For comparison, see NWC, *supra* note 2, at 92-97 (citing articles XV-XIX) and CANBERRA COMMISSION, *supra* note 12, at 99-106.

380. There are several possible formulas for the entry-into-force provision of the Zero Treaty. As drafted, the instrument will not become operational until a high degree of consensus is achieved: acceptance by all the states possessing nuclear weapons and fifty other states. However, this procedure not only allows the P5 and a few other states to veto the Treaty's entry into force for any state, it could also allow the treaty to enter into force without the participation by some important states; the parties would then endeavor to persuade those "holdout" states to join the regime promptly. Alternatively, the number of ratifications required for entry into force could be raised even higher, perhaps to 100 states (although no existing treaty specifies such a high

instrument of ratification thereafter, the Treaty shall enter into force thirty days after the deposit.

4. This Treaty shall not be subject to reservations.[381]
5. This Treaty shall be of unlimited duration.[382]
6. This Treaty shall be subject to amendments and changes as follows:[383]

   a. Any Party may propose an amendment, which shall be submitted to the Secretariat for prompt circulation to all Parties. If one-third or more of the Parties notify the Secretariat within sixty days after its circulation that they support further consideration of the proposal, it shall be considered at an Amendment Conference. The Amendment Conference shall be held immediately following a regular session of the Assembly. If the proposed amendment is adopted at the Amendment Conference by a majority vote of all Parties, with no Party casting a negative vote, the amendment shall enter into force for all Parties ninety days after the deposit of instruments of ratification by a majority of all Parties.
   b. A change may be related only to technical, administrative or procedural matters. Any Party may propose a change, which shall be submitted to the Secretariat for prompt circulation to all Parties. The Executive Council shall evalu-

---

number). Another alternative would be to specify additional particular states whose participation would be required, before the treaty could enter into force for any of them, thereby ensuring that no state would be obligated unless all other major players are likewise engaged. For example, the CTBT, *supra* note 129, art. XIV.1 and Annex 2, names forty-four countries whose ratification is required to bring the treaty into force; this provision has had the unfortunate effect of blocking the treaty's implementation, despite the ratification by 161 states. The Zero Treaty could also establish a high threshold for entry into force, but also allow individual states to waive that requirement, bringing the Treaty into force sooner for them. *Cf.* NWC, *supra* note 2, at 92 (citing article XV(B)); Treaty of Tlatelolco, *supra* note 117, art. 28.2.

381. If the Treaty is constructed with an annex or protocol containing the minute details of the verification regime, it could permit Parties to make reservations on some of those details. *See, e.g.*, CWC, *supra* note 139, art. XXII; CTBT, *supra* note 129, art. XV.

382. Some arms control treaties are of unlimited (i.e., permanent) duration. *See* CWC, *supra* note 139, art. XVI.1; CTBT, *supra* note 129, art. IX.1. Others have fixed terms. *See* New START, *supra* note 78, art. XIV.2. *See also* NPT, *supra* note 44, art. X.2 (specifying an initial term of twenty-five years, after which a conference of Parties determined an indefinite extension).

383. This paragraph is a streamlined version of the now-standard provisions for both "amendments" and "changes" to arms control treaties. *See, e.g.*, CWC, *supra* note 139, art. XV; CTBT, *supra* note 129, art. VII.

ate the proposed change and make a recommendation, which shall be circulated to all Parties within ninety days. If the Executive Council recommends that the proposed change be adopted, it shall be considered adopted if no Party objects within ninety days. If the Executive Council recommends that the proposed change be rejected, it shall be considered rejected if no Party objects within ninety days. If any Party objects to the recommendation of the Executive Council, the proposed change shall be considered as a matter of substance by the Assembly at its next session. Any adopted change shall enter into force for all Parties 180 days after adoption.

7. Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of the Treaty have jeopardized its supreme interests.[384] It shall give ninety days' advance notice[385] of such withdrawal, including a statement of the extraordinary events it regards as having jeopardized its supreme interests.[386]
8. Nothing in this Treaty shall be interpreted as in any way limiting or detracting from the obligations of the Parties under other international law. A Party's withdrawal from this Treaty shall not in any way affect its obligations under other

384. This is the standard "supreme interests withdrawal" clause, common to arms control treaties. It provides an "escape hatch" from the obligations, making it safer for states to enter the agreement in the first place. *See* CWC, *supra* note 139, art. XVI; CTBT, *supra* note 129, art. IX; New START, *supra* note 78, art. XIV.3. Withdrawal from an arms control treaty has been rare, with only the 2002 U.S. withdrawal from the ABM Treaty and the 2003 North Korean withdrawal from the NPT as precedents. Christer Ahlström, *Withdrawal from Arms Control Treaties, in* STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE 2004 YEARBOOK, *available at* http://www.sipri.org/yearbook/2004/files/SIPRIYB0419.pdf.

385. Alternatively, the time period specified for withdrawal could be shorter or longer. *See* CTBT, *supra* note 129, art. IX.3 (six months' notice); CWC, *supra* note 139, art. XVI.2 (ninety days' notice). A longer notification period provides other parties additional time to react to the impending withdrawal, but in the case of nuclear disarmament, parties may feel the need for an ability to respond very quickly to the most severe challenges.

386. Alternatively, the Zero Treaty could depart from precedent and prohibit withdrawal (except, perhaps, in the case of material breach of the treaty by another party). *Cf.* NWC, *supra* note 2, at 96 (citing article XVIII(5), prohibiting withdrawal); Perkovich and Acton, *supra* note 8, at 95-97.

international law, including other arms control or disarmament treaties.[387]

9. The Protocol is an integral part of this Treaty. Any references to the Treaty include the Protocol.[388]
10. Five years after the entry into force of this Treaty, and at five year intervals thereafter, the Parties shall assemble in a Review Conference to assess the operation and effectiveness of the Treaty, with a view to ensuring that the object and purpose of the Treaty are being realized.[389]
11. The Secretary-General of the United Nations is hereby designated as the Depositary of this Treaty, and shall perform all appropriate duties, including registering this Treaty pursuant to Article 102 of the Charter of the United Nations.[390]
12. The Arabic, Chinese, English, French, Russian and Spanish texts of this Treaty are equally authentic.[391]

In Witness Whereof, the undersigned, being duly authorized to that effect, have signed this Treaty.

Done at (place) on (date).[392]

VI. CONCLUSION

What are the prospects for this nuclear disarmament enterprise? Is the world now ready—after decades of contemplation—to initiate, and to pursue with the necessary vigor, the vision of abolishing all nuclear weapons?

It is hard to be optimistic about escaping the nearly seventy-year addiction to nuclear strategy, armaments and institutions. Even with the zealous advocacy from today's Gang of Four—echoing the judgments and sentiments from Baruch, Reagan, Gorbachev, and Gandhi—it is still difficult to summon the global commitment to ascend that mist-covered mountain. The concept of nuclear *arms control*—reducing

387. *Cf.* CWC, *supra* note 139, art. XVI.3 (specifying that withdrawal from the CWC would not affect a party's status under the 1925 Geneva Protocol).

388. *Cf.* CTBT, *supra* note 129, art. X; CWC, *supra* note 139, art. XVII.

389. *See, e.g.*, CTBT, *supra* note 129, art. VIII (providing for review conferences every ten years); CWC, *supra* note 139, art. VIII.22 (providing for review conferences at five-year intervals).

390. *Cf.* CTBT, *supra* note 129, art. XVI.1; CWC, *supra* note 139, art. XXIII.

391. *Cf.* CTBT, *supra* note 129, art. XVII; CWC, *supra* note 139, art. XXIV.

392. The Zero Treaty would probably be accompanied by an agreement to apply provisionally some of the key provisions of the Treaty and to establish a Preparatory Commission that would help pave the way for entry into force. *See* Resolution Establishing CTBT Preparatory Commission, *supra* note 185; Paris Resolution, *supra* note 185; New START, *supra* note 78, Protocol, Part VIII.

and limiting the mass destruction inventories of the United States, Russia, and others—is difficult enough, but it at least remains a credible "action item" on the contemporary political agenda; the concept of true nuclear *disarmament*, on the other hand, may seem almost as remote as ever.

Still, the goal of getting to zero remains persistent. It has been endorsed by world leaders and the general public; it has been adopted by the United Nations Security Council and General Assembly; and it stands as a binding legal obligation under the essential Nuclear Non-Proliferation Treaty. Perhaps its time is finally coming.

As the draft Zero Agreement and Zero Treaty indicate, there are a great many moving parts in this proposal, and several of them strain credulity. To conceptualize a world free of nuclear weapons, we have to presume a global readiness to effectuate the Comprehensive Nuclear Test Ban Treaty, a Fissile Material Cutoff Treaty, and sequential deep cuts in nuclear arsenals by the nine states currently possessing them; we need a resolution or at least mitigation of seemingly perpetual regional tensions in the Middle East, South Asia and elsewhere; and we have to assume that revolutionary new technologies for air-tight verification and enforcement of compliance can be crafted and accepted by mutually suspicious sovereigns. That's asking a lot of the public imagination.

On the other hand, the risks of sustaining the nuclearized status quo beggar belief, too. It cannot realistically be argued that a heavily-armed—and perhaps increasingly proliferating—world can perpetually dodge the specter of the use of nuclear weapons, by hostile forces or terrorists, by design, accident, or horrific miscalculation. No one can imagine that the world's current course will continue to escape forever a cataclysm beyond history.

Alice in Wonderland's White Queen, who claimed to be able to believe six impossible things before breakfast, would therefore enjoy a rich smorgasbord of competing non-credible choices here: both the option of an unprecedented exploration up the mountain and the option of nervously remaining at our current base camp seem implausibly hazardous and unsustainable.

The hardest part of nuclear disarmament, of course, is dealing with the potential for cheating. What can we do to deter, detect and defeat the potential bad actors, who might well perceive a powerful incentive for secretly violating the disarmament norm in pursuit of an awesome one-sided advantage? Where the stakes are so high—where the world is proceeding well beyond the relatively modest accomplishments of New START and a plethora of other incremental measures—the

standards for acceptable confidence in verification and enforcement must rise, too. Louis Henkin's famous aphorism about states' pattern of compliance with international law—"almost all nations observe almost all principles of international law and almost all of their obligations almost all of the time"[393]—may be comforting in many applications and environments, but it would be a woefully inadequate measure of success in the realm of nuclear weapons abolition.

In the effort to illuminate a path toward greater confidence in compliance, legal draftsmanship may be of assistance. The enterprise here to craft a pair of prototype instruments—the short-term, non-legally-binding Zero Agreement and the eventual legally-binding Zero Treaty—can highlight, if not conclude or finesse, a variety of confounding questions. Resolution of these "in the weeds" details will require additional engagement of diplomatic, political, military, and technical expertise, but the drafting exercise can contribute by raising the visibility of the outstanding puzzles. Sometimes, it's helpful just to imagine what the ultimate goal might actually look like.

393. LOUIS HENKIN, HOW NATIONS BEHAVE: LAW AND FOREIGN POLICY 47 (2d ed. 1979).