

THE HENRY L. STIMSON CENTER

**Beyond the Nuclear Peril:
The Year in Review
and the Years Ahead**

**Report of the Steering Committee,
Project on Eliminating Weapons of Mass Destruction**

Chair

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Pragmatic steps toward ideal objectives



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List of Abbreviations

ABACC	Brazilian-Argentine Agency for the Accounting and Control of Nuclear Materials
ACDA	Arms Control and Disarmament Agency
ACRS	Arms Control and Regional Security (working group)
ANC	African National Congress
BDA	Bilateral Destruction Agreement
BW	Biological weapon
BWC	Biological Weapons Convention
CBM	Confidence-building measure
CD	Conference on Disarmament
CSCME	Conference on Security and Cooperation in the Middle East
CSCE	Conference on Security and Cooperation in Europe
CTB	Comprehensive Test Ban
CTBT	Comprehensive Test Ban Treaty
CTR	Cooperative Threat Reduction program
CW	Chemical weapon
CWC	Chemical Weapons Convention
DGMO	Director General of Military Operations
DOD	Department of Defense
DOE	Department of Energy
DPRK	Democratic People's Republic of Korea (North Korea)
ESDI	European Security and Defense Identity
HEU	Highly enriched uranium
IAEA	International Atomic Energy Agency
IISS	International Institute for Strategic Studies
ICBM	Intercontinental ballistic missile
KEDO	Korean Energy Development Organization
LEU	Low-enriched uranium
LWR	Light-water reactor
MINATOM	Russia's Atomic Energy Agency

List of Abbreviations

MIRV	Multiple independently targetable reentry vehicle
MOU	Memorandum of Understanding
MTCR	Missile Technology Control Regime
MW	Megawatt
NATO	North Atlantic Treaty Organization
NPT	Nuclear Non-Proliferation Treaty
PAL	Permissive Action Link
Pu	Plutonium
SACEUR	Supreme Allied Commander, Europe
SIPRI	Stockholm International Peace Research Institute
SLBM	Submarine-launched ballistic missile
SSBN	Strategic ballistic missile submarine
START	Strategic Arms Reduction Talks
TASM	Tactical air-to-surface missile
UN	United Nations
UNSCOM	United Nations Special Commission (Iraq)
VEREX	Ad Hoc Group of Governmental Experts (BWC)
WMD	Weapons of mass destruction

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Foreword

The end of the Cold War and dissolution of the Soviet Union removed many of the obstacles that for over forty years effectively blocked progress toward substantially reducing the role of weapons of mass destruction in interstate relations. After decades of stalemate, the international community has witnessed in the past five years a rapid succession of arms control and non-proliferation successes, including the completion of two treaties that will slash US and Russian strategic nuclear arsenals by nearly two-thirds, an agreement drastically reducing conventional forces in Europe, and a treaty banning the development, production, acquisition, and use of chemical weapons.

Events in 1994 continued the generally positive trend toward a smaller role for weapons of mass destruction in national politics and in interstate relations. The adjustment of the declared nuclear powers to changes in the global security environment has been slow, yet there are encouraging signs of diminished nuclear reliance. Although the US Nuclear Posture Review reaffirmed the traditional roles of nuclear threats in US policies, US policymakers rejected any new purposes for nuclear weapons. The relative conservatism of the new US policy was justified by the need to hedge against a possible reversal of policy in Russia or the former Soviet Union. The direction of Russian nuclear policies is less clear because of the fluid nature of power relations between Yeltsin and his more conservative opponents. Russia has renounced its policy of no-first-use, but reductions in its strategic forces continue on schedule. Changes in the policies of the other nuclear states have been even more incremental. The United Kingdom has scaled back its plans for Trident modernization and has reluctantly agreed not to block completion of a comprehensive test ban treaty (CTBT). China continues with its modest modernization program, as does France, and both seem disinclined to accelerate CTBT negotiations, presumably to protect completion of current

or prospective test series. All five states share a common reluctance to reexamine the most fundamental assumptions that have guided their nuclear policies for the past four decades.

Arms control and disarmament efforts, in contrast, scored dramatic successes in 1994. After extensive negotiations with Belarus, Kazakhstan, and Ukraine, all three republics have agreed to abide by the treaty commitments of the former Soviet Union, allowing START I to enter into force. The United States and Russia are proceeding steadily with the implementation of START I reductions, and are now pledged to pursue rapid implementation of START II once ratification is secured. Progress toward entry into force of the Chemical Weapons Convention (CWC) has been slow, and ratification in key countries, including the United States, is not a foregone conclusion. Early agreement on a CTBT also appears to be bogged down by French, Chinese, and British resistance, reinforced by US passivity. Still, many observers believe that a treaty is achievable by the end of 1996.

Many countries appear to be inching toward the acceptance of non-proliferation as an international norm. Although the future of the Nuclear Non-Proliferation Treaty (NPT) is by no means assured, a majority of states appears likely to support a strong reaffirmation of the treaty when the review conference convenes in April 1995. Regardless of the outcome of the conference, the treaty received an important boost in 1994 with accession of the three non-Russian republics to the NPT as non-nuclear states. The process of nuclear rollback has survived domestic political changes in South Africa and Latin America, as well. The seemingly inexorable march of the countries in the Middle East toward the possession of ever more powerful arsenals appears to have slowed, and the breakthrough in talks between Israel and its Arab neighbors holds out the promise of further progress toward non-proliferation objectives. The contribution of the framework agreement between the United States and North Korea to non-proliferation objectives remains a subject of dispute. At the very least, however, the agreement appears to have averted the immediate threat of military conflict on the Peninsula; in addition, it provides a strict set of timetables and conditions for monitoring North Korean compliance with the agreement's constraints on Pyongyang's nuclear activities.

The events of 1994, in short, invalidated the gloomy predictions of unchecked proliferation and rampant nuclear danger. The international community has made impressive progress toward reducing the risks that weapons of mass destruction pose to human safety and security and the environment. But more profound changes in the ways that leaders and societies think about weapons of mass destruction also may be underway. Recent trends in national policies, in arms control and disarmament, and in the non-proliferation regime suggest that perceptions of the utility and

costs associated with weapons of mass destruction, and of the legitimacy of their use and possession, are undergoing an important evolution.

There is little reason for complacency, however. Though the trends are generally positive, many of the successes of the past year rest on shaky foundations and could easily be reversed. The situation in Russia is highly volatile and the continued commitment of Yeltsin's successors to cooperative steps in arms control cannot be assumed. Steps to strengthen international regimes for nuclear, chemical, and biological weapons could suffer any number of serious setbacks in the coming year. The failure of the US Senate to ratify the CWC would deal a devastating blow to efforts to control chemical weapons; similarly, a refusal to extend the NPT for an indefinite or prolonged period would send an alarming signal to would-be proliferators.

Just as troubling has been the emergence of new nuclear risks, which the international community has proven poorly prepared to address. Efforts to defuse the competition between India and Pakistan have been ineffective, and the two states now appear poised for a further deterioration in relations. Many states have encountered serious safety and security problems in the handling of nuclear materials and weapons. Indeed, few governments appear prepared to examine the long-term risks of nuclear reliance. Convinced that preserving nuclear options conveys important security benefits in the near term, governments are drifting into continued reliance on nuclear deterrence with little understanding of the longer-term consequences, particularly for non-proliferation objectives.

Poised between recent accomplishments and future dangers, the United States and all other countries clearly have both a need and an opportunity to reassess the role of nuclear weapons in interstate relations. With such reappraisals in mind, the Henry L. Stimson Center has organized a project intended to take a hard look at the conditions under which all states might move toward the gradual elimination of all weapons of mass destruction.

This first annual report of the project's Steering Committee is intended to fulfill two objectives. First, we believe that it is useful to review the current role of nuclear, biological, and chemical weapons in national policies and in interstate relations. While newspaper headlines this past year focused on dramatic incidents of nuclear smuggling in the former Soviet Union, and the seemingly unending crisis over North Korea's suspected nuclear activities, many successes in arms control, disarmament and non-proliferation went barely noticed. Contrary to popular perception, the international community has made steady progress toward reducing the risks associated with nuclear weapons. We believe it is important to acknowledge these positive trends and developments. But

we are also firmly convinced that additional steps must be taken, both to strengthen these trends, and to prevent reversals in the process of limiting nuclear dangers. Many of the successes in 1994 could easily have been transformed into defeats. For that reason, the Committee has identified certain areas in which further measures are necessary and warranted. This first report outlines general areas for action. The 1995 report of the Committee will describe specific strategies and measures designed to address these issues and risks. Above all, we believe that it is time for a high-level national and international debate on the next steps toward diminishing nuclear dangers, and on the longer-term future of nuclear weapons.

This year's report contributes to such an international dialogue by assessing the changing role of weapons of mass destruction in national policies and interstate relations. It is organized in five parts. The continuing roles of weapons of mass destruction in national foreign and defense policies of the declared nuclear powers are outlined in the first section. In the second section, we review important developments in arms control and disarmament. In the third section, we then evaluate progress in 1994 toward halting or reversing the proliferation of nuclear, chemical, and biological weapons, as well as the prospects for an extension of the NPT in 1995. In the fourth section, we describe growing security risks and dangers. In the final section of this report, we outline a series of steps that the United States should take in the effort to reduce the risks to national and international security, and to define the place of weapons of mass destruction in the long-term.

This report reflects general points of consensus among the members of the Steering Committee. We all support the general thrust of the report and its specific conclusions and recommendations. But we obviously should not be held individually responsible for every specific phrase or nuance of wording.

In closing, we would like to thank the Henry L. Stimson Center for organizing this project, and the Ford and Rockefeller foundations for providing financial support. We are particularly grateful to Cathleen Fisher, the project's director, for her many contributions to this report.

SIGNED,

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The Year in Review: The Role of Nuclear Weapons in National Policies

Nineteen ninety four was a very good year in the struggle to contain, and even reverse, the proliferation of weapons of mass destruction. Led by the United States, the world community made great strides toward the reduction of existing nuclear arsenals and toward the elimination of chemical weapons. In addition, the risks that new nuclear powers might emerge in the former Soviet Union and in East Asia were greatly diminished, progress continued toward the roll-back of nuclear programs in Africa and Latin America, and the two most powerful non-nuclear states—Japan and Germany—continued to show little interest in acquiring nuclear weapons. Despite gloomy predictions of unchecked proliferation, the problem, at present, is confined to two regions—South Asia and selected countries in the Middle East. The international community in general appears to be moving gradually toward the progressive de-legitimization of weapons of mass destruction as instruments of state policy.

While the trends in general appear positive, progress toward reducing the risks associated with weapons of mass destruction is not irreversible. The longer-term picture is particularly troubling. As some states dismantle their nuclear arsenals but others continue to develop nuclear capabilities, new security risks and urgent policy issues are emerging, yet are not being addressed. The United States' Cooperative Threat Reduction (CTR) program is helping to reduce safety and security risks in the former Soviet Union, but much more could be done to improve international standards to account for, and to ensure the safety and security of, nuclear materials. And while an extension of the Nuclear Non-Proliferation Treaty would bolster the existing non-proliferation regime, the April

1995 NPT review conference is unlikely to address the central issue underlying the debate on the treaty: the equity and sustainability of a two-tiered regime of nuclear “haves” and “have-nots.” Instead, the governments of the nuclear powers continue to cling to long-standing beliefs regarding the benefits of retaining nuclear capabilities. In the United States and Russia, domestic politics discourage political leaders from challenging the traditional calculus of nuclear risks and benefits. And basic attitudes are unchanged in Britain and France and, perhaps, in China, as well.

The changing role of weapons of mass destruction confronts the United States and the international community with important new policy issues and choices. National policies should reflect the changing utility and risks associated with weapons of mass destruction in the post-Cold War world, not long-established beliefs and assumptions that are, or may no longer be, relevant. While further cuts in existing nuclear arsenals seem likely, the long-term objective of future arms control efforts has been neither defined nor evaluated; transitional strategies and measures to achieve that nuclear end-state are equally lacking. The United States, along with most other countries, has made slow but steady progress toward addressing the nuclear legacy of the Cold War; the international community must begin to address the risks associated with the current period of transition, and to debate the place of weapons of mass destruction in international politics over the long-term.

The Role of Nuclear Weapons in National Policies

Throughout 1994, the nuclear states continued their efforts to adjust to changes in the international security environment. Despite significant steps to limit the role of nuclear weapons in national defense policies, national policy reviews in general have failed to come to terms with changes wrought by the end of the Cold War, the dissolution of the Soviet Union, and the threats posed by the possibility of new nuclear powers. The five nuclear powers remain firmly wedded to nuclear deterrence, though the source and nature of the threat to be deterred have become less clear (see table 1). Nuclear weapons are viewed as necessary insurance against an unexpected and disastrous reversal at the conventional level in some future, unspecified war, and as important inhibitors for would-be proliferators.

Table 1: Declared Nuclear Weapon States— Nuclear Forces & Policies

Country	Current Strategic Nuclear Forces	Known Nuclear Tests	Modernization Plans
United States	8,258	1,051	<ul style="list-style-type: none"> • Upgrade of Minuteman III • Trident retrofit with D-5 missile
Russia	8,943	715	<ul style="list-style-type: none"> • Modernization of SS-25 (2 versions) • Developing follow-on to SS-N-20
China	284	41	<ul style="list-style-type: none"> • Developing 2 new mobile ICBMs • Expanding fleet of SSBNs • Building nuclear-capable bomber
France	482	210	<ul style="list-style-type: none"> • Procuring 4 new SSBNs • Developing hybrid M-5 missile
United Kingdom	100	44	<ul style="list-style-type: none"> • Trident modernization scaled back

Sources: "Factfile: U.S. and Soviet/Russian Strategic Nuclear Forces: Past, Present and Projected," *Arms Control Today*, December 1994, 29; Dunbar Lockwood, "Nuclear Weapon Developments," *SIPRI Yearbook 1994* (Oxford: Oxford Univ. Press, 1994), 277-307.

United States

In September 1994, the United States Department of Defense (DOD) concluded a ten-month review of US nuclear policy and posture, the first to be conducted at such a high level in fifteen years. Initiated by former Secretary of Defense Les Aspin, the Nuclear Posture Review was intended to consider the influence of the new security environment on US nuclear policy and force structure. Six separate working groups examined the role of nuclear weapons in US security strategy, nuclear force structure, nuclear force operations, safety and security issues, the relationship between the US nuclear posture and counterproliferation objectives, and the relationship between the US nuclear posture and threat reduction policy in the former Soviet Union.¹

Though touted as a fundamental review, the report in fact represents a continuation of past policy (see table 2). Taking as its primary premise the need to hedge against a reversal of fortune in Russia, the review eschewed radical policy departures and reaffirmed the role of nuclear deterrence in US policy. Although administration officials insisted that the results of the review would give the United States the necessary flexibility to undertake further constraints on strategic nuclear forces if

1. Office of the Assistant Secretary of Defense (Public Affairs), "Department of Defense News Briefing, October 29, 1993." See also Peter Grier, "In Nukes Strategy Review, US Eyes 'Undeterrables,'" *Christian Science Monitor*, November 9, 1993.

circumstances warranted, no commitment to reductions below START II levels was made.² A no-first-use policy was not adopted, and alternative long-term objectives in arms control were neither identified nor evaluated. Only minor adjustments are to be made in US strategic forces, including elimination of the capability to deploy nuclear weapons on surface ships, and the introduction of permissive action links (PALs) on nuclear weapons deployed on submarines. The review specifies that the US will continue to construct *Trident* submarines and missiles, but the number of SSBNs that the US will retain after START II is reduced from 18 to 14. The program to upgrade the United States' Minuteman III force also will continue, but other nuclear modernization programs have been terminated.³

The results fall well short of the fundamental review of nuclear needs originally envisioned, and were remarkably conservative when contrasted with the recent positions taken by many high-ranking members of the defense and strategic communities. Air Force General Charles A. Horner, former chief of the US Space Command, for example, has argued that the "nuclear weapon is obsolete," and that the United States should eliminate its entire nuclear arsenal. Fred Iklé, former under secretary of defense under President Reagan, has argued that the United States and Russia could meet their respective security needs with only a few hundred nuclear weapons each. Many of the members of this group have written previously on this subject as well. General Andrew J. Goodpaster, former Supreme Allied Commander in Europe (SACEUR) and a national security advisor to President Eisenhower, has outlined a three-stage process of reductions in global nuclear arsenals. During the second phase, the nuclear states would negotiate cuts in their respective arsenals to 100 to 200 nuclear weapons each, at which time the problems associated with movement to lower levels might be reassessed. Paul Nitze, former special arms control advisor to President Reagan, has argued that the United States should scale back its reliance on its nuclear deterrent in favor of increased dependence on advanced conventional weapons in a strategic role. Robert McNamara, Secretary of Defense in the Kennedy Administration, has called for drastic reductions in the global nuclear stockpile to

2. See the comments of Deputy Secretary of Defense John Deutch at the Department of Defense briefing on the Nuclear Posture Review, September 22, 1994.

3. US Department of Defense, "Defense Department Briefing with Secretary of Defense William Perry, General John Shalikashvili, Chairman, Joint Chiefs of Staff, and Deputy Secretary of Defense John Deutch at the Pentagon on the Nuclear Posture Review, September 22, 1994," News Release, September 22, 1994.

Table 2: Principal Results of US Nuclear Posture Review

Force Structure	
<i>Strategic Forces</i>	<ul style="list-style-type: none"> • Maintain single warhead Minuteman III ICBMs • Reduce Trident SSBN fleet from 18 to 14 • Modernize all with D-5 missiles • Limit B-2 bombers with nuclear role to 20 • Cut B-52 bomber force from 94 to 66
<i>Non-Strategic Nuclear Forces</i>	<ul style="list-style-type: none"> • Maintain current level (490) of US tactical nuclear weapons in Europe • Eliminate nuclear weapons capability from US Navy surface ships • Retain nuclear cruise missile capability on submarines • Retain dual-capable aircraft
Infrastructure Requirements	
<i>Maintain Nuclear Weapon Capability</i>	<ul style="list-style-type: none"> • Cease underground testing and fissile material production <ul style="list-style-type: none"> • develop stockpile surveillance engineering base • maintain capability to refabricate & certify weapon types in stockpile • maintain science & technology base • Ensure availability of tritium • No new-design nuclear warhead production
Nuclear Safety, Security & Use Control	
<i>Nuclear Role in US Force Structure</i>	<ul style="list-style-type: none"> • US ground forces no longer have custody of nuclear weapons • Naval non-strategic nuclear forces no longer deployed at sea • Strategic bombers removed from day-to-day alert
<i>Safety of Weapon Systems</i>	<ul style="list-style-type: none"> • Introduce coded control devices (permissive action links) • Upgrade PALS on Minuteman III ICBMs and B-52 bombers
<i>Stockpile Measures</i>	<ul style="list-style-type: none"> • Since 1988, total active stockpile reduced by 59 percent; further total reduction of 79 percent by 2003 <ul style="list-style-type: none"> • strategic warheads reduced by 47 percent (71 percent by 2003) • non-strategic nuclear forces warheads cut by 90 percent • NATO stockpile cut by 91 percent • Storage locations reduced by over 75 percent • Personnel with access to weapons or control cut by 70 percent

Source: Department of Defense, "Nuclear Posture Review," September 22, 1994; and DOD News Release, "DOD Review Recommends Reduction in Nuclear Force," September 22, 1994.

100 or 200 weapons, and then, with proper protection against “break-out,” to zero. These and other statements are evidence of a lively debate on the future utility and risks associated with continued nuclear reliance.⁴

New departures in the US approach to non-proliferation have also been lacking. The administration supports an unconditional and indefinite extension of the NPT, but has decided to postpone discussion of the most important issue underlying the non-proliferation regime, namely, the legitimacy and equity of a dual-standard for nuclear and non-nuclear states. The issue is unlikely to be resolved soon, as the world’s nuclear powers continue to see significant roles for nuclear weapons in their foreign and defense policies. US diplomatic efforts instead are directed toward securing the necessary votes at the April review conference. To achieve that end, US negotiators are pointing to the steps taken by the United States and Russia as evidence of adequate progress toward fulfilling the Article VI obligations to pursue “effective measures” to cease the nuclear arms race and move toward disarmament. The United States’ failure to push for a negotiating endgame for a Comprehensive Test Ban (CTB), and its hedging in the Nuclear Posture Review with regard to further reductions beyond START II, may send a different message, however.

Many of the administration’s initiatives related to proliferation instead have fallen under the rubric of “counterproliferation.” Launched in December 1993, the policy is directed toward improving the United States’ capability to deter and prevent the use of weapons of mass destruction, and, if necessary, to respond to the use of nuclear, chemical or biological weapons in regional conflicts. To achieve these objectives, defense planners have been charged with implementing changes to US defense policies, force posture, procurement plans, and intelligence resources.⁵ Critics of the initiative argue that the policy could undermine

4. General Charles Horner, quoted in “Air Force General Calls for End to Atomic Arms,” *Boston Globe*, July 16, 1994; Fred Iklé, statement for the “NGO Commission on the US Nuclear Posture,” co-sponsored by Lawyers Alliance for World Security, The Committee for National Security, the Washington Council on Non-Proliferation, the James Brown Scott Society of International Law, and the American Academy of Diplomacy, September 22, 1994, Washington, DC; Andrew J. Goodpaster, *Further Reins on Nuclear Arms: Next Steps for the Major Nuclear Powers* (Washington, DC: The Atlantic Council, August 1993); Paul H. Nitze, “Is It Time To Junk Our Nukes?” *Washington Post*, January 16, 1993; Robert S. McNamara, “Nobody Needs Nukes,” *New York Times*, February 23, 1993.

5. “Remarks by Honorable Les Aspin, Secretary of Defense,” at the National Academy of Sciences Committee on International Security and Arms Control, December 7, 1993; US Department of Defense, Office of the Deputy Secretary of Defense, *Report on Non-proliferation and Counterproliferation Activities and Programs* (Washington, DC: May 1994).

traditional non-proliferation efforts and de-rail preparations for the NPT extension conference. At the very least, they argue, a more thorough understanding of the potential trade-offs between managing proliferation and preventing proliferation is needed.⁶

There has also been a failure to exercise visible and forceful leadership in support of CWC ratification. Absent a White House commitment of time and energy, the administration adopted a low-profile strategy to secure the Senate's consent. Few efforts were made to generate interest or support for the treaty in the Congress or with the general public. Neither the president nor the vice president has spoken out for the treaty's ratification. As a consequence, treaty opponents have been allowed to slow progress toward ratification, a delay that may translate into eventual defeat in the US Senate.⁷

Russia

The Russian government is deeply divided over the future of Russian foreign and defense policy and, particularly, the future of its nuclear forces. Yeltsin and his backers support further steps toward cooperative denuclearization. In a speech before the United Nations in September 1994, for example, the president and his foreign minister urged the pursuit of post-START reductions on a multilateral level, and a treaty among the permanent members of the Security Council banning production of fissile material for military applications. Other factions, concentrated in the Ministry of Defense and the Atomic Energy Agency (MINATOM), favor the maintenance of strategic parity and a residual deterrent capability. The announcement in late 1993 that Russia was renouncing its policy of no-first-use was troubling evidence of the influence of conservative forces on Russian defense matters.⁸

6. For a sampling of critical views, see Mark Sommer, "Can Military Strategies 'Ban the Bomb'?" *Christian Science Monitor*, April 29, 1994; Spurgeon M. Keeny, Jr., "Inventing an Enemy," *New York Times*, June 18, 1994.

7. David C. Morrison, "Political Chemistry," *National Journal*, October 14, 1994, 1131-34.

8. The reversal on no-first-use remains the subject of much speculation. Some contend that Yeltsin conceded to the military in repayment for the Russian armed forces' support during the October 1993 uprising, and are therefore hesitant to draw broader conclusions regarding the influence of the military on defense decision-making. Other observers argue that the previous declaratory policy rejecting first use was not credible, in any event. On Yeltsin's arms control proposals, see "Remarks of the Russian President Boris Yeltsin at the 49th General Assembly of the United Nations, September 26, 1994 Joint Statement," September 28, 1994. On divisions within Russia, see Alexei Arbatov, ed., *Implications of the START II Treaty for US-Russian Relations*, Report no. 9 (Washington, DC: The Henry L. Stimson Center, October 1993), 69-75. On the no-first-use decision, see Brian D. Taylor, "Russian Civil-Military Relations After the October Uprising," *Survival* 35 (Spring 1994): 15-16.

Conservative opponents within the Russian government will compel Yeltsin to move cautiously on further cuts in the country's nuclear arsenal. Despite ongoing reductions, some modernization programs are being continued. Russia is believed to be developing and deploying two versions of the SS-25 ICBM, and is developing a new SLEM to replace the SS-N-20; planning for a new SSBN may also be underway. Economic pressures may incline the Yeltsin government toward deeper cuts, but may be overridden by the resistance of senior military officers to losing their last remaining symbol of great power status. Many military figures and nationalists have criticized the START II treaty for requiring asymmetrical and "unfair" cuts in Russian nuclear forces. Yeltsin may have difficulty preventing START II from becoming a rallying point for his domestic opponents, particularly in the wake of the controversy over NATO expansion. If Yeltsin wishes to deflect international pressure for deeper cuts, he may do so by calling for multinational negotiations, as in his September 1994 speech before the United Nations, counting on the opposition of Britain, France, and China to short-circuit this process.

China

China is currently in the process of completing significant qualitative improvements in its nuclear arsenal. Its modernization efforts appear to be concentrated on the development of two mobile ICBMs, the single-warhead DF-31 and the DF-41, believed to be capable of carrying MIRVed warheads; both systems would represent significant gains in accuracy and survivability over China's small force of liquid-fueled ICBMs, currently deployed in fixed silos. Though information about China's tactical nuclear weapons is disputed, reports suggest that China has the capability to build shorter range systems as well. China is also expanding its fleet of SSBNs, has recently purchased advanced Soviet aircraft, and is building a new nuclear-capable bomber.⁹

There are no indications that China has engaged in any major review of nuclear policy or requirements in light of the changes in the broader security environment. According to one senior US analyst, China's continuing strategic force modernization is merely a product of its own "momentum."¹⁰ China's position on a comprehensive test ban also

9. Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *British, French, and Chinese Nuclear Weapons*, Natural Resources Defense Council *Nuclear Weapons Databook*, vol. V (Boulder: Westview, 1994), 372-76; Dunbar Lockwood, "Nuclear Weapon Developments," *SIPRI Yearbook 1994* (Oxford: Oxford Univ. Press, 1994), 303-7; idem, "The Status of U.S., Russian and Chinese Nuclear Forces in Northeast Asia," *Arms Control Today*, November 1994, 23.

10. Quoted in Patrick Tyler, "As China Upgrades Its Nuclear Arsenal, It Debates Need for Guns vs. Butter," *New York Times*, October 26, 1994.

reflects a determination to complete a modest test series for strategic modernization programs already initiated. Chinese officials have indicated that the PRC will be ready for a comprehensive test ban by 1996, when the current test series presumably will be completed. China has defended its position on a CTB by emphasizing equity issues. The United States has tested 1,051 times, and Russia 715 times, in contrast to China's 41 tests; Chinese officials argue that this disparity entitles the PRC to additional tests in order to achieve a safe and credible deterrent. In an effort to persuade China to cease testing, US Secretary of Defense William Perry met with Chinese leaders in Beijing in October 1994, and hinted that the United States might be willing to share data on computer simulations of nuclear testing, if the information could be provided without compromising US security interests. As with the major nuclear powers, the principal theme in Chinese nuclear and arms control policies has been continuity with past policies.¹¹

France

The disintegration of the Soviet threat, unification of Germany, and incremental progress toward European integration have altered the European security environment radically, yet nuclear weapons retain a central place in the foreign and defense policies of France. The 1994 *White Paper on Defense*, the first in 22 years, reaffirmed the importance of nuclear deterrence to France's security and to its international role. The paper does not contain specific scenarios for nuclear use and instead emphasizes the multiple uncertainties in France's security environment, including the possibility of a resurgent Russian threat, the proliferation of weapons of mass destruction, and the rise of Islamic fundamentalism. The paper also hints at a new role for French nuclear forces. Asserting that a "European security and defense identity" (ESDI) can not be realized without a nuclear element, the paper argues that France must not "dilute its national defence facilities." While the French government has made minor adjustments in its policy since the end of the Cold War, including a reduction in alert levels and procurement plans, there is a strong consensus across French political parties on the continued need for nuclear weapons.¹²

11. "Nuclear Notebook: Nuclear Pursuits," *Bulletin of the Atomic Scientists*, May 1993, 48-49; see also Tyler, *New York Times*, October 26, 1994; "News Briefs," *Arms Control Today*, December 1994, 28; "'Modest' Progress in US-China Talks," *United Press International*, October 18, 1994; and "US Offers Military Consultations with China," *Reuters*, October 18, 1994.

12. France, Ministry of Defense, *Livre Blanc sur la Defense*, 1994.

Though budgetary and domestic political constraints have forced cutbacks in procurement plans, France is currently engaged in a modernization effort to upgrade its fleet of strategic submarines. Following revisions in the construction schedule, the first *Triomphant* class SSBN is scheduled to enter into service in 1995, but only four new SSBNs will be procured rather than the six originally planned. The new generation SSBNs will be fitted with the M-5 SLBM, now under development and scheduled for deployment in 2005. Modernization of the second leg of France's strategic triad has been postponed. One alternative would be to adapt existing silos for the land-based version of the M-5 to replace France's force of intermediate range S-3 ballistic missiles, which are slated for retirement in 2003. If favorable decisions on both variants are made, the system could be deployed as early as 2005, giving France the only land-based MIRVed missile among the nuclear powers. Alternatively, France may choose to proceed with development of a new nuclear-armed air-to-surface missile with a range from 600 to 1,000 kilometers. In addition, France retains 30 short-range Hades missiles and 15 mobile launchers in storage.¹³

All major program decisions, as well as France's future position in the CTB negotiations, await the outcome of the May 1995 presidential elections. The center-right parties are expected to make a strong showing. Although votes may be split between Jacques Chirac and Prime Minister Edouard Balladur, the prospects of a Socialist victory are slim following Jacques Delors' decision against a presidential candidacy. There is a division of views among conservatives regarding the resumption of nuclear testing. Defense Minister François Leotard has recommended deferring the issue until after the elections; Chirac supports an early resumption of nuclear testing, a view endorsed by members of the military and scientific establishment, who argue that additional testing is necessary for refinements in the M-5 warhead design, and to ensure the continued safety and security of French nuclear weapons. A number of observers expect that a new conservative president will authorize between two and five additional nuclear tests before France accedes to a CTB.¹⁴

13. Norris, Burrows, and Fieldhouse, 212, 224-280; Lockwood, "Nuclear Weapon Developments," 301-3.

14. David S. Yost, "Nuclear Debates in France," *Survival* 36 (Winter 1994-95): 113-39. On French arguments for continued nuclear testing, see R.L. Garwin, R.E. Kidder, C.E. Paine, *A Report on Discussions Regarding the Need for Nuclear Test Explosions to Maintain French Nuclear Weapons Under a Comprehensive Test Ban* (Washington, DC: Federation of American Scientists/Natural Resources Defense Council, January 1995).

United Kingdom

Like France, the United Kingdom appears firmly wedded to retention of its nuclear deterrent. Emphasizing the uncertainties surrounding Russia's future course, the 1994 White Paper on British defense underscores the contribution of the British deterrent to the security of NATO and European stability. Nuclear disarmament is characterized as a "desirable ultimate goal," but an infeasible one, since "nuclear weapons cannot be dis-invented."¹⁵

Despite the declaratory emphasis on continuity, budgetary and domestic political constraints have forced the British government to diminish its reliance on nuclear weapons. The Trident modernization program, initiated by former Prime Minister Margaret Thatcher, continues, but has been scaled back. In November 1993, Defense Minister Malcolm Rifkind announced that each *Trident* submarine would carry no more than 96 warheads, rather than the 128 originally planned. Cancellation in October 1993 of the nuclear-armed tactical air-to-surface missile (TASM), and retirement of Britain's arsenal of WE-177 nuclear gravity bombs, will leave the Royal Air Force without a nuclear role. Instead, the British government has announced that Trident will fulfill both tactical and strategic deterrent roles.¹⁶

Under pressure from the United States, Britain has inched toward grudging acceptance of a comprehensive test ban. Under Conservative Party rule, the UK has been very reluctant to agree to a test ban, arguing that additional testing is necessary to maintain the safety and reliability of the British deterrent. Once the United States government declared a moratorium on nuclear testing, however, the UK was forced to accede to US preferences. With the Nevada test site closed to future British tests, the UK is effectively precluded from designing new warheads. British negotiators continue to insist, however, that a CTBT must include important threshold states and countries of the greatest proliferation concern, and adequate verification provisions.¹⁷

A change in government would likely result in minor modifications of current British policy, but even a Labour-led government is unlikely to scrap the UK's independent nuclear deterrent. Under the leadership of Tony Blair, the Labour Party has indicated that it would support the

15. United Kingdom, Ministry of Defence, *Statement on the Defence Estimates 1994* (London: HMSO, 1994), 19.

16. Lockwood, "Nuclear Weapon Developments," 296-300; Norris, Burrows, and Fieldhouse, 113-32.

17. *Statement on the Defence Estimates 1994*, 20.

conclusion of a CTBT, and would cap the Trident modernization program at replacement of the original Polaris force of 192 warheads. The party has also indicated that, in principle, it would support the inclusion of British nuclear forces in future multilateral arms control negotiations, but the conditions and details of British participation have not been specified.

The declared nuclear powers in 1994 exhibited few signs of abandoning long-held beliefs about the political or military utility of nuclear weapons. The United States' Nuclear Posture Review reaffirmed the need for US nuclear capabilities given other existing arsenals. And while Russian President Boris Yeltsin and his supporters might favor further downsizing of Russian nuclear forces, the threat of a conservative backlash will discourage fundamental changes in Russia's nuclear policy or force posture. The United States and Russia are thus at an impasse. Fearing a conservative backlash in Russia, the United States government has emphasized the need to hedge; Russian leaders are hesitant to undertake additional reductions for fear of angering the military and conservative politicians, which only strengthens the perception that Russia may be backsliding. Budgetary constraints and a shift in the US position on nuclear testing have forced the United Kingdom to scale back procurement plans, but British officials apparently hold fast to their belief in the desirability and necessity of maintaining an independent nuclear deterrent. China remains committed to further nuclear testing extending into 1996, and in France, the consensus in support of the French nuclear deterrent goes virtually unchallenged.

Movement Towards Arms Control and Disarmament

Even though the declared nuclear powers remained committed to maintaining nuclear arsenals, arms control and disarmament efforts nevertheless made progress toward achieving two general objectives in 1994: the continued implementation of negotiated reductions in the strategic arsenals of the successor states to the former Soviet Union and the United States, and a strengthening of the non-proliferation regimes for nuclear, chemical, and biological weapons.

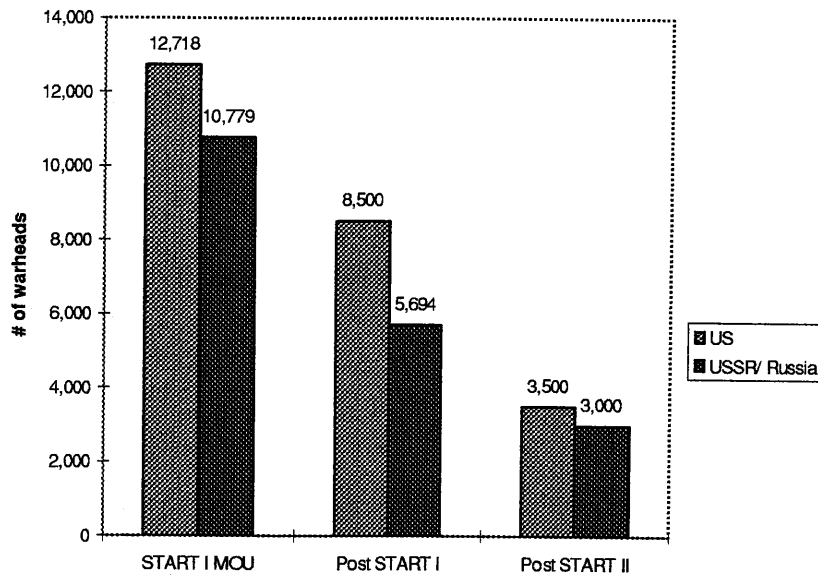
Reductions in Strategic Nuclear Arsenals

The implementation of reductions mandated by the START agreements continues, despite continuing economic, political, and social unrest in the former Soviet republics. Signed in 1991, the START I agreement required the Soviet Union and the United States to cut their strategic nuclear arsenals to 6,000 accountable warheads and 1,600 delivery systems each. START II would slash nuclear stockpiles further, leaving the United States and Russia between 3,000 and 3,500 warheads each (see figure 1).¹ While the Russian government declared its willingness to honor the treaty obligations of the former USSR, the disposition of Soviet

1. The actual number of warheads each state possesses may be larger due to START I counting rules. Figure 1 is based on START II counting rules and estimates the actual number of warheads in the US and Russian arsenals. See "U.S. and Soviet/Russian Strategic Nuclear Forces: Past, Present and Projected," *Arms Control Today*, December 1994, 29.

Movement Towards Arms Control and Disarmament

Figure 1. Projected US & Russian Strategic Forces Under START I & II



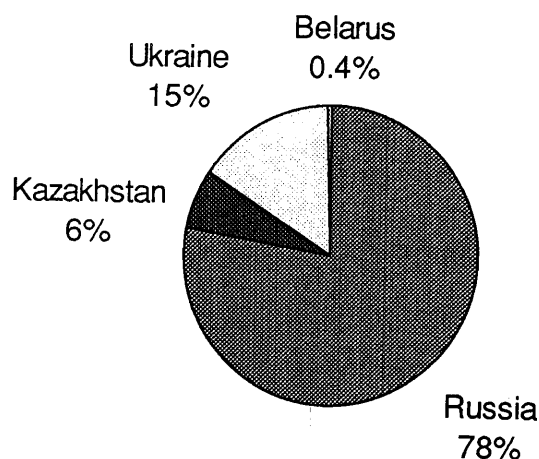
Notes: The figure for post START I warhead levels is based on START II counting rules, which raise the START I treaty declared limit of 6,000 warheads to 8,500 on the US side. The level of former Soviet/Russian warheads after START II is a rounded figure, and does not reflect the range of 2,999 - 3,499 warheads normally attributed to future Russian levels.
Sources: Dunbar Lockwood, "Nuclear Weapons Developments," *SIPRI Yearbook 1994*; "Factfile," *Arms Control Today*, December, 1994, p. 29.

nuclear forces in Belarus, Kazakhstan, and Ukraine was less certain (see figure 2). Securing the commitment of the three non-Russian republics has involved a complex series of bilateral and multilateral negotiations, pledges of US technical and financial assistance, and security assurances designed to address concerns about Russian intentions and capabilities.²

Belarus and Kazakhstan have made rapid progress toward meeting the START I targets (see figure 3). Of the estimated 81 ICBMs on Belarusian territory at the time the USSR dissolved, 45 SS-25s had been transferred to Russia by September 1994; if the current rate of progress is sustained, Belarus could fulfill its START obligations by late 1995 or mid-1996. Kazakhstan has begun the transfer of 104 Soviet SS-18s to Russia for dismantlement. As of September 1994, 44 SS-18s had been deactivated; the destruction of their silos, for which \$70 million in US assistance under the Cooperative Threat Reduction program has been earmarked, was scheduled to begin in September 1994 and should be finished by mid-1997.

2. US Arms Control and Disarmament Agency, *START Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms* (Washington, DC: US Government Printing Office, 1991). For an overview of the impact of START on US and Russian strategic forces, see Lockwood, "Nuclear Weapons Developments," *SIPRI Yearbook 1994* (Oxford: Oxford Univ. Press, 1994) 277-307.

Figure 2. Warhead Deployment by Former Soviet States



Source: Arms Control Association Fact Sheet, November 1994.

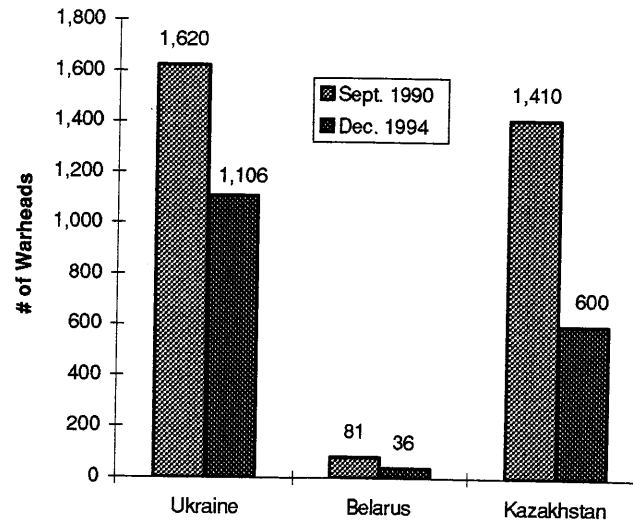
By December 1994, Kazakhstan had transferred approximately 500 warheads to Russia, a process that should be completed by mid-1995.³

The commitment of Ukraine to denuclearization has been both more difficult to obtain and to sustain, but the disarmament process now appears on track (see figure 3). Under the terms of the January 1994 trilateral accord between Russia, the United States, and Ukraine, then-President Leonid Kravchuk agreed that Ukraine would accede to the Nuclear Non-Proliferation Treaty as a non-nuclear state and, within ten months, would transfer 200 ICBM warheads to Russia for dismantlement and deactivate all 46 SS-24s on Ukrainian soil. In return, Russia promised to reimburse Ukraine with 100 tons of non-weapons-grade nuclear fuel for use in civilian reactors. The United States, in turn, pledged to provide Russia with \$60 million in compensation for fuel deliveries to Ukraine and to offset the cost both of warhead transfers and dismantlement, and of the production of fuel assemblies for nuclear power plants.⁴ Russia and

3. See Ashton B. Carter, Assistant Secretary of Defense for International Security Policy, "Testimony on the Cooperative Threat Reduction Program before the Senate Foreign Relations Committee," 103rd Congress, October 4, 1994; and Harold P. Smith, Jr., Assistant to the Secretary of Defense (Atomic Energy), "Testimony before the House Armed Services Committee," 103rd Congress, April 28, 1994. For an overall assessment of dismantlement in the former Soviet republics to date, see Carnegie Endowment for International Peace and Monterey Institute of International Studies, *Nuclear Successor States of the Soviet Union*, no. 1 (May 1994), and no. 2 (December 1994).

4. Russia apparently also agreed to write off a portion of Ukraine's outstanding debt for previous oil and natural gas deliveries in exchange for the withdrawal in 1992 of 2,000 to 3,000 tactical nuclear warheads. The \$60 million will be deducted from payments

Figure 3. Progress Toward START Implementation, 1990-1994:
Ukraine, Belarus & Kazakhstan



Sources: Carnegie Endowment for International Peace and Monterey Institute of International Studies, *Nuclear Successor States of the Soviet Union*, no. 2; *ACA Factsheet*, November 1994; and Dunbar Lockwood, "Strategic Weapons in the Former Soviet Union," *Arms Control Association*, December 1, 1994.

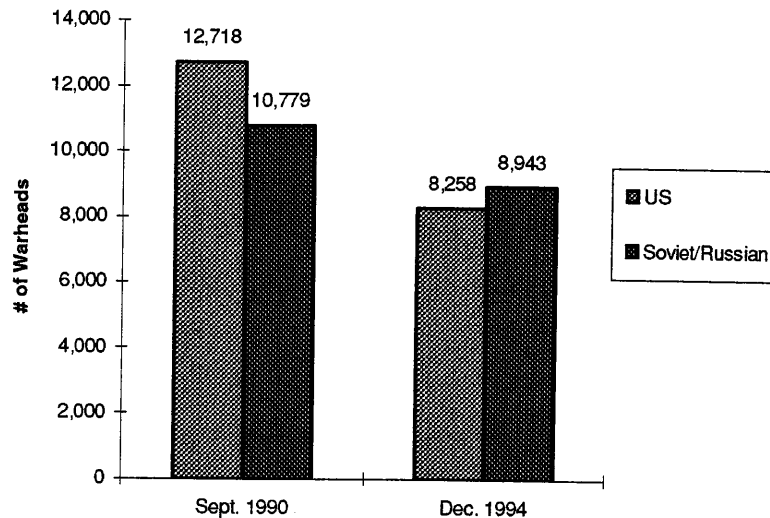
the United States also guaranteed the inviolability of Ukraine's borders, and promised to refrain from economic coercion pending Ukraine's accession to the NPT and contingent upon entry into force of START I.⁵

Though a change in political leadership in July 1994 initially appeared to call into question Ukraine's commitment to denuclearization, the new government moved gradually toward acceptance of START reductions and acceptance of the NPT. In the summer of 1994, Ukraine's current president, Leonid Kuchma, reiterated his predecessor's commitments. By November 1994, Ukraine had deactivated all 46 SS-24s and 40 of the 130 SS-19s on Ukrainian soil; and transferred approximately 360 warheads to Russia for dismantling, thus fulfilling its commitment under the January 1994 trilateral accord. After months of uncertainty, the *Rada*

that the US has agreed to make over a 20-year period for reactor-grade uranium derived from 500 metric tons of highly-enriched uranium (HEU) extracted from Soviet nuclear warheads. See "US Reaches Understanding with Ukraine, Russia on Denuclearization," *Arms Control Today*, January/February 1994, 19-20.

5. "Trilateral Statement by the Presidents of the United States, Russia and Ukraine," and "Annex to Trilateral Statement," reprinted in *Arms Control Today*, January/February 1994, 21-22.

Figure 4. Progress Toward START Implementation, 1990-1994: US-Russia



NOTE: The Russian figure for Dec. 1994 includes weapons in Belarus, Kazakhstan and Ukraine.

Source: "Factfile: US and Soviet/Russian Strategic Nuclear Forces: Past, Present and Projected," *Arms Control Today*, December, 1994, 29.

also ratified the NPT, paving the way for Ukraine's accession to the NPT as a non-nuclear state.⁶

Despite continuing domestic problems, the Yeltsin government appears fully committed to the implementation of START I limits on Russia's nuclear forces (see figure 4). By October 1994, Russia had deactivated its entire force of SS-11s (326), ten SS-13s, 22 SS-17s, and 16 SS-18 missiles, and retired eleven *Yankee-I* submarines, the only *Yankee-II* submarine, and six *Delta-I* submarines. Following Ukraine's accession to the NPT on December 6, 1994, Russia exchanged the instruments of ratification for START I, allowing the treaty to enter into force and paving the way for ratification of the second START agreement.⁷

The United States also has made significant progress toward implementation of the reductions stipulated by START I (see figure 4). As of

6. For Kuchma's pledge, see "Ukraine Parliament Backs Conditional NPT Membership," *Reuters*, November 16, 1994; and James Rupert, "Ukraine Joins Treaty Curbing Nuclear Arms," *Washington Post*, November 17, 1994. On the status of Ukrainian dismantlement, see Arms Control Association Fact Sheet, "Strategic Nuclear Forces of the United States and the Commonwealth of Independent States, November 1994"; Carnegie and Monterey, *Nuclear Successor States*, no. 2 (December 1994); and "Treaty to Cut A-Weapons Now in Effect," *New York Times*, December 6, 1994.

7. See Carter, "Testimony on the Cooperative Threat Reduction Program," October 4, 1994; ACA Fact Sheet, November 1994; and *New York Times*, December 6, 1994.

November 1994, the United States had reduced its arsenal from 12,718 [START I Memorandum of Understanding (MOU) level] to 8,258 warheads. All 450 Minuteman II ICBMs have been deactivated, and 40 Minuteman silos destroyed. The United States in 1994 also removed the last three Poseidon-armed ballistic missile submarines from patrol status and de-commissioned six Trident-armed submarines. All B-52G bombers have been retired and are being destroyed as specified by the treaty; an additional 127 B-52 C/D/E/F bombers have been eliminated under START rules.⁸ With a current dismantlement rate of roughly 1,500 tactical and strategic warheads a year, the United States' objective is to achieve a destruction rate of 2,000 nuclear warheads a year, a rate that one senior government official characterized as the limit of what is technically feasible.⁹

While progress toward START I implementation would appear to be slower in Russia, complaints about Russian delays overlook important differences in the two countries' respective approaches to dismantlement. The United States has adopted a "horizontal approach" to reduction; the warheads on a large number of missiles are simultaneously deactivated and removed, and the silos subsequently destroyed. In contrast, Russia employs a "vertical" approach; a single system is completely dismantled, and the silo destroyed before moving on to the next missile. Consequently, the United States can claim to have deactivated more systems, but Russia may have actually destroyed a larger number of missile silos.

A bilateral agreement between the United States and Russia concluded at the September 1994 summit of the two leaders is intended to give new impetus to START implementation and to introduce greater transparency into the dismantlement process (see table 3). The two nations agreed to exchange detailed information on the number and type of nuclear weapons each side possesses, and to deactivate and remove from combat status all strategic nuclear delivery systems affected by START II immediately following ratification of the treaty. The announcement on deactivation followed an agreement earlier in the year to "de-target" Russian and American strategic nuclear missiles by May 30, a step that Russia extended in February to the United Kingdom and, in September, to the People's Republic of China. The de-targeting decision, frequently

8. ACA Fact Sheet, November 1994. On dismantlement in the US, see Committee on International Security and Arms Control, National Academy of Sciences, *Management and Disposition of Excess Weapons Plutonium*, pre-publication copy (Washington, DC: National Academy Press, 1994), 106-7.

9. On the claim of US officials regarding technical feasibility, see *Strengthening the Non-Proliferation Treaty: Decisions Made, Decisions Deferred*, ACRONYM Report no. 4 (September 1994), 12.

Table 3: US–Russian Joint Statement on Strategic Stability and Nuclear Security (September 1994)

Issue	Type of Measure
<i>Non-Proliferation</i>	<ul style="list-style-type: none"> • Seek indefinite and unconditional NPT extension • Push for early completion of Comprehensive Test Ban Treaty • Achieve global ban on military production of fissile materials
<i>Strategic Force Reductions</i>	<ul style="list-style-type: none"> • Regular information exchange on deactivation and elimination of strategic systems • Early ratification of START II • Deactivation of systems affected by START II • Intensify dialogue on START III
<i>Nuclear Safety & Security</i>	<ul style="list-style-type: none"> • Cooperation to prevent illegal trade in nuclear materials • Information exchange on nuclear warhead and fissile material stockpiles • Measures to improve transparency and irreversibility of dismantlement process • Nuclear agencies and national laboratories to cooperate to ensure nuclear safety, security, and accountability

Source: “Joint Statement on Strategic Stability and Nuclear Security by the Presidents of the United States of America and the Russian Federation,” Washington, DC, September 28, 1994.

dismissed as a largely symbolic gesture, could have practical benefits in the event of some accidental launch scenarios.¹⁰

The entry into force of START I clears the way for ratification of START II, an objective that both the United States and Russia have pledged to achieve by spring 1995. Sufficient parliamentary support in Russia could be difficult to secure, however, since the START II treaty requires Russia to make deep-cuts in and to de-MIRV its land-based ICBM force—the backbone of its nuclear deterrent. Many in Parliament argue that the treaty favors US arms control preferences and interests, and therefore should not be ratified. Given the growing influence of nationalist forces in Russian politics, such equity issues are likely to feature prominently in parliamentary debate over START II ratification. Unconditional ratification in the US Senate also is not a foregone conclusion. While the treaty has enjoyed solid support, the new Congressional leadership, skeptical of Russian intentions and critical of the Russian record of compliance with

10. In a crisis situation, US and Russian missiles presumably could be rapidly reprogrammed. In the case of accidental or unauthorized launch, however, missiles would no longer be automatically programmed to strike targets in the US or former Soviet Union. See “Joint Statement on Strategic Stability and Nuclear Security by the Presidents of the United States of America and the Russian Federation,” September 28, 1994. On the de-targeting decision, see *Arms Control Today*, January/February 1994, 20. On the Chinese and Russian agreement, see “China: Missile Deal Signed,” *Far Eastern Economic Review*, September 15, 1994, 13.

the chemical and biological weapons' conventions, may attach conditions to, or delay, ratification of the accord. On balance, however, the prospects for Senate ratification of START II appear positive.¹¹

Initial planning for strategic arms reductions beyond START II also appears to have begun. At the September 1994 summit, Presidents Clinton and Yeltsin agreed to "intensify dialogue" on additional force constraints, in order to "adapt the nuclear forces and practices on both sides to the changed international security situation and to the current spirit of US-Russian partnership." In December 1994, on the occasion of the entry into force of START I, the two leaders expressed their intention to proceed immediately with the ratification of START II, so that the instruments of ratification could be exchanged when the two presidents meet again in spring 1995. In the interim, officials in both countries apparently have been directed to begin work on the framework for START III negotiations. Many observers consider speedy ratification unlikely, however, given the domestic politics of the ratification process in both countries.¹²

Chemical Weapons Convention

Twenty-four years in the making, the 1993 Chemical Weapons Convention is the first treaty to both require and verify the elimination of an entire class of weapons of mass destruction (see table 4). Unprecedented in scope and complexity, the CWC prohibits the development, production, acquisition, stockpiling, retention, transfer, and use of chemical weapons, and introduces an intrusive verification regime, under which all signatory countries may request, and are obligated to accept, challenge inspections. While over 150 nations have already signed the CWC, 65 signatory states must ratify the treaty before it enters into force. By October 1994, only 16 states had ratified the CWC; many states appear to be postponing ratification until the treaty has been approved by the United States and Russia.¹³

11. On the political debate in Russia regarding START II ratification, see Christoph Bluth, "The Russian View of its Strategic Nuclear Arsenal," *Jane's Intelligence Review* (June 1994), 263-67; and Alexei Arbatov, *Implications of the START II Treaty for US-Russian Relations*, Report no. 9 (Washington, DC: The Henry L. Stimson Center, December 1993), 69-78. For a preliminary assessment of new Congressional approaches to important foreign and defense policy issues, see Steven Greenhouse, "Republicans Plan to Guide Foreign Policy by Purse String," *New York Times*, November 13, 1994; and Steven Greenhouse, "The Election and the Kremlin," *New York Times*, November 13, 1994.

12. "U.S., Russia Open Door to More Nuclear Arms Talks," *Reuters*, December 5, 1994.

13. For a general introduction to and background on the Chemical Weapons Convention, see Amy E. Smithson, ed., *The Chemical Weapons Convention Handbook*, Handbook no. 2 (Washington, DC: The Henry L. Stimson Center, 1993); on ratification, see

Table 4: International Control Regimes for Biological and Chemical Weapons

Treaty	Year of Origin/ Entry into force	Parties	Major Provisions
<i>Biological Weapons Convention</i>	1972/1975	131	<ul style="list-style-type: none"> • Bans development, production, stockpiling, acquisition or retention of biological agents not associated with peaceful purposes; and weapons or means of delivery. • Requires destruction or diversion of banned agents to peaceful purposes within 9 months after entry into force. • Prohibits transfer of or assistance to manufacture, banned agents. • No verification measures.
<i>Chemical Weapons Convention</i>	1993/*	158	<ul style="list-style-type: none"> • Prohibits development, production, acquisition, stockpiling, retention, transfer and use of chemical weapons (CW). • Requires declaration of CW or CW capabilities, including those primarily associated with commercial use. Dual-use capable facilities subject to inspections. • Requires destruction of declared CW and associated manufacturing facilities. • Provides for routine inspections of relevant facilities and challenge inspections upon request.

Sources: "Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, April 10, 1972," in *Documents on Disarmament 1972* (Washington, DC: US Arms Control and Disarmament Agency, 1974), 133-38; Amy E. Stimson, *The Chemical Weapons Convention Handbook*, Handbook no. 2 (Washington, DC: The Henry L. Stimson Center, 1993).

* 65 states required to ratify for entry into force.

Whether or not the convention enters into force in 1995, as had been hoped for, the support of the United States and Russia will be crucial to its successful implementation. Both countries are publicly committed to eliminate their chemical weapon arsenals and have completed two bilateral agreements to establish ground rules for the destruction process. Under a 1989 Memorandum of Understanding (the "Wyoming Agreement"), the United States and the Soviet Union agreed to exchange information on their respective chemical weapon arsenals and to undertake a number of verification experiments, including a series of routine and challenge inspections. The 1990 Bilateral Destruction Agreement (BDA) called on both the US and Russia to stop producing chemical weapons and to cut back their stockpiles to no more than 5,000 agent-tons by the year 2002.¹⁴

The Henry L. Stimson Center, *The CWC Chronicle*, vol. 1, no. 7 (November 1994), 7.

14. Thomas Stock and Anna de Geer, "Chemical Weapon Developments," *SIPRI Year-*

Continuing political, social, and economic upheaval in Russia has delayed implementation of the bilateral agreements with the US, and ratification of the CWC. After the collapse of the Soviet Union the timetable for dismantlement had to be revised, so that destruction now must begin by June 1997 and be completed by June 2004. But even this schedule may be too ambitious. Russia currently plans to use three facilities to destroy its CW arsenal, which, according to critics, will be capable of destroying only 45 percent of the Russian stockpile in the specified time. Funding for additional facilities would be politically unpopular, however, as it would increase the cost of destroying approximately 40,000 metric tons of chemical weapons, now estimated at \$10 billion. As in the United States, moreover, destruction plans have met with growing grassroots opposition. Most Russians doubt the ability of the government to destroy chemical weapons safely.¹⁵

In an attempt to address both issues, the United States in 1991 agreed under the Cooperative Threat Reduction program to assist Russia with the dismantling of its chemical weapons arsenal. Though \$55 million has been obligated to develop a comprehensive plan for destroying the Russian stockpile and to purchase destruction-related technologies, only \$15 million had been delivered by September 1994. This delay has been attributed principally to the reluctance of many Russian chemical facilities to accept external assistance.¹⁶

Ratification of the CWC by the United States Senate is not a foregone conclusion. The Clinton Administration submitted the CWC to the Senate for ratification on November 23, 1993, and requested early approval in order to increase the chances of an early entry into force, but the treaty did not receive high-level backing. The Senate Intelligence, Foreign

book 1994 (Oxford: Oxford Univ. Press, 1994), 330–38; “The Memorandum of Understanding between the United States of America and the Union of Soviet Socialist Republics Regarding a Bilateral Verification Experiment and Data Exchange Related to Prohibition of Chemical Weapons,” September 23, 1989, Jackson Hole, Wyoming; and “Agreement between the United States of America and the Union of Soviet Socialist Republics on Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons” (“Bilateral Destruction Agreement” or BDA), June 1, 1990, Washington, DC in *SIPRI Yearbook 1991* (Oxford: Oxford Univ. Press, 1991), 536–39.

15. On compliance problems see US General Accounting Office, report to the US Senate Committee on Foreign Relations, “Arms Control: Status of US-Russian Agreements and the Chemical Weapons Convention,” March 1994. See also Alexei G. Arbatov, ed., *Russian Arms Control Compliance and Implementation*, Report no. 14 (Washington, DC: The Henry L. Stimson Center/Center on Geopolitical and Military Forecasts (Moscow), January 1995).

16. US Department of Defense, “Second FY 1994 Semi-Annual Report on Cooperative Threat Reduction Program,” October 30, 1994.

Relations, and Armed Services Committees held hearings on the convention at different times in 1994, but only the Intelligence Committee submitted its report and recommendations before the Senate adjourned in November prior to the mid-term elections. The new Senate leadership is likely to request additional hearings, further delaying the ratification process; the new Republican majority, moreover, contains many members who are deeply skeptical of Russian-American agreements.

Three issues are expected to dominate Senate debate on CWC ratification: (i) the cost to industry of treaty implementation; (ii) the environmental impact and safety of the destruction process; and, most importantly, (iii) the Russian record of compliance. Some American chemical companies have expressed concern about the cost of implementation and the difficulty of protecting confidential and proprietary information. The US chemical industry in general, however, has been supportive of efforts to negotiate a CWC. While the costs and efforts imposed on US companies could be substantial, many business leaders predict that the effect of the CWC will be no greater than that of environmental and health regulations.

The environmental impact and safety of the destruction process will also come under scrutiny. After considering various alternatives, the US Army Chemical Demilitarization Agency has selected a high temperature incineration process. Two minor incidents in 1990 and 1994 at the prototype destruction facility on Johnston Island in the Pacific fueled public concern about the safety of the incineration process and caused a revision of the destruction timetable. In response to public concern over safety issues, the US Senate requested additional study of the incineration process. The National Research Council of the National Academy of Sciences subsequently recommended several modifications to the destruction process, which the Army has taken steps to implement. The Council also advised proceeding with destruction by incineration; in the NRC's judgment, the risk to human health and the environment would be even greater if the United States were forced to store its chemical weapons for the time it would take to develop alternative methods of destruction.¹⁷

Questions about Russian compliance are also certain to be raised during Senate consideration of the CWC. According to one report, Russia has been destroying chemical weapons clandestinely, in order to reduce its holdings to previously declared levels.¹⁸ Two former Russian scientists,

17. Amy E. Smithson, ed., *Implementing the Chemical Weapons Convention: Counsel from Industry*, Report no. 10 (Washington, DC: The Henry L. Stimson Center, January 1994); and Amy E. Smithson, ed., *The US Chemical Weapons Destruction Program: Views, Analysis, and Recommendations*, Report no. 13 (Washington, DC: The Henry L. Stimson Center, September 1994).

18. Marcus Warren, "Russian Admits Deception on Chemical-Arms Stocks," *Washing-*

moreover, claimed that Russia has developed, tested, and produced a new generation of nerve agent.¹⁹ The National Security Council and the Arms Control and Disarmament Agency (ACDA) in early fall 1994 also reported compliance problems with the 1989 Wyoming Agreement, the Biological Weapons Convention, and the BDA. The report of the Senate Select Committee on Intelligence, issued in September 1994, was similarly concerned about the Russian record of compliance, and recommended that the US slow implementation of the 1989 bilateral accord on data exchange and verification. If accurate, these reports would suggest that Russian officials may be committed to disarmament, but are unable to exert political control over the military and scientific establishments associated with chemical and biological weapons.²⁰

The future of the CWC appears increasingly uncertain. While the treaty has strong bipartisan support in the US Senate, committed opponents could significantly delay the ratification process and, perhaps, even rally enough support to block ratification of the agreement. Rejection by the US Senate would have a devastating effect on global efforts to combat CW proliferation. Even if the CWC were to enter into force, many observers fear that implementation of the treaty's verification provisions would be severely weakened without strong US support and leadership.

Biological Weapons Convention

Important steps were taken in 1994 to strengthen compliance with, and confidence in, the Biological Weapons Convention (BWC). The BWC, in force since 1975, prohibits signatories from developing, producing, stockpiling or acquiring biological agents, toxins, or weapons, as well as the means to deliver them (see table 4).²¹ Lacking provisions to monitor or verify compliance, however, the convention's significance has been considered primarily symbolic. Reports in the early 1990s that the Soviet Union had maintained an ongoing biological weapons program—despite its signature of the BWC— and the growing ease of manufacturing biological

ton Times, March 19, 1994.

19. On allegations from former Soviet chemical weapons scientists, see Vil Mirazayanov, "Free To Develop Chemical Weapons," *Wall Street Journal*, May 27, 1994.

20. On the Wyoming Agreement and the BDA, see sources in fn. 14. On the NSC and ACDA report, see "Report on Demonstration of Russian Commitment to Comply with Three Agreements on Chemical and Biological Weapons," The White House, October 1, 1994, Washington, DC.

21. "Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, April 10, 1972" in *Documents on Disarmament 1972* (Washington, DC: US Arms Control and Disarmament Agency, 1974), 133–38.

toxins or weapons in civilian laboratories highlighted the need to strengthen the regime for controlling biological weapons.²²

Following several years of preliminary discussions, the first special conference in the history of the BWC convened in September 1994 to consider the addition of a legally binding verification annex to the Biological Weapons Convention. The conference builds on the work of the second (1986) and third (1991) reviews of the BWC, which suggested the introduction of several confidence-building measures (CBMs), including declarations on high containment and defense facilities, and other informational exchanges, to introduce greater transparency into the BW regime. An Ad Hoc Group of Governmental Experts (VEREX) was created in 1991 to review the technical and scientific feasibility of potential verification measures. Between 1992 and 1993, VEREX evaluated 21 verification measures both singly and in different combinations, including information exchanges and monitoring, data exchanges, remote sensing devices, inspections, and other international arrangements. Acting on the basis of the VEREX recommendations, the 1994 conference created a group charged with drafting a protocol to the BWC containing verification measures, including possibly mandatory declarations of specified activities and facilities, validations of declaration, and some type of requested inspections. The group could be asked to present a draft protocol to the state parties at the Fourth BWC Review Conference in 1996.²³

Comprehensive Test Ban Treaty

Since the completion of the Nuclear Non-Proliferation Treaty in 1968, many non-nuclear states have viewed the achievement of a nuclear test ban as proof of the nuclear weapons states' commitment under Article VI "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race . . . and to nuclear disarmament. . . ."²⁴ At the four previous review conferences of the NPT, the non-aligned states criticized

22. For good overviews of the Biological Weapons Convention, see US General Accounting Office, "Report to the Honorable Albert Gore, Jr., US Senate: US and International Efforts to Ban Biological Weapons," GAO/NSIAD-93-113 (Washington, DC: US Government Printing Office, 1992); and Brad Roberts, ed., *Biological Weapons: Weapons of the Future?* (Washington, DC: Center for Strategic and International Studies, 1993).

23. See Graham S. Pearson, "Forging an Effective Biological Weapons Regime," *Arms Control Today*, June 1994, 14-17; Erhard Geissler, "Biological Weapon and Arms Control Developments," *SIPRI Yearbook 1994* (Oxford: Oxford Univ. Press, 1994), 723-38; Frances Williams, "Biology Weapons Talks to Go Ahead," *London Financial Times*, October 3, 1994; and Michael Moodie, "Bolstering Compliance with the Biological Weapons Convention: Prospects for the Special Conference," *Chemical Weapons Convention Bulletin*, Issue no. 25 (September 1994).

24. "Treaty on the Non-Proliferation of Nuclear Weapons," in *Documents on Disarmament, 1968* (Washington, DC: US Arms Control and Disarmament Agency, 1969), 464.

sharply the failure to negotiate a Comprehensive Test Ban. If the past is any guide, the issue is likely to figure prominently at the April 1995 review conference of the NPT, and may influence decisively the decision regarding the duration and terms of the treaty's extension.²⁵

The latest push for a CTB began in January 1994 at the Conference on Disarmament (CD) in Geneva, but soon foundered due to divisions among the nuclear powers. Progress in 1994 was modest, resulting in a heavily bracketed text and only dim prospects for successful completion of a treaty before the NPT review conference commences in April 1995. The principal obstacle to speedy conclusion of a CTB is now the adamant refusal of France and the People's Republic of China to conclude a CTB before both states have had an opportunity to complete further tests (see figure 5). Though many consider a ban on nuclear testing inevitable, Paris and Beijing are unlikely to be prepared for a treaty until 1996. The People's Republic resumed nuclear testing in October 1993, despite the strong condemnation of the international community. France is likely to follow suit, if presidential elections scheduled for May 1995 usher in a conservative government.²⁶

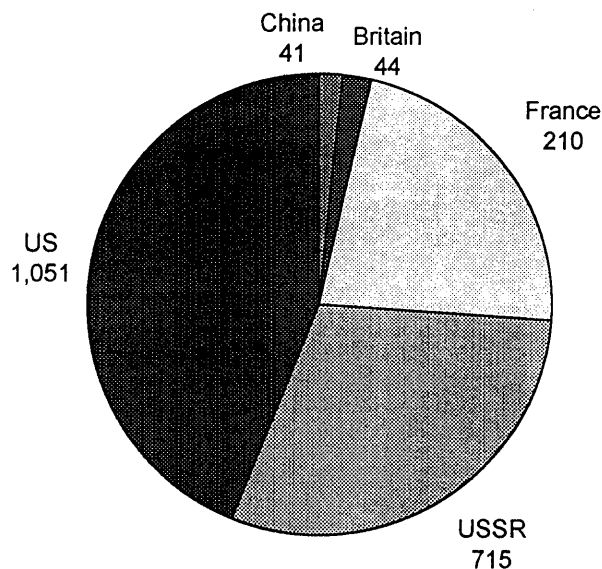
Rejecting twelve years of opposition to a CTB, the Clinton Administration declared that the United States was committed to achieving a test ban treaty "at the earliest possible time."²⁷ As a further demonstration of its commitment, President Clinton has twice extended a moratorium on nuclear testing, matching the behavior of Russia, Britain, and France, despite a resumption of testing by China. Rather than pushing the negotiations toward closure, however, the administration has committed itself to achieving consensus with the other permanent members of the Security Council, a decision that has allowed the most recalcitrant states—France, the People's Republic of China and, to a lesser extent, Great Britain—to set a slow pace toward completion of a treaty. Critics argue that support for a CTB among the other members of the Conference on Disarmament is sufficiently strong that an acceptable treaty might be

25. For an assessment of Article VI obligations, see George Bunn, Roland M. Timerbaev, and James F. Leonard, *Nuclear Disarmament: How Much Have the Five Nuclear Powers Promised in the Non-Proliferation Treaty* (Washington, DC: The Lawyers Alliance for World Security, the Committee for National Security, and the Washington Council on Non-Proliferation, June 1994). On the role of a CTB in past NPT review conferences, see John Simpson, "Nuclear Arms Control and an Extended Non-Proliferation Regime," *SIPRI Yearbook 1994* (Oxford: Oxford Univ. Press, 1994), 615–17.

26. British American Security Information Council, *Prospects for CTB Negotiations*, Basic Occasional Paper no. 1, January 24, 1994; "Achieving a Comprehensive Test Ban: An ACT Interview with Miguel Marin-Bosch," *Arms Control Today*, June 1994, 3–7.

27. "White House Reports Progress in Nuclear Ban Talks," *Reuters*, September 22, 1994.

Figure 5. Declared Nuclear States' Nuclear Testing Since 1945



Source: "World Nuclear Testing, 1945-1993," *Arms Control Today*, and "O'Leary's Test Revelations" *Arms Control Today*, Jan/Feb 1994 Nov. 1993.

achieved, if the United States were to redirect its efforts toward cooperation with the non-nuclear states. Although a more assertive US role would be unlikely to influence the French or British position, some observers believe that France and China might abstain from vetoing a treaty that enjoyed widespread support among the other members. Without new political impetus from the United States, many observers believe, it will be difficult to demonstrate substantial progress toward the completion of a CTBT before the NPT extension conference begins.

If agreement in principle among the permanent members of the Security Council could be achieved, three key issues would require resolution: (i) the terms and timing of the treaty's entry into force; (ii) the scope of the treaty; and (iii) verification mechanisms and compliance. Many states view the CTB primarily as a symbol of the nuclear weapon states' commitment to end the nuclear arms race and therefore would support entry into force after ratification by the major nuclear powers. Other states, such as the UK, have insisted that the treaty must be universal, and include important threshold nuclear states. This second option would delay entry into force significantly. A third alternative would be to specify a threshold number of states for entry into force. Debate on scope of the treaty has focused primarily on definitional questions. While the majority of states favor an expansive definition of testing, nuclear weapon states have argued for exceptions. China, for example, would exclude peaceful nuclear explosions from the treaty, France and Britain

want to exclude "safety" tests, and France, the UK, the United States, and Russia want to continue varying yields of hydronuclear explosions.²⁸ Finally, states also differ widely with regard to the cost, means, and intrusiveness of necessary verification measures.

It is unclear what implications, if any, a stalled CTBT would have for the negotiations for an extension of the NPT. If significant progress toward a treaty could be demonstrated by April 1995, reluctant non-nuclear states might be persuaded to vote in favor of indefinite extension. If, however, the negotiations remain stalemated, the review conference is likely to involve contentious and heated discussion, diminishing the chances for an unconditional extension, or narrowing to a slim majority the margin of support for extension.

The advances in arms control in 1994 promise important benefits in reducing the dangers associated with weapons of mass destruction. After decades of unrelenting military competition, the two major nuclear powers have made significant advances toward reducing their Cold War stockpiles, and thus their reliance on the nuclear deterrent, at least in relations with one another. Though domestic political obstacles may delay negotiation of a CTBT, the current governments of the declared nuclear states view an end to nuclear testing as inevitable. In the chemical and biological weapons conventions, the international community has expressed its condemnation for these weapons as tools of statecraft, and significant states now appear willing to forego nuclear capabilities as well. These advances signal important progress toward transforming the aspirations expressed in international arms control and disarmament agreements into meaningful constraints on foreign policy and weapons decision-making.

28. "Peaceful nuclear explosions" refer to nuclear explosions that are carried out for purposes unrelated to nuclear weapons, for example, for civil excavation or other non-military projects. "Safety" tests are experiments designed to ensure the continued reliability and safety of existing weapons. "Hydronuclear" tests involve experiments that use mock nuclear warheads and some fissile material, and that produce a small nuclear yield. The nuclear-weapon states have different views on the level of nuclear yield that should be allowed under a CTBT. US officials argue that nuclear yields for HNE's can be limited to a few pounds, while France argues that yields of several tons should be allowed. For a discussion of the nuclear weapon states' positions, see *A Comprehensive Test Ban: Disappointing Progress*, ACRONYM Booklet no. 3 (September 1994), 12-13.

Advances in Halting or Reversing Proliferation

Important advances were also made to halt or even reverse the spread of nuclear, chemical, and biological weapons. The nuclear non-proliferation regime received an important boost with the accession of three former Soviet republics to the NPT, and the negotiation of an agreement between the United States and North Korea, which, if fully implemented, should halt and eventually roll-back Pyongyang's nuclear weapons program. The UN's role in the destruction of the Iraqi nuclear and chemical programs, moreover, set a powerful precedent for international intervention in support of non-proliferation objectives. In the Middle East, another principal region of proliferation concern, two landmark agreements between Israel and its Arab neighbors may alter the security environment in the region fundamentally and, over time, change the incentives that states or other groups have for acquiring or retaining weapons of mass destruction. In South Africa and the southern cone of Latin America, the process of nuclear roll-back continues, despite, or perhaps because of, continuing domestic changes and upheaval.

Extension of the Nuclear Non-Proliferation Treaty

Since its completion in 1968, the Nuclear Non-Proliferation Treaty has been the principal political and legal vehicle for slowing the spread of nuclear weapons. Under the twin bargains forged in the NPT, the non-nuclear signatories agreed to forego development or manufacture of nuclear weapons in exchange for a commitment from the nuclear weapon states to nuclear disarmament (Article VI) and access to the peaceful uses of nuclear energy. Unlike other arms control treaties, the duration of the

NPT was limited to 25 years, at which time a review conference would determine whether the treaty should be extended indefinitely or for an additional fixed period of time. The Nuclear Non-Proliferation Treaty Review and Extension Conference will convene in New York from April to May 1995. Many observers consider the extension of the NPT essential to the preservation of the entire non-proliferation regime.

The United States and other nations seek to achieve an indefinite, unconditional extension of the NPT. By January 1995, 68 states were committed publicly to indefinite extension, with 11 states expressly opposed to an extension; a minimum of 84 votes will be needed to ensure passage.¹ Treaty supporters believe that a majority vote in favor of indefinite extension can be achieved. The size of the majority may be just as important, however; unless an overwhelming majority votes in favor of extension, many observers believe that the non-proliferation regime will be seriously weakened. Alternatively, the conference may decide to support short-term (five to ten years) or prolonged "rolling extensions" (20 to 25 years), or to recess temporarily, with the intention of reconvening at a later date to review progress toward a CTB and other evidence of the nuclear states' commitment to their Article VI obligations. A short-term extension of the treaty is also possible, but considered unlikely.²

Negotiations at the review conference are likely to focus on several key issues:

- *Progress toward a comprehensive test ban treaty:* Although many non-nuclear states appear to have abandoned hope of a CTB before the extension conference, many might be willing to vote in favor of a lengthy or indefinite extension if convinced that a treaty would be concluded soon thereafter.
- *Security assurances:* The prospects for agreement on legally-binding security assurances from the nuclear states are more positive. The permanent members of the Security Council are currently drafting a text on negative security assurances, which is likely to

1. Many undeclared states are not necessarily opposed to extension, but have refrained from declaring their support for renewal in an effort to influence the policies of the nuclear weapon states. The poll was conducted by the Campaign for the Nuclear Non-Proliferation Treaty. See "U.S. Short of Votes for Non-Proliferation Treaty," News Release (Washington, DC: Campaign for the Non-Proliferation Treaty, December 23, 1994). Other countries have conducted similar surveys, and report that approximately 90 countries are likely to favor indefinite extension.

2. Simpson, *SIPRI Yearbook 1994*, 605-29. For an assessment of the third meeting of the NPT Preparatory Committee (PrepCom) in September 1994, see Joe Cirincione, "Third PrepCom Highlights Uncertainties: NPT Showdown Ahead," *Arms Control Today*, December 1994, 3-6.

be modeled on the United States' 1978 pledge not to threaten or use nuclear weapons against non-nuclear state parties to the NPT "except in the case of an attack on the United States, its territories or armed forces, or its allies, by such a state allied to a nuclear weapon state or associated with a nuclear weapon state in carrying out or sustaining the attack."³ Agreement on positive security assurances also appears within reach. Various proposals have been tabled to reaffirm the UN Security Council's 1968 resolution pledging assistance to non-nuclear weapon states in the event that they are threatened or attacked with nuclear weapons.

- *Reaffirmation of Article VI disarmament commitments (further reductions beyond START II commitments):* The non-nuclear states also are likely to press the nuclear powers to reaffirm their commitment to nuclear disarmament under Article VI of the NPT. The United States can be expected to emphasize progress toward reversing the nuclear arms race with the former Soviet Union as proof of its commitment.
- *Status of undeclared nuclear states:* The issue of universality is also likely to be raised with regard to the undeclared nuclear states that have refused to sign the NPT (Israel, India, Pakistan). Egypt, for example, is seeking the support of the Arab League states to oppose an extension of the NPT unless Israel pledges to join the non-proliferation regime.
- *Progress toward achieving a global ban on fissile material production for military purposes:* After months of stalemate, agreement was finally reached in December 1994 on the mandate for negotiations for a fissile-material cutoff; negotiations were scheduled to begin in January 1995 when the CD reconvened in Geneva.

Despite important differences on these and other issues, the prospects for lengthy extensions of the NPT nevertheless are good. Though many non-nuclear states may be dissatisfied with the actions of the nuclear weapon states, most view the non-proliferation treaty as serving important regional security interests. Even without a CTB, the non-nuclear states might be persuaded to support prolonged rolling extensions, if the nuclear weapon states could point to progress toward ratification of START II, a commitment to follow-on negotiations, and progress toward agreement on a fissile material production ban.

3. For the text of the US pledge, see US Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements* (Washington, DC: ACDA, 1990), 94.

Advances in Regions of Proliferation Concern

While attention generally tends to focus on failures of the non-proliferation regime, events in 1994 served as important reminders that the spread of nuclear or chemical weapons need not be irreversible. The three non-Russian nuclear heirs, Ukraine, Kazakhstan, and Belarus, are proceeding with START reductions and are now committed to non-nuclear status. In North Korea, the country of most immediate proliferation concern, an agreement between the United States and Pyongyang has provided a set of standards and strict deadlines that will allow the international community to steer North Korea toward elimination of its suspected nuclear weapons program. In the Middle East, two landmark agreements between Israel and its Arab neighbors in time may help to halt or even reverse the region's seemingly inexorable advance toward widespread proliferation. Denuclearization is already a reality in the southern cone of Latin America and in South Africa, where the democratization of key states has helped to consolidate commitments to forego acquiring nuclear weapons and to dismantle previous efforts to develop such capabilities. Perhaps most importantly, despite new regional security risks and uncertainties, two of the world's most powerful and advanced nations, Germany and Japan, appear firmly wedded to their non-nuclear status.

The initial commitment of the three non-Russian republics to non-nuclear status signals an important first step toward reversing the problem of "instant proliferation." Belarus was the first of the Soviet nuclear heirs to commit to denuclearization, acceding to the NPT in July 1993. Kazakhstan followed suit, signing onto the treaty in February 1994. The Ukrainian *Rada* gave its sanction to non-nuclear status in the NPT in November 1994, contingent upon the receipt of security guarantees from the nuclear powers.⁴

The October 1994 agreement between the United States and North Korea has defused the crisis on the Korean Peninsula and eventually may achieve the dismantlement of Pyongyang's nuclear program. Tension in the region has been building steadily since March 1993, when North Korea first refused "special inspections" by the International Atomic Energy Agency (IAEA) of two suspected nuclear sites at its Yongbyon facility. After refusing once again to allow international inspections, North Korea in May 1994 began refueling at the Yongbyon facility in the absence of international inspectors and, therefore, in violation of its obligations under the NPT. According to US estimates, North Korea already has

4. *Nuclear Successor States to the Soviet Union*, no. 1 (May 1994); James Rupert, "Ukraine Joins Treaty," *Washington Post*, November 17, 1994.

Table 5: US–North Korea Framework Agreement

Phase	North Korean Commitments	United States' Commitments
All	<ul style="list-style-type: none"> • Implement full-scope safeguards agreement with IAEA. • Resume high-level talks with Republic of Korea. • Open liaison office in Washington, DC 	<ul style="list-style-type: none"> • US pledges not to use nuclear weapons against North Korea. • President Clinton reaffirms US commitment to provide light-water reactors (LWR) if financing from allies falls through. • Ease trade/economic restrictions. • Open liaison office in Pyongyang.
Phase I (5 years)	<ul style="list-style-type: none"> • Seal & cease operation of 5-megawatt (MW) reactor; store spent fuel in cooling ponds. • End work on 2 gas graphite reactors & on related facilities, including reprocessing facility. 	<ul style="list-style-type: none"> • Provide alternative sources of energy. • Create multinational consortium [Korean Energy Development Organization (KEDO)] to construct two 1,000 MW LWR; KEDO to provide 500,000 tons of heavy fuel oil annually. • Financing cost of \$4 billion to come from Japan and South Korea; contributions from Germany, Russia and the US. • No nuclear components to be installed during phase I.
Phase II (3 years)	<ul style="list-style-type: none"> • Allow international inspections, including special inspections by IAEA, before delivery of LWR components on Nuclear Suppliers' Group "trigger list". • Begin transport of stored fuel rods to third country; complete transfer by finish date of first LWR. 	<ul style="list-style-type: none"> • Complete work on first LWR. • Begin operation and production of electricity.
Phase III (2 years)	<ul style="list-style-type: none"> • Dismantle key nuclear facilities including 5-MW reactor, partially built 50- and 200-MW reactors. • Dismantle plutonium reprocessing facility and fuel fabrication plant. 	<ul style="list-style-type: none"> • Complete construction of second LWR.

Sources: US Arms Control and Disarmament Agency, "U.S.-Democratic People's Republic of Korea Agreed Framework," *Fact Sheet*, October 21, 1994; Arms Control Association, "The U.S.-North Korea Nuclear Agreement: A Preliminary Assessment," Arms Control Association Briefing Packet, October 21, 1994.

diverted slightly less than 22 pounds of weapons-grade plutonium, or enough for 1 to 2 nuclear bombs; spent fuel from the Yongbyon reactor, after reprocessing, would provide enough plutonium for five additional nuclear weapons. The dispute intensified throughout the summer as the United States and the international community deliberated over the imposition of sanctions against North Korea. Following a visit to North Korea by special US envoy, former President Jimmy Carter, high-level talks between the United States and North Korea resumed in Geneva, culminating on

October 21, 1994, in a bilateral agreement that is intended to dismantle the North Korean nuclear program over ten years (see table 5).⁵

The agreement's potential contribution to non-proliferation objectives has been disputed. Critics argue that the accord in effect rewards North Korea for violating the NPT and sets a dangerous precedent for other rogue proliferators. A number of South Korean officials, moreover, argue that the economic assistance required by the agreement will only prolong the life of a despised and crumbling regime. Other observers are concerned about the impact of improved US–North Korean relations on the United States' defense commitment to South Korea. And many question the wisdom of granting a five-year delay before North Korea is required to open its facilities to international inspection.⁶

Supporters of the agreement and administration officials point out that the agreement contains specific deadlines and standards for measuring North Korean compliance. Rather than rewarding a proliferator, they counter, the accord subjects North Korea to even stricter controls than required under the Nuclear Non-Proliferation Treaty; under the terms of the bilateral accord, North Korea will not be allowed to produce nuclear fuel, to reprocess, or to acquire plutonium—activities that the NPT allows, as long as they are subject to IAEA monitoring. Finally, many observe that alternative courses of action were even less attractive. Japan and South Korea have been demonstrably reluctant to impose sanctions on North Korea, while a military strike against North Korea, as advocated by some, could have led to full-scale conflict on the peninsula at inestimable cost in human lives and destruction of property.⁷

5. For a historical overview of the North Korean nuclear program, see Leonard S. Spector with Jacqueline R. Smith, *Nuclear Ambitions: The Spread of Nuclear Weapons 1989–1990* (Boulder, CO: Westview Press, 1990), 118–40. On the evolving crisis since 1990, see “North Korea at the Crossroads,” *Arms Control Today*, May 1993, 3–9; Michael Mazarr, “Lessons of the North Korean Crisis,” *Arms Control Today*, July/August 1993, 8–12; and “The Continuing North Korean Crisis,” *Arms Control Today*, June 1994, 18–22. On the October agreement, see “US, Pyongyang Reach Accord on North's Nuclear Program,” *Arms Control Today*, November 1994, 25, 33.

6. For a sampling of critical views, see Terrence Kiernan and Barbara Opall, “N. Korea Nuclear Accord Sparks Dissent,” *Defense News*, October 24–30, 1994, 3; Carol Giacomo, “N. Korea Accord, While Welcomed, Not Risk Free,” *Reuters*, October 18, 1994; The Heritage Foundation, “The Clinton Nuclear Deal With Pyongyang: Road Map to Progress or Dead End Street?,” Heritage Foundation Asian Studies Center Background, November 4, 1994; and Stefan Halper, “Nuclear Deal's Demons,” *Washington Times*, October 27, 1994.

7. Jessica Mathews, “A Good Deal with North Korea,” *Washington Post*, October 30, 1994; Selig S. Harrison, “Beware the Hawks in Seoul,” *New York Times*, October 21, 1994; idem, “The North Korean Nuclear Crisis: From Stalemate to Breakthrough,” *Arms Control Today*, November 1994, 18–20; and Spurgeon Keeney, “A Triumph of Quiet Diplomacy,” *Arms Control Today*, November 1994, 2.

In the final analysis, varying assessments of the agreement reflect different assumptions about North Korean motivations for seeking a nuclear capability, and thus about what measures are most likely to alter those preferences. The framework agreement appears to be premised on the assumption that Pyongyang's actions are driven as much by economic and political insecurity as by concerns about military threats. The accord therefore offers the promise of economic assistance and an end to North Korea's political isolation, but defers the delivery of these benefits until there is conclusive evidence of Pyongyang's compliance with the constraints on its nuclear activities.

The Middle East and the Persian Gulf pose two of the greatest challenges to the non-proliferation regime. At least six states in the Middle East are believed to either possess or to be pursuing a chemical weapons capability, while five countries are suspected of developing biological weapons or conducting related research. Israel is commonly assumed to possess nuclear weapons and the means to deliver them. In the neighboring Persian Gulf region, the UN has dismantled Iraq's weapons programs but, in all likelihood, the Iraqi leadership remains committed to the acquisition of nuclear, chemical and biological weapons—an ambition that it shares with rival Iran.⁸

Two landmark agreements in 1994 offered new hope that a comprehensive and lasting peace in the Middle East over time may be achieved, thus diminishing the pressures for proliferation. The September 1993 Declaration of Principles provides a framework for cooperation between Israel and Palestinians in order to resolve outstanding differences and develop cooperative security arrangements. The Gaza-Jericho accord represents a first step toward implementation of the agreed principles. The peace treaty between Israel and Jordan officially ends the state of war between the two states, and provides a broad framework for cooperation in security affairs, economic relations, the development and protection of water resources, cultural and scientific exchange, and refugee issues. Both governments have pledged to work toward the creation of a regional security regime, the Conference on Security and Cooperation in the Middle East (CSCME), modeled after the Conference on Security and Cooperation in Europe (CSCE). While implementation of the agreements is certain to encounter difficulties and setbacks, these agreements

8. US Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks* (Washington, DC: US Government Printing Office, August 1993), 65. See also Spector, 143–218; and International Institute for Strategic Studies (IISS), *The Military Balance, 1993–1994* (London: Brassey's, 1993), 109 (Iraq and Iran), and 233 (Iran); and IISS, *The Military Balance, 1994–1995* (London: Brassey's, 1994), 122.

nevertheless may provide new impetus for the process of confidence-building between Israel and its Arab neighbors, and thus help to create a climate more conducive to the settlement of long-standing grievances and differences.

The Arms Control and Regional Security (ACRS) working group of the Middle East peace process already has made substantial progress toward agreement on a series of confidence-building measures, including pre-notification of military exercises, maritime CBMs, and the establishment of a regional communications center. Although the participants in the group remain at odds over nuclear issues, both Israel and Egypt in the past have declared their support, in principle, for the creation of a nuclear-weapon-free zone in the Middle East. Continued progress in the Middle East peace process could help to diminish the likelihood of a major military conflict and, perhaps, to lessen demand for weapons of mass destruction as well.⁹

In the neighboring Persian Gulf region, the international community has forced Iraq to dismantle its nuclear, chemical, and biological weapons programs. UN Security Council resolution 687, passed in April 1991 at the conclusion of the Gulf War, required Iraq to relinquish all chemical and biological weapons, agents, and related subcomponents and facilities; to surrender all ballistic missiles with a range of over 150 kilometers, as well as related parts and facilities; and to foreswear the development of nuclear weapons, nuclear weapons-usable material, nuclear subsystems or components, and nuclear-related research and manufacturing facilities. Iraq was also forced to declare the locations of all banned facilities and stockpiles, and stocks of all prohibited items. To ensure compliance with these restrictions, the UN Special Commission (UNSCOM) has carried out intrusive inspections and has pressed Iraqi authorities forcefully to provide a complete and accurate accounting of all of its weapons-related activities and materials. Although Iraq has resisted, hindered, or otherwise obstructed UN inspectors, in the end it has been forced to accept intrusive monitoring, and to provide extensive information regarding its weapons-related activities. Though Iraqi leaders may retain their nuclear ambitions, any resumption of the country's nuclear program would be both difficult and costly. And while

9. For the text of the Declaration of Principles, see "A Commitment to Peace: Signing of the Israeli-Palestinian Declaration of Principles," US Department of State *Dispatch Supplement*, vol. 4, supplement no. 4 (September 1993), 2-6. Excerpts from the Jordan-Israeli accord can be found in "The Agreement: Establishing Principles for a Lasting Peace," *New York Times*, October 27, 1994. On the ACRS dialogue, see Gerald M. Steinberg, "Non-Proliferation: Time for Regional Approaches?" *Orbis* 38 (Summer 1994): 418-19; idem, "Middle East Arms Control and Regional Security," *Survival* 36 (Spring 1994): 131-32.

Western intelligence sources conclude that Iraq might more easily resume development and production of chemical and, perhaps, of biological weapons as well, the international community remains deeply suspicious of Iraq and is likely to continue monitoring its activities closely.¹⁰

Though Iran has been spared the crippling effects of UN sanctions, international scrutiny, poor economic performance, and domestic political instability apparently have slowed the country's progress toward the development of nuclear capabilities. Iranian intentions remain suspicious, and several Israeli officials have warned that Iran may be within five years of building a nuclear weapon. According to revised US intelligence estimates, however Iran is incapable of producing a nuclear bomb for at least ten years without external support; other sources, such as the International Institute for Strategic Studies, conclude that it will be several decades before Iran will be able to manufacture a nuclear weapon. While a crude nuclear device might be achievable somewhat sooner, particularly with external assistance, Iran, at worst, is a potential nuclear power that warrants close monitoring, but presents no immediate threat of proliferation.¹¹

In two other regions, southern Africa, and the Southern Cone of Latin America, the spread of nuclear weapons has been effectively halted. Both regions continue to set new precedents in the process of nuclear roll-back.

South Africa's commitment to non-nuclear status appears firm after the pivotal election of a majority-led government. Responding to South Africa's growing international isolation and pressures at home for reform, former South African president F.W. de Klerk in 1989 ordered a halt to nuclear weapons production and the dismantlement of South Africa's existing arsenal of 6 or 7 nuclear bombs. In 1991, South Africa acceded to the NPT as a non-nuclear state. Following disclosures in 1993 that South

10. It is not clear that Iraq ever possessed an offensive biological weapons program. Missing data has impeded the efforts of UNSCOM to determine the nature of Iraq's past activities related to biological weapons. See "Iraq Still Hiding Crucial Weapons Data," *Reuters*, December 16, 1994; and "U.N. Council Split on Iraq's Disarmament Progress," *Reuters*, December 20, 1994. On the monitoring of Iraqi activities, see Maurizio Zifferero, "The IAEA: Neutralizing Iraq's Nuclear Weapons Potential," *Arms Control Today*, April 1993, 7-10; Tim Trevan, "UNSCOM Faces Entirely New Verification Challenges in Iraq," *Arms Control Today*, April 1993, 11-15; and Tim Trevan, "Ongoing Monitoring and Verification in Iraq," *Arms Control Today*, May 1994, 11-15.

11. "U.S. and Israel See Iranians 'Many Years' From A-Bomb," *New York Times*, January 10, 1995. See also James Woolsey, testimony on "Current and Projected National Security Threats to the United States and its Interests Abroad" before the Senate Select Committee on Intelligence, 103rd Cong., 2nd sess., January 25, 1994, 8; IISS, *The Military Balance 1993-1994*, 233.

Africa had manufactured six nuclear weapons, de Klerk promised to share with the IAEA information on past production, though such information was not required under the standard safeguards agreement. Despite concerns that Nelson Mandela's ANC-led government might retain South Africa's arsenal for political leverage, the roll-back process continues. The Mandela government, moreover, has announced plans to conduct further investigations into South Africa's nuclear program, and to implement the necessary export controls to prevent nuclear materials or know-how from leaving the state. Mandela has declared his commitment to the NPT regime, and has endorsed the Organization of African Unity's proposal to create a nuclear-weapon-free-zone on the African continent.¹²

Like South Africa, Argentina and Brazil have abandoned their nuclear ambitions. By the early 1980s, both countries had advanced civilian nuclear energy programs and were suspected of having nuclear weapon programs as well. Their regional rivalry might well have escalated into a full-fledged nuclear arms race, were it not for the return of civilian governments in 1983 (Argentina) and 1985 (Brazil). After refusing for many years to open Argentine nuclear facilities to IAEA inspection, President Raul Alfonsín in March 1985 initiated a program of mutual inspections of the two countries' installations. Five years later, the two governments signed the "Declaration on the Common Nuclear Policy of Brazil and Argentina," in which they agreed to establish the Brazilian-Argentine Agency for the Accounting and Control of Nuclear Materials (ABACC), which would verify that all nuclear materials were being used for peaceful purposes; to negotiate a safeguards agreement between the two governments, the ABACC, and the IAEA; and to prepare for the two countries' full ratification of the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco), a step taken by Argentina in 1993 and Brazil in 1994.¹³ Both countries in 1994 continued to consolidate progress toward nuclear roll-back. Reversing previous policies, the two governments announced their opposition to peaceful nuclear explosions, and took steps to tighten national export controls, including the imposition of new restrictions on exports of missiles, in compliance with the Missile Technology Control Regime (MTCR). Opposition to NPT membership, moreover, may also be weakening. Both countries until now have steadfastly refused to sign the NPT, arguing that the treaty is discriminatory. In December 1993, President Carlos Saúl Menem of Argentina announced

12. David Albright, "South Africa's Secret Nuclear Weapons," *ISIS Report* (May 1994); David Albright, "South Africa and the Affordable Bomb," *Bulletin of the Atomic Scientists*, July/August 1994, 37-47; David Albright and Mark Hibbs, "South Africa: The ANC and the Atom Bomb," *Bulletin of the Atomic Scientists*, April 1993, 32-37.

13. John R. Redick, "Latin America's Emerging Non-Proliferation Consensus," *Arms Control Today*, March 1994, 3-9.

that his country will accede to the NPT before the April 1995 extension conference. The newly elected leader of Brazil, Fernando Henrique Cardoso could follow Argentina's example.¹⁴

Despite far-reaching changes in the international security environment, the commitment of Germany and Japan to non-proliferation also appears firm. Both countries have assisted US efforts to forge more effective global non-proliferation strategies. From providing financial support to the former Soviet nuclear states to dismantle their weapons, to endorsing the indefinite extension of the NPT, to supporting the push for a CTBT, Germany and Japan have demonstrated a solid commitment to slowing the proliferation of weapons of mass destruction. And despite much speculation that either state might reconsider its non-nuclear status, the domestic consensus on non-nuclear status in both countries remains solid, at least at this time.¹⁵

The commitment of both states, however, may not be irreversible. The emergence of new threats—particularly new nuclear threats—under certain circumstances could prompt both states to reexamine current policies. As the North Korean crisis began to heat up in early 1994, Japanese leaders hinted that the country might need to reexamine its defense role. While government officials were quick to dismiss the possibility that Japan would remove restrictions on the possession or production of nuclear weapons, nuclear proliferation on the Korean peninsula clearly would have far-reaching implications for Japan, and might even nudge the country toward reconsideration of the nuclear option. German officials underscore the importance of developments in Ukraine and Russia for stability in Europe, and have termed the elimination of all nuclear weapons on Ukrainian soil and that state's accession to the NPT as a non-nuclear state as "indispensable." A reversal of Ukraine's policy would represent a significant worsening of Germany's security situation, and might even lead some officials to entertain a nuclear option, depending on future developments within NATO.¹⁶

14. On Argentina's accession to the NPT, see Naoki Usui, *Nucleonics Week*, December 9, 1993, 9. On Brazil's consideration of NPT membership, see "Cardoso Views NPT, Ties with US," *Foreign Broadcast Information Service (FBIS)-Latin America*, November 9, 1994, 31.

15. For a discussion of the two countries' commitment to non-nuclear status, see Leonard Spector, "Nuclear Nonproliferation: The Contributions of Germany and Japan," *FPI Policy Briefs* (Washington, DC: Foreign Policy Institute, The Paul H. Nitze School of Advanced International Studies, 1994).

16. "Domino Effect Triggers Seoul, Tokyo Nuke Plans," *Washington Times*, March 23, 1994; "Crisis in Korea Pushes Japan to Review Role," *Wall Street Journal*, March 23, 1994; David E. Sanger, "Japan Denies Any Plans to Build Nuclear Bombs," *New York Times*, February 2, 1994; Germany, Federal Ministry of Defence, *White Paper 1994*, 29.

Security Risks and Dangers

The events of 1994 belie the seemingly widespread perception that the proliferation of weapons of mass destruction is inevitable and unstoppable. The US-Soviet nuclear arms race has been halted and reversed. The strategic force reductions mandated by START I and II will result in sharp cuts in the United States and Russian nuclear forces, and both countries are pledged to eliminate their chemical weapon arsenals. The three non-Russian heirs to the Soviet nuclear arsenal have become members of the NPT, and are proceeding with the transfer of Soviet nuclear warheads to Russia for dismantlement. In short, the nuclear weapon states have taken significant steps toward fulfillment of their commitment under Article VI of the NPT to work toward nuclear disarmament. The pressures for proliferation also appear to have lessened in many regions of the world. In the Middle East, the peace process at the least holds the promise of reducing the regional tensions that drive proliferation; in the neighboring Persian Gulf, the progress of Iran and Iraq toward acquiring weapons of mass destruction has been slowed, if not halted. Latin America has fulfilled the nuclear-free promise of the Treaty of Tlatelolco.

But many of the positive developments registered this past year could easily have turned out otherwise. North Korea is a case in point. From late March to June 1994, tensions mounted steadily in the region, and the prospect of renewed military conflict on the Peninsula suddenly appeared possible once again. After President Clinton ordered the transfer of Patriot missile systems to South Korea, North Korea responded with warnings against pushing the situation "to a very dangerous brink of war." Addressing the Korean situation in early May, US Secretary of Defense William Perry warned that the imposition of sanctions would "increase the risk of a military confrontation." War rhetoric in North Korea again escalated, prompting the South Korean government to place its troops on a higher level of alert. The framework agreement between

Washington and Pyongyang has effectively defused the immediate crisis and indeed progress toward implementation of the first phase appears smooth. While many questions regarding North Korean intentions remain, the outcome to the crisis clearly could have been far worse.¹

The North Korean case, unfortunately, is not the only example of a success that could all too easily turn to defeat. The Chemical Weapons Convention promises important national security benefits to many states, yet domestic political factors could block ratification in the United States and other countries, dealing a devastating blow to this landmark agreement. Although the negotiations for a CTB appear to be moving slowly, but steadily, toward the completion of a treaty after 1996, all of the major nuclear weapon states could face changes of government either before or in 1996, introducing new uncertainties into the CTB negotiations. Progress toward nuclear roll-back in the former Soviet Union may be equally tenuous. The three non-Russian republics are now committed to denuclearization, but the transfer of nuclear warheads could be delayed if Russia suddenly adopted more menacing policies.

The potential for reversals is rooted in part in the fluid international situation, but it is also due to the approach that most governments have adopted to address the nuclear risks of the post-Cold War period. Many of the successes registered in 1994 relied heavily on ad hoc solutions, sometimes clumsily crafted under the pressure of events. A comprehensive and long-term strategy for combating proliferation in the changed international context has been sorely missing. To be fair, the pace and scope of change in many regions has left governments with little choice but to think in terms of short-term objectives and incremental advances.

The focus on near-term problems and objectives, however understandable, is dangerous and unwise. The US Nuclear Posture Review cannot be the final word on the role of nuclear weapons in US policy. Nor is the completion of a CTBT the sole measure of the nuclear weapon states' commitment to the "bargains" contained in the NPT. Both the nuclear and non-nuclear states, in a very real sense, display a similar short-sightedness. If the positive trends of the past years are to be sustained, and indeed strengthened, then all states must begin to consider the linkages between measures that appear to offer some benefit in the near term but may, at

1. "Clinton Orders Patriot Missiles to South Korea," *Washington Post*, March 22, 1994; "North Korea Warns of 'Brink of War,'" *Washington Post*, March 23, 1994; "U.S. Preparing Public for a Korea Crisis," *Philadelphia Inquirer*, May 3, 1994; "Perry Offers Dire Picture of Failure to Block North Korean Nuclear Weapons," *New York Times*, May 4, 1994; "North Korea Threatens Japan Over Backing U.S.-Led Sanctions," *New York Times*, June 10, 1994; "U.S. Considered Attacks on N. Korea, Perry Tells Panel," *Washington Post*, January 25, 1995.

the same time, carry adverse long-term consequences. Additional steps must be taken to further reduce the risks that nuclear weapons pose to the security of all states and nations.

While the nuclear risks associated with the bipolar confrontation are much diminished since the end of the Cold War, the current period of transition has introduced new and often unanticipated security threats. Despite progress toward a new international consensus in support of nonproliferation, a number of countries continue to perceive potential benefits in seeking clandestinely to acquire nuclear weapons. India and Pakistan have made no progress in alleviating long-standing grievances and are poised to add new ballistic missiles to their arsenals. To limit nuclear risks in South Asia, the international community must find effective ways to “manage” proliferation that do not at the same time undermine efforts to prevent proliferation elsewhere in the world. New risks also are emerging from the efforts of states to scale back their nuclear arsenals. Both the United States and Russia have encountered difficulties in accounting for all nuclear materials. The risk of nuclear leakage is particularly acute in the former Soviet Union due to the disintegration of political authority. The problems of the major nuclear powers, however, are only symptomatic of a larger and growing global problem in ensuring the safety and security of all nuclear materials.

Nuclear Competition in South Asia

Both India and Pakistan are capable of producing nuclear weapons; both countries, moreover, are improving advanced delivery systems. India is believed to have produced enough plutonium for 40 to 60 weapons, while Pakistan, boasting fewer and less advanced facilities, has reportedly produced enough enriched uranium to manufacture between five and ten nuclear weapons. Both states possess aircraft and missiles capable of delivering nuclear warheads against major targets in the other country.²

International efforts to defuse the competition have met with only limited success. India rejects regional dialogue on security concerns; Pakistan rejects bilateral discussions without measures designed to address its concerns over Kashmir. Each side has proposed initiatives in the confident knowledge that they would be rejected by the other. Pakistan has become increasingly unable to respond positively to external initiatives, given the divisive nature of its domestic politics. In April 1994, a US proposal to begin talks on regional non-proliferation stalled after US Deputy Secretary of State Strobe Talbot failed to convince Pakistan to cap its nuclear program, in exchange for the delivery of the F-16s that

2. Leonard S. Spector with Jacqueline R. Smith, *Nuclear Ambitions: The Spread of Nuclear Weapons 1989-90* (Boulder, CO: Westview Press, 1990), 79.

Pakistan had already purchased from the United States. India once again rejected the US initiative for a regional dialogue as "absurd."³

Before the current impasse between India and Pakistan, relations improved sufficiently to allow the two governments to negotiate a number of minor CBM agreements, including a pledge not to attack each other's nuclear facilities (see table 6). The two governments also agreed to provide advance notification of military maneuvers along their shared border, to hold meetings between military field commanders, to establish a crisis communications link between headquarters, and to end violations of each other's air space.

Though a promising start, implementation of these measures reportedly has been uneven. The non-attack pledge was ratified in 1991, but did not enter into force until a year later due to delays in exchanging lists of declared facilities. The Siachen Glacier has been the site of repeated skirmishes over the past nine years as the two countries struggle to establish territorial rights. Neither government, moreover, has been willing to reduce military deployments along their shared border; since 1990 India has dramatically increased its troop presence in Kashmir. There have been no bilateral discussions on reducing tensions since January 1994. In the absence of a regional or bilateral security dialogue, with uneven implementation of CBMs, and with the prospect of new missile deployments, the potential for another flashpoint in South Asia remains of great concern.⁴

Accountability, Safety and Security of Nuclear Materials

The dismantlement of existing nuclear arsenals and acquisition of new nuclear weapons creates new security risks for all states. The international community is faced with a dual challenge: (i) to prevent and diminish the risk of nuclear accidents; and (ii) to thwart the diversion of nuclear materials to clandestine military programs.

The problem of preventing nuclear accidents or safety incidents is not new, but has grown more serious in the post-Cold War world. The

3. On previous US initiatives in South Asia, see Brahma Chellaney, "The Challenge of Nuclear Arms Control in South Asia," *Survival* 35 (Autumn 1993): 121-36. On Talbot's mission to South Asia, see Emily MacFarquhar, "Can South Asia's Nukes be Capped?" *US News and World Report*, April 25, 1994, 22; John Burns, "India Unmoved in Arms Talks with US," *New York Times*, April 9, 1994; and Thomas W. Lippman, "US Effort to Curb Nuclear Weapons in Peril as India Insists on Limits for China," *Washington Post*, July 7, 1994.

4. See Chellaney, 129-31. A brief summary of confidence-building measures between India and Pakistan can be found in Michael Krepon, Dominique M. McCoy, and Matthew C.J. Rudolph, eds., *A Handbook of Confidence-Building Measures for Regional Security*, Handbook no. 1 (Washington, DC: The Henry L. Stimson Center, 1993), 46-49.

Table 6: Bilateral Confidence-Building Measures in South Asia

Year Signed/Ratified	Agreement
1988/1991	<i>Agreement on the Non-Attack of Nuclear Facilities:</i> Requires annual exchange of lists detailing location of all nuclear-related facilities in each country. Both countries agree not to attack each other's facilities.
1990	<i>DGMO Hotline:</i> India and Pakistan agreed to use dedicated communication link (established in 1971) between Pakistani and Indian director generals of military operations on a weekly basis.
1991/1992	<i>Agreement on Prior Notification of Military Exercises:</i> Required for exercises involving 10,000 or more troops at specified locations. No military activity can occur within 5 miles of border. Corps and division level exercises are limited to certain distances away from border.
1991/1992	<i>Agreement on the Violation of Airspace:</i> Armed fixed-wing aircraft are not to fly within 10 nautical miles of international borders.
1992	<i>Joint Declaration on the Prohibition of Chemical Weapons:</i> Both countries agree not to develop, produce, acquire or use chemical weapons. No verification measures included.

Source: "Confidence-Building Measures between Pakistan and India," *A Handbook of Confidence-Building Measures for Regional Security*, Handbook no. 1 (Washington, DC: The Henry L. Stimson Center, 1993), 46-48.

United States and the Soviet Union both developed special personnel regulations, operational rules and procedures, and special mechanical and electronic safety devices to prevent the accidental or unauthorized detonation of nuclear weapons; yet even these elaborate procedures and mechanisms could not entirely prevent serious incidents from occurring. The downsizing process will place heavy strains on existing systems not only in Russia, but in the United States as well. Even less is known about the design of safety systems in threshold nuclear states and in proliferant states. The dismantlement of nuclear weapons and storage of nuclear materials pose additional environmental, health, and safety risks.⁵

New measures and procedures will be necessary to combat the growing risks of diversion of materials, as well. New supply chains have blossomed in the economic and social turmoil of the former Soviet Union and eastern and central Europe. Many of the best publicized cases of nuclear smuggling in 1994 involved loose collections of individuals and other amateur operators. The greatest threat, however, lies in emerging professional networks, which may involve former intelligence and military figures as well as organizations and rogue states intent on acquiring nuclear weapons. Preventing diversion of nuclear materials in a world of

5. On the safety of US nuclear weapons operations, see Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton Univ. Press, 1993).

more open borders will require higher standards of accountability, to ensure that accurate records of stocks of weapons and fissile materials are maintained. Greater cooperation among governments, national law enforcement agencies, and international organizations is vital to prevent diversion of weapons or fissile materials when weapons are transported and dismantled, warheads disassembled, and nuclear materials stored.

The United States has long maintained an elaborate system of controls over its nuclear weapons and materials, yet even this system is proving inadequate to the challenges posed by downsizing and dismantlement. In May 1994, Energy Secretary Hazel O'Leary admitted that the United States could not account for 1.2 tons of plutonium—enough for 300 weapons. Officials from the Department of Energy (DOE) rejected the possibility of theft, attributing the discrepancy to sloppy record-keeping at the Hanford weapons facility in Washington state, but the disclosure raises troubling questions about the adequacy of US accounting standards.⁶ The uncertain future of national laboratories and nuclear facilities in the United States may create new safety and security problems as well. Investigations in 1993–94 by the Office of Nuclear Safety in the Department of Energy identified problems with management and morale at a number of DOE facilities as the cause of several cases of intentional tampering with nuclear safety systems.⁷ The Defense Nuclear Facilities Safety Board, an independent agency created by Congress, for example, found a “widespread level of non-compliance” with safety rules and procedures at the Y-12 plant in Oak Ridge, Tennessee, which disassembles and stores uranium from 800 to 1,000 warheads annually. Safety violations were also reported at the Pantex plant in Amarillo, Texas, the disassembly and intermediate storage site for plutonium components from nuclear warheads.⁸ While the handling of plutonium involves inherent risks, a DOE assessment of current practices and facilities for plutonium storage identified nearly 300 environmental, safety, and health vulnerabilities at 13 separate sites, including problems with materials and packaging, facility conditions, and institutional practices.⁹ Efforts to

6. Josef H. Hebert, “Plutonium Production Remains Mystery to US,” Associated Press, *Washington Times*, May 21, 1994;

7. US Department of Energy, Office of Nuclear Safety, *New Directions in Nuclear Safety Management and Organization*, April 2, 1993, 34–35.

8. The most serious problem reported was the storage of uranium containers more closely together than allowed by safety rules. Though hundreds of violations were reported, DOE officials emphasized that most violations were low level, and that there was no danger of a nuclear chain reaction. See John T. Conway in Matthew Wald, “Inspection Halts Disassembly of A-Bombs,” *New York Times*, October 4, 1994.

9. US Department of Energy, *Plutonium Working Group Report on Environmental, Safety and Health Vulnerabilities Associated with the Department's Plutonium Storage*,

redress existing vulnerabilities, moreover, are unlikely to provide a long-term solution to the problem of storing and disposing with nuclear materials.¹⁰

Incremental improvements in standards of accounting, safety and security are helping to reduce the risks of accidents and diversions, but much remains to be done. As noted above, the Department of Energy is designing steps to improve interim storage. The Department of Defense has also taken initiatives designed to reduce the risk of accidental or unauthorized detonation of US nuclear weapons, including the installation of PALs on nuclear weapons deployed on US submarines, reductions in the number of personnel with access to weapons or control over weapons, and improvements in storage procedures. DOD is also considering new initiatives to improve Russian safety, security and use control.¹¹

The former Soviet Union poses a far greater threat to non-proliferation objectives and international security. The root of the problem is the great weakening of political authority in Russia and the continuing social upheaval in the country. Under the Soviet system, nuclear facilities enjoyed a significant degree of autonomy; the Russian Ministry of Defense, the Russian Atomic Energy Agency, MINATOM, and the directors of many nuclear facilities consequently are resentful of efforts to introduce outside inspectors and uniform accounting and safety standards. Insufficient funding, equipment, and personnel, and a lack of parliamentary support or interest, have also slowed improvements in nuclear safety standards. International concern about an emerging nuclear black market in the former Soviet Union was raised greatly after four incidents of nuclear smuggling from Russia to Germany were uncovered, the most serious of which involved 300 to 350 grams of plutonium-239. One of the cases subsequently was identified as a police sting operation. Such incidents nevertheless are an alarming indication of accounting and security problems in the former Soviet Union.¹² At the September summit of Russian and American leaders, Presidents Boris Yeltsin and Bill Clinton agreed to exchange detailed information on each country's respective

vol. 1: *Summary* (Washington DC: September 1994), 24.

10. For a discussion of the problems associated with the intermediate storage and long-term disposition of plutonium, see Committee on International Security and Arms Control, National Academy of Sciences, *Management and Disposition of Excess Weapons Plutonium*, pre-publication copy (Washington, DC: National Academy Press, 1994), 115-45, 147-231.

11. US Department of Energy, *Plutonium Working Group Report*; US Department of Defense, "DOD Review Recommends Reduction in Nuclear Force," News Release, September 22, 1994.

12. Mark Hibbs, "Plutonium, Politics, and Panic," *Bulletin of the Atomic Scientists*, November/December 1994, 24-30.

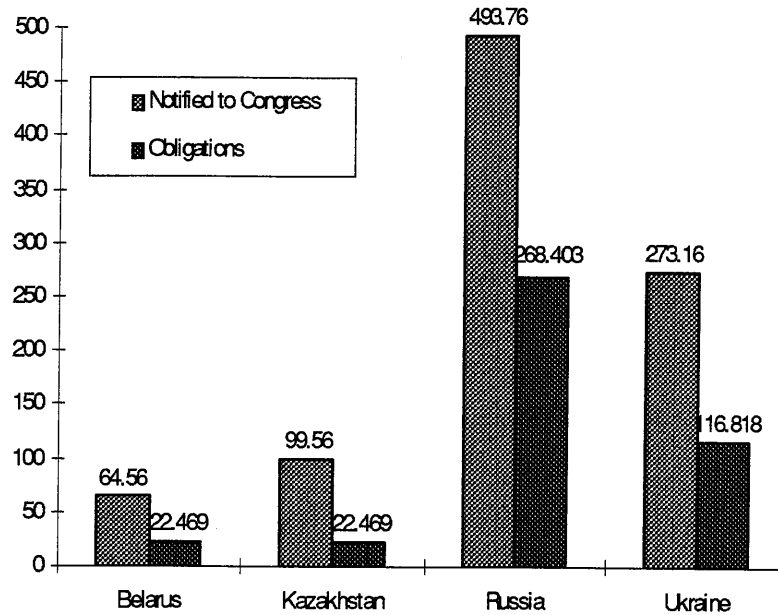
stockpiles of nuclear warheads and fissile materials, and on their safety and security, and to cooperate to ensure effective control, accounting and physical protection of nuclear materials, but the instability of political authority in the former Soviet Union will remain a formidable obstacle to the introduction of more effective mechanisms.¹³

Recognizing the growing risk of nuclear accidents or leakage in the former Soviet Union, the United States in 1991 passed the Soviet Threat Reduction Act, or the Nunn-Lugar amendment. The Cooperative Threat Reduction program is intended to assist the former Soviet republics in the safe and secure dismantlement of the Soviet nuclear arsenal, to ensure that disassembled components are adequately safeguarded, and to aid in the conversion of Soviet defense facilities to civilian production (see figure 6). The Congress has authorized \$400 million in aid each year, beginning in fiscal year 1992, but delays in implementation of the program have reduced the total to \$998 million in authority. In October 1994, the US Department of Defense reported that \$446 million, or 46 percent of all CTR funds, had been committed to the republics in support of dismantlement programs. An additional \$215 million, 22 percent of CTR funding, had been earmarked for the safe and secure transport and storage of nuclear weapons and materials, while \$110 million is to be directed toward improving security at nuclear plants and facilities and at national frontiers. The remaining \$115 million is designated for defense conversion programs. If the past is any guide, implementation of these commitments will be slow. Though the Congress in October 1994 had been notified of \$961 million in proposed obligations, and \$897 million had been committed for projects, actual obligations totalled only \$117 million. Implementation of the program has been slowed by the stipulation that US technology and expertise be used whenever possible, by delays in the negotiation of bilateral umbrella agreements with the former Soviet republics, and by the lack of effective partner institutions to implement the program in Russia and elsewhere.¹⁴

13. See Michael R. Gordon and Matthew L. Wald, "Russian Controls on Bomb Material are Leaky," *New York Times*, August 18, 1994; William J. Broad, "US Energy Chief Sees Russian Security as Lax" *New York Times*, August 18, 1994; Lee Hockstader, "Nuclear Materials Secure, Russia's Intelligence Chief Asserts," *Washington Post*, June 30, 1994; Lee Hockstader, "US, Russia Set Joint Crime Fight," *Washington Post*, July 6, 1994. For an overview of Soviet procedures, see CISAC, *Management and Disposition of Excess Weapons Plutonium*, 45-51, 119-21, 135-39.

14. See Ashton B. Carter, Assistant Secretary of Defense for International Security Policy, "Testimony on the Cooperative Threat Reduction Program before the Senate Foreign Relations Committee," 103rd Congress, October 4, 1994; US Department of Defense, "Second FY 1994 Semi-Annual Report on Cooperative Threat Reduction Program," October 30, 1994. On delays in the implementation of the CTR, see Dunbar Lockwood, "Purchasing Power," *Bulletin of the Atomic Scientists*, March/April 1994, 10-12; and idem, "Dribbling Aid to Russia," *Bulletin of the Atomic Scientists*, July/Au-

Figure 6. Current US CTR Funding Allocation (\$ millions)



Sources: US Department of Defense, "Second FY 1994 Semi-Annual Report on Cooperative Threat Reduction Program," October 30, 1994, photocopy.

American concern about the potential black market for nuclear materials has also inspired more creative solutions. In November 1994, US officials disclosed that the United States had completed the transfer of 600 kilograms of highly enriched uranium, enough for approximately 25 nuclear weapons, from Kazakhstan to the United States' Y-12 plant in Oak Ridge, Tennessee. The transfer followed months of sensitive negotiations between US authorities, the government of Kazakhstan, and Russian officials. The operation, code-named "Project Sapphire," could provide a useful model for future efforts to address the problems of nuclear diversion in the former Soviet Union.¹⁵

Though international attention has focused on the former Soviet Union, other countries may pose significant risks to international security

gust 1993, 39-41.

15. R. Jeffrey Smith, "US Takes Nuclear Fuel," *Washington Post*, November 23, 1994; Michael Gordon, "Big Cache of Nuclear Bomb Fuel Found in an Ex-Soviet Republic," *New York Times*, November 23, 1994.

as well. Very little is known, for example, about accounting, safety and security procedures in China, or in the threshold nuclear states. The clandestine nature of nuclear programs in these and other proliferant states may create even greater security risks. Preliminary studies of the Iraqi and South African nuclear programs, and of command and control systems, suggests that new proliferants may be running a substantially higher risk of nuclear accidents than the established nuclear powers. Where resources are limited, for example, countries may be unable to afford mechanical safety devices or modern warning sensors, rendering their arsenals more prone to accidents and false alarms. Weapon design may also be crude, as it was in the Iraqi case, increasing the likelihood of accidental detonations. And where countries perceive pressing security threats, the temptation will be strong to maintain nuclear forces on a high stage of alert, and to forego complicated assembly or code-clearance systems that might delay nuclear use.¹⁶

The need for greater transparency extends to countries with significant civilian nuclear programs, as well. Though formally committed to its non-nuclear status, Japan possesses a steadily growing stock of weapons-grade plutonium and recently completed the first of two fast-breeder reactors, which will produce additional plutonium. Though most governments have decided against using this type of reactor for safety and cost reasons, Japan remains firmly wedded to its existing program, though it has agreed to delay construction of the second reactor. Japan's persistent secrecy regarding its plutonium stocks has always been the source of some international concern, but revelations in August 1994 that Japan had contemplated pursuing a nuclear weapons program in 1969 led to calls for greater accountability and transparency. In response, Japan disclosed in November 1994 that it possessed roughly 14 tons of plutonium.¹⁷

The growing number of publicized nuclear incidents is likely to increase international concern about the management and disposition of fissile materials. A conference of the IAEA in September 1994 recommended improvements in safety measures, further study of the illicit trade

16. Sagan, *The Limits of Safety*, 266–67; Peter Feaver, "Command and Control in Emerging Nuclear Nations," *International Security* 17 (Winter 1992/93): 160–87. See also Scott D. Sagan, "Perils of Proliferation: Organization Theory, Deterrence Theory and the Spread of Nuclear Weapons," *International Security* 18 (Spring 1994): 66–107; and Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: N.W. Norton, 1995).

17. See David C. Morrison, "Heavy Metal," *National Journal*, October 22, 1994, 2457; David E. Sanger, "Japan, Bowing to Pressure, Defers Plutonium Projects," *New York Times*, February 22, 1994; Eugene Moosa, "Japan in 1969 Ensured Nuclear Arms Potential-Daily," *Reuters*, August 1, 1994; and "Japan to Disclose Size of Plutonium Stockpile," *Reuters*, October 17, 1994.

in nuclear materials, and assistance to member states in improving their controls on radioactive materials. Bilateral cooperation between the United States and Russia also appears likely to intensify. These initiatives represent helpful first steps, but much more will have to be done at the international, national and local level if the risks of nuclear accidents and diversion are to be effectively countered.

The Years Ahead: Recommendations for US Policy

For more than forty years, nuclear weapons played a central role in the national defense policies of major states, and in international relations. The United States and the NATO alliance came to believe that only the threat of nuclear annihilation could deter Soviet aggression. The Soviet Union, for its part, built a massive nuclear arsenal and integrated the possibility of nuclear warfare into its military planning. Over time, states developed an elaborate calculus of nuclear needs and a refined body of assumptions regarding the balance of risks and benefits associated with nuclear reliance. While many argue that nuclear weapons, in the end, exerted a stabilizing influence on the international system, others counter that the nuclear competition between the two superpowers brought the world perilously close to the brink of nuclear war on more than one occasion. Nuclear reliance may have conveyed benefits, but it also entailed significant risks.

The last four decades consequently have also seen concerted efforts by states and international organizations to reduce nuclear risks. The arms control efforts of the United States and the Soviet Union reflected the belief that an increase in the number of nuclear weapons did not lead to an increase in security and that limits on the overall number and on certain kinds of nuclear weapons could be stabilizing. Similarly, non-proliferation efforts have been motivated by a widely-held belief that any increase in the number of states possessing nuclear weapons would only increase the risks to human security and well-being. For even if nuclear weapons could convey certain stabilizing effects on regional conflicts, as some defenders of proliferation contend, *any* increase in the number of

states possessing nuclear weapons inevitably increases the chances of accidental or unauthorized use.

The task of reducing nuclear danger, however, has only begun. Additional measures will be necessary both to secure the advances of past years and to further diminish the risks that nuclear and other weapons of mass destruction pose to the security and well-being of all states and nations. Current trends are positive, but also subject to reversal. And the post-Cold War nuclear world contains new risks, as well. The dismantlement of thousands of nuclear warheads threatens to create a world awash in fissile materials, yet the international community is poorly equipped to face this challenge. And despite the first signs of movement toward a consensus that nuclear, chemical, and biological weapons should play a much reduced role in the affairs of states or nations, the five declared nuclear powers are far from giving up their weapons and certain outliers will continue to seek weapons of mass destruction, posing additional risks to national and international security.

If the progressive elimination of nuclear danger is to be achieved safely, urgent new policy issues will have to be addressed. Some of these issues demand immediate short-term action; others are more fundamental and are likely to require longer-term strategies and approaches. All will demand the involvement of government leaders at the highest level. Reducing nuclear danger will require the reaffirmation and strengthening of the existing non-proliferation regime; the design of new measures and mechanisms to address emerging nuclear risks; and consideration of future steps toward reducing nuclear arsenals.

As the world's leading military power, largest economy, and preeminent political force, the United States should play the leading role in eliminating the risks associated with nuclear weapons and in shaping the place of weapons of mass destruction in international politics over the long-term. As the events of the past year demonstrate, US leadership, or the lack thereof, can greatly influence the success or failure of international efforts to limit Cold War arsenals and slow the proliferation of nuclear, chemical, and biological weapons.

We therefore recommend that the US president take the initiative to further devalue nuclear weapons in international affairs. Our examination of the developments in the past year and current trends suggests four specific areas for action:

- (i) The United States should take a more active role in securing an indefinite and unconditional extension of the NPT. Extension of the NPT is the crucial first step toward reducing nuclear danger further.

- (ii) The president should initiate a national debate on the future role of nuclear weapons in US policy. The Nuclear Posture Review cannot be the final word on US nuclear policy.
- (iii) To address emerging nuclear risks, the United States should initiate an international dialogue on standards for the accountability, safety, and security of nuclear materials.
- (iv) The president should initiate an international dialogue at the highest levels on the long-term future of nuclear weapons.

Extension of the Nuclear Non-Proliferation Treaty

A reaffirmation of the Nuclear Non-Proliferation Treaty is the crucial prerequisite for all subsequent measures to limit nuclear danger. At this writing, a significant number of states have not declared their position on NPT extension. While many of these states may conclude eventually that extension would serve important national or regional security interests, the preparatory conferences to the NPT have revealed a deep level of skepticism regarding the commitment of the nuclear states to Article VI of the treaty. Many states view the NPT review and extension conference as a powerful form of leverage over the policies of the nuclear states, and will be reluctant to grant significant extension if further progress toward nuclear disarmament and, particularly, the completion of a CTBT, looks uncertain. Failure to extend the NPT indefinitely would send a dangerous signal to potential proliferators and might weaken the entire non-proliferation regime, reversing the positive trends of the past year and increasing the danger of nuclear accidents or use. While extension of the NPT would not ensure the longevity of the regime, a reaffirmation of the treaty would at least stabilize the current situation and give the international community time to consider future actions or supplemental approaches to non-proliferation.

As a first step, the United States must redouble its diplomatic efforts to conclude a comprehensive test ban treaty and to secure an unconditional and indefinite extension of the NPT. This will require stepping up the pace and level of diplomatic initiatives and contacts, both in the negotiations for a CTBT and in the preparations for the April NPT conference. To achieve an indefinite extension of the NPT, US efforts should be directed toward enlisting the support of key regional states, and toward persuading governments that extension would be in the security interests of *all* states—and not just a concession by non-nuclear signatories to the nuclear powers.

Once an extension has been secured, the international community could begin to explore additional measures to strengthen the norm against non-proliferation. A number of observers, for example, have suggested the passage of a UN Security Council resolution declaring that proliferation

is a threat to international peace and security, and requiring mandatory sanctions against proliferators.

Future Roles of the United States' Nuclear Weapons

Though the calculus of nuclear risks and benefits has changed fundamentally for the United States, the Nuclear Posture Review reaffirmed traditional assumptions and beliefs. The outcome of the review is understandable, given the constraints and pressures associated with a Defense Department review of this nature and the current uncertain international environment.

The end of the Cold War and dissolution of the Soviet Union have eliminated many of the traditional rationales for US nuclear weapons, while the spread of advanced technologies increases the chances that the United States will face a regional adversary armed with weapons of mass destruction. While the preservation of certain nuclear options may appear desirable in the near-term, continued US reliance on nuclear deterrence could have negative long-term consequences for its non-proliferation objectives that are unwarranted in light of the United States' overwhelming conventional superiority.

Maintenance of the even smaller nuclear force envisioned in the Nuclear Posture Review could entail a considerable financial cost. According to one estimate, the United States could spend \$40 billion a year to preserve its nuclear forces at START II levels; this is in addition to the \$4 trillion that the US already has spent on its nuclear forces over the last fifty years.¹ We may well have reached the time when the costs and risks associated with weapons of mass destruction exceed their benefits to US national security. This possibility merits close analysis of a far-reaching type, not provided by the Nuclear Posture Review.

The consequences for non-proliferation objectives of the United States' continued reliance on nuclear deterrence also deserve particularly close scrutiny. Many would argue that US nuclear guarantees serve an important non-proliferation objective and that the withdrawal of these assurances might erode the consensus against the possession of nuclear weapons in Germany, Japan, and perhaps in other non-nuclear states as well. On the other hand, the recent reaffirmation of nuclear deterrence by the United States suggests that nuclear weapons have broader military and political values than simply deterring their use by others. In short, the nuclear postures and policies of the United States and of other nuclear states may either aggravate or ease pressures for proliferation, depending

1. Steven M. Kosiak, *The Lifecycle Costs of Nuclear Forces: A Preliminary Assessment* (Washington, DC: Defense Budget Project, October 1994).

on the particular regional context. If extended deterrence were seen to offer continued justification for the special status of the declared nuclear weapon states, countries that now rely on US nuclear assurances might reject both an independent nuclear capability and dependence on the US nuclear guarantee. The implications of US nuclear policies and postures for its non-proliferation objectives, as well as alternatives to nuclear security assurances, need to be explored in greater depth.

It is time for a broader debate on the long-term role of nuclear weapons in US defense policy. Prominent members of the US strategic community already have suggested that nuclear weapons have little utility beyond the deterrence of their use by others, and that the United States therefore might contemplate reductions, in cooperation with others, to significantly lower levels. Various proposals also have been put forward with regard to alternative nuclear end-states. A number of former high-ranking military officers and defense officials have suggested that the United States, in conjunction with other nuclear powers, could reduce its arsenal from START II levels of 3,000 to 3,500 nuclear weapons to a minimal deterrent of a few hundred nuclear weapons, assuming that progress toward democratic reform in Russia continues and the situation elsewhere in the former Soviet Union and in East Asia stabilizes. A number of analysts have also suggested relatively rapid movement to even lower levels, with the ultimate objective of eliminating all weapons of mass destruction, an objective that would raise additional challenges with regard to verification and safeguards against potential cheating or a sudden break-out from the regime. These alternatives, of course, need not be mutually exclusive, and might indeed be pursued as part of a step-by-step strategy. But near-term steps should be linked to a clear vision regarding the optimal nuclear end-state for the United States.

Presidential involvement will be needed to initiate this discussion, and Congress has a crucial role to play as well. Both parties share an interest in minimizing nuclear dangers, and in ensuring that the United States has the most effective non-proliferation policy. Alternative nuclear end-states have broad implications for US foreign policy and relations with other states, and have clear consequences for other aspects of US defense policy, including the development of defensive systems and the maintenance of US conventional forces. Congressional participation in the discussion of nuclear alternatives is a crucial first step in forging a new public consensus on US nuclear policy. Without debate, however, the United States could drift into continued reliance on nuclear weapons with an incomplete understanding of the long-term trade-offs or risks associated with such a course.

International Cooperation on Nuclear Safety and Security

New measures are also urgently needed to address emerging nuclear risks. The National Academy of Sciences' Committee on International Security and Arms Control estimates that the dismantlement of US tactical and strategic nuclear warheads will yield 60 tons of plutonium; Soviet warheads targeted for dismantlement are estimated to contain between 50 and 70 tons of plutonium (see figure 7).² And stocks of civilian plutonium may be growing by 60 to 70 tons a year. Even advanced industrial countries have difficulty accounting for all their plutonium. Though little is known about procedures elsewhere, threshold nuclear states and countries with clandestine nuclear programs presumably have encountered similar problems. Without more stringent international standards for accountability, safety, and security, the risks of nuclear theft, diversion, or accident will multiply, undermining non-proliferation and arms control objectives, and posing grave threats to human health and safety, and to the global environment.³

To address these risks, the United States should initiate an international dialogue on standards of accountability, safety, and security of nuclear materials. The United States has already made a promising start; a bilateral dialogue with Russia—termed “Mutual Assured Safety”—is intended to improve the security and transparency of nuclear weapons and fissile material under US-Russian control.⁴ The forum could be expanded fruitfully, however, since safety issues concern all states that manage nuclear materials. An explicit focus on nuclear materials, moreover, rather than on nuclear weapons, would provide a means of engaging threshold nuclear states and countries of proliferation concern, which might otherwise refuse to participate. The agenda might include, but not be limited to, the following issues:

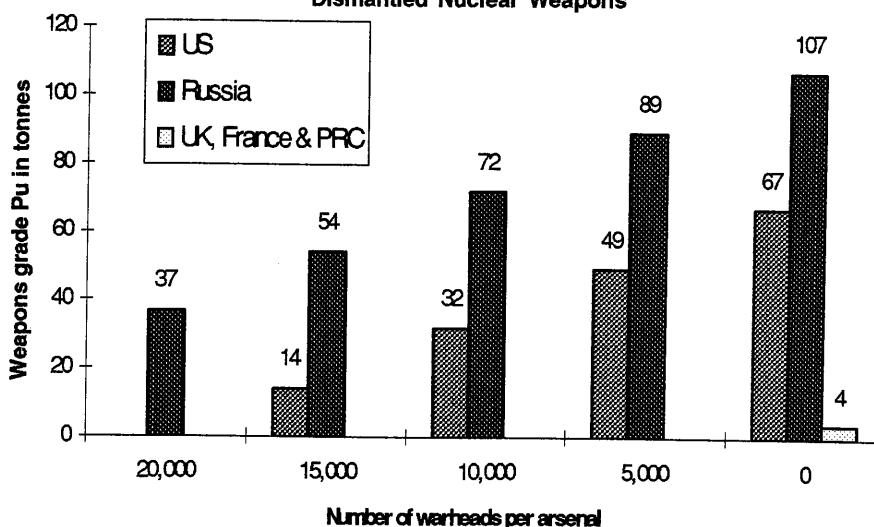
- *International accounting standards for nuclear materials.* More stringent controls on inventories of fissile materials would strengthen efforts to combat proliferation, and enhance confidence in ongoing arms reduction processes.

2. Committee on International Security and Arms Control, National Academy of Sciences, *Management and Disposition of Excess Weapons Plutonium*, pre-publication copy (Washington, DC: National Academy Press, 1994), 27, 41–51.

3. Other sources predict even larger stockpiles. See David Albright, Frans Berkhout and William Walker, *World Inventory of Plutonium and Highly Enriched Uranium, 1992* (Oxford: Oxford Univ. Press, 1993), 208.

4. “Remarks by Secretary of Defense William J. Perry,” *The Henry L. Stimson Center Award Presentation to Secretary of Defense William J. Perry, September 20, 1994*, (Washington, DC: The Henry L. Stimson Center, November 1994), 16–17.

Figure 7. Amounts of Weapons Grade Plutonium Released from Dismantled Nuclear Weapons



Source: David Albright, Frans Berkhout and William Walker, *World Inventory of Plutonium and Highly Enriched Uranium, 1992* (Oxford: Oxford Univ. Press, 1993), 208.

- *Fissile material production cutoff.* As part of its non-proliferation initiative, the Clinton Administration in September 1993 proposed a global ban on the production of fissile materials for weapons; many non-nuclear states strongly support a production ban as well.
- *Information exchange on safety and security mechanisms for the handling and storage of nuclear materials.* Under the Cooperative Threat Reduction program, the United States shares information with Russia regarding security practices for nuclear weapons and materials; this discussion could be expanded to include all other states that manage and store nuclear materials, particularly in light of the large and growing stockpiles of civilian plutonium.⁵
- *Joint safety studies and risk assessment.* The United States has already undertaken studies to identify unsafe practices and procedures for handling nuclear materials and weapons. Other countries may have encountered similar problems. Joint study of safety issues and procedures could contribute to the design of better safety systems and thus reduce the risk of nuclear accidents.

5. See the proposals put forth in Scott D. Sagan and Benjamin A. Valentino, *Nuclear Weapons Safety after the Cold War: Technical and Organizational Opportunities for Improvement: A Report of a NATO Research Workshop August 25-27, 1994* (Stanford, Calif.: Center for International Security and Arms Control, Stanford Univ., 1994), 4-5.

- *Personnel reliability.* The downsizing of nuclear arsenals in the United States and Russia and budgetary pressures have led to reductions in staffing at many nuclear facilities and a climate of uncertainty regarding employment security. Measures to ensure the reliability of the personnel responsible for nuclear materials and weapons would help to reduce the risks of diversion and of nuclear accidents.

To address the more immediate dangers in the former Soviet Union, the United States should also increase financial and technical assistance under the Cooperative Threat Reduction program, and accelerate its implementation. The program is providing valuable assistance to the former Soviet republics as they dismantle their nuclear weapons, and the United States would reap substantial national security benefits if funding were increased significantly. As the program has gathered momentum, requests for assistance have begun to outstrip available funds. Additional technical and financial aid, for example, could be used to speed the destruction of Russia's solid-fuel ballistic missiles and chemical weapons arsenal.

Multilateral Dialogue on the Nuclear Future

A debate on the future of mass destruction weapons is needed in the United States. But it must be extended to other countries as well, especially the five declared nuclear weapon states. Alternatively, new structures or formats might be designed to acknowledge significant changes in power relations among states and the emergence of important de facto nuclear states.

The United States is not the only state for whom the calculus of nuclear risks and benefits has changed fundamentally. In the current period of transition, all states and nations are confronted with profound questions and choices. What is the military or political utility of weapons of mass destruction in the new international environment, and what risks, particularly for non-proliferation objectives, does continued nuclear reliance imply? Is a two-tier non-proliferation regime viable in the long-term? If not, then what should be the long-term objective of future arms control and non-proliferation policy? What is the most desirable nuclear end-state? And what transitional strategies would be appropriate to achieve that objective, however defined?

A broader international dialogue on the nuclear future would also address the central questions that the NPT review conference is likely to leave unanswered. The extension of the NPT is a crucial first step toward further reducing the risks of a proliferated world, but it will not ensure the longevity of the NPT's dual standard for nuclear possession. At issue is the sustainability of a system that sanctions nuclear possession by the five declared nuclear powers but condemns all other states who aspire to the same status.

The events of the past year suggest that the international community has reached a turning point with regard to the role of weapons of mass destruction in global politics. While many states appear to be inching toward the gradual de-legitimization of these weapons, the consensus on non-proliferation remains fragile at best. In this period of transition, it is important to limit and narrow the current drift into continued reliance on nuclear weapons. The profound changes in the international system, and grave risks to international security that a more proliferated world would entail, demand a fundamental review of past assumptions and policies. Only the United States is capable of providing the leadership and strategic vision necessary to initiate and shape the debate on the future of mass destruction weapons.

