

# F.A.S. PUBLIC INTEREST REPORT

DEEP  
REDUCTIONS

Journal of the Federation of American Scientists (FAS)

Volume 42, No. 7

September 1989

## Deep Reductions: Old Arguments Confront New Realities

The Cold War is over and the arms race is nearing its end. To see how rapidly the future will unfold, we should reflect on how rapidly the past has shifted.

The "iron curtain" of 1953 gave way, a decade later, to the John F. Kennedy-era "long twilight struggle" and the Limited Test Ban Treaty of 1963. By 1973, after another decade had passed, we saw the era of "detente" and an anti-ballistic missile treaty that confirmed the mutual vulnerability of both sides. By the mid-eighties, after another decade, we saw the new Soviet era unfold: glasnost had replaced the iron curtain of thirty years before; the INF Treaty provided real "disarmament;" and a Soviet leader, Mikhail Gorbachev, became, in public opinion polls, one of the persons most respected by American citizens. In parts of Western Europe he was more respected than the American President!

### Fifteen Years to Deep Reductions?

By this standard, 1993 and 2003 should permit really substantial disarmament. And many of the signs confirm this possibility. The drive for a Star Wars defense appears to have been contained by such factors as Reagan's retirement, Gorbachev's openness, economic distress and the failure of the Star Wars backers to come up with an actionable plan. US planners are having real trouble building and paying

for both new fleets of strategic bombers—B-1 and B-2—and even with the new Trident missile. Confidence in the military-industrial complex has hit a new low.

The Soviet Union has given up the arms race challenge and is openly ready to try disarmament of any kind. Recently, it even accepted what amounted to inspection without disarmament—a truly incredible concession by pre-Gorbachev standards. As FAS knows better than anyone, the Soviet Government is absolutely open, now, to new suggestions that might rid itself of the arms burden that it can no longer tolerate.

The Soviet Government is going well beyond what cynics called the strategy of "denying the US an enemy;" it is providing the American public with a daily inside glimpse at a newly three-dimensional society coping with grave internal problems that preclude a return to arms race. When a visiting House of Representatives delegation from the Armed Services Committee can give advice to a newly formed counterpart committee of the Supreme Soviet on how to cut the Soviet defense budget, a new world has emerged. And when Les Aspin finds them eager for just such cuts, disarmament has to be somewhere around the corner.

You name the objection to arms control and Gorbachev is working to remove it from the agenda: Afghanistan, Cambodia, Human Rights, Nicaragua, Angola,

*Continued on page 2*

## BEYOND START: DEEP REDUCTIONS IN STRATEGIC NUCLEAR FORCES

*Thomas K. Longstreth*

The current thaw in US-Soviet relations suggests that possibilities for progress in arms control considered remote several years ago may now become a reality. Witness, for example, the dramatic progress that has occurred over the past year in efforts to reduce the conventional military confrontation in Europe.

Several economic, political, and military developments are driving the momentum towards greater cooperation on arms reductions and other East-West issues. Economic catastrophe in the East and less severe, but still pressing economic difficulties in the West are convincing political leaders in both the US and USSR of the need to reduce military spending. Public sentiment will continue to support diverting funds from defense, particularly spending associated with nuclear war, to other problems considered more immediate: the environment, health, education, crime.

The political change that has been unleashed inside the Soviet Union and in Eastern Europe by Gorbachev and

other forces is nothing short of revolutionary. Even if there is a temporary retrenchment in the political reform under way there (which does not, at this stage, appear likely), it is difficult to imagine that the Soviet Union will return to the internal political system that existed before Gorbachev came to power. The opportunities that this opens up for Soviet-American cooperation in arms control are striking.

Even the respective military establishments of the two sides seem caught up in the spirit of greater cooperation and dialogue. There has been a growth in military-to-military visits and agreements to prevent dangerous incidents between East and West military forces. Even Chairman of the Joint Chiefs of Staff, Admiral William J. Crowe, said recently of the Russians, "They're not my enemy."

This background of profound economic problems, sweeping political change, and greater military cooperation provides reason enough to consider other, more ambi-

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conventional force imbalances in Europe, repression of Eastern Europe, etc. At the rate things are moving, one wonders what the bureaucratic opponents of disarmament will have to say in their internal memos.

But something will be said. Just as every criminal defendant has some kind of defense, the institutions and ideologies friendly to continued arms competition will have arguments. In the accompanying article, some of the arguments are listed and answered; the non-expert reader will be startled, we think, at how anachronistic they sound in the Gorbachev era.

That 100 clandestine missiles would be more significant at lower levels of weaponry, for example, is not going to be a persuasive argument against disarmament in an era in which the Soviet Union not only is open to satellites but is proposing more ground inspection anytime, anywhere, than the US can itself accept. Openness is outrunning fears of cheating.

The arms race, today, is living on borrowed time. Even the willingness of each side to continue to maintain weapons in the number now purchased is dropping fast. Disarmament may eventually be the child of a common wish to lower inventory levels for economic reasons if nothing else. Indeed, the political obstacles to disarmament drop away, motivations for reductions that are of less than cosmic strength may carry the day: irritation at the waste, fear of the inadvertent holocaust, desire to clean up the weapons-production complex, loss of faith in the aerospace industries competence to deliver, and, above all, all kinds of other human needs competing for resources.

#### Preconditions of Disarmament Here?

Reading Thomas Longstreth's essay on some aspects of deep reductions, one cannot escape the feeling that the preconditions of deep reductions have completely overrun the planning for them. Much more will be feasible much sooner than the bureaucracy expects. So as the arguments for the arms race weaken, someone must begin laying the groundwork for running the arms race in reverse.

In Longstreth's references to Percentage Annual Reductions, FAS is reminded that this Vienna Summit proposal of President Carter was invented and advanced here. So we understand well that the purpose of the notion of asymptotic reductions to zero—in which zero would never be reached but only approached with steady 5% or 7% reductions per year—was to start a process that could be continued, year after year, with a minimum of new negotiations and complicated treaties. Moreover, we sold it, to the Carter Administration and others, as a treaty process that could be started, and maintained, with bilateral agreement on only one number, the percentage itself.

If and when deep reductions are ever achieved, some notion as simple as this will have to have been adopted. And some President will have to have seen disarmament as a political opportunity to achieve his economic and foreign policy goals. But it seems, increasingly, that not too much more than such a Presidential will is required to set the world on a deep reductions path. ■ —*Jeremy J. Stone*

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The FAS Public Interest Report (USPS 188-100) is published monthly except July and August at 307 Mass. Ave., NE, Washington, D.C. 20002. Annual subscription \$25/year. Copyright © 1989 by the Federation of American Scientists.

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tious arms control objectives; including truly deep reductions in the nuclear arsenals of the superpowers.

Very deep reductions and even the elimination of nuclear weapons have been the stated objectives of American and Soviet leaders since nuclear weapons were invented. Yet the goal continues to elude us. And despite the public perception that the danger of nuclear war is receding, each side's strategic nuclear arsenal continues to increase both in quantity and effectiveness, complicating attempts at reductions.

While policy-makers have failed over four decades of effort to reduce Soviet and American strategic arsenals significantly, the present period of better Soviet and American cooperation provides renewed hope that such deep cuts will yet be realized.

### A Modest START

In 1982, Ronald Reagan introduced the Strategic Arms Reduction Talks (START) as a significant departure from past negotiations and agreements because, unlike the SALT II Treaty, which he criticized for "legitimizing an arms race," START would achieve "truly substantial reductions" in the strategic forces of both sides.

However, because of the growth in arsenals since the negotiations began, and the liberal counting rules under the draft treaty's terms, the fact is that deep reductions will not result from START. At best, the strategic arms reduction treaty still under negotiation in Geneva will achieve a 35 per cent reduction in current warhead levels rather than the commonly advertised 50 per cent. This is because the START aggregate ceiling of 6,000 on ballistic missile warheads and air-launched cruise missiles (ALCMs) excludes thousands of nuclear gravity bombs and short-range attack missiles (SRAMs) carried on strategic bombers. At this

stage, it also excludes hundreds of long-range, nuclear sea-launched cruise missiles (SLCMs) to be deployed on each side that are, arguably, "strategic" weapons.

Consequently, even after the START reductions are fully implemented—which under the most optimistic of schedules will not occur until the mid-to-late-1990's—the aggregate totals of US and Soviet strategic nuclear weapons will remain at about the level they had reached in January 1981, when Ronald Reagan became president [see accompanying chart], or somewhere in the neighborhood of 9,000 weapons on each side, even excluding SLCMs.

Thus, after decades of arduous negotiations, the capacity of each side's arsenal to wreak unimaginable damage will be unchanged. Like SALT II, START will halt the growth of strategic forces by imposing some quantitative limits but will still allow much of the qualitative arms race to continue. It will not be a radical departure from previous strategic arms control efforts and will require only modest changes in US and Soviet strategic modernization programs.

This is not to imply that START will have no positive effect in reducing the risk of nuclear war. Symbolically, it represents the first success since SALT II in bringing some control over the central strategic arms competition. Substantively, it will make certain contributions—such as reducing the capacity for and risk of a preemptive strike by eliminating a disproportionate share of fixed, land-based ICBMs. How much of an impact START will have on improving strategic and crisis stability and on maintaining controls that have prevented a race in anti-ballistic missile (ABM) weapons over the past two decades will depend to a large extent on certain terms and parameters that have yet to be agreed upon.

Facing a post-START world of 9,000 strategic weapons

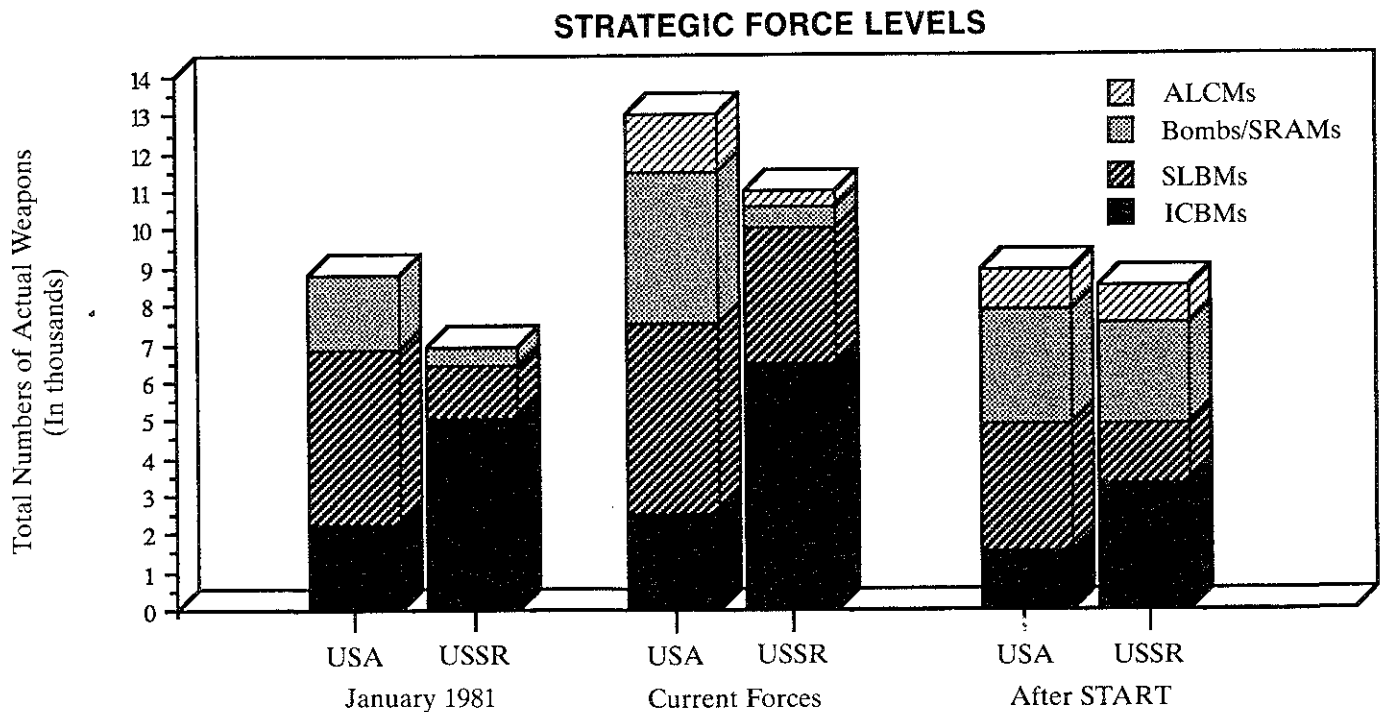


Chart prepared by author. Sources for data include DoD, RAND, NRDC.



Practice loading of nuclear short-range attack missile (SRAM) onto FB-111 strategic bomber. Such weapons are under-counted under the terms of the draft START Treaty.

on each side, policy-makers will be forced to consider further steps: whether to move to deeper reductions, how to structure such an agreement, and how far to go.

### Preconditions for Deep Reductions

One aspect of the debate over deep reductions that analysts have wrestled with is the question of what political and security conditions would have to be met before the two sides might be willing to enter into such an ambitious arrangement.

One set of preconditions might be termed "institutional" or "structural." Some would argue that such a radical transformation as very deep reductions would represent a direct challenge to those institutional interests (e.g. the military, defense contractors, etc.) with the largest stake in the current structure. Such interests, it is argued, could never be expected to support reductions on a scale that would diminish their influence or profits.

The historical role of the "military-industrial complex" in thwarting certain arms control efforts cannot be discounted—witness the role of national labs and the military in blocking a comprehensive test ban. If indeed a transition is under way from the Cold War to a much more benign period of relations between the US and USSR, it will be a painful transition for many, challenging a number of long held assumptions.

Another type might be termed "international security" preconditions. In testimony before Congress after the October 1986 Reykjavik Summit meeting between then-President Reagan and Soviet General Secretary Gorbachev, Reagan's senior arms control adviser Paul Nitze mentioned three such preconditions that would have to be met before the United States could agree to *eliminate* all nuclear weapons (according to Nitze, these criteria did not apply to Reagan's proposal to eliminate all ballistic missiles). First was "a rectification of the current imbalance" in conventional forces. Second was "an effective verifiable ban on chemical weapons." Third was an improvement in regional tensions in Afghanistan, Nicaragua, and other trouble spots.

While most analysts would agree that the preconditions for deep reductions should be less stringent than for the complete elimination of nuclear weapons, they would support the notion that a lessening of the Soviet conventional military threat to Western Europe would be a necessary precondition to any post-START nuclear reductions. Recent progress at the talks on Conventional Forces in Europe (CFE) that have been taking place in Vienna since March, as well as Soviet President Gorbachev's December 1988 announcement of dramatic unilateral reductions in Soviet military forces, offer the promise of satisfying that precondition in the near future. In addition, significant progress on a chemical weapons ban has also been made in recent months, and the Soviets are demonstrating an interest (e.g. through their withdrawal from Afghanistan) in drawing down regional tensions across-the-board. Thus, it is entirely possible that most or all of the preconditions that Nitze established for the *elimination* of nuclear weapons will be met within the next five years.

### Why Deep Reductions?

But, if by the mid-1990's the US and the USSR are able to conclude a START Treaty and the Eastern and Western military alliances agree to reduce the conventional military confrontation in Europe, these agreements would, by themselves, represent significant accomplishments. Some would argue that arms control efforts should then focus on other issues besides deep reductions; for example, nuclear and missile proliferation.

Another objection likely to be raised by the experts would be along the lines of the following: Even if we were able to reduce each side's weapons to 1,000 or even a few hundred, such a force would still be capable of destroying either country. What's the difference between that and the situation that exists today? In other words, arms agreements should not focus on reductions because reductions aren't important, stability is important.

In 1961, arms analysts Thomas Schelling and Morton Halperin established three main objectives for arms control that became widely accepted as criteria against which to measure the success of arms control. First was the objective of reducing the risk that war would occur. Second was to reduce the damage to civilization if deterrence should fail and war should erupt. Third was to reduce the costs of the arms race. Of these three criteria, a START agreement would only make a significant contribution to the first, while an agreement on very deep reductions at least holds the promise of contributing to all three.

Both superpowers face economic conditions that indicate defense spending will continue to decline for the foreseeable future. Yet, a START agreement will do little to alleviate the burden of expensive strategic weapons, and instead is likely to be used to justify new programs, as is already the case with respect to the \$70 billion B-2 Stealth bomber, the \$30 billion Midgetman ICBM, and \$15 billion rail-mobile MX ICBM. Only after deep reductions could the US and USSR hope to realize any major cost savings from a smaller requirement for new strategic forces.

Reducing the impact if deterrence fails—often referred to by the short-hand term “damage limitation,” has taken on a new meaning with the advent of predictions of a “nuclear winter”—the theory that a climatic catastrophe for the planet could occur if only a few hundred nuclear weapons were exploded. The nuclear winter theory remains highly controversial, but its discovery has at the very least created a new rationale for wanting to seriously examine very deep reductions. Richard Turco and Carl Sagan, scientists well known to the public for their work on nuclear winter, have argued that “The smaller the arsenals, the less likely it is that errors will be catastrophic” and have advocated that American and Soviet strategic force levels be reduced to 100-300 warheads on each side.

Another reason for pursuing deep reductions is a political one. It is difficult to imagine that the public will remain complacent for long about a post-START world that still contains on the order of 9,000 strategic weapons and perhaps 10,000 more tactical nuclear weapons on either side. And if the current promise of improved East-West cooperation and significant arms control accomplishments bears fruit, the public’s appetite for additional measures may actually increase.

In addition, the argument remains valid that a successful effort by the US and the USSR to truly reduce their own arsenals could help slow the “horizontal” spread of the nuclear arms race to new nations. If, after decades of effort, the best that the US and USSR can achieve is an agreement that still leaves them with enormous strategic arsenals, there is little incentive for the other nuclear powers or threshold nuclear nations to slow their own nuclear development. In fact, the United States remains legally committed under Article V of the Nonproliferation Treaty to pursue “a cessation of the nuclear arms race at an early date and to nuclear disarmament . . .” (It is similarly obligated under domestic law, via the 1963 Arms Control and Disarmament Act.)

Some civilian analysts support deep reductions as a means of moving US deterrent policy away from a “war-fighting” doctrine, with its ever-escalating requirements for more and better weapons, towards a policy in which nuclear weapons could only be used as a weapon of last resort. As Professor Richard H. Ullman has put it, “Perhaps the most important argument is that only drastic reductions would bring the sizes of the superpower arsenals into correspondence with the reality that nuclear weapons are instruments of mass destruction that are virtually unusable for military purposes.”

### Previous US-Soviet Attempts at Deep Reductions

Since the mid-1940’s, the United States and Soviet Union have undertaken numerous attempts—some more serious than others—to either eliminate or reduce drastically their nuclear arsenals.

In 1946, the US put forward the Baruch plan (named for Truman advisor Bernard Baruch) at the newly-created United Nations Atomic Energy Commission. Under the Baruch plan, the US proposed to both eliminate its mo-

nopoly of the few existing nuclear weapons and place all nuclear activity under international control. There is considerable doubt today as to whether the Baruch plan was put forward seriously, but it was rejected by the Soviet Union for a number of reasons, including a disagreement on sequencing—while the US offered to dismantle its existing weapons only after the Soviet nuclear program was put under international control and scrutiny, the Soviets wanted the weapons destroyed first.

The next period of serious negotiations on comprehensive disarmament took place between 1955-57. A Soviet plan presented at the United Nations on May 10, 1955, in part based on an Anglo-French proposal to reduce and eventually eliminate both conventional and nuclear forces in stages, was widely regarded by Western negotiators as the first serious Soviet comprehensive proposal, since it included far more numerical specificity than had previously been seen. Of note, in 1955 the US pulled back from its previous commitment, under the Baruch Plan, to total nuclear disarmament.

The climax of this period of disarmament proposals and counter-proposals took place at the five-power negotiations in London in 1957. At this meeting, the US and USSR narrowed differences over a range of issues, including a comprehensive test ban, a halt in production and reduction in nuclear weapons stockpiles, conventional arms reductions, and nonproliferation.

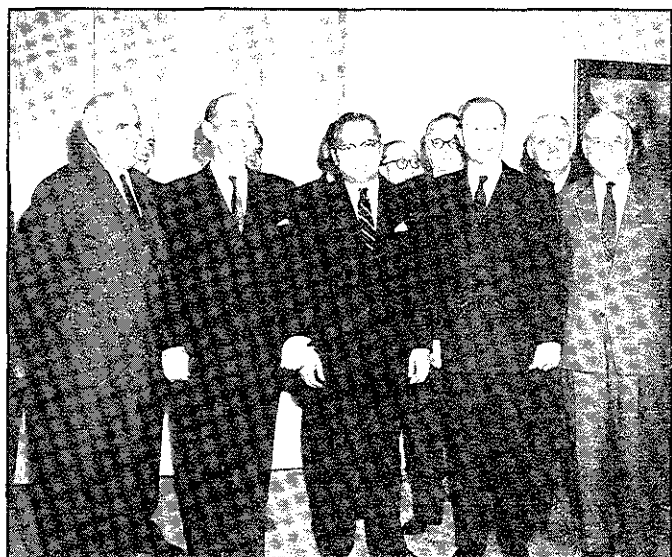
However, differences remained. The US pushed for a ban on the production of fissionable material for weapons purposes and reductions in warhead stockpiles, but did not envision their total elimination. The Soviets, who argued that the US had a larger materials stockpile from which it could fabricate additional weapons, argued for total nuclear warhead and materials elimination. These talks ultimately collapsed for a variety of substantive and internal political reasons.

### General and Complete Disarmament

Soviet and American discussions from 1958-60 were intended primarily for public consumption and little progress was achieved. In 1959, Soviet leader Nikita Khrushchev achieved a minor propaganda success when he introduced a proposal at the U.N. for “General and Complete Disarmament”—including conventional reductions down to



Soviet Ambassador Andrei Gromyko (left) and US Representative Bernard Baruch confer at United Nations in 1946.



*John McCloy (far left) and Valerian Zorin (far right) pose at UN in 1962 with: (from left to right) Adlai Stevenson, U. Thant, and Vasily Kuznetsov.*

small militias and the elimination of nuclear weapons "with effective control."

After he entered office in 1961, John F. Kennedy took immediate steps to begin serious negotiations with the Soviets on "general and complete disarmament." One early accomplishment of this effort was a general framework for disarmament worked out by chief negotiators John McCloy of the United States and Valerian Zorin of the Soviet Union, presented to the U.N. in September 1961.

The McCloy-Zorin framework appears rather Utopian by today's standards: not only did the two sides agree on the objective of "the elimination of all stockpiles of nuclear, chemical, bacteriological, and other weapons of mass destruction," but also the "disbanding of armed forces" and "the discontinuance of military expenditures." While the McCloy-Zorin Joint Statement did not lead to any major agreement, some saw it as an important political step that facilitated the resumption of serious discussions after the relatively barren period of the late 1950's.

However, disarmament efforts soon took a back seat to rising tensions between the superpowers, culminating in the Cuban Missile Crisis. After the events of October 1962, each side's interest in arms control seemed renewed with a special sense of urgency, but Kennedy, Khrushchev and their advisers elected to take on the nuclear arms control agenda in a step-by-step fashion—the principal early accomplishments being to establish a direct communications link via the 1963 "Hotline" agreement and a ban on certain types of nuclear tests under the Limited Test Ban Treaty.

### The SALT Era

The advent of the SALT talks in 1969 put more comprehensive efforts at nuclear reductions on hold as the US and USSR sought a partial regime that put a "freeze" on additional offensive delivery systems (launchers) while closing off a race to deploy large Anti-Ballistic Missile (ABM) systems in order to reduce the incentive for addi-

tional offensive weapons to overcome strategic defenses. Unfortunately, the 1972 SALT I Agreement failed to place a ban on the development and deployment of multiple independently-targetable reentry vehicles (MIRVs), a failure that allowed each side to increase by several fold its number of deliverable warheads without increasing the number of launchers.

### Carter and Reagan, the Nuclear Radicals

Both Jimmy Carter and Ronald Reagan, each in his own way, revived serious high-level discussion of radical approaches to nuclear arms control.

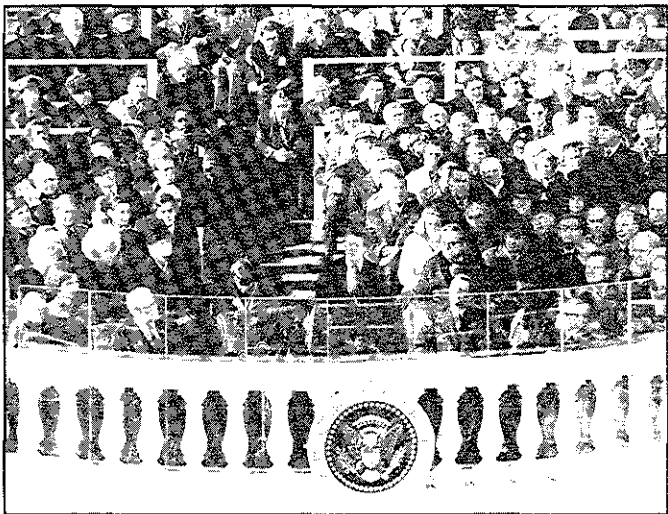
After being elected in 1976, Carter was anxious to have a major impact in curtailing the nuclear arms race. In his inaugural address, Carter stated that the "ultimate goal" of the United States under his administration would be "the elimination of all nuclear weapons from this earth." In his memoirs, Carter recalled that "My ultimate goal was the total elimination of nuclear weapons, but I was also intrigued by the penultimate solution which would be much more readily achievable: each side retaining small, exactly balanced, relatively invulnerable forces, confined either to submarines located in safe havens or to missiles in silos . . ."

Even before taking office officially, during his first briefing by the Joint Chiefs of Staff, Carter asked the admirals and generals assembled at Blair House why the United States couldn't maintain deterrence with a much smaller force, on the order of two hundred missiles. Although advisers like Zbigniew Brzezinski were reportedly embarrassed by Carter's naivete, as a result of this meeting a study was set in motion of a "minimal deterrence" type of posture.

Later, this apparently was folded into a comprehensive examination of US military forces and strategic objectives, known as Presidential Review Memorandum (PRM) 10. In its final form, the strategic forces section of PRM-10 outlined a number of options for strategic force postures—including a minimum deterrent force of only several hundred warheads—and an extensive analysis of the alterations in objectives necessary to carry them out.

The military establishment responsible for nuclear planning reacted harshly to this incursion onto their turf, taking the view that civilian planners under Carter's direction had put together a blueprint for carrying out deep reductions in strategic forces.

Ironically, the PRM-10 exercise did not result in radical reductions in nuclear forces at all (although similar guidance from Carter did lead to the ill-fated March 1977 "comprehensive" SALT II proposal for deeper arms cuts—a deal that, when offered to the Soviets, was immediately rejected). Rather, PRM-10 led to a reexamination of US strategic policy and the subsequent drafting of Presidential Directive (PD)-59, a "codification" of US targeting policy that established requirements for more numerous and capable US strategic forces. Ultimately, Carter signed a SALT II Treaty that was criticized by both the left and the right for not being ambitious enough and allowing both



*Inaugural Address of President Jimmy Carter.*

sides to build up to higher nuclear force ceilings.

During President Reagan's eight-year term in office, several events reinserted the subject of deep reductions into the forefront of the strategic debate. First, was Reagan's own radical vision for rendering nuclear missiles "impotent and obsolete" enunciated in his March 1983 speech that led to the creation of the Strategic Defense Initiative.

Second was the rise to power in the Soviet Union of Mikhail Gorbachev, which resulted in a fundamental change in Soviet nuclear diplomacy. Gorbachev's counter to Reagan's "Star Wars" speech came on January 15, 1986, when he put forward his alternative vision of the future, proposing "a step-by-step and consistent process of ridding the Earth of nuclear weapons, to be implemented and completed within the next fifteen years, before the end of this century."

### **The Reykjavik Summit**

In one of the most fascinating diplomatic exchanges of the nuclear era, Reagan and Gorbachev's competing visions collided in October 1986 in Reykjavik, Iceland. For a few hours, the leaders of the two most powerful nations became immersed in a discussion of eliminating all of their respective nuclear weapons.

A truly comprehensive public account of exactly who said what during the private meetings at Hofti House has yet to be written, and Reagan's advisers moved quickly after the event to obscure what had actually taken place in order to protect their boss. That the two leaders were discussing dizzying proposals is not in doubt. Gorbachev proposed and Reagan at least temporarily accepted a plan to eliminate all strategic offensive weapons over a ten-year period. After consulting with his advisers, Reagan was still prepared to do away with all ballistic missiles over the same period (a proposal the US subsequently tabled at Geneva). But for their sharp disagreement over the treatment of ABM systems, Reagan and Gorbachev might have shaken on such a deal right then and there.

The response of the American strategic establishment to what had transpired at Reykjavik was swift and harsh.

Former Defense Secretary James Schlesinger said, "To call Reykjavik ill-prepared is to indulge in classic understatement. . . . It was ill-prepared; it was ill-executed. . . . The consequence of the elimination of all strategic offensive weapons by 1996 would have been the end of the shield that has protected the Western World."

After the negative reaction to Reykjavik, the two sides retreated quickly toward completing the INF Treaty and pounding away at the details of START, but perhaps never before or since in the nuclear age had Soviet and American leaders made such a serious and concerted effort to achieve a dramatic change in the nuclear equation.

### **The Road to Deep Reductions**

The literature of nuclear strategy and arms control is littered with proposals for "radical" reductions in nuclear weapons and how they might be implemented. The principal rhetorical strategy and policy questions are discussed below.

**How low do you go?** The majority of advocates of "minimum deterrence" postures argue that going to zero is probably too far, both because of the perceived need to retain some minimum threat of nuclear retaliation to protect against Soviet breakout or the nuclear weapons of other powers and because, given the fact that nuclear knowledge cannot be erased, there must always remain some potential nuclear threat even in a world of zero weapons.

But, beyond that, there is little consensus on a definition of "deep reductions." A survey of various analyses produces a range from 6,000 down to less than 100. As already mentioned, Turco and Sagan have advocated a posture of 100-300 weapons as a level "below the threshold" for nuclear winter.

Soviet analysts examining this question in response to Gorbachev's January 1986 proposal have put forward a plan that would result in a strategic force of around 600 single-warhead mobile ICBMs on each side [See Box on page 11].

Brookings Institution defense analyst John Steinbruner and Dr. Michael May of the Livermore National Laboratory undertook an elaborate study involving computer modeling that examined force postures of 6,000 and 3,000 warheads, respectively.

Steinbruner and May sought to establish a level of reductions that would require the fewest changes in strategic policy—that would not "rock the boat" of targeting doctrine. Put simply, they established a basic deterrent requirement for a strategic force posture of being able to absorb a first strike and still be able to retaliate and destroy a set of 1,500-2,000 specified military and industrial targets. According to Steinbruner and May, while a 6,000 warhead level "would readily meet a basic deterrent requirement. . . . At the level of 3,000 weapons, strategic force deployments would be set very close to the plausible upper bound for the deterrent requirement, and configurations of forces that increase survivability would matter much more."

**How do you get there?** In classic arms control theory,

some reductions are good and others bad. In a deep reductions regime, it would be especially important to structure the reductions in order to ensure stability at ever-decreasing levels. This means both keeping at a minimum any incentive to strike first in a crisis (crisis stability) and protecting against the possibility that one side or the other might "breakout" of the treaty's terms (arms race stability).

Obviously, the lower that quantitative limits are set, the more important it would be that those forces which remain be highly survivable. This requires trying to further reduce the ratio of available warheads to numbers of missiles and other strategic forces on the other side.

One way this could be accomplished is through percentage annual reductions that focused on further reducing and eventually eliminating highly MIRVed ballistic missiles. The aggregate warhead ceiling of 6,000 could be lowered on an annual basis by 10 per cent or so, with a simultaneous lowering of the ceiling on MIRVed missiles (currently set at 1,200 launchers) at an accelerated pace, perhaps 20 per cent. Obviously, the US would want to push for a zeroing out of the permitted number of Soviet "heavy" ICBMs (154 are permitted under START), early on in a deep reductions regime.

The concept of percentage annual reductions is not new. President Carter proposed it to Soviet President Leonid Brezhnev at the Vienna Summit signing the SALT II Treaty in July 1979 as a means of carrying forward the progress of SALT II.

In view of the continued US concern with the breakout potential inherent in the larger throwweight of Soviet missiles, percentage annual reductions might also incorporate a drawdown in this throwweight advantage, a concept already established under START. In line with current strategic target planning, residual forces might also be structured in order to preserve the maximum targeting flexibility possible.

Alternative force postures each have their own advantages and liabilities. For example, basing all remaining weapons on ballistic missile submarines, offers a highly survivable means of delivery, but also one that has certain inherent communication difficulties and would consist of a very limited number of platforms (unless and until a new type of SLBM were developed with a much smaller number of reentry vehicles per missile). Any dramatic technical breakthrough in anti-submarine warfare (ASW) would pose a threat to such a force.

Reliance on air breathing weapons (bombers and cruise missiles) for such a force has the advantage of land-basing (removing communication difficulties), and recallability after launch. However, in the absence of any agreed constraints on anti-aircraft defense systems, this posture is highly susceptible to improvements in those defenses.

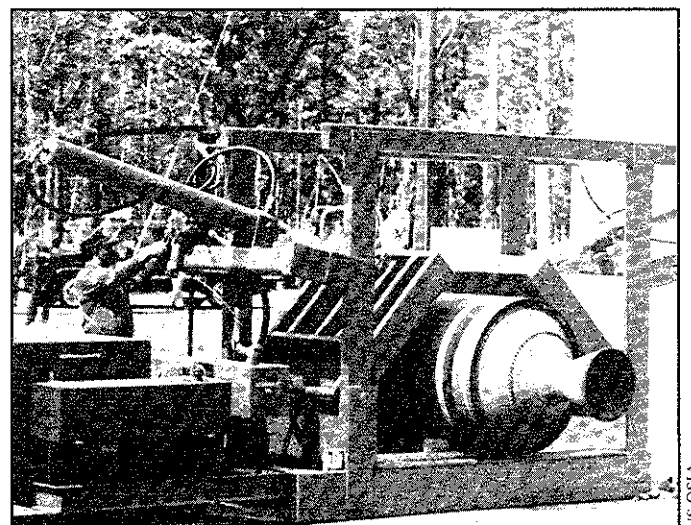
A force of several hundred single-warhead, mobile ICBMs might offer the best combination of survivability, ease of communication and flexibility. It would also have the advantage of not being as susceptible to improvements in opposing air defenses and ASW, if they are left unconstrained. A continuation of some modified triad or dyad of forces at lower levels also should also not be ruled out.

**How do you verify deep reductions?** The criterion for "adequate" or "effective" verification is the same for a deep reductions agreement as it is for other arms control measures: Can a militarily significant violation be detected in time for the US to be able to take an appropriate response? The difference is that after START the US will retain thousands of weapons and thus the margin for error is much greater than if it only has a force of several hundred. As President Bush's national security adviser, Brent Scowcroft has put it, "If you have 10,000 warheads and you cheat and you add another 1,000, so what? It doesn't matter. If you have 1,000 and you cheat and add another 100 or 200, it could make a significant difference."

Any verification regime associated with deep reductions will likely be the most detailed and complicated in arms control history. However, such measures would not be negotiated from scratch but rather would build on the considerable progress and experience with very intrusive verification and monitoring procedures obtained through negotiation of past agreements like the INF Treaty, now in force, as well as agreements under way on strategic reductions, conventional forces, and chemical weapons.

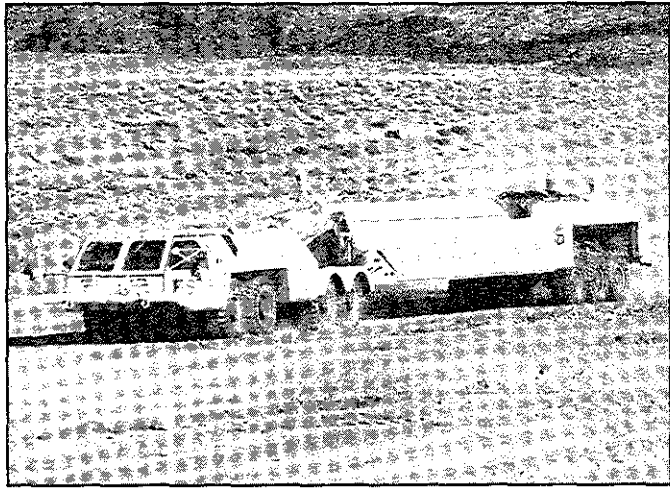
These measures will include: extensive "base-line" inspections to verify initial exchanges of data on force numbers and locations; "close-out" inspections to confirm eliminations; continuous on-site inspection of dismantlement facilities as well as delivery system production and deployment areas; "spot" inspections of missiles and bombers to verify compliance with type limits; "short-notice" inspections of declared and certain undeclared facilities to verify continued compliance and check out suspicious activities, and other cooperative measures, such as lining up mobile missile launchers within their designated deployment area periodically to allow reconnaissance satellites to accurately count and verify their number.

As intrusive and unprecedented as these measures will be, they may still not be adequate for a deep reductions



1988 elimination of US Pershing 1A missile under the terms of INF Treaty. Deep reductions will require a very intrusive verification system, including close monitoring of missile eliminations.





Boeing

*Midgetman ICBM hard mobile launcher being tested in Nevada. After deep cuts, US might move to a strategic force comprised mostly of small, mobile ICBMs. A similar Soviet force might consist of several hundred SS-25 ICBMs (see below right).*

regime. Other problems will have to be addressed.

For example, the remaining infrastructure of systems uncovered by the agreement, such as production of civilian space launch vehicles and their launch facilities, will loom larger as a potential means for breakout. Production of "dual-capable" weapons (e.g. conventional cruise missiles and advanced combat aircraft) will present another breakout threat.

In order to guard against breakout or reduce its consequences, a deep reductions treaty would probably have to be complemented by other measures that reduced the capability of either side to build up its nuclear potential clandestinely.

One possibility is to reduce the potential for clandestine warhead fabrication offered by the large quantities of special nuclear materials that each side has already produced or could produce in the future. Measures to reduce this potential could include: the destruction and dismantlement of nuclear warheads and their special nuclear materials as deployed warheads are reduced; a cutoff of additional fissionable material production and close monitoring and eventual elimination of material production facilities, and a comprehensive test ban treaty.

A ban on ballistic missile flight testing would reduce the confidence of either side in its ability to launch a preemptive strike, but would also affect the reliability of the remaining minimum deterrent force if that force were comprised largely of ICBMs or SLBMs.

**How do you deal with the qualitative arms race?** As the recent history of the arms race has demonstrated, areas left unconstrained in an arms agreement can quickly open up to a renewed competition. Witness the cases of both MIRVs and cruise missiles. Subsequent to the entry into force of a START Treaty, one can expect both sides to increase their investment in areas of the strategic arms competition left free or relatively free of limits: bomber weapons, cruise missiles, maneuverable reentry vehicles, and other systems.

This presents two problems. First, it creates uncertainty about future stability as each side moves to lower levels of strategic forces and, secondly, it complicates verification.

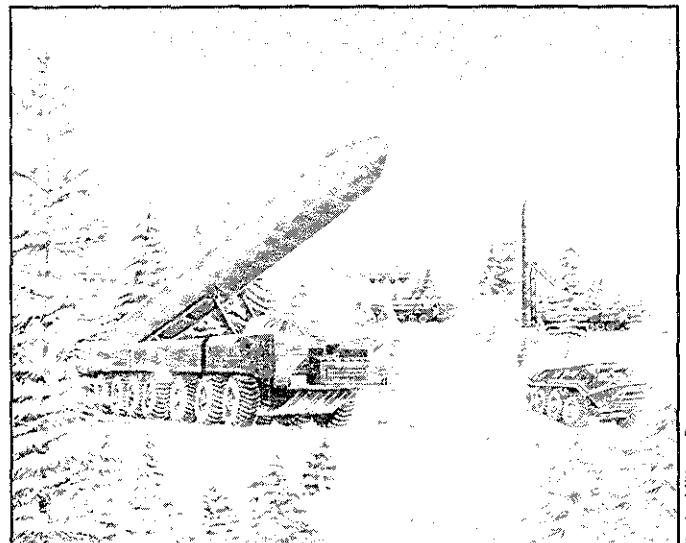
**How do you deal with tactical nuclear weapons?** The lower the strategic arsenals are reduced, the more important become the tactical nuclear weapons of the two sides. Currently, even with the eliminations under the INF Treaty, each side retains between 10-15,000 tactical nuclear weapons available for air-, sea-, and land-based platforms and delivery systems. If tactical weapons are left unrestricted, each side might seek to circumvent strategic limits by putting more nuclear weapons on other "tactical" platforms like attack submarines and forward-based aircraft which could still be used to strike the other country's national territory.

Many schemes for deep strategic reductions presuppose that tactical nuclear weapons would be greatly reduced or eliminated, but verification of such reductions is extremely difficult.

First, whereas the delivery systems for strategic weapons have tended to be quite distinctive and exclusively for nuclear use, "dual capable" delivery systems for tactical nuclear weapons are more common. Obviously, this complicates verification because monitoring tactical nuclear reductions might require severe intrusions into the normal operational procedures of armies, navies and air forces.

However, it is also the case that many of the tactical nuclear weapons deployed on each side (more than 50 per cent by some estimates) are primarily for use in or adjacent to Europe. If negotiation of a CFE agreement is successful, this could reduce the requirement for large numbers of tactical nuclear weapons on both sides and make Western and Eastern militaries more willing to accept deep reductions in these forces.

**What about the nuclear forces of other countries?** Soviet analysts, in particular, have stressed the need for the other major nuclear powers—France, the United Kingdom and China—to participate in deep nuclear reductions. How



Soviet Military Power

*Artist's depiction of Soviet SS-25 mobile ICBM*

willing those countries would be to include their forces is difficult to determine at this stage, although the political leaders of all three are on record as being generally supportive of inclusion of their forces *if* the superpowers are successful in bringing their nuclear forces down to much lower levels.

An additional issue will be the nuclear forces of undeclared nuclear powers, such as Israel. Some analysts have estimated that Israel already possesses several hundred nuclear weapons. It is difficult to imagine even in a far more cooperative climate of US-Soviet relations than today that the USSR would be willing to reduce its forces to a level below that of Israel.

### Objections to Deep Reductions

The political and technical problems that any effort at deep reductions would face are daunting, even by comparison with those that have surrounded the exceedingly complex draft START Treaty. Moving from a world of 10,000 strategic nuclear weapons on each side down to levels of 1,000 or less will require a fundamental change in American and Soviet strategic policy. Each side's military establishment will be highly skeptical of such a sweeping change, even if the impact is made less severe by completion of a START Treaty and CFE agreement. While some likely objections have already been addressed, some additional objections also require discussion.

**Deep reductions would detract from deterrence because US strategic forces would no longer be capable of implementing a selective and flexible targeting policy that holds at risk the most important and highly-valued Soviet military and leadership targets.**

Over the past several decades, the requirements for effective "deterrence," as reflected in strategic nuclear planning and the forces to implement that planning, have increased dramatically. In part, it has been a deliberate shift meant to reflect a changing (and more demanding) perception of what is necessary to deter Soviet military and civilian leaders. But it can also be seen as simply a haphazard matching of qualitative and quantitative improvements in the forces (through innovations like MIRVs and cruise missiles) to strategic targeting requirements.

There has been a great deal of criticism of the manner in which the US plan for nuclear war, the Single Integrated Operational Plan (SIOP), is developed. Critics who have had direct involvement in the process suggest that the military produces "worst-case" analyses of targeting requirements that generate an artificial need for more weapons. Civilian attempts at involvement in the process, such as the Carter Administration's PD-59 or Reagan's NSDD-13, have also simply accentuated requirements for ever more weapons.

The extent to which deep reductions would affect the ability of the US to execute its strategic war plans will depend on how many weapons and delivery systems of what type remain, what is the targeting flexibility of those weapons, and the composition of the Soviet target base after they implement their own reductions.

Obviously, retention of several thousand strategic war-

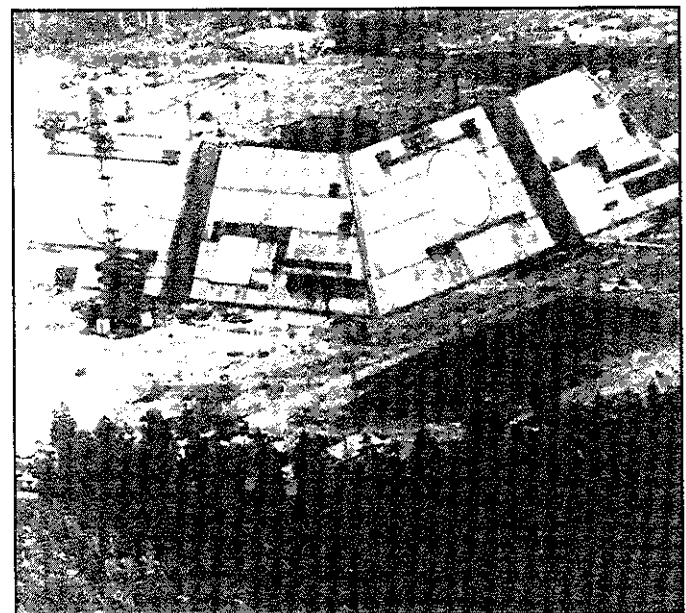
heads on each side would permit greater targeting flexibility and options for leaders than a residual force of less than one hundred. If that force were contained on mobile land-based missiles which have high accuracy, reliable command links and rapid re-targeting capability, this would allow decision-makers considerable targeting flexibility.

In addition, one must bear in mind that the number of *truly* high-value Soviet military and leadership targets would decline in the wake of a START Treaty and a CFE Agreement reducing Soviet conventional military forces. However, it is also true that certain high-value targets (e.g. leadership relocation facilities, communication bunkers, etc.) would probably not be reduced under an arms control agreement. Nevertheless, as the Steinbruner-May study showed, if proper steps were taken to ensure survivability and high alert levels, a force of only several thousand warheads could attack successfully a large portion of high-value Soviet targets in a retaliatory strike.

**The US and USSR derive much of their superpower status from their large strategic nuclear forces. Cutting that capability drastically would lessen America's influence and leadership role in the world.**

The US derives its world leadership status from many factors: its political and legal structure, its economic and financial infrastructure and capability, its natural resources, and its military strength. The importance of nuclear weapons as psychological weapons is steadily declining in today's world due to the recognition that they can never be used. Reducing reliance on these unusable weapons would, if anything, allow the US to contribute more resources to, and reassert itself in areas of economic competition where it has lagged in recent years.

**Deep reductions would render the US incapable of supporting NATO's policy of flexible response. The result would be its abandonment, and a breaking apart of the alliance relationship.**



*Soviet Pill Box ABM System Radar near Moscow.*

Changes are already occurring in the military confrontation in Europe that will undoubtedly force NATO to re-evaluate both its "first use" policy and the doctrine of flexible response. Such an evaluation should be welcome and is long overdue.

Again, one must bear in mind that deep reductions in strategic forces would take place only after implementation of a conventional force reduction agreement. Conventional reductions of the scale now being negotiated will certainly lead NATO to alter its strategy and policy. What role nuclear weapons would continue to play in NATO doctrine after deep Soviet conventional reductions is not clear, but it would most likely be a lessened one. Given a reduction in the Soviet offensive threat, one can foresee a sharply reduced NATO requirement for nuclear weapons of all ranges and types.

**In a world of much lower strategic offense levels, the possible introduction of ABM systems and lack of additional controls on strategic air defenses would be sources of instability.**

The question of what to do about strategic defenses during and subsequent to deep reductions is an extremely important and difficult one. Some have argued that if defenses were introduced *after* reductions were fully implemented, they could enhance the survivability of the limited remaining forces and command and control, while hedging against the threat of offensive breakout. However, the introduction of large-scale ABMs at such a low level of offensive forces could undermine each side's confidence in its deterrent and lead to a renewed race in offensive weapons. It was these very concerns that in the 1960's motivated the two sides to negotiate strict limits on ABMs and it was, in part, the US fear of Soviet development of a nationwide ABM that led to the development of MIRVs.

At low levels of offensive forces, the problem of ABM "breakout" is further exacerbated by the fact that the timeline for making such defenses effective is shortened. Either side could deploy more rapidly a defense designed to counter several hundred warheads than one capable of stopping many thousand. This would greatly reduce the period of time available to the country trying to respond to a breakout by building its own defense or deploying additional offensive forces.

Air defenses also present a problem at such low levels. Since no constraints on air defenses currently exist, deep reductions in offensive forces (including, presumably, far less reliance on ballistic missiles as the core of the deterrent) would give each side incentive to modernize its air defense system in order to make it more effective against the remaining offensive force. The Soviet Union has invested tens of billions of rubles in its air defense system over the years, while the US has largely neglected this area. Stricter limits on air defenses, while extremely difficult to both devise and negotiate, might nevertheless be an important prerequisite for deep reductions. □

*Thomas K. Longstreth is the Associate Director for Strategic Weapons Policy at FAS.*

## SOVIET VIEWS ON DEEP REDUCTIONS

Following on the heels of Gorbachev's January 1986 proposal to eliminate nuclear weapons by the year 2,000, a number of Soviet defense analysts began studying deep nuclear reductions in some detail.

One of these studies was undertaken by the Committee of Soviet Scientists for Peace and Against the Nuclear Threat, a group affiliated with the Soviet Academy of Sciences and with which the Federation has had much contact. The study, entitled *Strategic Stability Under the Conditions of Radical Nuclear Arms Reductions*, examined both reductions to 25 and five per cent of current strategic warhead levels. The study concluded that there are, "a number of options of radical reductions up to and including their complete elimination which would not only permit the balance to stay within the limits of stability, but would broaden those limits as well." Some excerpts from the study appear below:

*On the inclusion of other nuclear powers:* "In examining options after 75-percent reductions in US and Soviet strategic nuclear forces, the authors *a priori* proceeded from the premise that from both the political and military points of view such reductions would be impossible if the other nuclear powers had not participated in the process of nuclear disarmament by that time."

*On other measures complementing deep reductions:* "In examining option (2) of the reductions (by 95 percent) of the nuclear forces of both sides it was supposed that US and Soviet strategic delivery vehicles would only have several hundred remaining nuclear warheads; medium-range and tactical weapon systems of the sides would be eliminated; nuclear weapons of the "third" nuclear powers would be reduced proportionately or completely eliminated; the ABM Treaty would be still in force; there would be a ban on the deployment of space-strike weapons and ASAT weapons of all types; an agreement on a general and full nuclear test ban would be in force; and the production of fissionable material for nuclear munitions would be stopped."

*On the optimum residual force:* ". . . the best option for mutual security would be as follows: each side would have approximately 600 light mobile single-warhead ICBMs, i.e., all other types of nuclear weapons and their delivery vehicles would be eliminated . . ."

*On proceeding to total disarmament:* ". . . it would be advisable, in terms of providing reliable conditions for the prevention of war and strengthening strategic stability, to make the transition from the level of approximately 600 highly-survivable warheads not gradual and split into substages, but to implement the last stage of nuclear disarmament in a comparatively short period as a single act." ■



*Steven Aftergood joins FAS*

### FAS ANNUAL ELECTION RESULTS

The following individuals were elected to the FAS Council in the summer election:

**Stephen F. Cohen**, Director, Russian Studies Program, and Professor of Politics at Princeton University.

**David Hafemeister**, Professor of Physics at California Polytechnic State University.

**George W. Rathjens**, Professor of Political Science at M.I.T.

**Arthur H. Rosenfeld**, Professor of Physics at the University of California-Berkeley.

These new members are replacing Thomas B. Cochran, Hugh E. DeWitt, William Higinbotham, Barbara G. Levi, Francis E. Low, and Andrew M. Sessler (who continues, however, as FAS Chairman). The number of Council Members, which is declining in accordance with a Constitutional amendment reducing the Council size from 24 to 12, now stands at 18 and will be 12 after two more elections. ■

### FAS News & Notes

**Steven A. Aftergood**, director of the Los Angeles-based Committee to Bridge the Gap, has accepted a position at FAS as senior analyst and legislative liaison. Aftergood, an engineer, is well-known for his work on restricting the use of nuclear reactors in outer space.

**Michael May**, a PhD candidate at Syracuse University and a reserve officer in the Army Chemical Corps, has spent the summer at FAS preparing a military analysis of the use of chemical agents in the Gulf War, to be incorporated in the book on chemical proliferation being prepared by the FAS Chemical and Biological Weapons Project.

In August, FAS sponsored a workshop on ways of verifying limits on the potential brightness of lasers that might otherwise threaten the viability of satellites. One approach would use black boxes placed near laser installations, the boxes would measure the brightness of the lasers through light scattered out of the beam by aerosols in the atmosphere. The summer study, organized by **Ron Ruby** of U.C. Santa Cruz and **Dan Hirsch**, had participants from National laboratories as well as: **Richard Garwin**, of IBM Thomas J. Watson Research Center, **Richard Muller**, of Berkeley, **David Spergel**, of Princeton, and others.

In September, FAS will participate with the Committee of Soviet Scientists in the first Moscow International Disarmament School whose purpose is to interest a new generation of Soviet post-doctoral researchers in studies on the technical basis for disarmament. □

### CORRECTION

In our May 1989 issue we reported incorrectly the name of the originator of the U.S. Committee for Scientific Cooperation with Vietnam; his name was **Edward Cooperman**. After threats to his life for his work on improving relations with Vietnam, Cooperman was killed in California. His work was an outgrowth of the visit to Hanoi in October, 1971 of **Ethan Signer** and **Arthur W. Galston**. ■

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