Reagan Plans Test Ban Revisions

In a significant change of heart, the United States may demand access to Soviet nuclear weapons test sites

President Reagan, risking a major protest from overseas allies and domestic critics of U.S. defense policies, is expected to announce shortly that he wants to renegotiate a bilateral treaty that bars the testing of high-yield nuclear weapons. The agreement, which was signed by the United States and the Soviet Union in 1974, has fallen prey to the concerns of some Reagan appointees in the weapons community that Soviet compliance cannot be verified properly through the use of distant seismic monitoring stations. As a result, the White House is considering a treaty amendment that calls for the direct, on-site measurement of Soviet weapons blasts—an intrusion that the Soviets have historically resisted.

Under the terms of the amendment, the United States would send a team of nuclear weapons experts to the Soviet Union in advance of tests above a threshold of 75 kilotons. The experts would stand by while the Soviets snake special sensing cables into holes above an underground test site. They would then attach to each cable a black box that can be easily transported in a large suitcase. Inside the box will be equipment capable of measuring the speed with which the sensing cable is crushed by a nuclear detonation, information that in turn permits an estimate of the weapon's yield. The purpose of this effort is to cut the range of uncertainty about the yield by 65 percent. At present, the United States is said to be certain of Soviet weapon yields only within a factor of 2, which some within the Administration find intolerable.

Many in Congress will doubtless be mystified at this apparent change of heart by the bureacracy. Representatives of the State Department, the Defense Department, and the Joint Chiefs of Staff generally praised the Threshold Test Ban Treaty at a series of hearings conducted by the Senate Foreign Relations Committee in 1977. No one challenged the adequacy of its verification provisions. Stayre Stevens, who was then a deputy director of the Central Intelligence Agency, testified that "the intelligence community as a whole was deeply involved in the whole process. . . . A tremendous amount of attention was devoted to the problems of verification and so on. I think these issues were dealt with in detail and at great length."

Specifically, the treaty bars each country from detonating warheads with a yield of more than 150 kilotons. Although the treaty itself was proposed by the Soviet Union, the magnitude of the threshold was largely a compromise between the Pentagon, which wanted 200 kilotons, and the State Department, which wanted 100 kilotons. Eventually, all of the agencies agreed that the level was high enough to permit development of essential low-yield weapons, but sufficiently constraining to diminish confidence in the reliability of the most threatening multimegaton bombs.

There was also ample awareness, at the time the treaty was signed, that the United States would be incapable of verifying absolute Soviet compliance, due to uncertainties about the rock structure of Kazakhstan Province, a remote area where many of the tests are conducted. The treaty provides for the exchange of some geological data, as well as precise yield estimates for two conspicuous detonations, which can be used in seismic calibrations. But Philip Habib, a former under secretary of state who now serves as President Reagan's chief negotiator in the Middle East, testified in 1977 that "I should make clear to you that in the event of Soviet tests at or near the 150-kiloton level, we could not be absolutely certain that the yield is at or below 150 kilotons." He and others felt confident that the United States could determine if Soviet tests were more than double the limit.

During the early 1970's, no one seemed troubled by this uncertainty. Harold Agnew, who was then director of the nuclear weapons laboratory at Los Alamos, New Mexico, stated that Soviet cheating within this range had no "military significance vis-à-vis our own position." A current weapons lab official, who wants to remain anonymous, says that even prolonged Soviet testing at 200 or 300 kilotons "is not particularly impressive as far as military utility is concerned."

These assurances are insufficient, in the eyes of some Administration officials. They believe—on the basis of disputed evidence—that the Soviets are already systematically cheating and will continue until the treaty is revised. Much of the concern is said to emanate from the Pentagon, and in particular from the office of Richard Perle, the assistant secretary of defense for international security.

Perle's involvement in this dispute apparently goes back a long way. According to several sources, Perle, as a Senate staff aide in the early 1970's, argued that the United States should retain the flexibility to test high-yield weapons, which would be useful for threatening Soviet command posts and other targets that could be made extremely resistant to nuclear blasts. He also argued that a ban on testing of high-yield weapons froze in place an existing Soviet advantage. The Soviets have historically constructed high-yield warheads in an attempt to compensate for the inaccuracy of their missiles.

In the early days of the Reagan Administration, Perle and others in the military community repeated these arguments in a brief attempt to persuade the President to disavow the treaty outright. But they were unable to win over high officials at the Pentagon and elsewhere. Perle's immediate superior is Fred Ikle, the under secretary of defense for policy. Ikle, as director of the Arms Control and Disarmament Agency in 1974, helped determine the U.S. negotiating position on the Threshold Test Ban Treaty. At the hearings in 1977, he testified warmly on its behalf.

Even the weapons labs were unenthusiastic about breaking the treaty. Roy Woodruff, an associate director of the nuclear design program at Lawrence Livermore, told a symposium last fall that congressional "ratification of this treaty is in order." Another lab official challenged the reasoning behind a break. He noted that any claim of Soviet superiority in high-yield weapons depends on an assumption that the Soviets' warhead designs are simpler and more reliable than those in the United States. "Since they don't exactly show us the inside of their bombs, this is extrapolating a hell

of a long way from minuscule information," the official says.

There proved to be much broader support for a claim that the Soviets had grievously cheated. As Secretary of Defense Caspar Weinberger noted last August, some of the Soviets' recent underground tests have been large enough "to raise serious questions about compliance." Several officials pegged the number of suspicious detonations at 14, as of the middle of last year. Because of seismic uncertainty, there is a chance that all are below the treaty threshold. But the Administration looks not at the limits of uncertainty but at the median of the probability distribution. This median has frequently been between 150 and 300 kilotons.

So far, support from the scientific community for these allegations has been thin. Analysts in England and Sweden have reportedly estimated that the yields of several suspicious events are actually within the treaty limit. The U.S. formula for estimating explosive yield was recently radically altered and might still be slightly wrong. Prior to 1978, calculations were made using faulty assumptions about the similarity of rock structure at test sites in the Soviet Union and the United States. Analysts determined, after several apparent Soviet treaty violations, that the Asian landmass broadcast seismic signals far better than the area around the U.S. test site. As a result, they halved their estimates of Soviet weapon yields and concluded that no real violations had occurred.

The source of present confusion is that the Soviets subsequently detonated weapons twice as large as they did before the recalculations. As one Pentagon official explains, "this means that the Soviets were abiding by the treaty before and they are violating it now. Or, alternatively, they are abiding by it now, but were testing at well below the threshold before. The first seems more likely than the second."

One possibility, which may be discomforting to those in the U.S. intelligence community, is that that Soviets were testing at the threshold limit in 1977, became aware of a change in the U.S. formula, and determined to take maximum advantage of it. This means that further adjustments in the formula may be necessary. This view is espoused by Lynn Sykes, a geologist at Columbia University, and Jack Evernden, a program manager at the U.S. Geological Survey's National Center for Earthquake Research. In an article last October in *Scientific American*, they assert that reports of Soviet violations "are based on a miscalibration of one of the curves that relates measured seismic magnitude to explosive yield." Even a seismologist at the Pentagon acknowledges considerable room for debate. "If you start out with a philosophical bias that the Soviets are not cheating, the geological data are there to say that. If you start with a philosophical bias that they are cheating, the data are there to say that."

The Administration has supposedly described its concern about the tests in a series of letters to the Soviet Union. More drastic action is desired as a means of proving that the Soviets cannot consistently flout an arms treaty and get away with it. As a Pentagon official says,

"Both sides will be plunged into a very difficult negotiation," says former diplomat Robert Buchheim.

"We need to establish that uncertainties will have to be resolved. If arms control has a future, verification makes a difference."

Last July, when President Reagan first decided to seek treaty amendments, he did so without any idea about the form they should take. Consequently, the Administration spent a considerable amount of time groping about before it arrived at a consensus. The Department of Energy (DOE), in particular, was uneasy about the prospect of on-site verification. Troy Wade, a deputy assistant secretary for defense programs, says that in interagency discussions, DOE representatives "identified several areas that we wanted people to be cognizant of. One area of importance is the fact that any provision for on-site verification would create a Soviet presence at the U.S. test site." The Energy Department would be forced to take precautions so that the Soviets see only what they are supposed to see—precautions that may delay the test program and cost a lot of money. Wade is careful to note, however, that he supports the Administration's decision to seek enhanced verification.

A number of less intrusive enhancements were considered. Under one proposal, each side would send technicians to the detonation site at a time when no blast was scheduled. They would take geological samples, listen for earthquakes, and then depart. At last report, the Administration found this unpalatable because it would cut the range of uncertainty by a paltry 25 percent.

While elements of the bureaucracy have been dickering over such matters, support for keeping the treaty intact has grown considerably on Capitol Hill. Resolutions urging prompt Senate ratification have been introduced in both Houses and have acquired substantial Democratic support. Among Republicans, Senator Charles Percy of Illinois, who chairs the Foreign Relations Committee, has expressed a desire for modest treaty improvements that fall short of the Administration's present plan. According to an aide, Percy is especially worried that a proposal for inordinately intrusive verification procedures will be regarded as an attempt to scuttle the treaty by provoking a flat Soviet rejection or by leading to lengthy negotiations. Percy says that, if the United States repeatedly negotiates treaties on nuclear weapons and then fails to seek congressional ratification, how can it dispel general cynicism that the existing strategic arms reduction talks and the negotiations on intermediate-range weapons in Europe will ever lead to ratified accords?

Similar fears are expressed by Robert Buchheim, a former chief scientist for the Air Force who served as a top negotiator on the Threshold Test Ban Treaty and on its companion agreement, the Peaceful Nuclear Explosions Treaty. Buchheim told *Science* that "both sides will be plunged into a very difficult negotiation if direct, on-site verification is demanded. I expect that the Soviets will object. Why? It isn't needed."

Lacking strong support from the scientific community for the Administration's charges of Soviet cheating, President Reagan will have difficulty generating much enthusiasm for his proposed amendments. Without such support, he will have a tough time getting any major Soviet concessions. The implications of a rejection are clearly worrisome to many in Congress and in the arms control community. If the Soviets reject the Administration's proposal out of hand, they may close the door on verification measures that will be needed for a comprehensive treaty banning all nuclear weapons tests, not just those above a certain threshold. President Reagan decided last June to delay any further talks on a comprehensive treaty until after the threshold treaty is tightened up. He may thus have created a major impediment to this ultimate goal.—**R. JEFFREY SMITH**