Star Wars and the Summit

Tentative agreements on reducing nuclear forces ran into a roadblock over Soviet demands for restricting SDI; exactly what those restraints would entail was not discussed, however

In the conflicting accounts and interpretations offered by both sides during the sour aftermath of the Reykjavik summit meeting, one conclusion has remained constant: President Reagan's Strategic Defense Initiative (SDI) was both the principal reason for the breathtaking progress of the talks and the chief barrier to reaching an agreement.

Both sides have acknowledged that an impasse over Soviet demands for restrictions on SDI research and testing ultimately blocked agreements that could have led to a 50% cut in U.S. and Soviet strategic nuclear forces over 5 years, and perhaps the elimination of all ballistic missiles—the most threatening nuclear weapons—over 10 years. Both sides were also apparently willing to agree to the removal of intermediate-range missiles from Europe and a phased end to nuclear testing.

These tentative accords foundered when Soviet leader Mikhail Gorbachev insisted that they be linked with an agreement to limit SDI research and testing to the laboratory. Reagan refused, as he later explained, because the stricture would "kill off" the program, which he described as an "insurance policy" against Soviet cheating on the arms reduction agreements. Gorbachev subsequently interpreted the refusal to mean that the United States is "hoping to achieve through SDI military superiority."

It was perhaps inevitable that an impasse would develop over SDI, given Reagan's enduring commitment to his "dream" that the program will develop technologies that will render ballistic missiles obsolete, and Gorbachev's equally firm fear that the effort could provide a shield from behind which the United States could launch a first strike. It was also inevitable that the arena in which these two visions would clash would be the 1972 antiballistic missile (ABM) treaty.

Not only have differing interpretations of what is permitted under the ABM treaty long divided the Soviet Union and the United States, but they have also sparked a vigorous debate among arms control experts in the West. Gorbachev described his proposal at Reykjavik as an attempt to "strengthen" the ABM treaty. But a demand to limit SDI to laboratory work would go well beyond the strictures embedded in the treaty, and most observers in the West—including many critics of SDI—believe that such a constraint would be unverifiable. At the same time, the Reagan Administration's argument that virtually everything short of actual deployment of an SDI system is permitted, is not generally shared in the arms control community.

The disagreements center mostly on space-based defense systems, for the ABM treaty explicitly permits research, development, and testing of fixed land-based systems, and it allows each side to deploy one system using no more than 100 single-warhead interceptors. Indeed, the Soviet Union has chosen to deploy such a system around Moscow, while the United States initially decided to build a system to protect its ballistic missile base in North Dakota but scrapped the idea in 1976 on the grounds that it would not be effective. (Deployment of land-based systems based on "exotic" technologies such as lasers is prohibited, however.)

The Soviet proposal states: "Testing of all space elements of antiballistic defense in space [is] prohibited except research and testing in laboratories."

As for space-based systems, there is no disagreement that the ABM treaty permits *research* on technologies that might be used in SDI. And there is also no disagreement that it prohibits *deployment* of space-based defenses. What is in dispute is the kind of testing and development that is allowed—in short, where to draw the line between research and testing.

The treaty itself is somewhat fuzzy on this point. It prohibits development, testing, or deployment of sea-based, air-based, space-based, or mobile land-based ABM "systems or components," and precludes testing of non-ABM systems "in an ABM mode." Not surprisingly, these terms have been subject to a wide range of definitions.

The Reagan Administration has justified several planned space experiments on the grounds that subcomponents rather than actual ABM components will be tested, or that the tests will not take place "in an ABM mode." The experiments include efforts to improve tracking and discrimination of rockets and warheads, a test of the feasibility of using mirrors in space to relay beams from ground-based lasers to targets, an experiment that involves tracking incoming warheads with sensors on a Boeing 767, and an attempt to determine whether neutral particle beams can be used in space to discriminate between warheads and decoys.

Some of these experiments have raised concerns in Congress and among arms control experts in the United States, however (*Science,* 5 July 1985, p. 29). And shortly before the summit meeting, the *Washington Post* reported that the Soviet Union has officially raised objections to four tests, claiming that they would violate the treaty.

However, both the Reagan Administration and the Soviet Union have now staked out positions that would finesse these definitional problems—although with very different results. Last October, the Administration announced that a reading of the classified negotiating record of the ABM treaty reveals that the accord restricts development and testing only of systems and components that were "current" at the time the treaty was written (*Science,* 8 November 1985, p. 644). New technologies, it said, can legally be developed up to the point of deployment. This reinterpretation of the treaty caused a furor, however, and the Administration subsequently announced that it would abide by its earlier, more restrictive reading.

Now the Soviet Union has attempted to move the interpretation in the opposite direction by apparently seeking an agreement to restrict research to the laboratory—in effect making the laboratory wall the dividing line between research and development, and outlawing any SDI experiments in

space. Such a ban would raise a number of legal problems, according to arms control experts.

John Rhinelander, the legal adviser to the U.S. delegation that negotiated the ABM treaty and a leading critic of Reagan Administration policies in this area, argues that the Soviet proposal would set "an unverifiable standard." It would exacerbate the problem of what would be permissible, because testing and development of some technologies, such as sensors for early warning satellites, could also be used in ballistic missile defense systems. Similarly, Ashton Carter, a physicist at Harvard University who wrote a critical study of SDI for the Office of Technology Assessment, says "It is totally unclear what limiting to the laboratory really means. I don't think there is any serious way to add restrictions beyond the ABM treaty, because the treaty already bans everything that can be verifiably banned."

Many observers are also left wondering whether Gorbachev's proposal would limit all SDI research—including work on land-based systems, which is currently permitted. In a televised address 2 days after the summit, Gorbachev repeatedly referred to restricting SDI to the laboratory, but the actual proposal he says he gave Reagan in Reykjavik is not all-encompassing. It states: "Testing of all space elements of anti-ballistic defense in space [is] prohibited except research and testing in laboratories."

In fact, a detailed discussion of what Gorbachev had in mind when he proposed limiting SDI research to the laboratory did not take place at Reykjavik, John Poindexter, Reagan's national security adviser, acknowledged at a press briefing. There was also no discussion of the Administration's interpretation of the treaty. According to assistant secretary of defense Richard Perle, "there has been enough discussion of this so that I think it's clear that the Soviets understand that they have to go beyond the ABM treaty if they're going to drive a stake through the heart of the SDI program."

However, there were indications a week after the summit that the Soviets may seek to clarify their proposal. White House spokesman Larry Speakes said on 20 October, "We have had at least some representation from the Soviet Union that they would like to discuss their interpretation of, and our understanding of their paper that they presented at Reykjavik, which talked about laboratory testing. We would be anxious to discuss it with them at Geneva and attempt to clarify [it]."

Whether a clarification of the proposal will provide any basis for a compromise remains to be seen. ■ COLIN NORMAN

San Diego's Tough Stand on Research Fraud

When a faculty member was caught faking data, UCSD asked all of his coauthors to defend their work. The result: 68 medical papers may be invalid

"ALL of us thought very highly of this young man," said radiologist Elliott Lasser, speaking of a junior scientist named Robert Slutsky who wreaked havoc at the medical school of the University of California at San Diego (UCSD) by publishing false data.

Lasser, a senior member of the radiology department, accidentally came upon the Slutsky bombshell in 1985. Following rules established in the wake of fraud cases elsewhere, UCSD created an ad hoc investigative committee in the dean's office, beyond the jurisdiction of the affected department. The group quickly determined that Slutsky had fabricated data in three papers, listed coauthors without their permission, and falsified some of his qualifications on a curriculum vitae.

A second committee, chaired by thoracic surgeon Richard Peters, was appointed to sort through all of Slutsky's publications and to winnow the bad from the good data. On 9 October, after more than a year of painful work, the committee released the bitter residue: 10 additional papers originating in UCSD labs were deemed "fraudulent" because they had relied heavily on suspect work done by Slutsky, and 55 others were of "questionable validity."

In an unusually strong report, the committee noted that it was "unable to persuade Dr. Slutsky through his attorney to acknowledge the fraud." But when the committee asked journals to retract two papers, "Dr. Slutsky, through his attorney, subsequently withdrew 15 published papers, apparently in response to the UCSD retraction letter, but without acknowledging fraud." The group leaves no question about its own view, however, that Slutsky was engaged in "extensive research fraud."

The Peters committee noted that toward the end of his time at UCSD, Slutsky was producing papers at the rate of about one every 10 days. More than anything else, Peters said in a telephone interview, he was shocked by this rate of production, which he said was faster "than most of us could write even if we made it up out of whole cloth." The pace was extraordinary, and "it should have been noted."

Were faculty members perhaps acquiescing in what they knew to be a slapdash approach because it made the lab so productive? Peters said that for some it was "more than acquiescing." The report notes that some senior faculty members "expected that their names be used even though they had provided only facilities for a project, without substantive contribution to, or knowledge of, the validity of the work." This practice, the report said, made "a mockery of authorship of scientific manuscripts, and in this case may have contributed to the perpetration of research fraud."

The Slutsky case appears to be as significant as an earlier and oddly parallel one—the "Darsee affair"—in which a young and ambitious researcher named John Darsee was accused of fabricating data at Emory and Harvard universities. Both cases involve cardiological experiments on dogs, both involve "touching up the numbers" to improve statistical results, and both raise questions about the responsibility of senior faculty members who were supposedly in charge and whose names appeared on questionable papers.

Lasser uncovered the fraud at UCSD in the process of reviewing Slutsky's massive oeuvre when the young scientist was up for a promotion in 1985. As a widely respected former chairman of radiology, Lasser had been asked to write a letter of support. But in reading two of Slutsky's papers side by side, he suspected that the same "control" animals had been used in both without mention of the fact in either. Identical data points appeared in both articles, but the value of the standard deviation in one was given as the standard error in the other. Furthermore, the actual number of animals