# Star Wars Chief Takes Aim at Critics

## *He says the program is feasible and expects deployment by the year 2000; convincing Congress and scientific skeptics will not be easy*

Lieutenant General James A. Abrahamson, the manager of the Pentagon's controversial new Strategic Defense Initiative (SDI), is an irrepressible scientific optimist. "I don't think anything in this country is technically impossible," he says. "We have a nation which can indeed produce miracles."

Abrahamson's cheerfulness will be invaluable in coming years. His assignment is to design a series of weapons capable of destroying ballistic missiles fired by the Soviet Union—a system of extraordinary complexity, refinement, and strategic significance. Potential technological and diplomatic stumbling blocks have been highlighted in recent reports by the Office of Technology Assessment, the Union of Concerned Scientists, and a coalition of former national security officials such as McGeorge Bundy, Robert McNamara, Cyrus Vance, George Kennan, Gerard Smith, William Colby, Stansfield Turner, and Averell Harriman. A lengthy new study by the Stanford University Center for International Security and Arms Control concludes that a missile defense would give rise to "a dangerously illusory hope of safety" and "a dangerous immediate impulse to instability."

Still, Abrahamson believes not only that "the ultimate program is one that over a period of time is doable," but also that it can be done for a reasonable cost, and without kindling World War III. In a recent wide-ranging interview with *Science*, he indicated that President Reagan and Secretary of Defense Caspar Weinberger share this faith, and that he fully expects the United States to begin deployment of such a system before 2000.

Soft-spoken, earnest, and unflappable, Abrahamson, 51, is highly regarded in Washington as an experienced manager and a shrewd politician. In two previous supervisory posts, he successfully steered the space shuttle and the F-16 jet fighter past substantial congressional opposition and public controversy. According to the official SDI charter, one of his principal tasks now is to "aggressively present" the program to Congress, the public, industry, scientists, and allied governments. During a recess in recent congressional hearings, he did so by circling the room, introducing himself to congressmen, staff members, and journalists, and also by pulling aside former Secretary of State Dean Rusk, an opposing witness, for a private debate.

Thus far, Abrahamson's efforts on Capitol Hill have been well received. The House and the Senate are expected to approve a $1.5 billion SDI expenditure in fiscal 1985, $250 million below the Administration's request, but a 60 percent increase over the previous year.* But more substantial resistance is expected next year, when the Administration seeks an appropriation of roughly $3.5 billion for 1986.

**James Abrahamson**

*"Nothing is perfect, not even the shuttle."*

Consequently, Abrahamson has begun building a large staff to manage the program's far-flung research and to defend it against assailants. Recently, he hired as a principal science adviser Gerald Yonas, a cautious and widely respected SDI supporter who is now the director of pulsed power sciences at Sandia National Laboratory, and he plans also to establish a fairly large advisory board composed of both government and nongovernment scientists. To date, Abrahamson has not met with any prominent scientific critics of his program, other than Ashton Carter at MIT. But he says that he intends to meet with some of the others later this year.

Perhaps more importantly, Abrahamson has devised some careful arguments to step over some of the political and technical challenges strewn in the program's path. Perhaps the most serious immediate problem is widespread confusion about the program's ultimate goal. Last year, President Reagan said the goal was to eliminate the threat posed to civilians by ballistic missiles, allowing the subsequent elimination of the missiles themselves. The trouble is that virtually no one in the weapons bureaucracy or the scientific community believes that this is feasible. Late last year, in fact, an influential group of weapons consultants suggested that an imperfect defense of nuclear weapons, devised as a complement to offensive nuclear forces, is a far more realistic and worthwhile goal (*Science*, 6 April, p. 32).

In the interview, Abrahamson indicated that he fully accepts this mainstream Pentagon viewpoint. "Nothing is perfect, not even the [space] shuttle. A perfect astrodome defense is not a realistic thing," he said. "The point is to get a thoroughly reliable and effective system. What does this mean? We haven't quantified it." He emphasizes that even a partial destruction of Soviet missiles shortly after their launch could save lives and create a climate for significant arms reductions. "Remember that the Russians are afraid of our technology. That is what all this business is about. When they see that we have embarked on a long-term effort to achieve an extremely effective defense, supported by a strong national will, then they will give up on the development of more offensive missiles and move in the same direction."

On the relative status of U.S. and Soviet technology, Abrahamson says, "It is clear that the Soviet Union has gained a great deal by developing and operating a terminal defense system. They are upgrading it. I don't think this means they have any kind of leakproof umbrella over Moscow. But it is the kind of system that could easily be deployed on a much broader scale, over 2 or 3 years—more quickly than we could react. However, it is a limited system, it isn't the kind of system that the United States is talking about. It would only be partially effective. We do know that they have invested heavily in directed energy systems, but it is very hard to see concrete results. . . . Are they dramatically better off? No. In the key technologies

*This total does not include roughly $300 million for research on ballistic missile defenses conducted by the Department of Energy.

# A Dim Future for Weapons Talks

If the United States and the Soviet Union actually meet in Vienna next month to discuss weapons in space, two vastly different viewpoints will collide head on. The prevailing U.S. view, as explained in interviews with a number of high-ranking Administration officials during June and July, is that no ban should be imposed on weapons capable of intercepting Soviet ballistic missiles before they reach U.S. soil. The deployment of such weapons—or even just the threat of deployment—is seen by the Administration as the best means of compelling the Soviets to accept an enormous reduction in the size and strength of their strategic nuclear force.

The Soviet view, as gleaned from recent public statements and interviews with several U.S. experts on Soviet affairs, is likely to be exactly opposite: that deployment of antiballistic missile systems must be prohibited, or else no reduction in strategic nuclear forces will be possible. Judging from the volume and tone of their remarks, the Soviets are apprehensive that an unrestrained competition in this area will leave them far behind, and vulnerable to U.S. coercion. Even though the United States has already expended billions of dollars on missile defense without much success, considerable fear exists that a breakthrough might someday occur. In any event, it is clear that the Pentagon's latest research effort represents a major new departure from settled arms policies. Previously, the program was justified as a hedge against unilateral Soviet deployment; now, President Reagan has indicated that Soviet intentions are essentially irrelevant and that unilateral U.S. deployment is not only possible, but likely.

These concerns began to interfere with U.S. negotiations on strategic arms within a few weeks after Reagan's "Star Wars" speech last year. "[We] got an earful of complaints" at the negotiations in Geneva, says one high-ranking U.S. official. The Soviets also complained at several meetings last year of the Standing Consultative Committee, an official group established to resolve disputes on compliance with the SALT I treaty, which bans sophisticated missile defenses.

To date, the Reagan Administration has refused to yield to these concerns out of a belief that U.S. superiority in missile defense technology will become a powerful coercive lever. "The important point is that [the United States] must show the resolve to go ahead with such a system; otherwise it is an empty kind of threat," says Lieutenant General James Abrahamson, the director of the Pentagon's research effort. Similarly, a high-ranking Administration arms control official states frankly that "I'm not above exploiting their fear on this. I think we can get some mileage out of it."

The trouble is that lingering uncertainty about the timing and effectiveness of any defensive U.S. deployment may inhibit the Soviet Union's willingness to constrain forces that might be used as countermeasures. Last year, for example, N. Chervov, a high-ranking Soviet military official, explained to *Pravda* that "the efforts of one side to form an 'absolute shield' force the other side to reinforce devices for overcoming it, all the more so as the antimissile defense system will naturally have its weak, vulnerable spots—in the control, command and targeting system, in the work of the computers and so forth."

This is why a recent study by the Stanford University Center for International Security and Arms Control concluded that the Administration's plan decreases the likelihood of obtaining a new arms control agreement. "The Soviet Union [wants] to retain the capacity to penetrate or overwhelm the defense, and thus [may] be unwilling to limit the throwweight of its offensive force, or the number of reentry vehicles it could deploy, and might even feel impelled to withdraw from the SALT II treaty," the report concludes.

Arnold Horelick, who served as the Central Intelligence Agency's national intelligence officer on the Soviet Union and Eastern Europe from 1977 to 1980, agrees with this assessment. "The Soviets are unlikely to return to negotiations on offensive strategic forces unless strategic defenses are also put on the table," says Horelick, who is now the director of the RAND/UCLA Center for the Study of Soviet International Behavior. "They are also unlikely to agree to any substantial reductions in strategic offensive systems without a reaffirmation of "[SALT I] treaty that would prevent any deployment of strategic defenses." Senator Sam Nunn (D–Ga.) raised the same point during recent hearings of the Senate Armed Services Committee. "Can you conceive of the Soviet Union developing a defensive system and as they develop it over the next 10 years, we would reduce our offensive capability?" he asked Abrahamson. "You would come in and say to President Reagan, 'Mr. President . . . they can shoot down so many of our missiles that I recommend we decrease our offensive effort.' . . . I can't conceive of it."

In his recent book, *Weapons and Hope*, Princeton physicist Freeman Dyson mentions this problem and argues that arms control should be pursued before any strategic defense is attempted. But Major Peter Worden, a special assistant to Abrahamson, contrasts this view with that prevailing in the Administration. "Most of the people in the Administration feel that you build the system before you do arms control." Worden adds that "a complete ban on weapons in space would tend to foreclose most of your more effective strategic defense options."

The desire to build such systems also helps to explain the Administration's lack of enthusiasm for limitations on antisatellite weapons. "It is no secret that the technology for our ASAT was originally developed by the Army for use as a ballistic missile defense option," Worden says. "It is interesting because it offers the potential of building a tiny, cost-effective warhead that could be incorporated as part of an exoatmospheric nonnuclear missile interceptor."

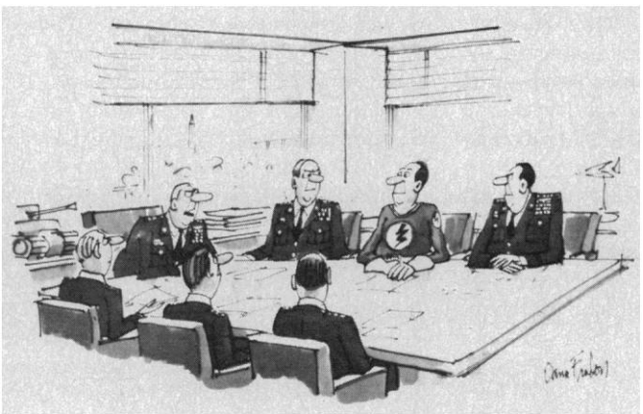
Consequently, about all the program's managers are willing to consider is a ban on missile defenses permanently based in space, which may not be feasible anyway. Such an agreement would explicitly allow ground-based defensive systems as well as those fired on suspicion of an attack, however. Alternatively, one high-ranking arms control official favors an agreement simply to share key technology. "Optimally, what I'd like to do is get them to accept deep reductions in their nuclear forces, perhaps in exchange for the sharing of technology for missile defenses. Certainly, I would take a deal like this back to Washington. I think there is a good chance that we would accept it," the official says.

There will clearly be a lot to negotiate, if talks occur.

**—R.J.S.**

needed for a broader defense—such as data processing and computer software—we are far, far ahead."

Weapons experts such as Hans Bethe and Sidney Drell assert that if the United States capitalizes on this advantage and deploys a ballistic missile defense before the Soviets, it could provoke Soviet fears of a first strike against their nuclear forces. The reason is that a preemptive U.S. attack would sharply limit any Soviet retaliation and dramatically improve the effectiveness of an imperfect U.S. missile defense. "The fact is that a leaky umbrella does you more good if you are protecting yourself against a drizzle than a downpour," Drell explains. The result may be a preemptive Soviet attack to prevent the missile defense from being deployed.



*"General Hoskins, I don't care if you are in charge of our star-wars defense. You must wear a regulation uniform."* [Drawing by Dana Fradon; © 1984 *The New Yorker* Magazine, Inc.]

Abrahamson, on the other hand, asserts that any such fears would be groundless and that an early U.S. deployment will enhance, not threaten, world peace. "Lots of people use this rather simplistic label—stability or instability—and they say, well, defense is obviously destabilizing, particularly if one side gets ahead of another," he says. "There will be some off-balances. If the off-balance is that the Soviets are dramatically ahead and we are doing very little, then it is dangerously destabilizing. If you accept the idea that the United States will not capriciously initiate a first-strike, and I don't think we will . . . then if we get ahead, what is that? It is an opportunity for all kinds of arms control negotiations." The United States would be able to demand Soviet concessions in exchange for a delay in the deployment of a missile defense, he says. "I think it's an opportunity, provided we're the ones that get ahead—an opportunity for the right thing. . . . I do not believe that the United States—without important provocation—would ever attack."

By late this year, Abrahamson hopes to have a staff of 70 or 80 people assigned to the SDI headquarters in downtown Washington. "I think we will move ahead with research; some of the systems will prove attractive; and we'll go ahead and begin to construct portions of a full-fledged defense," he predicts. Through the end of this decade, the focus will be on basic research, accompanied by limited demonstrations of technologies required by advanced satellite- and air-based missile sensors; a high-powered ground-based excimer laser; a neutral particle beam; a hypervelocity railgun; and a nonnuclear ground-based missile interceptor. In the early 1990's, prototypes of actual defensive systems may be designed, built, and tested.

The late 1990's will be a period of incremental deployment leading up to comprehensive missile defense. At this point, said presidential science adviser George Keyworth in a recent speech, "we begin to realize the major military capabilities. . . . we can negate the [ballistic missile] realistic-first-strike options against strategic military objectives, preferentially defend a limited set of either conventional military systems or populations, [and] introduce the capabilities to defend more effectively against the air-breathing threat or airplanes and cruise missiles." The initial focus on protecting military targets "doesn't mean that we value those more than we value people," Keyworth added. "But it does mean that an enemy makes those military targets his first priority in a preemptive attack."

Asked about this assessment, Abrahamson says he disagrees only with Keyworth's statement that bomber and cruise missile defenses will be included under the rubric of SDI. "At this time in the program, there is clearly no [such] mandate." He also emphasizes that the timing of most missile defense deployments will be determined by future U.S. decisions about modifications of the SALT I treaty, which generally bans prototype testing of sophisticated missile defenses. He speaks disparagingly of "people who believe the . . . treaty is perfect and should be enshrined like the Ten Commandments." Last February, Defense Secretary Weinberger went even further, telling the Senate Armed Services Committee that it was a mistake for the United States to have signed the treaty in the first place.

Gerard C. Smith, who helped negotiated the treaty, claims that talk about "modifications" is inherently misleading. "This would be like amending the Volstead Act to permit the sale of liquor," he says. Opposition to such a move is particularly strong in Europe, partly out of fear that French and British nuclear forces could be rendered impotent by a robust Soviet missile defense, and partly out of fear that the abandonment of traditional nuclear deterrence would make the continent ripe for conventional conflict. Manfred Wöerner, the conservative West German Defense Minister, spoke for many Europeans when he declared, on a recent trip to Washington, that he supports vigorous U.S. research but worries that actual deployment would be highly destabilizing.

Wöerner added that his concern has been ameliorated somewhat by a U.S. promise to seek European counsel as the research progresses, and an agreement "that from the first moment on, they should include their European allies" in the coverage provided by a missile defense. Abrahamson says, however, that the program will concentrate primarily on U.S. defense. "Eventually, one could go much further and build . . . over Europe; it could be extended," he told a recent aerospace industry conference in New York.

Critics of the SDI program worry that its managers' scientific judgment may eventually be skewed by their present political determination and technical optimism. When asked if he is intellectually prepared to conclude, after a costly and time-consuming research effort, that a comprehensive missile defense is not feasible, Abrahamson says, "If there [was] a reason that I clearly came to that conclusion, I'd say it." Confidence in the Administration's judgment is hardly strengthened, however, when Frank Miller, the Defense Department's director of strategic forces policy, testifies—as he did before the House Foreign Affairs Committee on 26 July—that "one of the good arguments for a research program" is that "we have to prove what we say is correct."—**R. JEFFREY SMITH**