Carter's Plan for MX Lives On

The Reagan Administration calls it BMD, and proposes to double the budget for its development

It is an occasional phenomenon in Washington that publicly buried programs are not actually killed, but instead are maintained with diminished visibility under another title, until they reemerge in almost exactly the same form. A contemporary example is the plan, advanced during the Carter Administration, to hide the MX nuclear missile among a series of shelters in the Southwest.

Last October, President Reagan seemed to inter the shelter program during a nationally broadcast press conference. "We have decided not to deploy the MX in the racetrack shelters proposed by the previous Administration or in any other scheme for multiple protective shelters," Reagan said. The decision, he added, was based on military and not political considerations. The program would afford the MX only limited protection against a massive Soviet attack. "We have concluded that these basing schemes would be just as vulnerable as the existing Minuteman silos."

Early this year, the U.S. land-based force of nuclear missiles became vulnerable—on paper—to destruction in a preemptive attack by the Soviet Union. The Air Force has worried about this problem for a long time, searching high and low for a better place to put both the existing, silo-based Minuteman missiles and a new missile, the MX.

Under the Carter Administration, the Air Force agreed to a missile basing plan known as MPS, for multiple protective shelters. The Reagan Administration has ostensibly dropped this plan in favor of several alternatives.

Previous articles in this series explored why U.S. officials became alarmed about missile vulnerability; the genesis of a short-term plan to put more missiles into silos; continuing Air Force opposition to a plan for missiles on constantly roving aircraft; and a bizarre plan to bury missiles deep underground.

Contrary to Reagan's announcement, however, the essential elements of the Carter plan have been preserved in a program entitled Ballistic Missile Defense (BMD). The managers of the program are busily hatching schemes to shuffle the MX among a series of shelter-like structures in hopes of deceiving Soviet satellites. These will be different from the Carter plan in two respects: BMD will probably be incorporated from the start, rather than added later on; and less land and fewer shelters will be used. But the strategic concept is the same.

All plans of this type share a common defect: They cannot ensure that a substantial portion of the MX missiles can survive a massive assault. The Soviets would probably build enough weapons to overwhelm the system, a move that would aggravate international tensions. Additional problems would be created in breaking a treaty between the United States and the Soviet Union that outlaws BMD. Competition in missile technology would be heightened and, as either side neared the creation of a truly effective BMD, the balance of power could be tipped dangerously in one direction or the other.

The concept of a deceptively deployed MX missile, protected by BMD, is nevertheless considered the front-runner among the ideas being considered by the Reagan Administration for protection against a Soviet attack. Earlier this year, the Pentagon proposed a doubling of the annual budget for BMD research, to an amount just shy of a billion dollars. Competing options, such as the deep underground basing system, or the Big Bird airplane, will receive one-tenth this amount, even though they are at a less mature stage of development.

Support for the BMD program comes from those in Congress and at the Pentagon who were disappointed when the Carter plan was canceled. One supporter is Senator John Tower (R–Tex.), the powerful chairman of the Senate Armed Services Committee, who says that the Carter program "offered the best prospect, when you couple this with a ballistic missile defense system, of providing us a survivable deterrent by the end of the decade." Another is General David Jones, the chairman of the Joint Chiefs of Staff, who said after Reagan's announcement that he still thought the Carter plan "was both affordable and would be survivable." A third major supporter is General Lewis Allen, the Air Force Chief of Staff, who says that Reagan and Defense Secretary Caspar Weinberger failed to grasp the merits of the Carter plan despite his (Allen's) concerted efforts to sell it to them.

Opposition to the BMD program has been muted by the Pentagon's vigorous attempts to distinguish it from the politically unpopular Carter plan. The object of the plan was to engage Soviet satellites in an elaborate shell game, by constructing thousands of missile shelters over a vast region of the Southwest, and hiding several hundred missiles among the shelters. Carter Administration officials argued that the Soviets would be unable to attack every shelter, so that about half of the concealed missiles would survive a preemptive strike. But it eventually became clear, as President Reagan said last October, that "no matter how many shelters we might build, the Soviets can build more missiles, more quickly, and just as cheaply."

In light of this realization, most observers concluded that the concept of deceptive missile basing was dead. They were surprised by a Pentagon announcement 2 months later. Under pressure from Tower and others in Congress who had publicly backed the Carter plan, the Pentagon said that deceptive basing would be explored "as an option within the BMD program. To do otherwise would exclude highly effective tactics [such as] preferential defense, which the United States could use to gain leverage against the Soviet threat." Preferential defense is a tactic whereby antiballistic missiles attack only those incoming warheads that threaten an MX and let the others strike empty shelters.

The reason that such tactics interest the Pentagon is that contemporary BMD, as well as any BMD that might be available over the next decade or so, is incapable of destroying all incoming missiles. In this regard, it is not a true defense but merely a stratagem that

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forces the Soviets to use up more of its arsenal before a target is destroyed. As Weinberger said last autumn, "What we have now is not good enough. It works . . . perhaps with 50 percent of the incoming missiles. And this is not a situation in which a 50 percent average is very good."

Others have rated BMD effectiveness as high as 70 percent, but it is all mere conjecture. The system that Weinberger and others usually discuss—the so-called LoAD, or Low Altitude Defense system—exists only in the imagination of designers. Supposedly the system can pinpoint the location of incoming objects, distinguish warheads from decoys, and coordinate the flight of numerous small maneuvering intercepts. The missiles would supposedly be destroyed less than 15 seconds before impact, when they are traveling at roughly 20 times the speed of sound. But no one really knows, because the heart of this system—an interceptor capable of working reliably in battlefield conditions—has not been constructed.

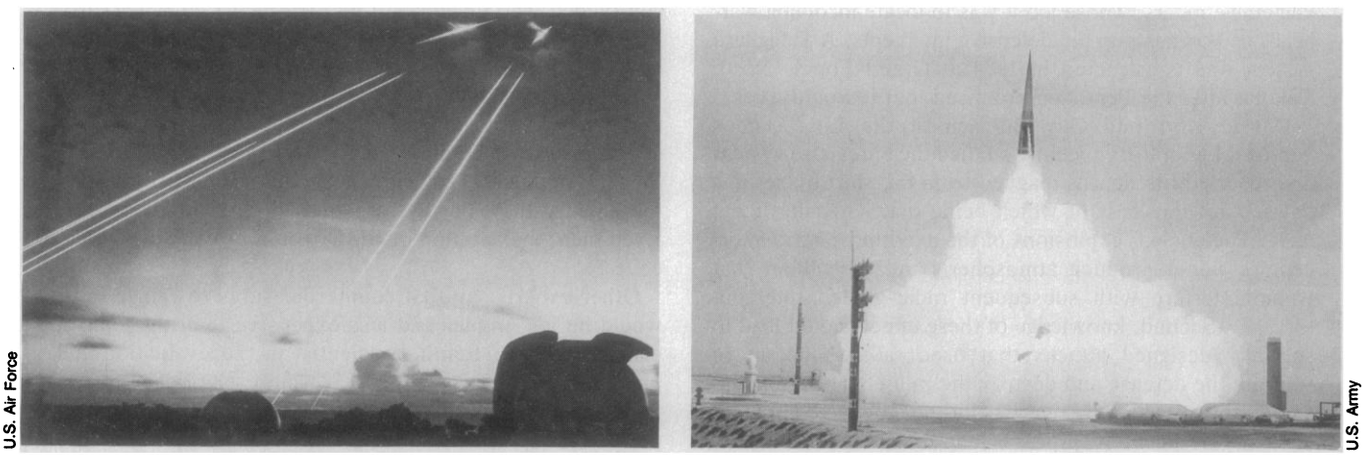
"We're quite confident that the technology of that interceptor is there," says John Gardner, the director of defensive systems at the Department of Defense. Gardner is highly familiar with BMD, having come to the Pentagon directly from the McDonnell Douglas Aerospace Co., the Pentagon's primary BMD contractor. He says that his technological optimism comes in part from the fact that $20 billion has been invested in interceptors and other BMD technology over the last 15 years. Data processing capabilities have been improved, interception strategies have been refined, and radars have been made smaller and more mobile. But the designs are far from complete. Additional work is still required to harden the radars against the effects of a nearby nuclear blast, for example, and to produce them more cheaply than possible now. Doubts have been expressed by Major General Stewart Meyer, the former commander of the BMD program, who recently told an aerospace conference that "there is no such thing as a low-cost, phased-array radar."

Ideally, LoAD would be combined with MX in such a way that the location of both missiles and missile defenses was unknown to the Soviets. If the system was large enough, the Soviets might have to use all of their own land-based missiles to overwhelm it. In the absence of treaty limitations on arsenal size, however, the Soviets could simply build more warheads. And no one in the United States can confidently predict how high the toll must be before the Soviets decide not to fire. Charles Townes, a physicist who studied the MX basing problem extensively at the request of the Pentagon, says that "there are so many variables, it is hard to give a clear answer. Perhaps they would decide not to fire if they had to expend as many as seven or eight missiles to destroy one of ours." T. K. Jones, the deputy under secretary of defense for strategic and theater nuclear forces, says that computer models of nuclear conflict show that the Soviets would fire at MX unless the ratio was as high as 40 to 1. Certainty in this area is impossible. Any BMD system that appears sufficient to counter the Soviet threat today might be a fraction of the system required at some point in the future.

Surprisingly, many military officials consider the survivability of MX to be unimportant. General Allen, for example, believes that targets that induce attrition of the Soviet arsenal are useful even if the target is destroyed. "The basis of the President's decision, the thing we were not able to convince him of, is that he believed that the MPS [Carter] system was fundamentally vulnerable to saturation," Allen told a Senate appropriations subcommittee. "I believe that was the wrong way to look at it. . . . If the system required the Soviets to disarm themselves in that leg of the triad to which they had clearly ascribed the highest value, then that system did the job we wanted it to do. That is, it changed the balance in such a way that the Soviets could no longer face us with this great superiority of ICBM's." What Allen wants, in short, is not an invulnerable target but a sponge to soak up accurate Soviet warheads.

This is, to put it mildly, a highly unpopular viewpoint in Utah and Nevada, where the Carter system would have been located. And it might be an equally potent stumbling block for the Reagan Administration's combination of deception and BMD. When Senator Gary Hart (D–Colo.) recently questioned Defense Department officials about the various schemes now under consideration, he made a point of saying that "if those states were concerned about becoming a nuclear sponge, I don't think my state or the surrounding states are any more anxious to become that sponge either."

This problem would be eliminated if a really effective BMD was created, which would act as a deterrent to expansion or use of the Soviet arsenal. Once the treaty banning BMD is breached, both sides can be expected to work hard at the invention of such a system. Even the Reagan appointees at the Arms Control and Disarmament Agency acknowledge, in the agency's annual report, that "ABM [antiballistic missile] deployments could stimulate an offense-defense competition, including the development and deployment of advanced penetration



U.S. Air Force

U.S. Army

An authentic ballistic missile defense would have to track numerous incoming warheads (as shown in photo at left) and orchestrate the flight of many short-range interceptors (such as those shown in photo at right), an exceedingly difficult task in a hostile nuclear environment.

A Legacy of Technical Problems

"In 1948 a walk on the moon was estimated to be two hundred years away," says Major General Grayson Tate, the manager of the Ballistic Missile Defense (BMD) program. "Today it is history. What brought man to the moon was a need to get there, and a decision. What will make strategic defense a technological reality is a need to make it a technological reality, and a decision."

By such hubris is the BMD program, which has yet to result in success, justified to the Congress and the public. Twenty years of research has resulted in the development of two highly flawed BMD systems, and a continuing string of promises that success is almost at hand.

The first major antiballistic missile system to be developed was Safeguard, which consisted of long- and short-range nuclear armed interceptors and two enormous, highly vulnerable radars, whose job it was to locate incoming warheads and orchestrate the defensive intercepts. A Safeguard system was constructed in 1974 at Grand Forks, North Dakota, after the Pentagon promised that it would work.

Donald Kerr and Guy Barasch of the Los Alamos National Laboratory recently studied the Safeguard system and reported that it was plagued from the start by serious flaws, "not the least of which being that it would defeat itself. The nuclear explosions of the exoatmospheric interceptors would produce atmospheric radar blackout that would interfere with subsequent radar-guided interceptors. . . . Second, knowledge of these effects could lead to specially designed attacks that used radar blackout to saturate the defense and destroy the radars. Third, expansion of the attack could overwhelm the defense computers and exhaust the interceptors." Congress ordered it dismantled in 1976.

Subsequently, the Pentagon began work on the Site Defense system, which consists of a cheaper, short-range nuclear interceptor, better computers, and smaller—but still highly vulnerable—radars. It, too, can be easily overwhelmed.

The successor to these ideas is the Low Altitude Defense system, which would use a nuclear warhead with a yield of several kilotons to destroy incoming warheads at an altitude below 50,000 feet. At this range, there would be no margin for error. Major General Stewart Meyer, the former BMD program commander, is not concerned, however. "Much has been made of the fact that LoAD with MX [in the Carter plan] would be effective only half the time. It should be noted, however, that was all that was required. . . . Certainly, under another set of conditions and requirements, we can produce systems that are much more effective and robust," he told a congressional committee last autumn.

Eventually, the managers of the BMD program say, a system known as Overlay could be combined with this low-altitude defense, incorporating a conventional warhead to destroy incoming missiles outside the earth's atmosphere. A test of the concept will be performed later this year, but the development of a working system is considered at least a decade away. Even then, it may be incapable of distinguishing real warheads from sophisticated Soviet decoys, says Pentagon consultant Richard Garwin. "The history of BMD development is replete with instances in which simple countermeasures, *sure* to be deployed by the time we could build a BMD, were ignored," he notes.

The Pentagon has been studying several methods of deploying the MX that can be combined with the low-altitude and Overlay systems, including plans to shuttle the missile among either silos or shelters and make the BMD radar mobile. The only new idea to emerge recently along these lines is a concept known as Dense Pack, in which missiles would be rotated among silos in tight clusters and defended by BMD interceptors at the periphery.

The objective of Dense Pack is to aggravate Soviet accuracy and timing problems. It does this by forcing such close targeting that incoming warheads would be destroyed or deflected by radiation, blast waves, or debris. A Pentagon official who declined to be identified said that Dense Pack would "put the Soviets to a severe test and cost them an enormous amount of money." Timing of explosions would have to be controlled to within a second or two, so that warheads could strike before the dust clouds had spread but after radiation and blast waves had dissipated. Smaller, more accurate warheads would have to be built by the Soviets, the official said, a task that would take years. Even then, the addition of BMD would provide protective cover.

Other experts say that countermeasures to Dense Pack would be far simpler and less expensive than this official claimed. George Smith, a scientist in the evaluation and planning group at Lawrence Livermore National Laboratory, studied the Dense Pack at the request of the Townes panel, a group formed to study the MX basing problem last year. He says that, although it would be difficult for the Soviets to defeat it now, "it does not look as if one could preclude a favorable attack by the time it could be operational. In fact, it opens up a Pandora's box of potential attack strategies."

Smith says that the Soviets may want to construct warheads of extremely high yield, so that they could use fewer missiles and knock out more than one of the closely packed silos with each explosion. Alternatively, he said, the Soviets could litter the missile field with nuclear mines, sent by rocket but landed by parachute. Missiles that survived a normal attack would thus be destroyed by the mines during their launch. And finally, the Soviets might also decide to detonate a continuous string of warheads over the missile field, causing such a hostile environment that U.S. missiles would be pinned down for fear of destruction. Meanwhile, other warheads hardened against this environment could be dropped through the fray onto the silos.

At best, Smith says, the Dense Pack might force the Soviets to attack the missile fields in successive waves, allowing a small opportunity for launches by the United States in between. If true, the system would ensure survivability for maybe 15 minutes or so, at a cost of perhaps $15 billion. The addition of a BMD would make an attack more difficult, but would again buy only a short period of time before the system was overwhelmed.

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aids and maneuvering reentry vehicles for offensive forces, as well as increases in force levels, giving each side, in turn, an incentive to further improve the capabilities of its ABM systems."

Such a race would be destabilizing because it would be difficult to assess the capabilities of either country at any given time. Jack Ruina, an arms control expert at MIT, notes for example that Soviet deployment of an BMD would create great uncertainty in the United States "about possible rapid deployment of equipment from ICBM sites to urban locations and about the potential for simple technical upgrading of equipment to make it more suitable for urban defense." Taking this and other problems into consideration, the Committee for National Security, a group founded by former SALT negotiator Paul Warnke, declared last summer that the treaty barring BMD is "the single most important arms control measure achieved thus far." Defense Secretary Weinberger disagrees, however. "If we find . . . that there is a far more effective system that would require revisions in the treaty, I think it's fair to say that we wouldn't hesitate to seek those revisions," he says. "Obviously if we are able to destroy incoming missiles effectively, I don't think it's destabilizing. I think it would be extremely comforting."

The problem is that the price of this comfort could be quite high—both politically and economically. Thomas Reed, a former Air Force Secretary who is now with the White House national security council, chaired a panel on BMD for the Defense Science Board last summer. He told *Science* that although the panel concluded that a LoAD system could indeed be built, he came to a personal conclusion that it was not worth the effort. The system, he says, would require thousands of nuclear-tipped interceptors, pulling scarce nuclear materials and money away from more effective offensive weapons. "If we want to spend money on things that go bang, then maybe we should spend it on things that go bang over the Soviet Union and not us," Reed says.—R. JEFFREY SMITH

Binary Nerve Gas Production Plans Debated

Critics say existing stocks are adequate deterrents; warn of adverse reactions from both allies and Soviets

A heated debate is brewing over the Administration's proposal to resume production of nerve gas after a 13-year hiatus. At issue is a plan to spend $104 million next year on research and production of artillery shells and a bomb to deliver binary nerve gas. Binary weapons contain two nonlethal chemicals that are kept apart until the weapon is in flight, when they combine to form highly lethal nerve agents. The Army has long been pushing for replacement of its existing nerve gas stocks with binaries on the grounds that they are safer to handle and transport than conventional chemical weapons, but until now, presidents have resisted the pressure.

In 1980, however, Congress passed a $3.2-million appropriation for construction of a facility to produce binary weapons at Pine Bluff, Arkansas. Last year $20 million was approved to equip the facility. Now the Administration wants to start production of binary artillery shells—part of an overall chemical warfare deterrent program costing around $7 billion over the next 5 years, most of which would be spent on upgrading protective equipment for U.S. troops.

This year a number of members of Congress (including both Arkansas senators) have voiced strong opposition to the binary plan. Senators Gary Hart (D–Colo.) and Thad Cochran (R–Miss.) are sponsoring a measure to delete the binary production money from the armed services authorization bill, and Representative Toby Moffett (D–Conn.) has introduced a similar bill in the House.

The debate over binaries revolves around two intertwined themes. The first centers on the question of whether or not the Army's existing nerve gas munitions have deteriorated so badly that they are no longer serviceable. And the second involves the broader question of whether renewed U.S. interest in chemical weapons will have adverse political ramifications among NATO allies for what critics believe are dubious military gains.

The Administration defends its proposed chemical weapons program by pointing to Soviet capabilities in this area. The Soviets are well known to integrate a chemical war–fighting capacity into all elements of their military apparatus. Extensive evidence for this was furnished by the Soviet tanks and equipment captured during the 1973 Arab-Israeli war. In absence of a verifiable ban on chemical weapons (the Geneva Protocol of 1925, prohibiting their first use in warfare, contains no means of verification or enforcement), the Administration wants a "credible" deterrent. The purpose of having a nerve gas is not so much to inflict casualties on the enemy, since once in protective garb troops are relatively invulnerable. Rather, it is to get the other side to "suit up." Wearing bulky protective gear and performing necessary safety and decontamination measures entails a 50 percent degradation in troop performance, says the Army. Thus, if the enemy is going to make allies don protective garb, they must be made to do likewise.

Amoretta Hoeber, the former Systems Planning Corporation executive who is now deputy assistant secretary of the Army for research, development, and acquisition, says that as soon as the Soviets show willingness to negotiate a verifiable ban we will promptly scuttle our new program. But our "sitting around doing nothing" for the past 13 years has enabled them to build up their side without having to make any concessions to the United States.

The government financed a big buildup of chemical munitions in the 1950's and early 1960's which terminated when President Nixon in 1969 ordered a stop to all production. But in view of the perceived Soviet threat, Administration officials argue that U.S. chemical weapons are no longer adequate.

Most of the stockpile, about half of which consists of agents (VX, Sarin, and mustard gas) in bulk storage, is located at the Tooele Army Base in Utah. The rest is in various munitions—rockets, bombs, mines, sprays, and artillery shells. Some of the stocks have deteriorated through rust and leakage. Many are

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