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When the March/April 2004 issue was published, the Doomsday Clock remained at 7 minutes to midnight, where it had been since February 27, 2002 when the United States rejects a series of arms control treaties and announces it will withdraw from the Anti-Ballistic Missile Treaty. Terrorists seek to acquire and use nuclear and biological weapons.

The protection paradox

by Hans M. Kristensen, Matthew G. McKinzie & Robert S. Norris

Who's kidding who? If you think a missile defense deployment will make the world safer, take a look at how the United States reacted to the Soviet missile defense of Moscow.

THE UNITED STATES PLANS TO begin deployment of a limited ballistic missile defense system at Fort Greely in Alaska and Vandenberg Air Force Base in California by the end of 2004. With 10 silo-based interceptors intended to shoot down long-range ballistic missiles, the system will serve as "a starting point for fielding improved and expanded missile defense capabilities later," according to the White House. The system is expected to grow to 20 silo-based interceptors in 2005, and up to 100 interceptors in the following years.

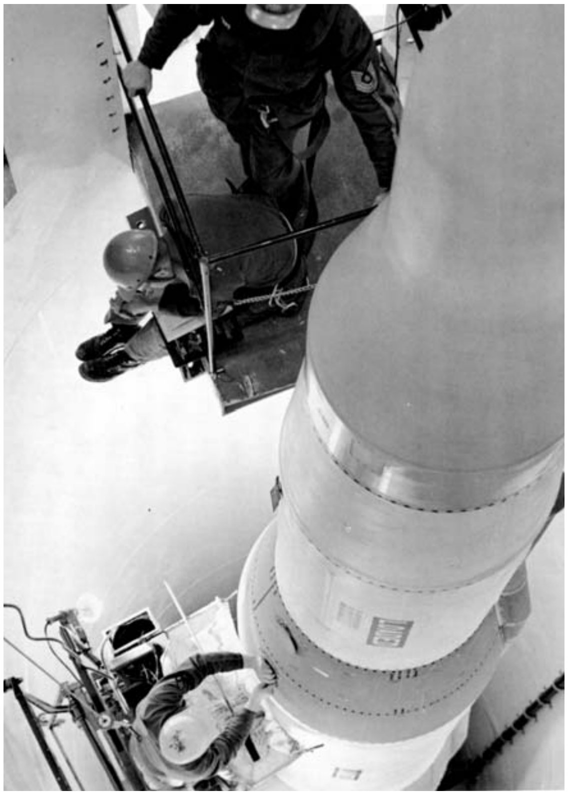
How will other nuclear powers respond? Some suggest that Russia might modernize its forces to be able to overwhelm the U.S. system and that China might improve its intercontinental ballistic missiles (ICBMs) to ensure the credibility of its deterrent. But the Bush administration insists this won't happen.

"Our missile defenses will be no threat to Russia," Douglas J. Feith, undersecretary of defense for policy, told the Senate Foreign Relations Committee in July 2001. Such U.S. defenses will not affect Russian capabilities, he said, so "there is no incentive for Russia to spend scarce resources to try to overcome them." And China, Feith claimed, "will continue [its] modernization whether or not we build missile defenses."

How can the Bush administration be so sure of how Russia or China will react? Its position is more wishful thinking than careful analysis. Had it bothered to examine how the United States itself reacted when faced with a Soviet missile defense system, it might have come to a different conclusion.

Documents recently declassified under the Freedom of Information Act (FOIA) reveal that in 1968 U.S. war planners sought to overwhelm Soviet defenses with enough nuclear firepower to kill tens of millions of people. The documents reveal that the United States considered all components of the Soviet anti-ballistic missile (ABM) system—missile interceptors, battle radars, and distant early warning radars—as high-priority targets for nuclear weapons.

Hans M. Kristensen, Matthew G. McKinzie, and Robert S. Norris work for the Natural Resources Defense Council in Washington, D.C. A footnoted version of this article appears online at www.thebulletin.org.



Missiles like this Minuteman II, shown in its North Dakota launcher, could have targeted Russian complexes.

USAF

The emergence of a Soviet missile defense system also spurred U.S. development of penetration aids ("pen-aids") and multiple independently targetable reentry vehicles (MIRVs), which vastly increased the U.S. stockpile. The United States undertook these efforts even though the Soviet ABM system was limited—similar in scale to the non-nuclear system planned by the Bush administration, which purports to defend against small attacks.

By reexamining the Soviet missile defense system of the late 1960s and how U.S. war planners might have planned to destroy it, and then by looking at how nuclear targeting is done today, it is clear that construction of a U.S. missile defense is actually cause for concern.

Soviet missile defense, 1968

The Soviet Union first deployed ballistic missile defense systems in the late 1960s. The most important was the A-35 anti-ballistic missile (ABM-1) defense system around Moscow, which began limited service in November 1967 with a few interceptors. The second, known as the Tallinn system, was located near Leningrad (now St. Petersburg) and became operational around the same time.

The A-35 Moscow system was originally designed to simultaneously intercept as many as eight incoming reentry vehicles. But there were doubts about whether it could intercept that many missiles, or missiles with multiple warheads and/or pen-aids (decoys that confuse radars). By 1968, the system was required to intercept only a single warhead or a single strike.

The initial system included 64 Galosh interceptors (ABM-1A, later upgraded to ABM-1B) located at four launch complexes outside Moscow. The Galosh had a 300-kilometer range and carried a warhead with a 2–3 megaton yield. Descriptions of the Soviet ABM system normally mention only four complexes, but a 1970 CIA report reveals that each complex consisted of two distinct launch sites separated by 4–7 kilometers. The four pairs of launch sites, the last of which became operational in early 1970, were arranged in a half-circle facing northwest, 85 miles (136 kilometers) from Moscow's center. Each launch site had eight reloadable aboveground launchers and three Try Add radars—one large radar for tracking and two smaller ones for tracking and guidance. A large Dog House tracking radar was built about 68 miles (109 kilometers) southwest of Moscow to track incoming reentry vehicles and provide battle management.

In addition to revealing the interceptor launch complexes, a CIA map released under FOIA shows that Moscow was also surrounded by 48 launch sites equipped with SA-1 Guild surface-to-air missiles. Twenty-six of the sites circled Moscow about 50 miles (80 kilometers) from its center; the other 22 sites formed an inner ring about 30 miles (48 kilometers) from Moscow's center. The 12-meter-long Guild missile had a range of 50 kilometers and could carry either a conventional or nuclear warhead.

Successful interception of reentry vehicles requires advance warning. In 1964, construction began on Hen House early warning radars, one at Skrunda in Lithuania and another at Olenegorsk on the Kola Peninsula. Hen House radars were designed to assess the size of an attack, confirm warnings from satellites and over-the-horizon radars, and provide target-tracking data to support ABM interceptor launches. The radars, located in the corridors through which U.S. ICBMs would strike Moscow, were almost entirely undefended and extremely vulnerable to the blackout that would result from nuclear airbursts.

The Tallinn system, named for the location where it was first detected, was deployed in a barrier line across the northwestern parts of European Russia, around Leningrad, and some parts of the southern approaches. After the conventionally armed SA-5 Griffon system was terminated in 1963, deployment of nuclear-capable SA-5B Gammon interceptors began at the old sites, with new sites constructed at Cherepovets, Liepaja, and Tallinn. The upgraded system became operational around 1966 or 1967.

In 1968, the total Tallinn system consisted of nearly 30 operational launch complexes with a similar number under construction. Each complex generally consisted of three launch sites. Each site had six SA-5B Gammon launchers and a modest-sized Square Pair radar. Of the 30 operational complexes, only six were close enough to the Hen House radars in Olenegorsk and Skrunda to have a potential ABM role (see "Soviet ABM System, 1968," p. 73).

There was considerable disagreement within the U.S. intelligence community at the time about whether the improved Tallinn system was to defend against aircraft, ballistic missiles, or some combination of the two. The Defense Intelligence Agency (DIA) agreed with the air force, which in late 1967 concluded that the system "possesses significant capabilities in both a terminal defense and area ABM role." But six months later, in a memorandum for President Lyndon Johnson, newly appointed Defense Secretary Clark Clifford said an ABM capability "now appears unlikely."

The CIA concluded that it did "not believe there is any deployment of ABM defenses outside the Moscow area," and the Tallinn system was "unlikely to have a present ABM capability," though it acknowledged, "the state of available evidence does not permit us to exclude this possibility." This view was shared by the navy, which decided that the system had "negligible capabilities against ballistic missiles."

There was general agreement that the limited Moscow and Tallinn systems would not be able to counter a large U.S. ballistic missile attack. In fact, the CIA later concluded that it "doubt[ed] that the Soviets will have an ABM system worth deploying against the U.S. threat in the foreseeable future."

The effect on U.S. nuclear planning

Despite disagreements and doubts, U.S. nuclear planners gave high priority to targeting the Moscow and Tallinn systems, worrying that even a limited ABM capability could diminish a strike against Soviet ICBM silos by U.S. ICBMs, which would overfly Moscow.

Soviet planners estimated in the early 1970s that Moscow would be targeted by at least 60 warheads of 1 megaton each. Newly declassified U.S. documents show that they were fairly accurate. A strike plan against the Moscow and Tallinn defenses, to ensure "penetration of the ICBM force," was incorporated into the single integrated operational plan (SIOP) war plan and entered into effect January 1, 1968. In addition to an undisclosed number of Polaris submarine-launched ballistic missiles (SLBMs), the plan involved "more than 100 Minuteman" ICBMs—about 10 percent of the U.S. ICBM force at the time. The attack would come in two closely coordinated waves. In the first salvo, Minuteman I/II and Polaris missiles would strike the Hen House early warning radars and their Tallinn system defenses. In the second wave, the Dog House radar and the Try Add system around Moscow would be attacked.

Assumptions about the 1968 attack

In attempting to reconstruct how U.S. nuclear war targeters might have devised such a strike plan we have made some assumptions about the targets and the weapons. The CIA's 1967 National Intelligence Estimate concluded that Moscow's ABM system did not "cover all of the multidirectional U.S. missile threats to Moscow; it is subject to saturation and exhaustion," and "none of the system components are hardened against nuclear bursts."

The strike plan would likely have exploited these weaknesses to the fullest and made use of the surprise effect of the significantly shorter flight time of SLBMs. So we have assumed that the Polaris missiles were targeted against the soft Hen House and Dog

Projected U.S. ABM suppression strike, 1968*

Target	Weapon**		Warhead		Total	
	Type	No.	Type	Yield (kt)	Warheads	Yield (kt)
Moscow system						
Dog House radar	Polaris A3	2	W58	200	6	1,200
Eight ABM launch complexes	Minuteman I/II	64	W56	1,000	64	64,000
Subtotal		*66*			*70*	*65,200*
Tallinn system						
Tallinn launch complex	Minuteman I/II	8	W56	1,000	8	8,000
Liepaja launch complex	Minuteman I/II	8	W56	1,000	8	8,000
Cherepovets launch complex	Minuteman I/II	8	W56	1,000	8	8,000
Three Leningrad complexes	Minuteman I/II	24	W56	1,000	24	24,000
Subtotal		*48*			*48*	*48,000*
Early warning radars* **						
Hen House (Skrunda)	Polaris A3	2	W58	200	6	1,200
Hen House (Olenegorsk)	Polaris A3	2	W58	200	6	1,200
Subtotal		*4*			*12*	*2,400*
Total		**118**			**130**	**115,600**

kt=kilotons. *Based on 100+ Minuteman I/II missiles, plus Polaris missiles, designated for 1968 Soviet ABM suppression. (U.S. Strategic Air Command, "History of U.S. Strategic Air Command January–June 1968," February 1969, p. 300. Partially declassified and released under FOIA.) **The assignment of individual weapons to individual targets is not known. We assume each launch complex was targeted by eight Minuteman missiles, each carrying one W56 warhead (1-megaton yield). ***Two other Hen House radars were located near China but could not detect missiles launched over the North Pole.

Characteristics of U.S. nuclear weapons

	Weapon	Yield (kilotons)	Accuracy (meters)*	Reliability**	MIRVs
1968					
	W56 (Minuteman I/II)	1,200	930	80 percent	1
	W58 (Polaris A3)	200	1,480	80 percent	3
1989					
	W78 (Minuteman III)	335	300	80 percent	2–3
	W76 (Trident I C4)	100	460	80 percent	8

MIRVs=multiple independently targetable reentry vehicles. *Circular error probable.
**Average reliability.

House radars, while Minuteman ICBMs were focused on the interceptor complexes. Moreover, since we don't know the capability the nuclear war planners assigned SA-5B and ABM-1B interceptors, or whether they considered these longer-range Moscow interceptors more capable (they probably were), we have assigned an equal number of attacking warheads per launch site.

Based on these assumptions and detailed calculations described below, the use of "more than 100 Minuteman" ICBMs and at least six Polaris SLBMs against the Soviet missile defense system's 17 individual facilities results in a staggering average of eight 1-megaton warheads per interceptor launch site around Moscow and Leningrad. The combined force of the strike exceeds 115 megatons—the equivalent of more than 7,500 Hiroshima bombs. Under these assumptions, the Moscow system would be clobbered with 70 warheads; the Tallinn system would be hit with 48 (see "Projected U.S. ABM Suppression Strike, 1968," p. 71).

Modeling the 1968 strike

To better understand the methodology by which U.S. nuclear war planners probably arrived at such an enormous strike plan, we performed calculations of target hardness, damage expectancies, and nuclear weapons effects. Our assumptions about the characteristics of the two types of attacking U.S. nuclear weapons are provided (see "Characteristics of U.S. Nuclear Weapons," above). It is important to note that at the time, high yields were used to compensate for the weapons' relative inaccuracy. A 1-megaton warhead can destroy residential structures out to a radius of about 4.5 kilometers from its ground zero. Many currently deployed U.S. nuclear weapons can do more damage at lower yields because of significantly higher accuracies.

This strike has two types of targets: ABM radars, and surface-launched ABM interceptor missiles. The targets' hardness and the characteristics of the attacking weapons would dictate to 1968's U.S. nuclear war planners how many nuclear weapons to assign each target, and, for each weapon, the height of burst (HOB).

The height of burst determines whether there is fallout from a nuclear explosion; above a certain height, no fallout would be expected because the detonation is too high to kick up ground debris. For the attacking weapons in this scenario, the "no-fallout HOB" is 935 meters for a 1.2-megaton weapon and 457 meters for a 200-kiloton weapon. To increase damage to a hardened target, war planners may call for a HOB lower than the no-fallout height. The "optimum HOB" maximizes the area exposed to a given blast pressure. For some targets and nuclear yields, the optimum HOB is above the no-fallout height (as at Hiroshima and Nagasaki, for example).

A high-yield nuclear weapon detonated at a lower height could produce hazardous radiation levels hundreds of miles from ground zero. With information from the partially declassified 1989 NATO Target Data Inventory (NTDI) Handbook, we calculated the hardness of the Soviet ABM targets and the optimum heights of burst for the attacking weapons. The optimum heights of burst are above the no-fallout HOB for both target types; this would avoid radiation contamination of Russia and Europe. Factoring in weapon accuracy and reliability, we can also compute the kill probability for an individual warhead on a specific target (see "Optimized U.S. Nuclear Forces Attack on Soviet ABM Targets," p. 74).

Our calculations show that, using this methodology, a couple of W56 Minuteman warheads were needed to destroy each ABM launch site. The fact that the U.S. nuclear war planners of 1968 assigned about eight warheads to each target implies that they were concerned with the effectiveness of the Soviet missile defenses and used extra warheads to overwhelm them. The six Polaris warheads assigned to each radar target would have achieved a combined 88 percent kill probability.

Substantial blast and fire damage would be expected from the strike. Central Moscow would be initially undamaged but surrounded by a semi-circle of fire soon after the attack. If rain or snow were falling, radioactive contamination of Moscow might occur because of the phenomenon of rainout.

Pen-aids and MIRVs

Our reconstruction of the ABM strike does not take into account how well the Soviet missile defense systems would have worked. What our calculations do show, however, is that U.S. planners added a large number of weapons to the strike plan to overcome any attrition by the system.

In the early to mid-1960s, in anticipation of the Soviet missile defense system, the United States developed pen-aids (decoys and chaff) to confuse interceptors. The United States wanted all its missile systems, whether SLBMs or ICBMs, "to be equipped with decoys capable of penetrating both area and local ballistic missile defenses." Some U.S. ICBMs had pen-aids, others did not; the Polaris SLBMs did not carry decoys (although subsequent Poseidon and Trident weapon systems did). In the 1968 strike plan described above, the Minuteman I reentry vehicles were equipped with "retro-rockets," and the Minuteman II carried Mk-11C reentry vehicles and Mk-1 pen-aids when available.

Another fundamental U.S. countermeasure to "saturate" the Soviet ABM system was the development and deployment of MIRVs. Many declassified documents from the time describe the MIRV development effort in an ABM context. The Polaris A3 carried three reentry vehicles, but the Poseidon SLBM that began replacing it in 1971 carried an average of 10 MIRVed warheads. Each warhead had a yield of approximately 50 kilotons and more than three times the accuracy of the Polaris A3. This meant the Poseidon could "be used to saturate an ABM defense or to attack independent soft targets."

The Minuteman III, deployed in 1970, and the current Peacekeeper ICBM carry two or three and 10 MIRVs, respectively. Individual missiles were eventually configured with different mixes of reentry vehicles and pen-aids to meet specific requirements of the mission.

British nuclear targeting of ABM systems

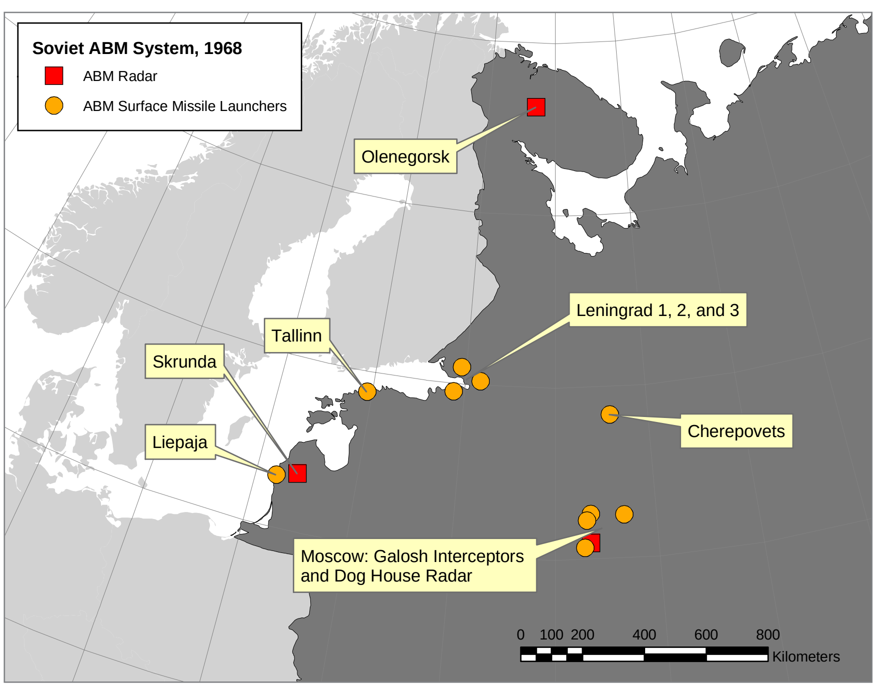
A British war plan supplemented the U.S. one. The first British nuclear-powered ballistic missile submarine (SSBN), the *Resolution*, sailed its first patrol in June 1968 armed with 16 U.S.-supplied Polaris missiles, each carrying three 200-kiloton warheads. Three more subs followed in June 1969, August 1969, and September 1970. The Polaris force took over the strategic role of the V-bomber.

By the end of the 1960s, targeting may have focused on Moscow, with all the missiles of a nuclear submarine committed to destroying the ABM system and the city. The capability of the Moscow ABM system might have limited the flexibility of British targeting by tying down most of the deployed force. Polaris appears to have been judged much more effective against the SA-5B Gammon interceptors of the Tallinn system. A 1970 study published by the British Atomic Energy Authority concluded that SA-5B interceptors were not a threat to British Polaris missiles, and that it would take only two Polaris missile payloads to saturate a standard SA-5B battery.

In 1972, the British government decided to develop a new front end for the Polaris missiles "designed specifically to penetrate [the] anti-ballistic missile defenses" around Moscow. This improved system, called Chevaline, was deployed in 1982. It carried pen-aids and three 40-kiloton maneuverable reentry vehicles that were "hardened" against the radiation effects of the nuclear ABM interceptors.

The Chevaline tied British targeting to Moscow. That changed in 1998, when Britain deployed Trident D5 missiles on four Vanguard-class SSBNs, returning flexibility to the war planners. "It is more than just the destruction of Moscow," said Field Marshall Nigel Bagnall, British chief of general staff from 1985 to 1988, "it is the destruction of the command and control system."

From late 1970 (when the British SSBN force became operational) through 1996 (when the Chevaline's operational deployment ended), the combined number of U.S. and British weapons assigned to suppress the Soviet ABM system may have been well over 200 warheads.



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The Soviet ABM upgrade

Aware of the severe limitations of its A-35 Moscow ABM system, the Soviet Union began upgrading it in the mid-1970s. Like its predecessor, the upgraded system, called A-135, was designed merely to provide an "adequate" defense (as opposed to an "optimum" defense) against threats like a renegade U.S. SLBM attack, a "limited, provocative" U.S. ICBM at-

Optimized U.S. nuclear forces attack on Soviet ABM targets*

Attacking warhead	Target type	Optimum HOB**	Kill probability (excluding reliability)	Kill probability (including reliability)
1968				
W56; 1,200 kilotons	SA-5B/ABM-1B surface-to-air missiles	2,000 m	99 percent	79 percent
W58; 200 kilotons	Radar installations	900 m	38 percent	30 percent
1989				
W78; 335 kilotons	Hardened silos similar to those of SS-7/8/9s	0–225 m	74 percent	59 percent
W76; 200 kilotons	Radar installations	700 m	92 percent	74 percent

m=meters. *Not considering ABM system effectiveness. **HOB=height of burst

tack, or a Chinese attack with as many as 100 intermediate-range missiles. The Moscow ABM capability was diminished by the reduction of interceptors in 1979–1980 from 64 to 32.

The upgrade was formally completed in 1989 (but had significant problems and was not fully operational until 1995). It added 68 launchers for a total of 100, the maximum permitted under the Anti-Ballistic Missile Treaty. Four new launch sites were built closer to Moscow, with new Gazelle (ABM-3) interceptors (17 launchers each) based in hardened silos to strike reentry vehicles inside the atmosphere. The Gazelle has a range of 80 kilometers and carries a 10-kiloton warhead.

The improved surface-mounted Galosh (ABM-1B) interceptors, of which only 16 of the original 64 remained in 1987, were replaced with 32 long-range Gorgon (SH-11/ABM-4) interceptors, deployed in hardened silos to engage incoming reentry vehicles outside the atmosphere. In 1989, there were four Gorgon sites with eight silos each. The Gorgon has a range of about 350 kilometers and carries a 1-megaton warhead.

The A-135, which some claimed was a scaled-up version of the U.S. Nike-X system, included a new Pillbox phased-array radar with 360-degree coverage at Pushkino, northeast of Moscow. The Pillbox, which became fully operational in 1990, was connected to other radars to track incoming warheads and guide the interceptor missiles toward their targets. The Soviets upgraded the Hen House radar at Skrunda to a much more capable large phased-array radar (LPAR), and added another LPAR to the system at Pechora in the northeastern Urals.

A U.S. response to the Soviet upgrade

Given the Soviet ABM modernization, how might U.S. nuclear planners have targeted the new A-135 system in 1989? Unlike our 1968 case study, neither the number of weapons nor their characteristics have been declassified. But from what we know about 1968 planning, targeting methodology, and our calculations of the above strike, it is possible to make a reasonable guess.

Well before the A-135 was completed, the United States concluded that despite the improvements, "the system cannot presently cope with a massive attack."

"With only 100 interceptor missiles," the Pentagon explained, "the system can be saturated, and with only the single Pillbox radar at Pushkino providing support to these missiles, the system is highly vulnerable to suppression." Even so, the Pentagon acknowledged, "It does provide a defense against a limited attack or accidental launch."

For the nuclear planners, one of the most important features of the upgraded Soviet system was that the new Gazelle interceptors could engage ICBM and SLBM reentry vehicles *after* most pen-aids were lost during reentry through the atmosphere. This capability meant that more attacking warheads would be needed to defeat the ABM system.

To better calculate and predict the loss of warheads in an attack, U.S. nuclear planners in 1986 acquired a new tool—the multiple engagement model (MEM). Developed by the Joint Strategic Target Planning Staff in charge of the SIOP, the MEM simulates warhead attrition caused by ABM interceptors.

Because of their capability for surprise, we assume that SLBMs in 1989 were primarily used to target the radars, much like the 1968 plan. Unlike in 1968, however, the new Poseidon and Trident I C4 SLBMs were equipped with pen-aids. Moreover, we assume that individual SLBMs assigned to take out the radars had been downloaded to carry only a few warheads (see "Characteristics of U.S. Nuclear Weapons," p. 72).

In 1968, Soviet interceptors were "soft" aboveground targets, but in 1989 both the Gorgon and Gazelle interceptors were deployed underground in hardened silos. We don't know whether the silos were hardened to the same degree as ICBM silos, but assumed a low hardness similar to the SS-7, SS-8, and SS-9 missile silos. Using the vulnerability numbers from the declassified NTDI Handbook, and including the weapon system's reliability, we calculated the optimum height of burst and kill probabilities for Soviet ABM targets attacked by U.S. nuclear forces in 1989 (see "Optimized U.S. Nuclear Forces Attack," above).

This shows that it would require at least two W78 warheads from a

Minuteman III, detonated at 225 meters, to achieve a kill probability greater than 80 percent for each interceptor silo. For the softer radar installations, a single W76 warhead detonated at 700 meters would have a kill probability of 74 percent. We have therefore assumed that each silo would be targeted with one ICBM with at least two W78 warheads at surface or shallow burst (approximately 200 meters), and that each radar would be targeted with two airburst W76 warheads from an SLBM.

Because each Gorgon launch site included eight interceptor silos, and each Gazelle launch site had nine silos, to achieve a kill probability of more than 80 percent would require a staggering 16–18 warheads per launch site. As a result, we estimate that a 1989 strike against the Soviet ABM system would have required more than 100 ICBMs and SLBMs with more than 200 warheads, for a combined explosive power of 68 megatons (see "Projected U.S. ABM Suppression Strike, 1989," p. 77).

Radioactive fallout from airbursts over the radar facilities would be limited, but the use of many surface or near-surface bursts over the interceptor launch sites would create considerable fallout over Moscow and the surrounding areas. Calculations performed with a U.S. Defense Department computer program, using historical weather patterns for December, show that an unsheltered population in Moscow and outside the city to a distance of 35–75 miles would receive a lethal dose of up to 10,000 rem during the first 48 hours after the attack. The radioactive plume would be carried by prevailing winds for hundreds of miles (see "Fallout From Projected U.S. Attack, 1989," below).

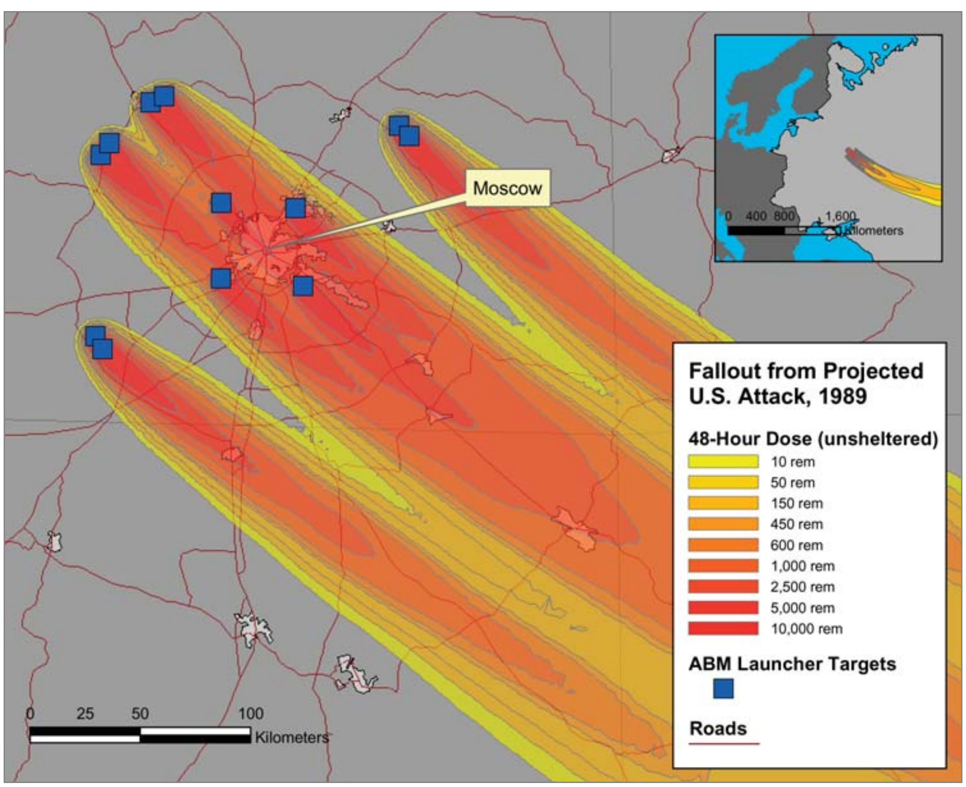
Modern anti-missile defense strike planning

Although U.S. offensive capabilities have changed considerably since 1989 with the advent of the Peacekeeper ICBM and Trident II D5 SLBM, the basic ABM mission remains the same: to destroy the ABM system and then the Russian leadership targets in Moscow, and to ensure penetration of the main ICBM force against Russian silos to the south and east.

In the late 1990s, the effects of the Soviet Union's demise reduced Russian ABM capabilities. The Skrunda radar closed in 1998, leaving a significant gap in Russia's ability to detect submarine missiles launched in shallow trajectories.

The same year, signs began to emerge that the Soviet ABM system was undergoing a more fundamental change—replacement of some or all of the nuclear warheads with *conventional* warheads. In February 1998, the commander in chief of the Strategic Rocket Forces said that the system needed some minor modifications, but that the "nuclear umbrella" over Moscow would once again be opened. A few days later, Col. Gen. Vladimir Yakovlev, commander in chief of strategic missile forces, suddenly declared that the ABM system, with conventional warheads on the Gorgon and Gazelle interceptors, was combat-ready and would be placed on 24-hour alert status.

Shortly thereafter, Gen. Eugene Habiger, U.S. commander of Stratcom, bluntly told reporters: "I'm at odds with the intelligence community regarding the ABM system around Moscow, in terms of its capability. . . . My view is the system is not as capable as the intelligence community says." Habiger added, "The Russians have told me that the system is no longer operational." Two months later, retired Russian generals told a conference in Washington, D.C., that Russia had removed the nuclear warheads from its ABM interceptors and replaced them with conventional warheads.



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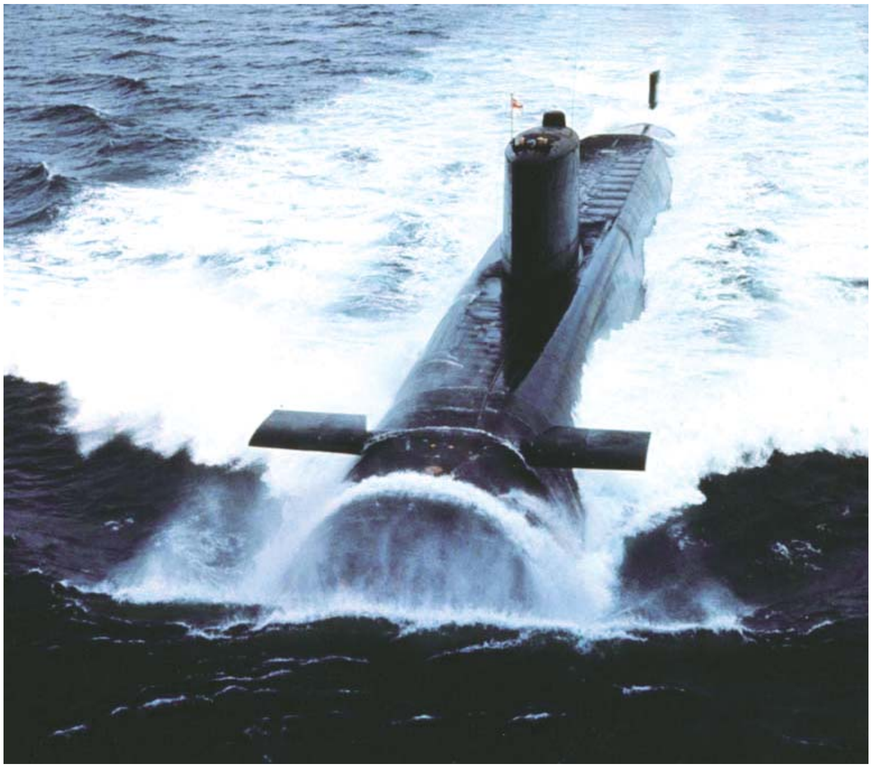

Britain's *Resolution* was armed with nuclear-capable Polaris missiles.

ROYAL NAVY

Armada International echoed this in April 2002, reporting that the A-135 system was stood down briefly in 1997–1998 for that purpose.

In contrast with these reports, British Defence Minister George Robertson wrote in late January 1989 to a member of Parliament about the status of the Russian ABM system: "We assess that the Moscow anti-ballistic missile system comprising the short range Gazelle and longer range Gorgon interceptors remains operational and effective. . . . Deployment of any significant upgrades in the near future appears unlikely."

Whether or not the system is still nuclear armed, it appears operational. In November 1999, Russia launched an unarmed Gazelle interceptor from the Moscow system in the first test launch since 1993. The U.S. State Department said the test was "distressing," and that "Russia is raising the specter of an arms competition when what we're trying to do is work cooperatively with them to focus on rogue states."

A second test followed in October 2002, when a long-range Gorgon interceptor was launched from the Sary Shagan test range in Kazakhstan. The test allegedly was part of further improvements to the A-135, and was followed by a Russian simulated attack on the Moscow ABM system. The exercise appears to have been a simulated strike against a future U.S. limited missile defense system.

In 2003, Russia decided to deploy additional SS-19 ICBMs equipped with MIRVed warheads. Russian President Vladimir Putin boasted that "their combat potential, including penetrating through any missile defense systems, is without peers."

This seems to indicate that Moscow is already adjusting its nuclear planning in anticipation of a future U.S. missile defense, much like the U.S. response to the Moscow ABM system in the 1960s. Russia is conducting its strategic planning in the context of the Bush administration's withdrawal from the ABM Treaty and construction of a 100-interceptor missile defense.

And despite the newly declared partnership with Russia, U.S. nuclear planners appear to be refining their nuclear-strike planning against the Russian ABM system. In November 2003, Stratcom initiated a new round of upgrades to its ABM attack-simulation program.

Major U.S. early warning radars are deployed at Thule, Greenland, and Fylingdales, England. (Additional facilities are scheduled to be built in Japan.) If these sites are not already considered high-value targets as central components of a missile defense system, they soon would be—just like the Soviet ABM radars, which became priority targets for U.S. planners.

An upgrade to the Thule and Fylingdales radars is part of the Bush administration's missile defense effort. Whether these facilities might be targets has created some debate in both countries, but the British and Danish governments have both dismissed the risks and agreed to support the Bush plan.

A mug's game

U.S. (and British) nuclear planners responded to the Soviet deployment of a limited missile defense system with enormous firepower. The large number of nuclear weapons that were assigned to overwhelm the Soviet ABM system and the substantial technical efforts the U.S. undertook to defeat it provide chilling examples of the attention missile defense systems attract from hostile nuclear planners. It is a history that fundamentally contradicts the portrayal of missile defenses as non-offensive, threatening no one. Ballistic missile defense systems threaten secured retaliation, and for smaller powers, deterrence itself.

Missile defense systems also indirectly threaten populations. The Soviet ABM system was intended to protect Moscow against nuclear attacks, but rather than shielding the capital from nuclear peril, the system in fact had the opposite effect of attracting nuclear warheads. Many other facilities would have been targeted in addition to the ABM system, including political and military leadership targets. "We must have targeted Moscow with 400 weapons," a former Stratcom commander has stated.

What is the relevance of this today? One could argue that all of this occurred during the Cold War, that U.S.–Soviet/Russian strategic competition is over, and that smaller nuclear powers do not have enough nuclear weapons to overwhelm missile defense systems. That may or may not be so. But at the superpower level, the action-reaction momentum seems to continue.

The United States apparently still targets the Moscow ABM system, and Russia appears to have begun adjusting its own forces to a future U.S. missile defense. The Bush administration's claim that its system will not be of concern to Russia may be true in a hypothetical Russian first-strike scenario with hundreds of missiles. But Russian planners are likely to be much more concerned with the effect on their surviving retaliatory capability after a hypothetical U.S. first strike has reduced the number of operational missiles. This will almost certainly drive new modernization efforts, newfound U.S.-Russian partnership or not.

For China, the situation is drastically different. The credibility of its nuclear retaliatory deterrent will be fundamentally challenged by a U.S. missile defense system. Ironically, the situation is similar to that in the late 1960s, when China was the "rogue" state used as the justification to build the first limited U.S. missile defense system. Back then, a system with 100 interceptors, the same capacity planned by the Bush administration today, was thought to be capable of reducing U.S. fatalities from a Chinese attack to "possibly zero, if the number [of Chinese missiles] does not reach 25." China today has approximately 20 ICBMs capable of hitting the U.S. mainland.

The current Chinese modernization program began more than a decade ago. The U.S. intelligence community estimates that by 2015, China will increase "several fold" the number of warheads primarily targeted against the United States. The Bush administration's claim that China will continue to modernize whether or not the United States builds missile defenses is a dangerous gamble that ignores the magnitude of the impact on the Chinese deterrent. "That impact will lessen if, as expected, China increases strategic nuclear arms over the next decade," said Stratcom commander Adm. James Ellis in 2001. But the U.S. experience with targeting Soviet missile defenses suggests that even the 75–100 warheads the U.S. intelligence community predicts China will have by 2015 may not be enough for it. The United States needed well over 100 missiles with even more warheads, pen-aids, and SSBNs to overwhelm the 1968 Soviet ABM system. The Chinese reaction to a more capable U.S. missile defense may spark similar changes in China's capabilities, as the CIA predicts: "MIRVing and missile defense countermeasures would be factors in the ultimate size of the force."

In the longer run, a missile defense system could also cause a doctrinal change, prompting China to abandon its purely retaliatory posture and replace it with counterforce targeting similar to that of the United States and Russia. As Admiral Ellis explained, "the more effective a U.S. missile defense system is in diminishing [the] retaliatory capability of Russian and Chinese deterrent forces, the greater the incentive for expansion of these forces to maintain their perceived deterrent effect."

The dynamics of nuclear competition and the history of the U.S. targeting of the Soviet ABM system remind us that missile defense systems are potent drivers of offensive nuclear planning. The missile defense that the Bush administration is building will be no exception, despite its limited capability, and it will almost certainly attract nuclear targeting from the start. ⚛

Projected U.S. ABM suppression strike, 1989

Target	Weapon*		Warhead		Total	
	Type	No.	Type	Yield (kt)	Warheads	Yield (kt)
Moscow system						
Cat House radar	Trident I C4	1	W76	100	2	200
Dog House radar	Trident I C4	1	W76	100	2	200
4 Gorgon launch complexes	Minuteman III	32	W78	335	64	21,440
4 Gazelle launch complexes	Minuteman III	68	W78	335	136	45,560
Subtotal		*102*			*204*	*67,400*
Early warning radars**						
Hen House radar (Olenegorsk)	Trident I C4	1	W76	100	2	200
LPAR radar (Skrunda)	Trident I C4	1	W76	100	2	200
LPAR radar (Baranovichi)	Trident I C4	1	W76	100	2	200
Subtotal		*3*			*6*	*600*
Total		**105**			**210**	**68,000**

kt=kilotons. *We assume each Gorgon launch complex was targeted by eight Minuteman III missiles, each carrying two 335-kiloton W78 warheads; that each Gazelle complex was targeted by nine Minuteman III missiles, also each carrying two W78s; and that each Trident was downloaded to at least two warheads. Both Moscow radars could also be targeted by warheads from a single missile. **The LPAR and Pillbox radars at Pechora and Moscow, respectively, were under construction in 1989, and would later be targeted as well.