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NATIONAL MISSILE DEFENSE: TEST FAILURES AND TECHNOLOGY DEVELOPMENT

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

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NATIONAL MISSILE DEFENSE: TEST FAILURES AND TECHNOLOGY DEVELOPMENT

FRIDAY, SEPTEMBER 8, 2000

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON NATIONAL SECURITY, VETERANS AFFAIRS, AND INTERNATIONAL RELATIONS,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:30 a.m., in room B–372, Rayburn House Office Building, Hon. Christopher Shays (chairman of the subcommittee) presiding.

Present: Representatives Shays, Chenoweth-Hage, Tierney, Allen, Schakowsky, and Burton, ex officio.

Also present: Representatives Kucinich and Turner.

Staff present: Lawrence J. Halloran, staff director and counsel; R. Nicholas Palarino, senior policy advisor; Alex Moore, fellow; Jason M. Chung, clerk; David Rapallo, minority counsel; and Earley Green, minority assistant clerk.

Mr. SHAYS. The House Subcommittee on National Security, Veterans Affairs, and International Relations is now going to undertake a hearing entitled, "National Missile Defense: Test Failures in Technology Development."

Under the National Missile Defense Act of 1999, "It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack." Adopted with broad bipartisan support and signed by the President, the statute answered the question whether to deploy a national missile shield, but could not mandate when a technologically feasible system would be ready.

When will effective and affordable National Missile Defense [NMD], technology, be ready? That is the question we pose this morning as we undertake oversight of a $10 billion technology development process that has yet to yield a deployable NMD system.

The Reagan administration's Strategic Defense Initiative [SDI], hastened the demise of the Soviet Union. Since then, we've moved away from the global vision dubbed "Star Wars" to merely trying to hit a bullet with a bullet and missing more often than not.

Without question, NMD program officials, today's stewards of the SDI legacy, confront complex technical challenges in a changing strategic, diplomatic and political environment. This is rocket science, and defending against emerging missile threats demands an unparalleled degree of technological precision in launch detec-

tion, target discrimination, command and control coordination, and target interception.

Our oversight of other complex weapons systems, the F–22 Raptor and the multirole Joint Strike Fighter, underscored the importance of permitting technology readiness to drive design and deployment decisions. In those programs, we saw a genuine sense of urgency to overcome test failures, conquer new technology and meet emerging threats.

Is a similar sense of urgency propelling the NMD technology program? A 1998 review of the missile defense program found motion but not progress, a rush to failure caused in part by poor management and lack of aggressive oversight. The President's hastily announced decision last week to defer initial NMD deployment steps, "until we have absolute confidence that the system will work," holds proven technologies hostage to an artificial all-or-nothing standard.

Factors other than technical feasibility appear to be constraining NMD success. One of those factors, Russia's refusal to discuss necessary changes to the 1972 Anti-Ballistic Missile [ABM], Treaty, could have been ameliorated had the President authorized construction contracts for that part of NMD technology we know will work, the X-Band radar facility in Alaska. Under the pressure of inevitable, if distant, NMD deployment, the Russians might be more willing to accede to limited ABM changes rather than face further loss of international stature in the event the treaty is deemed a legal nullity or a strategic anachronism.

The ballistic missile threat is real, and it is growing. China is developing weapons using stolen U.S. warhead designs, and appears willing to sell missile technology to rogue nations who may not be tamed by deterrence alone. North Korea could resume flight tests and acquire intercontinental missile capability at any time. Development of technology to defend against that threat should be pursued just as aggressively, unfettered by timidity over near-term diplomatic or political fallout.

The next President deserves to choose from a complete menu of mature NMD technologies in deciding how best to protect our national security.

Our witnesses this morning represent a wide range of views on how to implement the national policy on missile defenses. We welcome them all and look forward to their testimony.

At this time I would like to recognize Mr. Tierney.

Mr. TIERNEY. Thank you. I would just start this morning, Mr. Chairman, by thanking you for scheduling and conducting these hearings. I would also like to extend my appreciation to the witnesses today for their time, their insights, as well as their testimony.

I think President Clinton is to be applauded for his decision last week to defer any decision on deployment of a National Missile Defense. Those who seek to politicize this issue do the Nation a disservice, including those who last December said they would welcome such a decision, but who have subsequently claimed that deferral somehow evidences a failure to strengthen America's defenses. As I stated earlier, such politicization demeans the serious-

ness of our need to establish defense priorities based on appropriate nonpolitical criteria.

In addition, such assertions are patently inaccurate. Our country's defenses would only be substantially weakened should we move to deployment under current conditions. The President's decision seems to have been the only reasonable one available at this time, given the substantial delays in testing schedules, the severe cost overruns and several high-profile missile intercept failures.

Moreover, it appears to have at least recognized that Russia, China and our NATO allies oppose deployment because it would violate the Anti-Ballistic Missile Treaty which they regard as a cornerstone to nuclear nonproliferation.

As testimony submitted in writing for today's hearing by Professor Burton Richter clearly states, we are now in the third round of missile defense debates. In rounds one and two we concluded, after much effort, that the technology was not up to the job and we opted for arms control. The Nixon administration wanted to defend our missile force and instead signed the 1972 Anti-Ballistic Missile Treaty. The Reagan administration wanted to defend the entire Nation with what became known derisively and appropriately as the "Star Wars" defense system, but moved instead to decrease the nuclear threat through a series of treaties to reduce the number of nuclear warheads deployed on each side.

Now some propose the intercept-in-space, hit-to-kill system that would be the most technologically challenging of possible alternatives. Rightfully, criteria for development have been set out and have been largely accepted. One, we talk of the changing threat for emerging missile states and the anticipated need for a national missile defense.

Two, we talk about the cost of deployment. We talk about the effect of the National Missile Defense deployment on the United States/Russia nuclear arms reduction process and the broader strategic environment, including effects on our relationships with China, NATO allies and others.

Last, we speak of the technological readiness of the system for deployment.

While these hearings have been directed by the majority and the chairman mostly at the issue of technological readiness, we must recognize that none of the elements can be reviewed in a vacuum. Consideration of any one necessarily implicates some consideration of others. I should like to add yet another, a fifth or perhaps a subset of the fourth criteria we must consider before deployment, and that is the likely operational effectiveness of the planned National Missile Defense against a real-world attack, which would include countermeasures.

The intercept tests conducted prior to this date and prior to the President's decision did not assess operational effectiveness of the planned National Missile Defense. That criterion for the deployment should be whether the fully deployed system would be able to deal with countermeasures, not the much more narrow criterion of whether the system can intercept cooperative targets on the test range. If there are countermeasures that would be available to emerging missile states that would defeat the full National Missile Defense system, then it would make no sense for the United States

to begin deploying even the first stage until it demonstrates first on paper and then on the test range that the full system could be made effective against such countermeasures.

There is no doubt the countermeasure technology exists in even rogue nations right now and that the capacity exists for them to develop other measures. For instance, a September 1999 national intelligence estimate on the ballistic missile threat to the United States asserts that anti-simulation balloon decoys for nuclear warheads are readily available technology that emerging missile states could use to develop countermeasures to U.S. National Missile Defense systems. It is only slightly more difficult to implement measures using numerous balloons which would be much more effective as would be putting a warhead inside a balloon.

The combination of methods, tactics of overwhelming the defense and other strategies, will be developed and may already exist. So before we deploy at any time, we must consider the four criteria, or the five as I have noted, and satisfy ourselves that the deployment of a National Missile Defense will actually be needed, as opposed to reliance on deterrence and diplomacy; that costs which seem to be spiraling even as our confidence in the system remains uncertain; that those costs are in a range warranting deployment of a National Missile Defense as our best means to answering any threat.

A system that in 1996 was estimated to cost between $9 billion and $11 billion now appears to be nearing $50 billion and can be expected to increase. As the Union for Concerned Scientists write, the proposed U.S. National Missile Defense system may decrease the security of the United States. Russia and China would respond to the deployment of such a system by deploying a greater number of warheads than might otherwise have been planned.

In addition, Russia would likely increase its reliance on launch-on warnings to ensure that any retaliatory strike would be large enough to overwhelm the National Missile Defense system.

A decision to deploy a National Missile Defense system would also have a generally negative effect on U.S. relations with Russia and China and would threaten cooperative efforts to decrease the number of nuclear weapons, improve controls on weapons and weapons materials, and combat proliferation.

Finally, the National Missile Defense system could prompt emerging missile states to concentrate on our modes of delivery. We are a long way from achieving the kind of technological readiness that would provide confidence in the system. The number of tests with real-world conditions would tell if the system would work. A significant number of additional tests than are currently planned would be necessary to establish a high enough level of confidence. A National Missile Defense would need to be tested in many differing operational environments to take into account different possible countermeasures, each of which would require its own set of tests to estimate the system's performance under that environment.

There must be objective, independent test assessments, with authority, meaning at least that the Department of Defense should not be able to disregard the sound advice of the director of operational tests and evaluation.

As Professor Richter said, while the system proposed now has a less ambitious goal than Star Wars, the task is still very difficult and extraordinarily complex and challenging. The intercept-in-space, hit-to-kill system now in development is the most technically challenging of all the possible alternatives. It is the easiest to confuse with relatively simple decoys. The proposed test program is inadequate to ensure the necessary reliability before we begin to spend big money on National Missile Defense. The proposed system is not ready to graduate from development to deployment, and maybe it never will be.

Thank you.

Mr. SHAYS. I thank the gentleman.

At this time I would recognize the gentlelady Mrs. Chenoweth-Hage.

Mrs. CHENOWETH-HAGE. Thank you, Chairman Shays. I would like to thank the subcommittee for taking the time, as you have and are doing now, to examine this very, very critical issue of the feasibility and deployability of the National Missile Defense system. By holding these hearings, Chairman Shays, you are opening up an issue that is so vitally important and of great interest to the American people. I thank you for being here and holding this hearing after the House has temporarily recessed.

Mr. Chairman, since the dawn of the space age, we have often heard the crowing of the pessimists. Statements like "it can't be done" or "it is simply too expensive" have been the norm for the day with many programs where technology was the central component that existed. Now, people said this about the development of our military fighters in the 1970's and about our tanks in the 1980's and our stealth technology in the 1980's and the 1990's, but each time these pessimists have been proven wrong.

The genius of the American people is such that the seemingly insurmountable becomes surmountable. Specifically in the case of the National Missile Defense system, we are overcoming the failures that have so far been encountered. Failures to a certain extent are always expected. Now, any fourth grade student learns in his science lessons that failures are central to the scientific process, but they are overcome, just as we are overcoming many of the technical failures we are now encountering.

Mr. Chairman, when Ronald Reagan originally proposed his Strategic Defense Initiative, people ridiculed it by calling it "Star Wars." The press accused him of proposing the impossible and people inflamed the public by saying research in this area could cause a war. President Reagan refused to take no for an answer, and as a result, we are now much closer to defending the American public from ballistic missiles.

One of the arguments that people of goodwill on both sides of the National Missile Defense debate raise is the Anti-Ballistic Missile [ABM], Treaty of 1972, in that it prohibits the deployment of a National Missile Defense shield. However, I question this. Personally, I do not believe that the ABM Treaty still constrains us in this way, because with the death of the Soviet Union, many scholars argue that the ABM Treaty is no longer binding.

Mr. Chairman, at this point, I would like to ask unanimous consent to enter into the record three papers that explore the legal vi-

ability and application of the ABM Treaty to national missile defense and the timely report by Senator Thad Cochran regarding national missile defense.

Mr. SHAYS. Without objection, so ordered.

[NOTE.—The report entitled, "Stubborn Things, a Decade of Facts About Ballistic Missile Defense," may be found in subcommittee files.]

[The information referred to follows:]

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SIX REASONS WHY ARMS CONTROL ADVOCATES ARE WRONG: THE ABM TREATY IS NOT IN FORCE

DAVID B. RIVKIN, JR., AND LEE A. CASEY

Although the recent summit in Moscow between President Bill Clinton and Russian President Vladimir Putin yielded little agreement on missile defense, both presidents made clear that they believe the 1972 Anti-Ballistic Missile (ABM) Treaty between the United States and the former Soviet Union remains in force. This has long been Russia's position, but it was echoed recently by an arms control advocacy group in the United States known as the Lawyers Alliance for World Security.[1] On May 5, this group released a document to refute a 1998 letter to the President from several prominent members of the U.S. Senate, who concluded that the ABM Treaty ceased to be binding on the United States following the Soviet Union's collapse in 1991.[2] The arms control group asserts that the treaty survived the Soviet Union's demise because the Bush Administration recognized Russia as the Soviet Union's successor and an ABM Treaty party in 1992, and because Belarus, Kazakhstan, and Ukraine became ABM Treaty parties in 1993. Both of these assertions, which may have been issued to influence the summit, are factually incorrect and based on erroneous legal analysis.

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In fact, the United States has never formally acknowledged that Russia, or any of the other 14 former Soviet republics, are America's ABM Treaty partners. Indeed, under the U.S. Constitution, neither the President nor the Secretary of State could make Russia or any other state an ABM Treaty party by their own authority. The President has the power to recognize states and successors to states, but this power is not absolute or arbitrary. It is limited by the accepted principles of international law, to the extent that those principles have been

1. The Lawyers Alliance for World Security is a Washington-based research organization that studies national security and arms control issues, with a special emphasis on legal matters. For its recent study on the status of the ABM Treaty, see Lawyers Alliance for World Security, "State Succession and the Legal Status of the ABM Treaty," *Occasional Paper*, May 5, 2000.

2. Senator Trent Lott *et al.*, letter to the President, September 25, 1998.

accepted as binding on the United States within the limits of the U.S. Constitution and U.S. law. And under the principles of international law, the ABM Treaty was terminated by operation of law at the moment America's treaty partner, the Soviet Union, was dissolved on December 25, 1991.[3]

There are two obvious legal reasons why this is the case. First, none of the Soviet Union's former states continued its international legal personality; and second, no state, or group of states, that survived the dissolution of the U.S.S.R. was capable of fulfilling the totality of obligations the treaty imposed on the Soviet Union. Under these circumstances, a defunct state's bilateral treaties automatically are terminated. Successor states may claim the benefit of those treaties only with the consent of the dissolved state's treaty partners, secured according to relevant constitutional processes. Because the recognition of Russia alone, or some other combination of former Soviet republics, would profoundly change the rights and obligations of the United States under the 1972 ABM Treaty, its restrictions on ballistic missile defenses could be re-imposed on the United States only through the signing of a new treaty, with the advice and consent of the U.S. Senate.

SIX REASONS THE ABM TREATY IS NOT IN FORCE

In particular, the following points demonstrate why the claims of the Lawyers Alliance and other arms control advocates are in error.

1. **There is no U.S.-recognized legal successor to the ABM Treaty.** Based upon a statement made by then Secretary of State James Baker, the Lawyers Alliance alleges that Russia succeeded the Soviet Union as the ABM Treaty partner of the United States in 1992. At the time, the Secretary of State suggested that the United States expected the Commonwealth of Independent States (CIS) to choose to abide by the treaties entered into by the Soviet Union, including the ABM Treaty. It must be noted that Baker's statement reflected a negotiating position taken during discussions with Russian President Boris Yeltsin. It described U.S. expectations for the CIS (the Bush Administration evidently expected the CIS would survive as a centralized state consolidating control of Soviet strategic weapons under one authority), rather than the Russian Federation. The CIS is now moribund, and the 15 former republics of the Soviet Union are recognized as fully sovereign and independent states.

   Moreover, even with respect to the CIS, Secretary Baker's statement never was translated into official U.S. policy. The United States never accepted or recognized the CIS as a treaty partner *to any* of the former Soviet Union's treaties with the United States. In fact, since 1992, the official annual gazetteer of the treaties of the United States entitled *Treaties in Force: A List of Treaties and Other International Agreements of the United States in Force* has continued to list the ABM Treaty under the entry for the Soviet Union, with a notation recognizing that Russia claims to "perform the rights and fulfil the obligations following from the international agreements signed by the Union of Soviet Socialist Republics," but with the following disclaimer: "The United States is reviewing the continued applicability of the agreements listed below."[4] (This *Treaties in Force* entry belies the Lawyers Alliance's claim that Belarus, Kazakhstan, and Ukraine succeeded to the ABM Treaty in 1993 as well.)

2. **The Russian Federation is a new political and legal entity.** The 1992 claim by President Yeltsin that Russia was the successor to the Soviet Union's treaties was not legally sufficient to substitute the Russian Federation for the

3. For a legal analysis of why the ABM Treaty is no longer binding, see David B. Rivkin, Jr., Lee A. Casey, and Darin Bartram, "The Collapse of the Soviet Union and the End of the 1972 Anti-Ballistic Missile Treaty: A Memorandum of Law," prepared for The Heritage Foundation by Hunton & Williams, Washington, D.C., June 15, 1998.

4. U.S. Department of State, *Treaties in Force: A List of Treaties and Other International Agreements of the United States in Force on January 1, 1999*, p. 296 (1999).

Soviet Union as an ABM Treaty party. Yeltsin's Russia did not, by any objective measure, continue the international legal personality of the Soviet Union or the Russian Empire that preceded it. Shorn of its 19th century south and central Asian empire, as well as the ancient territories of Belarus and Ukraine, the Russian Federation is an entirely new political and legal entity. It is not entitled to succeed to the Soviet Union's treaties, absent the consent of the Soviet Union's former treaty partners.

3. **Russian succession to the Soviet Union's treaties is not automatic.** The United States has never purported to accept Boris Yeltsin's blanket claim that Russia is the successor to the U.S.S.R.'s treaties. When the Soviet Union dissolved, the United States determined that it would review succession matters on a treaty-by-treaty basis. This policy was noted by a number of commentators at the time, including one of the lawyers who signed the Lawyers Alliance occasional paper. In 1993, Thomas Graham, Jr., then serving in the Arms Control and Disarmament Agency (ACDA), explained to the staff of *Inside the Pentagon* that the United States was in fact reviewing succession matters on a treaty-by-treaty basis.[5] ACDA's annual reports also made it clear that the United States rejected Yeltsin's claim. The reports stated that any of the newly independent states that wished to become a party to the ABM Treaty had a legitimate claim to that status.[6] A case-by-case review of the Soviet Union's treaties is fundamentally inconsistent with automatic Russian succession as an ABM Treaty party.

4. **The United States has not treated any other state as its ABM Treaty partner.** The actions of the United States since 1991 contradict the claims of arms control advocates that the issue of ABM Treaty succession was settled in 1992 and 1993. It has permitted representatives of Russia, Belarus, Kazakhstan, and Ukraine to participate in meetings of the treaty's implementing body, the Standing Consultative Commission (SCC), *only as observers*, not as ABM Treaty parties. President Clinton acknowledged this point in a February 1999 report sent to the appropriations committees of the U.S. House of Representatives and the U.S. Senate. In that report, the President stated that the participation of Belarus, Kazakhstan, Russia, and Ukraine in periodic meetings of the SCC "in and of itself, does not settle succession to the [ABM] Treaty."[7]

5. **The Administration signed a new agreement with four former Soviet states, effectively acknowledging the absence of succession.** The fact that, upon the Soviet Union's collapse, no state or group of states became ABM Treaty parties as a matter of law (under the rules of state succession) also was acknowledged in September 1997, when the United States signed an agreement on succession to the treaty with Belarus, Kazakhstan, Russia, and Ukraine. (Had these states become ABM Treaty parties through a process of automatic state succession, as the Lawyers Alliance claims, signing such an agreement would have been superfluous.) This new agreement, in any case, would substantially revise the original ABM Treaty by, among other things, altering its geographical extent, fundamentally changing the treaty withdrawal and amendment procedures, and transforming it from a bilateral treaty into a multilateral one. The rights and obligations of the United States under this instrument

5. Jeffrey Moag, "Says Acting ACDA Director, U.S. Won't Seek ABM Treaty Changes to Permit More Robust Missile Defenses," *Inside the Pentagon*, Vol. 9, No. 22 (June 3, 1993), p. 1.

6. Arms Control and Disarmament Agency, *Threat Control Through Arms Control: Annual Report to Congress* (Washington, D.C.: Arms Control and Disarmament Agency, 1997), p. 32.

7. The White House, "Report to Congress on the Memorandum of Understanding Relating to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Systems of May 26, 1972," February 9, 1999.

would differ dramatically from those rights and obligations under the 1972 ABM Treaty. Thus, the new agreement on succession must be presented to the Senate for advice and consent, in accordance with the Constitution, before it could take effect. If the Senate does give its consent to this agreement, and if the President then ratifies it, a new treaty would be constituted.

6. **Allowing Russia to succeed the Soviet Union would fundamentally alter the treaty and therefore require the Senate's consent.** International legal issues aside, as a matter of constitutional law, the recognition of Russia alone as an ABM Treaty party would have required the advice and consent of the Senate. This is the case because a deal with Russia would so profoundly alter the original bargain struck in 1972, that a new treaty would have to be concluded, by and with the advice and consent of the Senate. Indeed, although President Clinton has supported continuation of the ABM Treaty, even he has recognized that neither a recognition of Russia alone, nor a recognition of Russia and the other former Soviet republics together, could reconstruct the 1972 bargain. In a letter to House Foreign Relations Committee Chairman Benjamin Gilman (R–NY), dated November 21, 1997, the President unequivocally stated that

> Neither a simple recognition of Russia as the sole ABM successor (which would have ignored several former Soviet states with significant ABM interests) nor a simple recognition of all NIS [Newly Independent States] as full ABM successors would have preserved fully the original substance and purpose of the Treaty as approved by the Senate in 1972.[8]

CONCLUSION

As a matter of law and fact, the 1972 ABM Treaty ceased to have legal force and effect when the Soviet Union dissolved in 1991. Under the applicable rules of state succession, only a state that could both fulfill the Soviet Union's treaty obligations and continue the U.S.S.R.'s international legal personality would automatically succeed the Soviet Union as a party to the ABM Treaty. No such state survived the Soviet Union's collapse, including Russia. The assertion that first Russia and later Belarus, Kazakhstan, and Ukraine are capable of filling its shoes in the ABMTreaty is sounding more and more troubling with each passing month. In reality, whatever legal restrictions the ABM Treaty imposed to prevent the United States from protecting Americans from ballistic missile attack disappeared on Christmas Day 1991—the day the Union of Soviet Socialist Republics finally made its way onto the ashheap of history.

There are today no legal limits on the right of the United States to build and deploy an anti-ballistic missile system to defend its citizens from ballistic missile attack, whether from former Soviet states or some other state. If there are to be limitations on mounting such a defense in the future, they can be imposed only after a new ABM treaty has been negotiated *and* ratified. That ratification could occur only after the U.S. Senate gave its consent by a two-thirds vote. Clearly, arms control advocates like those in the Lawyers Alliance for World Security believe the United States should be limited in its ability to deploy a ballistic missile defense system. However, in the absence of a binding ABM Treaty, deciding whether to build a national ballistic missile defense is a policy decision, not a legal one.

—David B. Rivkin, Jr., and Lee A. Casey are attorneys with the firm of Baker & Hostetler, 1050 Connecticut Ave., N.W., Suite 1100, Washington, D.C. 20036-5304.

8. President William J. Clinton, letter to The Honorable Benjamin Gilman, November 21, 1997.

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THE ABM TREATY WITH RUSSIA: A TREATY THAT NEVER WAS

BAKER SPRING

President Bill Clinton announced on June 20, 1999, while in Cologne, Germany, that he and Russian President Boris Yeltsin had agreed to negotiate amendments to the Anti-Ballistic Missile (ABM) Treaty. But there is one significant problem with this decision: Russia is not, and never was, a party to the ABM Treaty, which the United States signed in 1972 with the Soviet Union. Moreover, President Clinton's decision contradicts previous statements he and the Administration have made about whether Russia is indeed a treaty party. This contradiction is important because the Administration claims the treaty is a solemn legal obligation of the United States. It is not. As legal experts recently testified before Congress, the ABM Treaty became obsolete in 1991 when the Soviet Union dissolved.

ATTEMPTS TO AMEND A "VIRTUAL" TREATY

President Clinton's attempt to make Russia a treaty partner makes little sense. Fifteen states emerged from the former Soviet Union in 1991. None of the states, including Russia, is capable—alone, or with any of the others—of assuming the Soviet Union's ABM Treaty obligations. Nevertheless, on May 21, 1998, the President wrote to the chairmen of the House International Relations Committee and the Senate Foreign Relations Committee that the ABM Treaty remained in force because the "United States and Russia clearly are Parties to the Treaty."

On February 10, 1999, however, President Clinton apparently changed his stance. In a report to congressional appropriations committees on the ABM Treaty, the Administration indicates that no foreign states are currently parties to the treaty. According to the report, the Administration consciously and consistently had avoided using terms that would imply that any state participating in ABM Treaty–related meetings was a party to the treaty. For example, the communiqué of the fifth periodic review of the ABM Treaty, which was conducted in October 1998, referred to Belarus, Kazakhstan, Russia and Ukraine as the "sides participating in the ABM Treaty review" and made no reference to those sides as constituting Parties to the ABM Treaty.

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Also in February 1999, the General Counsel to the Arms Control and Disarmament Agency, Mary Elizabeth Hoinkes, remarked at a forum sponsored by the University of Virginia's Center for National Security Law that the United States has "no formal state party relationship with any of the potential

state parties at this time." The term "potential state parties" clearly is meant to include Russia.

This inconsistent policy regarding Russia and the ABM Treaty appears to be an attempt to revive the treaty by means that are at odds with the facts. President Clinton is grappling with a problem of his own creation: The more he has searched for a group of states to replace the Soviet Union as ABM Treaty partners, the more evident it has become that none of these states—including Russia—could fulfill the obligations the ABM Treaty imposed on the Soviet Union. The joint declaration in Cologne, therefore, is only the latest in a string of attempts to find new parties to the ABM Treaty. The President apparently believes that, if he can just pretend that the ABM Treaty is in force with Russia, then Congress will acquiesce and the treaty will return to force. This approach not only misrepresents the facts, it keeps Americans vulnerable to missile attack as the Administration honors the terms of a defunct Cold War relic.

DEBUNKING THE "LEGAL OBLIGATION" ARGUMENT

During hearings before the Senate Foreign Relations Committee in May 1999, legal scholars presented evidence that the ABM Treaty no longer is valid and explained that the United States legally is free to develop and deploy any national missile defense system it chooses. For example, attorneys David B. Rivkin, Jr., and Lee A. Casey of the Washington, D.C., firm Hunton & Williams testified on May 25 that:

> Based upon our review of the text of the ABM Treaty, its history, and the relevant international law and American constitutional law sources, we concluded that the ABM Treaty no longer binds the United States as a matter of international or domestic law. This is because the Soviet Union disappeared in 1991, rendering performance of the ABM Treaty as originally agreed impossible.

Fortunately for Americans, Congress listened to the facts about missile defense. On May 20, 1999, a bipartisan majority in both houses of Congress approved legislation establishing as U.S. policy the deployment of a national missile defense system. President Clinton is expected to sign the bill in the coming days, but this action will be meaningless until he stops playing legal games with the ABM Treaty.

CONCLUSION

Members of Congress must emphasize a central fact: There are no legally binding international agreements—with Russia or any other foreign country—that limit the type and number of missile defense systems the United States may deploy to defend the homeland. The June 20 joint declaration with Russia is little more than an attempt to convince Americans that they will be branded as outlaws by the international community unless they accept their current vulnerability to missile attack as a permanent condition.

Congress and the American people should understand that Russia, which is not a party to the ABM Treaty, cannot legitimately participate in negotiations to amend it—even if it were a valid agreement. Congress should ensure that missile defense policies and programs are no longer held hostage by the baseless claims that the ABM Treaty is in force with Russia and legally binding on the United States. A missile defense for America should now proceed as quickly as the technology permits.

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THE COLLAPSE OF THE SOVIET UNION AND THE END OF THE 1972 ANTI-BALLISTIC MISSILE TREATY:

A MEMORANDUM OF LAW

PREPARED FOR
THE HERITAGE FOUNDATION

By
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PREFACE

Although it has been fifteen years since President Ronald Reagan launched the Strategic Defense Initiative (SDI) to protect America from ballistic missiles armed with nuclear, chemical, or biological warheads, the American people still have no viable defense. It has been seven years since an Iraqi *Scud* missile killed 28 American soldiers in Saudi Arabia, yet today U.S. forces and allies abroad have no better defense against such theater missiles. The technology to do so is available and affordable, and yet America remains defenseless—as a matter of deliberate policy—against the weapons of mass destruction spreading rapidly around the world.

This policy of intentional vulnerability, which was codified in the 1972 Treaty on the Limitation of Anti-Ballistic Missile (ABM) Systems between the United States and the now-defunct Union of Soviet Socialist Republics, was based on the belief that strategic stability was possible if, and only if, each of the two nuclear superpowers was open to immediate retaliation from the other. This premise of mutual assured destruction (MAD), however, established that the United States, without missile defense, would be vulnerable to attack from *any* country. The fall of the Soviet Union in 1991 should have resulted in a withdrawal from a treaty that puts Americans at risk, to make the United States better able to respond to the challenges of the post-Cold War world, including an accidental or unauthorized missile launch from Russia. Instead, the Clinton Administration's foreign policy establishment clings to the ABM Treaty's old arms control dogma and holds America hostage to its limitations on defense.

Today, the United States must deal with a set of global tensions and conditions that are dramatically different from those that existed when the Soviet Union was a dominant global power. India's recent nuclear tests and Pakistan's responding tests demonstrate clearly that concerns over the uncontrolled proliferation of weapons of mass destruction are not baseless. In short, the ABM Treaty has not deterred nuclear proliferation, and it will not enhance or promote U.S. security in the current environment. America's leaders must "provide for the common defence" of all Americans, as the U.S. Constitution demands, and lay to rest a Cold War relic that will not protect Americans from annihilation.

Analysts at The Heritage Foundation have consistently criticized the Administration's policy of maintaining vulnerability to ballistic missiles carrying hyperlethal weapons. However, a number of recent developments led the Foundation to pursue an evaluation of the legal status of the ABM Treaty:

First, in September 1997, a delegation led by Secretary of State Madeleine Albright signed agreements in New York that would convert the old bilateral ABM Treaty with the Soviet Union into a multilateral agreement with Russia, Ukraine, Belarus, and Kazakhstan. The Clinton Administration appears incapable of breaking free from the Cold War paradigm of assured vulnerability, and seeks to resolve the legal question of succession by creating a new ABM treaty.

Second, the wording of the agreements reveals that the ABM Treaty must be rewritten in order to make the multilateral arrangements work. In other words, the original ABM Treaty, as amended in 1974, cannot be implemented under the New York "September Agreements." This brings into play a legal doctrine called "impossibility of performance."

Third, President Clinton, in an extraordinary letter last November to Representative Benjamin A. Gilman, Chairman of the House Committee on International Relations, stated: "Neither a simple recognition of Russia as the sole ABM successor (which would have ignored several former Soviet states with significant ABM interests) nor a simple recognition of all NIS states as full ABM Treaty successors would have preserved fully the original purpose and substance of the Treaty, as approved by the Sen-

ate in 1972." His assertion admits that it would be impossible for either Russia or all the New Independent States of the former Soviet Union to perform or carry out the terms of the 1972 ABM Treaty. This stands in sharp contrast to a letter dated May 21, 1998, and also addressed to Representative Gilman, in which the President suggests that Russia alone is now the United States' ABM Treaty partner. It is unclear how the President will reconcile his 1997 conclusion that Russia alone cannot fulfill the Soviet Union's ABM Treaty obligations and his assertion now that Russia alone is bound by that Treaty. In any case, the President's November letter and other clear statements and actions of the Administration, as well as the accepted rules of United States and international law, show that Russia is not capable of becoming the legal successor to the ABM Treaty.

Fourth, President Clinton certified to Congress in May 1997 that he would send the New York agreement on multilateralization to the Senate for advice and consent. When he does, the Senate is certain to debate both the legal standing of the ABM Treaty and whether the Treaty serves the security interests of the United States.

Finally, the Administration has quietly begun to implement the terms of the New York agreement on multilateralization and theater missile defense without obtaining the advice and consent of the Senate, as it is required to do by Article II, Section 2, of the U.S. Constitution, and by the Arms Control and Disarmament Act of 1961. For example, the ABM Treaty established procedures for determining the status of treaty-limited ABM systems, which require exchanges of information by the Treaty partners. The United States and the four states that signed the September Agreements in New York are sharing information now as if they were legitimate treaty partners. Furthermore, planning is under way to include them in the next meeting of the Standing Consultative Commission, in anticipation that their status as parties to the ABM Treaty will be permanent.

These troubling developments make it imperative that the legal status of the ABM Treaty be competently examined. To this end, The Heritage Foundation commissioned the national law firm of Hunton & Williams, a leader in constitutional and public process law, to perform *pro bono publico* an examination of the Treaty. The Heritage Foundation is deeply grateful to this firm and the principal authors of this memorandum: David B. Rivkin, Jr., Lee A. Casey, and Darin R. Bartram. The Heritage Foundation also acknowledges with gratitude the contributions of Douglas Feith and George Miron of the law firm of Feith & Zell; Baker Spring, Senior Defense Policy Analyst of The Kathryn and Shelby Cullom Davis International Studies Center, and Jim Renne, former Deputy Director of Congressional Relations, at The Heritage Foundation; and the following nationally recognized experts in constitutional and international law who have reviewed the memorandum: Robert Davis, University of Mississippi Law School; Leonard A. Leo, Director, The Federalist Society; former U.S. Attorney General Edwin Meese III; John Norton Moore, University of Virginia Law School; Ronald Rotunda, University of Illinois School of Law; former Ambassador Frank Ruddy of Ruddy & Muir; and Carl Smith of Higgins, McGovern and Smith.

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EXECUTIVE SUMMARY

MEMORANDUM OF HUNTON & WILLIAMS
TO
THE HERITAGE FOUNDATION
ON
THE COLLAPSE OF THE SOVIET UNION AND THE END OF THE 1972 ANTI-BALLISTIC MISSILE TREATY

This memorandum of law examines the following questions: (1) whether the 1972 Treaty on the Limitation of Anti-Ballistic Missile Systems ("ABM Treaty") between the United States and the now-defunct Union of Soviet Socialist Republics ("U.S.S.R." or "Soviet Union") continues to bind the United States as a matter of domestic and international law; and (2) what would be the legal impact of action by the United States Senate denying its advice and consent to certain ABM Treaty-related agreements signed by Secretary of State Madeleine Albright with four former Soviet republics in September 1997. These agreements would, among other things, transform the ABM Treaty from what was a bilateral treaty between the United States and the Soviet Union into a multilateral treaty among the United States, Russia, Belarus, Ukraine, and Kazakhstan. In addition, they would revise the ABM Treaty's provisions to reflect and accommodate its new status as a multilateral agreement, and would introduce a number of additional restrictions on activities related to ballistic missile defense (BMD).

The United States and the Soviet Union entered into the ABM Treaty in 1972. The ABM Treaty barred the deployment of a defensive system for protecting the national territories of the United States and the Soviet Union against missile attack. By so doing, the ABM Treaty served to codify a policy that, 25 years later, leaves the United States completely vulnerable to ballistic missile attack.

We believe that the ABM Treaty no longer binds the United States as a matter of international or domestic law. This is because the Soviet Union has disappeared, and there is no state, or group of states, capable of implementing the Soviet Union's obligations under the ABM Treaty in accordance with that agreement's terms. Therefore, in view of the relevant facts, and the applicable doctrines of domestic and international law dealing with state succession issues, the ABM Treaty cannot now be said to be in force. That Treaty expired with the Soviet Union, and any new treaty regarding ballistic missile defenses between the United States and any of the former Soviet republics can be effected *only* through renewed negotiations and the agreement of both the United States and one or more of these states. As a matter of United States law, the United States Senate would have to consent to such an agreement before it could be ratified by the President.

Our conclusions are based upon the following facts and analysis.

Facts:

- The United States and the Soviet Union signed and ratified the ABM Treaty in 1972. They agreed to constrain severely the ability to deploy anti-ballistic missile systems to defend their respective territories from ballistic missile attack by imposing a broad array of proscriptions and limiting BMD deployments to two permitted sites per treaty partner.
- The Treaty was modified by a 1974 Protocol, which was ratified in 1976, that reduced the number of allowed ABM sites from two to one per treaty partner.
- The Soviet Union collapsed in 1991, and 15 independent states emerged.

- Since 1993, the United States has proceeded to explore ways to resolve the ABM Treaty-related succession issues and to determine whether the rights and obligations of the Soviet Union under the Treaty could be assumed by one or more of the states that emerged following its collapse.
- The United States, Belarus, Kazakhstan, Russia, and Ukraine signed agreements on September 26, 1997, that would, if ratified, effectively multilateralize the ABM Treaty. The President has agreed to submit these agreements for the Senate's advice and consent, although they have not yet been submitted.
- President Clinton asserted that the original ABM Treaty would remain in force even if the Senate rejects the agreement to multilateralize the Treaty. He asserted this in two letters, one dated November 21, 1997, and a second dated May 21, 1998, to Representative Benjamin A. Gilman, Chairman of the House Committee on International Relations.

Analysis:

- The President's claim that the ABM Treaty would remain in force even following Senate rejection of the agreement to multilateralize the Treaty raises the question of whether the ABM Treaty is currently in force and legally binding on the United States.
- The resolution of this question must be sought in the rules of international law, as those rules may be applicable in the United States, and in the norms of American constitutional law. When these sources are consulted, a compelling argument emerges that the ABM Treaty no longer binds the United States.
- A review of the ABM Treaty's provisions, its negotiating history, and the subsequent performance of the treaty parties suggests that the obligations assumed by the United States and the Soviet Union under that agreement did not survive the Soviet Union's dissolution. This is because key terms of the ABM Treaty were drafted in a manner that makes them incapable of being performed by any parties other than the United States and the Soviet Union. These key terms depended on the following assumptions:

  1. That the geographic expanse of the two states would remain as it was in 1972;
  2. That the strategic relationship between the two states would remain essentially as it was in 1972; and
  3. That the Treaty would remain a bilateral agreement.

- It has long been recognized that treaties are a species of contract between states. As is true with any contract, the performance of obligations under a treaty may be rendered impossible when one party to the agreement disappears or loses its independent existence. The collapse of the Soviet Union was just such an instance, and it has rendered impossible the performance of the ABM Treaty.

  As applied in the treaty context, a state's treaties do not survive its dissolution under this doctrine unless there is a successor state that (1) can be said to continue its predecessor's international legal personality, and (2) can perform the treaty in accordance with its original terms. There is today no post-Soviet state or combination of such states that can be said to continue the Soviet Union's international legal personality or that could perform the totality of its obligations under the ABM Treaty as it was originally drafted.

  The doctrines generally applied to resolving questions of treaty succession suggest that the ABM Treaty did not survive the Soviet Union's dissolution. Two competing doctrines—the "continuity"

model and the "clean slate" model—are generally applied in determining questions of treaty succession. The continuity doctrine presumes that the treaty rights and obligations of a predecessor state pass to its successor states. However, whether a treaty actually survives under this model depends upon the type of treaty, as well as the type of dissolution suffered by its predecessor state. By contrast, the clean slate doctrine assumes that new states begin afresh, and that the treaties of any predecessor will apply to them only if both the new state and its predecessor's treaty partners agreed (or at least acquiesced) to being bound by a renewed treaty arrangement.

The application of either model to the ABM Treaty leads to the conclusion that it did not survive the Soviet Union's collapse. The ABM Treaty cannot be said to have survived under the application of a continuity model because it was a political treaty that was "personal" to the Soviet Union. None of the former Soviet republics (including Russia) can be said to continue the U.S.S.R.'s international legal personality.

Under the clean slate analysis, the model generally preferred in the post-World War II era, the ABM Treaty also cannot be said to have survived the Soviet Union. Each of the former Soviet republics is a newly independent state, and can accede to the benefits and burdens of the Soviet Union's treaties only upon a renewed agreement with the Soviet Union's former treaty partners. Despite some ambiguous actions and statements, the United States has refused such an agreement to date. Indeed, in the more than six years since the Soviet Union's demise, the State Department has listed the status of the ABM Treaty as unresolved.

- The United States cannot now be bound by the ABM Treaty without the advice and consent of the Senate. Because the ABM Treaty did not automatically survive the Soviet Union's collapse, it cannot now be revived without the advice and consent of the United States Senate. Because of the ABM Treaty's unique purpose and assumptions, extensive negotiations with the Soviet Union's successor states would have to be undertaken, and the original treaty substantially modified, before the original bargain obtained by the United States in 1972 could be revived. The amendments in this Treaty, and particularly any new treaty's character as a multilateral (as opposed to a bilateral) instrument, would represent changes so fundamental that they can be effected only with the advice and consent of the Senate under the Constitution's treaty-making power.

Conclusion:

When the Soviet Union dissolved in 1991, the ABM Treaty became impossible to perform in accordance with its original provisions. Because of the unique terms and conditions of the ABM Treaty, and the underlying assumptions of the parties, none of the states that emerged from the Soviet Union, either alone or with others, could carry out the totality of the Soviet Union's obligations under the ABM Treaty. Consequently, the obligations of the United States under the Treaty were discharged at the time the Soviet Union disappeared. Although a number of the former Soviet republics have indicated that they are prepared to undertake the Soviet Union's role in the ABM Treaty regime, this willingness alone is insufficient to bind the United States. Transforming the ABM Treaty from a bilateral accord, applicable to the entire Soviet territory, into a multilateral convention, applicable only to a portion of the former Soviet territory, and redrafting in the process a number of key substantive Treaty provisions fundamentally alters the bargain originally struck by the United States and the Soviet Union in 1972. The President cannot, of his own authority, accomplish these results.

Accordingly, the United States can again be bound to the ABM Treaty only if two-thirds of the Senate agrees to the revisions required by the transformation of the ABM Treaty, and the President then chooses to ratify them.

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June 15, 1998

THE COLLAPSE OF THE SOVIET UNION AND THE END OF THE 1972 ANTI-BALLISTIC MISSILE TREATY: A MEMORANDUM OF LAW PREPARED FOR THE HERITAGE FOUNDATION

You have asked us to review the following questions: (1) whether the 1972 Treaty on the Limitation of Anti-Ballistic Missile Systems ("ABM Treaty") between the United States and the now-defunct Union of Soviet Socialist Republics ("U.S.S.R." or "Soviet Union") continues to bind the United States as a matter of domestic and international law; and (2) what would be the legal impact of action by the United States Senate denying its advice and consent to certain ABM Treaty-related agreements signed by members of a delegation led by Secretary of State Madeleine Albright with four former Soviet republics in September 1997. These agreements would, among other things, purport to transform the ABM Treaty from what was a bilateral treaty between the United States and the Soviet Union into a multilateral treaty among the United States, Russia, Belarus, Ukraine, and Kazakhstan. In addition, they would revise the ABM Treaty's provisions to reflect and accommodate its new status as a multilateral agreement, and would introduce a number of additional restrictions on activities related to ballistic missile defense (BMD). We have examined the text of the ABM Treaty, its available negotiating history, the publicly available post-1972 Treaty implementation record, and a number of statements issued by Russia, a number of other former Soviet republics,[1] and the United States since the U.S.S.R.'s dissolution. In addition, we have consulted the relevant international law and American constitutional law sources. We have concluded as follows.[2]

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1. The post-Soviet countries are often referred to as the Newly Independent States ("NIS").
2. It should be noted that, in preparing this memorandum, we have been regretfully unable to access a number of potentially relevant sources and materials. For example, large portions of the ABM Treaty's negotiating history, as well as of its implementation record, remain classified. Meanwhile, all of the records generated by the so-called Standing Consultative Commission ("SCC")—a special consultative body established pursuant to the ABM Treaty and charged with reviewing Treaty compliance, clarification, and amendment issues—remain classified. (For a discussion of the SCC's role, *see, e.g., Agreement on Limitation of Strategic Offensive Weapons: Hearings Before the House Comm. on Foreign Affairs*, 92d Cong. 13–14 (1972).) This has presented certain problems, insofar as the SCC has apparently served as a major forum for the post-1991 discussions between the United States and various of the NIS parties concerning, among other matters, ABM Treaty-related state succession issues. Accordingly, we cannot be certain that we have reviewed the text of all of the relevant U.S.–Russian understandings concerning ABM Treaty-related succession matters. This, of course, is not a new or a unique problem. *See The ABM Treaty and the Constitution: Joint Hearings before the Senate Comm. on Foreign Relations and the House Comm. on the Judiciary*, 100th Cong. 33–34 (1987) [hereinafter *Hearings on the ABM Treaty and the Constitution*]. Notwithstanding these limitations, we believe that we have been able to consider a sufficient portion of the existing factual records to enable us to reach--having also consulted the appropriate legal materials—our stated conclusions about the legal and constitutional status of the ABM Treaty.

We believe that the ABM Treaty no longer binds the United States as a matter of international or domestic law. This is because the Soviet Union has disappeared, and there is no state, or group of states, that can be considered to continue its international legal personality (sovereignty) and that also are capable of implementing the U.S.S.R.'s obligations under the ABM Treaty in accordance with that agreement's *original* terms. Therefore, in view of the relevant facts and the applicable doctrines of domestic and international law dealing with treaties and state succession issues, the ABM Treaty cannot now be said to be in force or binding on the United States. That treaty died with the Soviet Union in 1991, and any new treaty regarding anti-ballistic missile defenses between the United States and the former Soviet republics can be effected *only* through renewed negotiations and the agreement of both the United States and one or more of these states. Moreover, any such agreement would require the consent of the United States Senate before the President could ratify it.

In that regard, given the wording of the key ABM Treaty provisions, the overall goals reflected in the 1972 U.S.–Soviet ballistic missile defense bargain, the nature of the Soviet Union, and the facts and circumstances surrounding its dissolution, we believe that the President of the United States lacks the power to reconstitute on his own the ABM Treaty—despite the considerable foreign affairs-related powers vested in him by the U.S. Constitution (including the plenary power to recognize foreign governments[3] and the power to interpret and execute treaties). At this point, any renewed agreement between the United States and one or more former Soviet republics limiting anti-ballistic missile systems would constitute a new treaty entirely, and could be effected by the President[4] only with the agreement of two-thirds of the Senate.[5] In fact, an attempt by the President to reconstitute the ABM Treaty without the Senate's participation would constitute a very serious assault upon that body's constitutional prerogatives. Our conclusions are based upon the following facts and analysis.

I

Facts:

The United States and the U.S.S.R. signed the ABM Treaty on May 26, 1972, agreeing to constrain severely either state's ability to deploy any anti-ballistic missile system designed to defend its territory from ballistic missile attack. The Senate consented to this Treaty, which was duly ratified by President Nixon on September 30, 1972.[6] The Treaty was modified by a 1974 Protocol, to which the Senate consented in 1975, and which President Ford ratified in 1976.[7] This protocol made clear that each

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3. *See, e.g., Banco Nacional de Cuba v. Sabbatino*, 376 U.S. 398, 410 (1964) ("Political recognition is exclusively a function of the Executive.").
4. It also might be argued that the President could possibly "revive" the ABM Treaty if, instead of obtaining the Senate's "advice and consent," he obtained express congressional authorization for concluding such an agreement with one or more of the Soviet Union's successor states. A recent United States Department of Justice Office of Legal Counsel ("OLC") opinion has specifically concluded that "it lies within the power of Congress to authorize the President substantially to modify the United States' obligations under a prior treaty, including an arms control treaty." Memorandum from Christopher Schroeder, Acting Assistant Attorney General, Office of Legal Counsel, to Alan J. Kreczko, Special Assistant to the President and Legal Advisor to the National Security Council, Re: Validity of Congressional–Executive Agreements that Substantially Modify the United States' Obligations Under an Existing Treaty (Nov. 25, 1996). We have not analyzed the constitutionality of such action for purposes of this memorandum. However, regardless of how this issue might be resolved, it is clear that the President cannot, absent either the Senate's "advice and consent" action or the Congress's express legislative authorization, reconstitute the ABM Treaty on his own authority.
5. *See* U.S. Const. art. II, § 2, cl. 2.
6. Treaty on the Limitation of Anti-Ballistic Missile Systems, May 26, 1972, 23 U.S.T. 3435.
7. Protocol to the Treaty on the Limitation of Anti-Ballistic Missile Systems, July 3, 1974, 27 U.S.T. 1645.

party to the ABM Treaty was entitled to deploy only a limited anti-ballistic missile system, located at a single site.[8]

The U.S.S.R. collapsed in 1991. Its "republics" became independent states, and all were recognized as such by the United States.[9] While there have been efforts to establish some form of a federated structure among at least some of the former Soviet republics, the so-called Commonwealth of Independent States ("CIS"),[10] these efforts have not resulted in a "state" capable of taking the Soviet Union's place as an ABM Treaty partner. Moreover, although some of the post-Soviet states have indicated a willingness to carry out the Soviet Union's treaty obligations, the status of most of the U.S.S.R.'s bilateral treaties with the United States, including the ABM Treaty, remains unresolved. *See* U.S. Department of State, Treaties in Force: A List of Treaties and Other International Agreements of the United States in Force on January 1, 1997, 282 (1997) [hereinafter Treaties in Force] (With respect to treaties with the Union of Soviet Socialist Republics, and their possible applicability to the former Soviet republics, this official listing of United States treaties explains that: "The United States is reviewing the continued applicability of the agreements listed below [including the ABM Treaty].").

Beginning in 1993, during the fourth five-year ABM Treaty Review (a regular process provided for under the Treaty's terms), that took place from September 27 to October 1, 1993, the United States proceeded to explore with Russia, Ukraine, and Belarus ways to resolve ABM Treaty-related succession issues. Specifically, the United States has since indicated that it is working with Russia and "other potential successor states . . . to develop an effective ABM Treaty regime that will provide for multilateral succession to the ABM Treaty."[11] Towards this end, the State Department negotiated a number of proposed revisions to the ABM Treaty with four of the former Soviet republics—the Russian Federation, Belarus, Ukraine, and Kazakhstan. These proposals are contained in seven agreements signed in New York on September 26, 1997 ("September Agreements"). If ratified, these agreements would multilateralize the ABM Treaty and make a number of other substantive changes in its terms. President Clinton has committed to submit several of these agreements to the Senate for its advice and consent, although he has not yet done so. (*See infra* note 13.)

There appears to be some doubt whether, when the September Agreements are submitted, the Senate will consent to their ratification by the President. In view of this, President Clinton has suggested, in a November 21, 1997, letter to Representative Benjamin A. Gilman, Chairman of the House

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8. The ABM Treaty, as amended in 1974, anticipated that the Soviet Union would deploy a ballistic missile defense system, with a specified allotment of radars, launchers, and interceptors, around its capital (Moscow) and that the United States would deploy a similar system around Grand Forks, North Dakota, to protect an intercontinental ballistic missile (ICBM) field. The Soviet Union deployed a full complement of Treaty-allowed equipment associated with its Moscow BMD site. The United States brought its Grand Forks Treaty-permitted BMD site to a state of full operational readiness for a time, but quickly mothballed the system.

9. Since the United States never had recognized Stalin's annexation of the three "Baltic States" of Estonia, Lithuania, and Latvia in 1941, only twelve of the U.S.S.R.'s fifteen republics were formally recognized. As soon as the December 8, 1991, Minsk Declaration recognizing the Soviet Union's dissolution was issued, the Bush Administration indicated that it was working promptly to establish diplomatic relations with Russia, Ukraine, Belarus, Armenia, Kazakhstan, and Kyrgyzstan, with diplomatic ties to Georgia, Moldova, Azerbaijan, Tajikistan, Turkmenistan, and Uzbekistan to follow shortly thereafter. *Pub. Papers of the Presidents: George Bush* 1645 (1991).

10. The republics of Ukraine, Belarus, and Russia proclaimed during the December 8, 1991, meeting in Minsk that the Soviet Union was now defunct and that a loose federation of the post-Soviet states, the so-called Commonwealth of Independent States, was being established.

11. See Arms Control and Disarmament Agency ("ACDA"), Fact Sheet on the Anti-Ballistic Missile Treaty, at 1, http://www.ACDA.gov/factsht5.htm. The United States also has informally indicated that "it is willing to accept as Treaty parties any of the New Independent States (NIS) that want to be a Party to the Treaty." Id.

Committee on International Relations, that the "ABM Treaty itself would clearly remain in force" if the Senate does not give its consent to the September Agreements.[12] The President restated this claim in a May 21, 1998, letter to Chairman Gilman, in which he also suggested that Russia, at least, is now party to the ABM Treaty in the Soviet Union's place. These claims raise the questions whether the ABM Treaty is currently in force and legally binding upon the United States, and how the Senate's future consideration of the September Agreements will affect the Treaty's status.

II

Discussion:

The question of whether the ABM Treaty survived the Soviet Union's fall is complex. The answer must be sought in the rules of international law, as those rules may be applicable in the United States, and in the norms of American constitutional law. When these sources are consulted, a compelling argument emerges that the ABM Treaty no longer binds the United States, and that the Senate's approval must be obtained before that Treaty, or a similar instrument, can bind the United States in the future, and limit its ability to deploy ballistic missile defenses to protect its territory from attack.[13] At the same time, as noted above, the President has stated that, in his view, if the Senate does not consent to ratification of the September Agreements, the original ABM Treaty will remain in effect. *See* Clinton/Gilman 1997 Letter, *supra* note 12, at 3–4 ("[i]f . . . the Senate were to fail to act or to disagree and disapprove the agreements, succession arrangements will simply remain unsettled. The ABM Treaty itself would clearly remain in force."). Clinton/Gilman 1998 Letter, *supra* note 12, at 2 ("the United States and Russia clearly are Parties to the Treaty."). The President's conclusion in these letters—that the ABM Treaty will simply remain in effect without further affirmative Senate action—appears, based on the facts and the applicable rules of law, to be insupportable.

A. The Impact of the Soviet Union's Demise on the ABM Treaty.

A review of the ABM Treaty's provisions, its negotiating history, and the subsequent performance of the treaty parties suggests that the obligations assumed by the U.S.S.R. and the United States under that agreement did not survive the Soviet Union's dissolution. This is because the key terms of the ABM Treaty were drafted in a manner that makes them incapable of being performed by any parties other than the United States and the U.S.S.R. Indeed, the ABM Treaty's substantive provisions are such that neither Russia alone, nor all of the former Soviet republics operating together, nor any partial combination of those states (such as the one contemplated in the September Agreements), could carry out those provisions. The only way to restore the ABM Treaty's viability would be to redraft its provisions to reflect the key changes in the geographical and strategic environment caused by the Soviet Union's dissolution. This, however, would constitute a new treaty entirely, and would require the consent of the Senate before it could bind the United States.

1. "Impossibility of Performance" and the Law of Treaties.

It has long been recognized that treaties are a species of contract between states. *Head Money Cases*, 112 U.S. 580, 598 (1884) ("A treaty is primarily a compact between independent Nations. It depends for the enforcement of its provisions on the interest and the honor of the governments which are parties to it."); *Z. & F. Assets Realization Corp. v. Hull*, 114 F.2d 464, 470 (D.C. Cir. 1940) ("A treaty is primarily a compact between independent nations."). Similarly, it is well established that contract obligations may be discharged by operation of law if one party's promised performance

12. *See* Letter from William J. Clinton to Benjamin A. Gilman 3–4 (Nov. 21, 1997) [hereinafter Clinton/Gilman 1997 Letter]; Letter from William J. Clinton to Benjamin A. Gilman 2 (May 21, 1998) [hereinafter Clinton/Gilman 1998 Letter].

becomes legally or factually impossible. In particular, the executory obligations of both parties to a contract are automatically discharged, and the contract relationship ended, if one party, whose existence is necessary to the performance of the contract, dies or is otherwise rendered incapable of performance. *See, e.g., Blakely v. Sousa*, 197 Pa. 305 (1900); *Ames v. Sayler*, 642 N.E.2d 1340 (Ill. App. 1994); *Cazares v. Saenz*, 256 Cal. Rptr. 209 (Cal. App. 1989); *Oneal v. Colton Consolidated School Dist.* 557 P.2d 11 (Wash. App. 1976); *Schusterman v. C & F Caterers, Inc.*, 77 N.Y.S.2d 718 (N.Y. City Ct. 1948). This also is true of the disappearance of legal entities such as corporations. *See, e.g., Lorillard v. Clyde*, 142 N.Y. 456 (1894). *See also* 18 Samuel Williston & Walter H. E. Jaeger, *A Treatise on the Law of Contracts* § 1960 (3d ed. 1978); Restatement (Second) of Contract § 262 & cmt. a. (1981).[14]

This "doctrine of impossibility" also is applicable to treaties. *See Yankton Sioux Tribe of Indians v. United States*, 272 U.S. 351 (1926). In particular, the basic rules governing the disappearance of individuals or legal entities necessary to a contract's performance also are relevant to the disappearance of states. As the Supreme Court explained in *Terlinden v. Ames*, 184 U.S. 270, 283 (1902):

> Undoubtedly treaties may be terminated by the absorption of Powers into other Nationalities and the loss of separate existence, as in the case of Hanover and Nassau, which became by conquest incorporated into the Kingdom of Prussia in 1866. *Cessation of independent existence rendered the execution of treaties impossible. But where sovereignty in that respect is not extinguished, and the power to execute remains unimpaired, outstanding treaties cannot be regarded as avoided because of impossibility of performance.*[15] (Emphasis added.)

In *Terlinden*, the Court rejected a German citizen's claim that he could not be extradited home under an 1852 treaty between the United States and the Kingdom of Prussia, because Prussia had since been incorporated into the German Empire. It concluded that the extradition treaty remained in

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13. The Office of Legal Counsel reached a contrary, if somewhat tentative, conclusion in a 1996 memorandum analyzing the constitutionality of Section 233(a) of the FY 1997 Defense Authorization Act. This law provided that any agreement multilateralizing the ABM Treaty would not bind the United States "unless the agreement is entered pursuant to the treaty-making power of the President under the Constitution." Pub. L. No. 103–337, 108 Stat. 2700 (1996). OLC concluded that including several former Soviet republics as ABM Treaty parties would not "necessarily comprise a substantive modification of that treaty, such as to require Senate advice and consent." Memorandum to John M. Quinn, Counsel to the President, from Walter Dellinger, Assistant Attorney General, Office of Legal Counsel, Re: Section 233(a) of S. 1745 (June 26, 1996), at 5 [hereinafter Dellinger Memorandum]. As discussed at length *infra*, we believe that this conclusion is incorrect. However, it is unlikely that the OLC's conclusion ever will be tested. After the Dellinger Memorandum was issued, the Senate took action to ensure that additional parties would not be added to the ABM Treaty without its advice and consent. To that end, the Senate Resolution of Ratification of the Document Agreed Among the States Parties to the Treaty on Conventional Armed Forces in Europe ("CFE")—the so-called "CFE Flank Document"—provided as follows:

> Prior to the deposit of the United States instrument of ratification [of the CFE Flank Document], the President shall certify to the Senate that he will submit for Senate advice and consent to ratification any international agreement:
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> (i) that would add one or more countries as state parties to the ABM Treaty, or otherwise convert the ABM Treaty from a bilateral treaty to a multilateral treaty; or
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> (ii) that would change the geographic scope or coverage of the ABM Treaty, or otherwise modify the meaning of the term "national territory" as used in Article VI and Article IX of the ABM Treaty.

Senate Report to Accompany Treaty Doc. No. 105-5, Flank Document Agreement to the CFE Treaty, 105th Cong. 20–21 (1997). Although the President asserted that additional parties could be added to the ABM Treaty without the Senate's approval in his message to the Senate on the CFE Flank Document, he nevertheless accepted this condition in full, and stated unequivocally that "I will submit any agreement concluded on ABM Treaty succession to the Senate for advice and consent." *See* The White House, "Message to the Congress of the United States," May 14, 1997.

force, both because the Kingdom of Prussia had not lost its identity as such, nor abrogated existing treaties, when the German Empire was proclaimed in 1871, and because both governments considered the treaty to remain in force.

This is, of course, in stark contrast to the situation involving the Soviet Union and the ABM Treaty. Unlike the Prussian state, which continued as a distinct legal entity within the German Empire (the monarch of which was both German Emperor and King of Prussia), the Soviet Union has entirely disappeared. In such circumstances, the ABM Treaty could survive *only* if there were one or more successor states that continue its sovereignty and in which "the power to execute [the treaty] remains unimpaired." *Terlinden*, 184 U.S. at 283. Both as a consequence of the unique features of the ABM Treaty, and, as described below, in light of the applicable international law rules governing questions of state succession to treaties, no such state or group of states can be said to exist.

2. The Terms of the ABM Treaty.

When a state dissolves, or is incorporated into another state, its treaties very often may be performed in accordance with their original terms by its successor state(s). For example, this is true of extradition treaties of the sort at issue in the *Terlinden* case, since the terms of such agreements are not necessarily linked to a certain state's strategic position, organizational structure, and territorial extent.[16] The ABM Treaty was fundamentally different. Its terms and conditions were negotiated on the assumption that the parties were the United States and the Soviet Union, that each controlled its territorial extent as of 1972, and that each held a unique position in the global balance of power.

Unlike most arms control agreements, the purpose of the ABM Treaty was not to limit the number or nature of offensive weaponry possessed by the parties. Rather, the ABM Treaty prohibited each party from deploying defensive measures in the form of anti-ballistic missile systems to defend its territory. The Treaty's purpose was to ensure that the entire territory and all population centers of each

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14. Although, it may be noted, the assets of a corporation that voluntarily dissolves itself may be held liable in damages for its inability to perform an executory contract. *See* Williston & Jaeger, *supra*.

15. *See also Mahoney v. United States*, 77 U.S. 62, 67 (1870) (treaty with the Dey of Algiers expired when that country passed under French control); *Yucyco, Ltd. v. Slovenia, et al.*, 984 F. Supp. 209 (S.D.N.Y. 1997) ("A full successor state, unlike a state that has experienced a mere change in government or ideology, is not bound by the contracts executed by the former sovereign.").

    It should be noted that "supervening impossibility of performance" also has been fully recognized under the Vienna Convention on the Law of Treaties as a legitimate ground for terminating or withdrawing from a treaty. *See* Vienna Convention on the Law of Treaties § 61, *reprinted in* Louis Henkin et al., *International Law Cases and Materials: Basic Document Supplement* 86, 100 (3d ed. 1993). This instrument does not, however, address how the doctrine is to apply in the circumstance where one treaty partner has disappeared, and particularly in light of the attendant state succession issues. Rather, this situation is addressed in the Vienna Convention on Succession of States in Respect of Treaties. Under that convention, when new states are formed from the partial or complete dissolution of a state, bilateral treaties do not survive if "the application of the treaty in respect of the successor state would be incompatible with the object and purpose of the treaty or would radically change the conditions for its operation." Vienna Convention on Succession of States in Respect of Treaties § 34, *reprinted in* Henkin et al., *supra*, at 103, 115 [hereinafter Vienna Convention on Treaty Succession]. However, this convention was not ratified by either the Soviet Union or the United States, and, therefore, does not control here. Consequently, this issue still is governed by the customary rules of international law as articulated in *Terlinden* and applied in the United States.

    In addition, it should be noted that the Dellinger Memorandum, *supra* note 13, incorrectly suggests both that the Vienna Convention articulates a rule of automatic state succession to treaties, and that that rule is applicable to the ABM Treaty. In fact, the rule cited in that memorandum—even if it were controlling here—does not apply in cases, such as this one, where the treaty's application would be incompatible with its "object and purpose," and would radically change the "conditions for its operation."

16. Of course, whether, and under what conditions, a "successor state" may undertake the treaty obligations of its predecessor is a complex, largely fact-driven question. That issue, relative to the ABM Treaty, is addressed at length below.

party would remain exposed to nuclear ballistic missile attack by the other.[17] The premise here was that ensuring a calculated "balance of terror"[18] would deter armed conflict between the Soviet Union and the United States (the aptly named "MAD" or "mutual assured destruction" strategy),[19] and would enable both sides to control the pace of additional offensive nuclear deployments. Concomitantly, any attempt to build a national anti-ballistic missile system would presumably undermine the delicate "stability" of this balance.

In that regard, two distinct types of stability were important—"arms race" stability and "crisis" stability. "Arms race" stability referred to a situation whereby the absence of large-scale ballistic missile defense deployments enabled both superpowers to gain assured "access" to each other's territory, for the purpose of massive retaliatory strikes in case of a first strike by one party. This, in principle, was to serve as a reason for both powers to eschew an all-out offensive nuclear arms race—since all of the desired targets in case of war could be reached with comparatively fewer nuclear warheads.[20] "Crisis" stability, also predicated upon the absence of large-scale defensive deployments, described a situation whereby both superpowers, when facing a crisis situation, did not feel a temptation to launch a first nuclear strike. Here, it was argued that the existence of ballistic missile defenses would put a premium on striking first at times of international crisis, in order to destroy a large portion of the enemy's nuclear arsenal, while at the same time using one's own defenses to absorb a weakened retaliatory response.[21]

In view of this historical context, the underlying assumptions upon which the ABM Treaty was predicated can be summarized as follows: (1) that only the United States and the Soviet Union, the world's two nuclear superpowers, were capable of delivering an annihilating nuclear ballistic missile attack against each other's territory; (2) that only a bilateral agreement between the United States and the Soviet Union was capable of shoring up strategic stability; and (3) that the United States and the Soviet Union could, and would, continue to control essentially the same territory and respective strategic arsenals they controlled in 1972.

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17. The notion that the 1972 ABM Treaty enshrined a situation of total societal vulnerability was well-understood in 1972, as demonstrated when this issue was revisited during the 1987 Senate hearings on the Reagan Administration's so-called "broad" interpretation of the ABM Treaty. Various Senate opponents of the broad interpretation sought to make the point that the ABM Treaty entailed a commitment by both sides to total societal vulnerability. For example, Senator Thurmond, who had some concerns about the 1972 Treaty, said the following during the floor debate: "[i]t [the Treaty] effectively prevents us from ever having the means to protect our population from a Soviet first strike. It also prevents us from developing new kinds of systems to protect our population . . . we forego forever the ability to protect our people." *Hearings on the ABM Treaty and the Constitution, supra* note 2, at 10. Senator Fulbright, who in 1972 was the Chairman of the Senate Foreign Relations Committee and served as the floor manager for the ABM Treaty, also testified in 1987 that "the basic purpose of the ABM Treaty was to prevent the parties from ever acquiring the capacity to build nationwide defense systems against strategic ballistic missiles. The intent of the Treaty was to base the security of both superpowers on mutual deterrence, which is to say, on the certainty of retaliation if either were to launch an attack. . . . It was precisely because of this prohibition [against defense] that two Senators [Buckley of New York and Allen of Alabama] voted against the Treaty and others expressed personal reservations." *Id.* at 27–28.
18. The concept of the "balance of terror" predates the nuclear age, although it acquired a particular poignancy with the advent of nuclear weapons. For a good discussion of this concept, *see* Thomas C. Schelling, *Arms and Influence* (1961), and B. Brodie, *Strategy in the Missile Age* (1959).
19. For a brief description of the history behind the development of the MAD strategy and its relationship to arms control, *see* Henry Kissinger, *White House Years* 204–210 (1979).
20. For example, the United States' decision to proceed with an ambitious program to multiply the number of warheads that could be delivered by its ballistic missile force was often linked with the U.S. desire to negate the effectiveness of projected Soviet ABM deployments. *See, e.g., ABM, MIRV, SALT and the Nuclear Arms Race: Hearings Before the Subcomm. on Arms Control, Int'l Law and Organizations of the Senate Foreign Relations Comm.*, 91st Cong. 3 (1970).

All of these points were critical. The United States assumed that the principal nuclear threat to its population and territory came from the centralized Soviet state, which controlled the only nuclear arsenal capable of launching a devastating ballistic missile attack against North America.[22] Moreover, the United States entered the ABM Treaty based on the understanding that a single government controlled this nuclear arsenal *and could be held responsible for its use.* At the same time, in negotiating the details of the agreement, and determining what forms of technology to include within its scope, the United States assumed that its treaty partner would control all of the territory of the former Soviet Union.

These geographic and demographic components were particularly important. Article I of the ABM Treaty specifically provided that "[e]ach party undertakes not to deploy ABM systems for a defense of the territory of its country." ABM Treaty, *supra* note 6, art. I. Although Moscow has always been the administrative center of the Soviet state, almost from the advent of the nuclear age, the United States put a premium on maintaining an ability to strike at a wide array of Soviet military, administrative, economic, and political targets—numbering eventually in the tens of thousands.[23] The American targeting strategy evolved with changes in the composition and capabilities of *both* U.S. nuclear delivery systems and Soviet targets, and was shaped by the desire to obtain, taking into account Moscow's own strategic priorities and values, the highest possible quality deterrence.[24] It was the combination of these U.S. nuclear planning imperatives, and its reading of the lessons drawn from Russian/Soviet history, that reinforced American determination to ensure that the Soviet leadership was unable to defend any portion of the Soviet Union's territory/population, or create a capability for erecting, on short notice, such a defense.[25] This history demonstrated the Soviet Union's willingness to accept, as a price of victory, the devastation of vast areas—displayed, for example, during Napoleon's 1812 Campaign and the World Wars—as well as its proven ability to relocate critical installations and industries beyond the Russian "heartland."

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21. For a full discussion of various alternative nuclear weapons postures and their impact on various types of stability, *see* Thomas C. Schelling and M. H. Halperin, *Strategy and Arms Control* (1961). *See also* Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs* 211–34 (1959) (discussing the importance, in the nuclear age, of developing "invulnerable" offensive nuclear forces, so as to avoid giving an adversary an incentive to strike first in a crisis, and thereby maintaining a robust deterrence).

    To be sure, it was understood that the presence of ballistic missile defenses did not always contribute to strategic instability. According to an influential arms control theorist, Thomas Schelling:

    > [b]allistic missile defenses, if installed on a large scale by the United States or the Soviet Union, might preserve or destroy stability according to whether they increased or decreased the advantage to either side of striking first; that, in turn, would depend on how much better they worked against an enemy missile force that had already been disrupted by a surprise attack. It would also depend on whether ballistic missile defenses worked best in protecting missile forces from being destroyed or best in protecting cities against retaliation.

    Schelling, *Arms and Influence*, *supra* note 18, at 247.

    Significantly, by the late 1960s, as the United States embarked on serious efforts to negotiate an ABM Treaty, there was a widespread consensus among nuclear strategists that, given the relative capabilities of the existing and projected ballistic missile forces on both sides, and of their ballistic missile defenses, the latter were much more capable of protecting the former, rather than defending population centers. This was particularly true because Moscow opted to develop a nuclear force consisting largely of "heavy" ICBMs, which were capable of carrying numerous independently targeted warheads ("MIRVs") and decoys that could simply saturate and overwhelm the then-existing and projected American "low" leverage BMD systems. *See, e.g.*, R. J. Woolsey, "A Loony ABM Postscript," *Wall St. J.*, May 30, 1997, at A18.

22. At the time, aside from the Soviet Union and the United States, there were only three (3) other nuclear powers. Britain and France were allies of the United States, while China's nuclear arsenal was comparatively small and, given the tenor of Soviet–Chinese relations, believed to be targeted mostly against the U.S.S.R.

It is because of these fundamental assumptions underlying the ABM Treaty, and the manner in which they were incorporated into that instrument, that the dissolution of the U.S.S.R. has rendered the Treaty's performance impossible. Among the ABM Treaty's specific provisions that no longer can be carried out, without being redrafted, by one or more of the post-Soviet states, are the following:

- Article I(b), in which the parties agreed "not to deploy ABM systems for a defense of the territory of its country and not to provide a base for such a defense, and not to deploy ABM systems for defense of an individual region."[26]
- Article III(a), as amended by the 1974 Protocol, which allowed the Soviet Union to deploy one ABM system, with no more than one hundred launchers and one hundred interceptors, around its national capital, and no more than six ABM radar complexes within its territory as a whole.[27]
- Article VI(b), in which the parties agreed not to deploy early warning radars except at locations "along the periphery of [their] national territory and oriented outward."[28]
- Article IX (as clarified by Agreed Statement G), in which the parties agreed not to "transfer to other States, and not to deploy outside [their] national territory, ABM systems or their components limited by this Treaty."[29]
- Article XIII, which establishes a consultative mechanism—the Standing Consultative Commission ("SCC")—to help the two original treaty parties deal with various treaty-related issues.[30]
- Article XIV, which established treaty amendment procedures that required the agreement of the Soviet Union and the United States. This article would become far more burdensome if additional parties are added to the ABM Treaty. As currently drafted, the Treaty would require the agreement of all parties to any amendment.[31]

In summary, given the importance the United States attached to preventing the U.S.S.R. from developing a strategic "sanctuary" *in any portion of its territory*, the dissolution of the U.S.S.R. rendered the ABM Treaty impossible to perform in accord with its original terms. Since no former Soviet republic, including Russia, controls the whole territory of the former Soviet Union, no single state can comply with the Treaty as originally agreed in 1972. At the same time, to multilateralize the Treaty, so that the states now in control of former Soviet territory are bound by its terms, would in and of itself transform the ABM Treaty into a different instrument. Instead of one centralized treaty partner, the

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23. While U.S. nuclear war plans have been among the most highly classified documents prepared by the United States Government, sufficient information has been provided over the years in various open-source analyses to enable observers to conclude that the so-called Single Integrated Operational Plan ("SIOP")—the American nuclear targeting blueprint—grew from hundreds of targets in the 1950s to a few thousand targets in the 1960s, over 20,000 targets by the 1970s, and well over 40,000 targets by the early 1980s. Numerical growth aside, as time went on, the SIOP's emphasis on flexibility, versatility, and intricacy of various targeting scenarios also became much more pronounced. *See, e.g.*, Leon Gouré, "The U.S. 'Countervailing Strategy' in Soviet Perception," 9 *Strategic Review* 51–64 (1981).

24. For a good discussion of this issue, *see, e.g.*, Leon Sloss and Marc Dean Millot, "U.S. Nuclear Strategy in Evolution," 12 *Strategic Review* 19–28 (1984), especially at 24–25. Thus, as U.S. deterrence requirements became ever more sophisticated, refined, and challenging, ABM Treaty compliance became ever more important. This imperative was buttressed by the various existing asymmetries between Soviet and American offensive and defensive programs, including Moscow's stubborn attachment to civil defense and Soviet willingness, at least at the rhetorical level, to "accept" high casualty levels as an acceptable price of "victory" in a nuclear war. For example, while commenting on what he perceived to be the original benefits of the ABM Treaty, Senator Adams stated as follows: "the basis of the ABM Treaty was a great advantage to the United States as well as to the Soviets. It was to freeze the whole operation of moving into outer space. It was to deal with the fact the Soviets were in a very large civil defense mode, and it was a deliberate decision made . . . to use mutual assured deterrence rather than go on with incredibly expensive ABM systems." *Hearings on the ABM Treaty and the Constitution*, *supra* note 2, at 185–88.

United States would have to accept numerous treaty partners, none of whom have any significant "track record" in terms of treaty compliance and implementation. Moreover, if the ABM Treaty were transformed from a bilateral into a multilateral treaty regime, the burdens assumed by the United States in terms of ensuring compliance by up to fifteen states, instead of one, and in obtaining the agreement of more than one state to any amendments to the Treaty it might wish to seek, would substantially increase.

Overall, only a centralized state controlling all of the territory of the former Soviet Union could undertake to discharge the obligations accepted by the U.S.S.R. in 1972 and 1974. No such state exists today.

B. The ABM Treaty and the Soviet Union's "Successor States."

Since the Soviet Union has itself disappeared, under *Terlinden*'s teaching, the United States can now only be said to be bound by the ABM Treaty *if* there is a state that can be considered to have retained the U.S.S.R.'s sovereignty—to have continued its international legal personality—and that also can execute the ABM Treaty's original terms "unimpaired." There is no post-Soviet state—including the Russian Federation—that meets either of these requirements.

1. The "Stated" Position of the United States and the Former Soviet Republics.

As noted above, the United States has not yet taken a definitive public position on the question of whether any one or more of the former Soviet republics may take the place of the U.S.S.R. as its ABM Treaty partner. The President's May 21, 1998, letter to Chairman Gilman comes closest to such a statement, and suggests that at least Russia is currently bound as a party to the ABM Treaty. *See* Clinton/Gilman 1998 Letter, *supra* note 12, at 2. Whether this statement to Chairman Gilman will be adopted by the Administration as its official position, and a statement to that effect included in the next edition of Treaties in Force, remains to be seen. However, as will be discussed below, neither Russia, nor any other former Soviet republic, may be recognized as a party to the ABM Treaty by the President without the advice and consent of the Senate.

At the same time, although several of the former Soviet republics have indicated a willingness to be bound by the ABM Treaty, none have claimed that they constitute the continuation of the Soviet Union's international legal personality, or suggested that they may be in a position to perform all of the Soviet Union's obligations under the ABM Treaty as it was originally agreed. It is for this reason that the stated desire of Russia, Ukraine, Belarus, and Kazakhstan to become parties to the ABM Treaty—the fact prominently hailed in the Clinton/Gilman 1998 Letter, *supra* note 12, at 1—is legally insufficient to place these states in the shoes of the Soviet Union for the purposes of the ABM Treaty.

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25. To be sure, an identical obligation applied to the United States. It is for this reason that some American critics of the ABM Treaty have argued that the Treaty today might prohibit the actual deployment of even the one hundred Grand Forks-based ABM interceptors allowed by its terms, if such a deployment could provide a modicum of defense for the United States' territory as a whole. The argument was that the overarching purpose of the ABM Treaty was to eschew the creation of a territorial defense, or a basic infrastructure for such a defense, and this imperative overrode any of the Treaty's more specific provisions. *See, e.g.*, Remarks of Amb. David J. Smith before the Subcomm. on Strategic Forces, Senate Armed Services Comm. 8–10 (1998). One does not have to agree with this interpretation of the ABM Treaty. Indeed, one can argue that the normal interpretive approach to any legal document is not to have specific prescriptions controlled by the more generic clauses. However, Ambassador Smith's remarks are notable as an illustration of the importance which the United States and the Soviet Union attached to the ABM Treaty's overarching purpose—to prevent the deployment of even an embryonic "territorial" defense system. Moreover, it is abundantly clear that the United States continues to structure its missile defense activities by taking account of the threshold limit of not creating a nationwide missile defense network.

At the time the Soviet Union dissolved in 1991, eleven of its former republics pledged themselves in the "Alma Ata Declaration" to "the discharge of the international obligations deriving from treaties and agreements concluded by the former Union of Soviet Socialist Republics." 31 I.L.M. 138 (1992).[32] Significantly, this declaration did not suggest that its signatories in any sense continued the Soviet Union's international legal personality, or that any of these states were to be bound automatically to the Soviet Union's treaty rights and obligations. Rather, the declaration provided only that its signatories were committed to the discharge of the Soviet Union's erstwhile obligations "in accordance with their constitutional procedures." *Id.*

A similarly oblique statement, dated January 13, 1992, was issued a few weeks later by the Russian Federation's Ministry of Foreign Affairs. This statement was contained in a note sent by the Ministry to the heads of all Moscow-based diplomatic missions. It proclaimed:

> The Russian Federation continues to perform the rights and fulfill the obligations following from the international agreements signed by the Union of the Soviet Socialist Republics.
>
> Accordingly, the Government of the Russian Federation shall perform the functions of a depository in conformity with the corresponding multilateral agreements instead of the Government of the USSR.
>
> Therefore, the Ministry kindly requests to consider the Russian Federation as a Party to all international agreements in force instead of the USSR.

Thus, while clearly evidencing Russia's intent to continue to discharge at least the U.S.S.R.'s multilateral international obligations, this statement left its position unclear as to bilateral agreements. Moreover, it did not suggest that Russia considered itself to be a continuation of the Soviet Union's international legal personality, and failed to explain on what basis it believed itself entitled to the ben-

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26. If Russia alone is considered to have succeeded to the Soviet Union's rights and obligations under the ABM Treaty, then all of the other fourteen former Soviet republics would be free to deploy ABM systems to defend their territory, unless the ABM Treaty were amended by the addition of these fourteen parties. Even if the post-Soviet ABM Treaty successors are Russia, Ukraine, Belarus, and Kazakhstan, then the remaining eleven former Soviet republics would be left free to proceed with a full panoply of BMD-related activities. And, although it might be argued that holding hostage the population centers of all of the former Soviet republics would not contribute to America's ability to deter Russia, relieving the territory of those states of ABM Treaty limitations would nevertheless represent a fundamental alteration of the bargain originally struck by the United States and the U.S.S.R. in 1972 and 1974, which envisioned that Leningrad, Kiev, Talin, and Tbilisi (among other former Soviet cities) would be on the same footing in terms of vulnerability to a U.S. ballistic missile attack. Similarly, if only the four former Soviet republics who signed the September Agreements are to be considered ABM Treaty parties, the territorial extent of the ABM Treaty will be significantly reduced from that agreed to in 1972. As a matter of domestic and international law, under the 1972 ABM Treaty, the United States traded away the right to defend its territory for the right to "access" any and all of the Soviet Union's territory. Although it may seem unrealistic to suggest that Estonia or Georgia might want, or be able, to deploy an ABM system, they would nevertheless legally be entitled to do so under the September Agreements. Moreover, the ABM Treaty is of unlimited duration, and it is impossible to foresee what relations between the United States and *any* of the former Soviet republics will be like in ten years, let alone in twenty or thirty years. Likewise, it is difficult to understand what legal principle, if any, or even what strategic rationale underlies the Administration's apparent decision to treat Russia, Ukraine, Belarus, and Kazakhstan, and not the eleven post-Soviet states, as the ABM Treaty successor states. To be sure, the Clinton/Gilman 1998 Letter notes that each of these four open "successor" states "has ABM Treaty-related assets on its territory." Clinton/Gilman Letter, *supra* note 12, at 1–2. This, however, is not unique to these four states; Latvia, for example, has a major ABM-related large phased-array radar system ("LPAR") at Skrunda. In any case, the Clinton/Gilman 1998 Letter seems to overlook the fact that the 1972 ABM Treaty was designed to do more than control BMD-related hardware; its overarching purpose was to buttress deterrence and enhance strategic stability by enabling American offensive nuclear forces to reach unimpeded all targets throughout the entire Soviet territory.

efit of the Soviet Union's treaties. Indeed, the note was entirely silent on the critical matter of whether Moscow believed that all of the post-Soviet states or some core group thereof were the presumptive successors to all of the U.S.S.R.'s international treaties, or whether the succession was to be considered on a case-by-case, treaty-by-treaty basis.[33]

A further statement on the status of the former Soviet Union's treaties was made by several former Soviet republics in a memorandum of understanding issued by the Council of Heads of State of the Commonwealth of Independent States on July 6, 1992. This memorandum made clear that these states were only to be automatically bound by former Soviet treaties in certain circumstances. According to the Russian text of this document, three categories of treaties that might apply to the members of the CIS were identified. First, it was recognized that there were a number of multilateral treaties to which the Soviet Union had been a party that also were of common interest to the CIS members. The application of these treaties to CIS members was to be determined based upon the rules of international law—which might or might not result in one or more of the CIS members being bound by those agreements. Second, there were bilateral treaties to which the Soviet Union had been a party, but which were of interest or concern to some, but not all, of the CIS members. Here, the CIS members would not necessarily all be bound by these treaties. Third, there were bilateral treaties dealing with the issue of borders. It was agreed that these treaties should remain in force. Thus, only one narrow class of dispositive agreements was *automatically* to bind former Soviet republics. (As discussed below, this is consistent with the applicable rules of international law.)

Finally, on October 9, 1992, the member states of the CIS adopted a resolution in Bishkek, Kyrgyzstan, that dealt specifically with the issue of ABM Treaty succession. The so-called "Bishkek Resolution" indicated that the CIS member states, "as successor states of the U.S.S.R. will fulfill the terms of the [1972 ABM Treaty] as it applies to their territories and in consideration of the national interests of each, will conclude, as necessary, corresponding agreements among themselves and also with the United States of America which are required for fulfilling the obligations of the Treaty." The Resolution further specified that "the government of Belarus shall inform all other governments which have been established on the territory of the former U.S.S.R. [presumably this means governments other than those that signed the Bishkek Resolution] of this resolution so that, in case they agree to it, a suitable form of participation in the fulfillment of the provisions of the ABM Treaty as it applies to their territory will be determined by agreement with the member states of the Commonwealth."

The overall import of the Bishkek Resolution falls far short of an unequivocal commitment by all, or even some, post-Soviet states to become successors to the U.S.S.R.'s ABM Treaty obligations. Indeed, it is difficult to understand on what basis the President has asserted in the Clinton/Gilman 1998 Letter that "ten of the twelve states of the former Soviet Union initially asserted a right . . . in Bishkek, on October 9, 1992, to assume obligations as successor states to the Soviet Union for purposes of the Treaty." *See* Clinton/Gilman 1998 Letter, *supra* note 12, at 1. At most, the intent of at least those states that signed the Bishkek Resolution was to enter into arrangements among themselves and with the United States to multilateralize the ABM Treaty. The Resolution made clear that some CIS members could choose not to become involved with this matter, and that even those that do can

27. If more than one former Soviet republic is considered to be an ABM Treaty successor—a necessary result if the Treaty's original territorial integrity were to be preserved—then this article would entitle each of the new treaty parties to deploy a full complement of ABM launchers, interceptors, and radars originally allotted to the entire Soviet Union. This, of course, would constitute a fundamental change in the Treaty's terms, putting the United States at a very significant disadvantage when compared with the position it originally bargained for. Indeed, the fact that the September Agreements specifically allocate to Russia the one allowable Soviet ABM site, and preclude the deployment of BMD systems by Ukraine, Belarus, and Kazakhstan, suggests that the Administration also accepts that the ABM Treaty cannot now be performed in accordance with its original terms without such a limiting amendment.

choose "a suitable form of participation" in the new ABM arrangement. Overall, the Bishkek Resolution amounts to, at most, a declaration of intent by several of the post-Soviet states to devise a new arrangement capable of fulfilling at least some elements of the U.S.S.R.'s erstwhile ABM Treaty-related obligations.[34] All in all, the fact that, following the U.S.S.R.'s dissolution and even up to now, neither Russia, Ukraine, Belarus, nor Kazakhstan, have unambiguously and publicly declared themselves to be, for the purposes of the ABM Treaty, a continuation of the Soviet Union's international legal personality is quite significant.

In any case, whether any one or more of the former Soviet republics can be properly considered a successor to the U.S.S.R.'s treaty rights and obligations depends not just upon the declarations of the concerned parties, but also upon the application of a number of international law rules. When these rules are applied to the facts and circumstances surrounding the Soviet Union's demise, and in light of the terms and conditions of the ABM Treaty, any conclusion other than that the ABM Treaty ceased to exist at the time the Soviet Union dissolved appears insupportable.

2. State "Succession" to Treaties.

States do not often vanish. Since the rise of the organized state as the principal unit of governance around 1500, comparatively few states have emerged and then *entirely* disappeared.[35] The number of states that, like the Soviet Union, have achieved great power status and then evaporated could be counted on one hand. Not surprisingly, the rules of international law designed to deal with such events are comparatively underdeveloped. As one leading authority on the subject wrote:

State succession is an area of great uncertainty and controversy. This is due partly to the fact that much of the state practice is equivocal and could be explained on the basis of special agreement and

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28. This key provision was designed to prevent the Soviet Union from creating a large-scale radar network that could serve as a base for a "breakout" from the ABM Treaty. American negotiators maintained that, with the exception of a few battle management radar systems ("radars") and radars located at one of the existing or additional agreed upon ABM test ranges (whose numbers were severely limited by the Treaty), and the few radars used for space-tracking purposes or used as "national technical means of verification," the Soviet Union could only deploy early warning radars along its borders and oriented outward. Their location made these radars vulnerable to precursor attacks (*see* ABM Treaty, *supra* note 6, Unilateral Statement D, where the United States declared that "any increase in the defenses of such [early warning] radars by surface-to-air missiles [w]as inconsistent with an [ABM] agreement") and made it more difficult to integrate them into a country-wide interconnected radar network. Again, this provision cannot be performed as it was originally agreed in the absence of the Soviet Union. Each new ABM Treaty party would, unless this language were amended, be entitled to ring its national territory with early warning radars, creating a large-interconnected radar network in the former Soviet heartland—the very outcome that the 1972 ABM Treaty sought to avoid. (Obviously, any former Soviet republic that did not join the treaty would be free to deploy any defenses it pleased.)

The importance of radar-related issues is demonstrated by the fact that most of the Soviet ABM Treaty violations involved radar-related activities. In that regard, for example, the 1986 United States Arms Control and Disarmament Agency ("ACDA") Report on Soviet noncompliance with various arms control obligations noted: "Limitations on large phased-array radars are one of the core priorities of the ABM Treaty. Large phased-array radars ('LPAR') constitute the most critical and the longest-lead time components needed for a prohibited territorial ABM system." Arms Control and Disarmament Agency, *Soviet Noncompliance*, Feb. 1, 1986 at 1; and proceeded to criticize the Soviet Union for violating Article VI of the ABM Treaty by building a prohibited LPAR in the interior of the U.S.S.R., near the city of Krasnoyarsk. Indeed, the Krasnoyarsk radar has been widely hailed, over the course of many years, as the single most significant Soviet ABM Treaty violation. *See, e.g.*, *The President's Report to Congress on Soviet Noncompliance with Arms Control Agreements*, Jan. 23, 1984; *The President's Unclassified Report to the Congress on Soviet Noncompliance with Arms Control Agreements*, Feb. 1, 1985, and Dec. 23, 1985; *The President's Unclassified Report to the Congress on Soviet Noncompliance with Arms Control Agreements*, Jan. 19, 1993; *see also Verification and Compliance: Soviet Compliance with Arms Control Agreements*, CRS Issue Brief, Jan. 13, 1992.

various rules distinct from the category of state succession. Indeed, it is perfectly possible to take the view that not many settled legal rules have emerged as yet.[36]

In light of this uncertainty, two competing theories traditionally have been advanced in an effort to articulate some meaningful standard by which state treaty succession issues may be resolved—under which a new state's rights and obligations with respect to its predecessor's treaty partners can be assessed. These are the "clean slate" and the "continuity" models of state succession to treaties. Under the clean slate model, new states are presumed not to be bound by the treaties of their predecessor state unless and until both of the following conditions are met: (1) the new state agrees to be bound; and (2) the relevant treaty partner itself agrees to, or acquiesces in, the new relationship. *See* Restatement (Third) of the Foreign Relations Law of the United States § 210(3) (1987) [hereinafter Restatement (Third)]. This rule may be justified based upon the nature of treaties, which at bottom are consensual contracts between states, and the fundamental principles of self-determination and the sovereign equality of states now codified in the United Nations Charter. United Nations Charter art. 1 & 2, *reprinted in* Brownlie, *Basic Documents*, *supra* note 31, at 1, 3. Under this approach, a sovereign state may be bound by a treaty only if it has given its consent to be bound.

By contrast, under the continuity model (also called "universal succession"), when a new state emerges it is presumed *automatically* to be a party to all of the treaties of its predecessor. These agreements appertain to the newly created state based upon the notion that the new state has continued the international legal personality of its predecessor, and should therefore be held to its predecessor's treaty commitments. The continuity model of treaty succession usually is justified based upon the importance of the rule that agreements between states generally should be honored—"*pacta sunt servanda*." In addition, the general interest in a stable and predictable international order has been cited as justification for application of the continuity model:

> [P]roponents of the theory contend that the threat posed to international relations if separating states could renounce treaty obligations justifies maintaining the often tenuous but manageable existing legal order by requiring treaty continuity. Thus, when applied to separating states, the influence of self-determination on the clean slate theory is eclipsed by the need to promote stable international relations.

Andrew M. Beato, *Newly Independent and Separating States' Succession to Treaties: Considerations on the Hybrid Dependency of the Republics of the Former Soviet Union*, 9 Am. U. J. Int'l L. & Pol'y 525, 537–38 (1994). *See also* Beemelmans, *supra* note 32, at 75 ("since the international community has attempted to establish a worldwide rule of law wherever useful and possible, these international rules as applied to States and individuals should not be interrupted because a State dissolves.").

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29. Since Article IX only bans certain activities by a Treaty party, it *would not* prevent those post-Soviet states that do not become parties to the Treaty from deploying on their own any ballistic missile defenses they may wish to field. Given the inherent capabilities—*i.e.*, the large footprint of even the "traditional" ABM systems—of all ballistic missile defenses, a BMD network deployed by, for example, Armenia would protect large portions of central Russia.

30. Under the original 1972 Treaty, only two parties—the United States and the U.S.S.R.—were eligible to participate in the SCC's deliberations. From its inception, the SCC played an extremely important role, providing a forum for the two treaty partners to review compliance issues and to clarify ambiguities about the meaning of various treaty provisions. Any attempt to multilateralize the ABM Treaty would work fundamental changes in the SCC's procedures and activities, a fact acknowledged by the September Agreements, which provide that the SCC's regulations are to be revised to give each new treaty party an equal voice and vote in its decisions. The fact that Russia, Ukraine, Belarus, and Kazakhstan appear to have "participated in the work of the SCC," a situation acknowledged in the Clinton/Gilman 1998 Letter, *supra* note 12, at 1–2, does not alter the original agreed-upon bilateral nature of SCC proceedings.

However, regardless of the theoretical basis of the rule, continuity is almost never applied in actual practice in its strict form as universal state succession, where a new state and its predecessor's treaty partners automatically are bound to all of the predecessor's treaty commitments. As one leading authority wrote, a rule of "universal succession" is not supported by international law: "Failing any evidence to the contrary, it may . . . be safely affirmed that general international law admits partial succession only." Krystyna Marek, *Identity and Continuity of States in Public International Law* 10–11 (1954). In fact, as applied, the continuity model provides only a *presumption* that a successor state stands in its predecessor's place regarding treaty commitments. Whether a predecessor's treaties actually survive vis-à-vis its successor under a continuity analysis depends upon a number of factors, including the type of treaty at issue, the nature of the predecessor state's end, its constitutional structure (federal as opposed to centralized), and the attitude of its treaty partners.

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31. By contrast, the United Nations Charter may be amended upon the agreement of two-thirds of the members of the General Assembly, so long as all five of the permanent members of the Security Council also agree. *See* United Nations Charter art. 108, *reprinted in* Ian Brownlie, *Basic Documents in International Law* 1, 33 (4th ed. 1995).

Yet, at the time the Senate ratified the 1972 Treaty, any treaty amendment required the consent of only two parties, the U.S.S.R. and the United States. *See* ABM Treaty, *supra* note 6, art. XIV. Given the importance of this provision to the United States as an integral part of the original 1972 bargain, the fundamental alteration in the workings of Article XIV brought about by any attempted multilateralization of the ABM Treaty (again, a necessary result if the Treaty's territorial integrity is to be preserved) should alone suffice to demonstrate the impossibility of performance of the Treaty in the new, post-Soviet environment. Aside from the fact that Article XIV played a key role during the 1974 treaty amendment process, there are good reasons to believe that it will remain highly relevant in the future. For example, according to James Woolsey, a former senior U.S. arms control negotiator, despite Moscow's current oft-stated opposition to BMD deployments:

> [i]n early 1992 President Boris Yeltsin announced his willingness to work with the U.S. on ballistic missile defense programs, and the last year of the Bush administration saw serious negotiations toward this end. In 1993 these efforts ended, and now the frequently reasonable Andrei Kozyrev has been replaced as Russia's foreign minister by Yevgeny Primakov. . . . But it is possible that a future Russian government will again realize, as President Yeltsin did in 1992, that Russian security is far more endangered by ballistic missiles in the hands of Mr. Primakov's rogue-state friends than it is by American ballistic missile defenses. If that awakening occurs, Russia may again be willing to work with the U.S. to enhance the security of both countries by developing and deploying ballistic missile defenses under a substantially modified ABM Treaty.
>
> We make such modification of the treaty impossible if we add three more countries to membership, including particularly the execrable Lukashenko regime in Belarus, which can be counted on to carry the water for the most unreconstructed and anti-American parts of the Russian establishment and to block any return to Russian–American cooperation.

Woolsey, *supra* note 21, at A18.

Additional problems are posed by the fact that Belarus, Kazakhstan, and Ukraine are non-nuclear states and enjoy a rather complicated relationship with Russia. Hence, it is conceivable that their attitudes toward ABM Treaty-related issues may be driven by an entirely different set of concerns than those of Russia and the United States.

Overall, as far as Article XIV is concerned, the net consequences of multilateralizing the 1972 Treaty would render Article XIV completely unworkable. This, in turn, would mean that the ABM Treaty had become devoid of any treaty-compliant amendment opportunities, leaving the parties to it with only two unpalatable future choices upon encountering a situation that necessitates any kind of an amendment—to terminate the Treaty or retain the Treaty as it then exists, despite the perceived need for a change in its provisions. This, again, represents a fundamental departure from the 1972 bargain between the U.S.S.R. and the United States.

3. *Validity of the ABM Treaty Under a "Continuity" Analysis.*

It has been asserted that the United States generally has favored the application of a continuity approach to state treaty succession questions.[37] However, in accord with the requirements of international law, it has never consistently followed the rules of universal state succession.[38] Consequently, when the U.S.S.R. dissolved (Christmas Day, 1991), the United States Department of State adopted a "presumptive continuity" model to determine which U.S./Soviet treaties would continue to bind the U.S.S.R.'s successor states. Williamson & Osborn, *supra* note 37, at 264–65. The legal and practical justification of this approach was stated as follows:

> Except for the Baltic states, which the United States never recognized as part of the Soviet Union, we regarded the emergence of Russia and the other former republics to have stemmed from what was essentially the complete breakup of the Soviet Union. Thus, continuity of treaty relations is supported by our reading of state practice, and by the policy considerations underlying this rule. Perhaps most importantly, however, continuity has been supported by the republics themselves, who affirmed this approach in the Alma Ata Declaration when they guaranteed the "fulfillment of international obligations stemming from the treaties and agreements of the former U.S.S.R."

Id. at 265. Nevertheless, the State Department proceeded to make an individual assessment of the Soviet Union's treaties with the United States to determine which could be continued in force as bilateral agreements between the United States and the former Soviet republics. As State Department Legal Advisor Edwin Williamson acknowledged:

> [T]here are exceptions even under a strict rule of continuity, such as where the agreement is relevant only to the territory of one republic, *or if it is simply not feasible to continue a particular agreement on its terms.* Moreover, if an international accord creates indivisible and non-regrettable rights and obligations, as is the case with the Non-Proliferation Treaty, then it simply would be unworkable to apply the terms of such an agreement to all of the constituent republics of the former Soviet Union.

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32. The Baltic States of Estonia, Latvia, and Lithuania, which took the position that they never had lawfully been incorporated into the Soviet Union in the first place, and the Republic of Georgia declined to sign this declaration. Hubert Beemelmans, *State Succession in International Law: Remarks on Recent Theory and State Practice*, 15 B.U. Int'l L.J. 71, 80 n.33 (1997).

33. By contrast, Serbia and Montenegro, now associated in the Federal Republic of Yugoslavia, have insisted from the time the Socialist Federal Republic of Yugoslavia ("SFRY") dissolved in 1990–1992 that they constitute the continuation of the SFRY's international legal personality, and are entitled to continue without interruption its treaty rights and obligations. This claim, however, has consistently been rejected by the United States. *See* Paul R. Williams, *The Treaty Obligations of the Successor States of the Former Soviet Union, Yugoslavia, and Czechoslovakia: Do They Continue in Force?* 23 Denv. J. Int'l L. & Pol'y 36 (1994).

34. The overall impression, generated by a combination of American and Russian statements issued over a period of years, is that both sides, as well as a number of former non-Russian Soviet republics, are desirous of reestablishing an ABM Treaty regime. What has been much less clear are the precise legal modalities, under both international and relevant domestic laws, by which it would be possible to effect this plan.

35. A leading expert on state succession issues, Professor D. P. O'Connell, suggests that the accession of Henri de Bourbon, king of Navarre, as French king in 1589 raised the issue of state continuity for the first time. The French government considered Navarre (a small state adjacent to southwestern France) to have been absorbed into the French realm when its king became Henri IV of France, and the issue of its continuing status was hotly debated at the time. 1 D. P. O'Connell, *State Succession in Municipal Law and International Law* 4 n.3 (1967) [hereinafter O'Connell].

Id. (emphasis added). The Clinton Administration continued this basic case-by-case approach. *See* Clinton/Gilman 1997 Letter, *supra* note 12, at 1 ("The United States took the view that, as a general principle, agreements between the United States and the U.S.S.R. that were in force at the time of the dissolution of the Soviet Union would be presumed to continue in force as to the former Republics. It became clear, however, particularly in the area of arms control, *that a case-by-case review of each agreement was necessary.*") (Emphasis added). As noted above, this case-by-case analysis of the Soviet Union's bilateral agreements with the United States has been in progress since 1991. *See* Treaties in Force, *supra*, at 282.[39]

In any such analysis of whether a treaty has survived a succession of states, well-accepted international law principles provide that any determination of whether a state can continue the treaties of a predecessor depends upon the consideration of a number of circumstances, including the type of treaty involved, the type of state that has dissolved, and under what circumstances. When these considerations are applied to the ABM Treaty, it becomes clear—even under a continuity analysis—that there is no successor state to the Soviet Union that can be said now to be a party to that instrument, having succeeded, upon its dissolution, to the U.S.S.R.'s ABM Treaty rights and obligations.

a. *"Personal" v. "Dispositive" Treaties.*

Recognizing the impossibility of a consistent application of the extreme continuity or universal succession principle, late-18th and 19th Century legal scholars articulated a number of legal theories to explain and rationalize state practice. In particular, they discerned a distinction among "personal" treaties (entered by monarchs acting on their own behalf), and "real" treaties (intended to bind a state even after the monarch's death), and a small subset of "real" treaties, now generally referred to as "dispositive" treaties. Personal treaties expired at the death of the monarch, and real treaties ended with the disappearance of the state. As explained by Vattel:

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36. Ian Brownlie, *Principles of Public International Law 655* (4th ed. 1990). *See also* 2 O'Connell, *supra* note 35, at 6 (suggesting that the "search for a universal touchstone of succession to treaties . . . is foredoomed to failure because it seeks to resolve too many disconnected problems in virtue of a single rubric, and because any rule of law regulating the question is likely to be either excessively comprehensive or excessively restrictive with respect to the category of treaties whose fate is in issue."). Indeed, the term "state succession" is itself troubling, since it suggests a kind of successorship in interest of the sort familiar in the domestic law of the United States and certain other jurisdictions. As O'Connell noted, the term "seems to suggest that the State which extends its sovereignty over a specific territory thereby becomes invested with all the juridical consequences of its predecessor's acts, that it is, in law as well as in fact, the latter's 'successor.'" *See* 1 O'Connell, *supra* note 35, at 3. This usage is far too imprecise. As Professor O'Connell writes:

> The significance of the term is to be limited . . . to the factual situation which arises when one State is substituted for another in sovereignty over a given territory, and in this sense it enjoys the authority of an extensive literature. *It does not necessarily presuppose a juridical substitution of the acquiring State in the complex of rights and duties possessed by the previous sovereign.*

Id. (emphasis added). Whether, and to what extent, the new state enjoys those rights and duties will be determined based upon the application of a number of largely customary international law principles that must be analyzed on an issue-by-issue basis. Among these issues are questions involving succession to treaty rights and obligations (both bilateral and multilateral), rights with respect to property (located both internally and abroad), state responsibility for internationally recognized wrongs, and questions regarding the nationality of individuals living within and without the new state's borders. *See generally* O'Connell, *supra* note 35; Brownlie, *supra*, at 654-67. Overall, it is perhaps most important to recall that a state can be considered to be a "successor" and nevertheless not be bound by, or entitled to the benefits of, its predecessor's treaty obligations.

37. *See, e.g.*, Edwin D. Williamson & John E. Osborn, *A U.S. Perspective on Treaty Succession and Related Issues in the Wake of the Breakup of the USSR and Yugoslavia*, 33 Va. J. Int'l L. 261, 264-65 (1993); Beemelmans, *supra* note 32, at 97 n.97.

> Just as a personal treaty expires at the death of the King, a real treaty comes to an end if one of the allied Nations is destroyed; that is to say, not only if the men composing it should all happen to perish, but even if, for any cause whatever, the Nation should lose its character as an independent political society.

E. de Vattel, *The Law of Nations or the Principles of Natural Law* 178 (1758) (Carnegie Institution ed. 1916). By contrast, dispositive treaties, which involve the grant of rights or obligations intended to last in perpetuity—covenants that would "run with the land," in common law parlance—would survive a state's disappearance. As Vattel explained:

> we must not confound those treaties or alliances which, *since they impose the obligation of repeated acts on both sides, can not remain in force except through the continued existence of the contracting powers*, with those contracts by which a right is once and for all acquired, independently of any subsequent acts of either party.

Id. (emphasis added). Professor O'Connell provided a modern formulation of the distinction as follows:

> *A treaty may be primarily political, relating to alliance, neutrality, amity or pacific settlement*; it may be economic, and concerned with subsidies, commerce, tariffs and preference; it may be administrative, involving matters of post and telegraph, drug control, protection of women and children, aerial and nautical navigation; or it may be judicial, and relating to extradition or the enforcement of foreign judgments. On the other hand, it may be intended to impose on the territory of a State restrictions of a continuing and indestructible character. *The former categories of treaties are said to be 'personal' to the contracting parties, while the latter is not.*[40]

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38. In fact, it must be admitted that the United States has never been very consistent in its application of even a modified continuity approach. For example, upon declaring its own independence in 1776, the United States declined automatically to accept *any* of the treaty obligations entered by King George or his predecessors. 2 O'Connell, *supra* note 35, at 91 ("The United States never regarded itself, nor was regarded by Great Britain, as bound by or entitled to the latter's treaties, although it is clear from the text, and from action taken under it, that the Anglo–Swedish commercial treaty of 1661 affected the colonies."); Detlev F. Vagts, *State Succession: The Codifiers' View*, 33 Va. J. Int'l L. 275, 287 n.56 (1993).

    However, the United States reviewed its "clean slate" position at a time when the ink on its founding documents was barely dry. By the 1790s, despite having declared its independence from King George and his treaties, the United States demanded that Spain respect its right to free navigation of the Mississippi River based, in part, upon provisions in the 1763 Treaty of Paris ending the French and Indian War (Seven Years War in Europe). *See* 2 O'Connell, *supra* note 35, at 234. This new "continuity" approach was not, however, consistently applied. For example, when the Kingdom of the Netherlands was created in 1815, the new Dutch Government took the view that the Kingdom was not bound by the treaties of the United Provinces (the "Dutch Republic"), including a 1782 treaty with the United States. The U.S. Government asserted that the 1782 treaty remained in force, but ultimately accepted the Dutch position. *Id.* at 27–28.

39. A similar position has, in fact, been adopted in practice by many of the former Soviet republics. Although the Russian Federation and ten other former Soviet republics declared their willingness to be bound by the Soviet Union's treaty commitments in the Alma Ata Declaration, the former Soviet republics have not been willing to accept application of the unrealistic and insupportable universal succession approach. Russia, for example, has stated that it will honor those treaties only to the extent that they do not conflict with Russian law. *See* Williams, *supra* note 33, at 36. Similarly, Ukraine has indicated an intention to review the U.S.S.R.'s treaties to determine which it will remain bound by. *Id.* Turkmenistan and Belarus have sought the agreement of the United States that individual Soviet treaties remain in force, and such agreements have been provided on an individual basis. *Id.* All in all, as one scholar noted: "the practice of state succession [with respect to the former Soviet Union] has confirmed that the automatic acceptance of obligations of predecessor states (except perhaps universal treaties) is often impossible. Negotiations and adjustments are necessary." Rein Mullerson, *New Developments in the Former USSR and Yugoslavia*, 33 Va. J. Int'l L. 299, 321 (1993).

Although the distinction between dispositive and personal treaties has been criticized,[41] it remains an accepted and useful means of rationalizing otherwise apparently arbitrary state practice in this area—explaining why some treaties may survive after the dissolution or extinction of a state, and why others cannot. Significantly, as Professor O'Connell wrote:

> There has been, at least since the late nineteenth century, *almost unanimous agreement that personal treaties of a totally extinguished State expire with it* because they are contracted with a view to some immediate advantage, and their operation is conditional on the nice adjustment of the political and economic relations which they presuppose. When this adjustment is upset the rationale of the treaty is destroyed.

2 O'Connell, *supra* note 35, at 26–27 (emphasis added).

When the ABM Treaty is measured against these rules on dispositive and personal treaties, there can be little doubt that it was extinguished with the Soviet Union. Although the Justice Department's Office of Legal Counsel indirectly, and incorrectly, suggested in the Dellinger Memorandum that the ABM Treaty was "dispositive," *see* Dellinger Memorandum, *supra* note 13, at 3 n.3, it clearly was a treaty "personal" to the Soviet Union. It was a bilateral agreement, as opposed to a multilateral convention, which might be more likely to survive the collapse of one party. *See generally* 2 O'Connell, *supra* note 35, at 212. It was, in fact, based upon a careful calculation by both treaty partners of their competing interests and objectives during the Cold War, and ordered one important facet of the relationship between the United States and the Soviet Union during that period. Although the bargain underlying the ABM Treaty involved the granting of unimpeded access by each superpower's offensive nuclear arsenal to the entire territory of the other, the rights and obligations undertaken by the United States and the Soviet Union in the ABM Treaty were not intended to "run with the land," such as rights of transit on international waterways (although the territorial boundaries of each state as they existed in 1972 was a critical premise upon which the Treaty was based).

Likewise, it is significant that the Treaty, although quite prescriptive and proscriptive in many respects, did not impose site-specific limitations on each and every item of BMD-related hardware. Indeed, to construe the key features of the Treaty as amounting to a site-specific land easement would produce an absurd result, whereby in the post-Soviet environment Russia, Ukraine, Belarus, and Kazakhstan would be allowed to deploy LPARs, with a few exceptions, only along the former U.S.S.R.'s borders. Yet, these four states do not control large portions of that former border and, in any case, placing LPARs there would not give them an adequate early warning capability. Moreover, the rights and obligations delineated in the ABM Treaty were not meant to be permanent and indestructible. Although the Treaty itself did not contain a "sunset" clause, it was nevertheless subject to periodic review and revision by the parties, and could be terminated by either party, upon six months notice, if it concluded that withdrawal was necessitated by "extraordinary" events jeopardizing its "supreme" interests. ABM Treaty, *supra* note 6, art. XIV.

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40. O'Connell, *supra* note 35, at 1 (emphasis added). This distinction was, in fact, advanced by the United States at the time it claimed rights to free navigation of the Mississippi River from Spain based upon the Treaty of Paris (1763). *See supra* note 38. The rights of the 1763 Treaty, argued the United States, "devolved upon them 'because the grant of right made His Britannic Majesty by Article VII of the Treaty of 1763 was intended to run with the soil, was in other words an easement.'" *See* 2 O'Connell, *supra* note 35, at 234. The issue finally was resolved in a 1795 treaty between the United States and Spain.

41. *See* Beemelmans, *supra* note 32 at 74. In fact, the distinction recently was relied upon by the International Court of Justice in its judgment in *Case Concerning the Gabcikovo–Nagymaros Project*, 1997 I.C.J. (September 25) (treaty establishing a "territorial regime" involving use of the Danube River was unaffected by a succession of states resulting from the dissolution of Czechoslovakia).

b. *The Type of Dissolution.*

In addition, when the type of "extinction" suffered by the U.S.S.R. is considered, it becomes even clearer that the ABM Treaty could not survive even under a "continuity" model of state treaty succession. This is because, in determining whether the treaties of a state can survive its demise under a continuity theory, the type of predecessor state involved and how it met its end must be considered. For example, when one state is absorbed by another, its treaties are more likely to be extinguished than if a genuinely federative state dissolves into its component parts.[42] A state that annexes new territory will likely have preexisting treaty obligations that may be inconsistent with those of the state it has absorbed. By contrast, when a confederate or a federal state disintegrates into its component parts, its treaties may be more likely to survive. As Professor O'Connell wrote:

> When a Union of two or more States dissolves so that the several constituent elements become fully sovereign while the central entity disappears the problem is different from that arising from independence or secession, inasmuch as there is no surviving holder of rights and obligations, yet the real beneficiaries of these rights and bearers of the corresponding obligations occupy its place; it is also different from annexation, for

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42. This rule has often been followed by the United States, including in the following examples:

- Annexation of Algiers by France (1830)—When France annexed Algiers in 1830, the United States took the position that its treaties with the Dey were extinguished. 2 O'Connell, *supra* note 35, at 28 (citing *Mahoney v. United States*, 77 U.S. 62 (1877)).
- Admission of Texas to the Union (1845)— The United States Government took the position that the preexisting treaties of the independent Republic of Texas automatically lapsed, and that the new state was subject instead to the treaties made by the United States with foreign powers. 2 O'Connell, *supra* note 35, at 62.
- Risorgimento (1860)—After Italy was united under the House of Savoy, the new Italian Government took the position that the treaties entered by the formerly independent Italian states, such as the Kingdom of the Two Sicilies, had been extinguished and replaced by the treaties entered by Sardinia. The United States ultimately accepted this position. 2 O'Connell, *supra* note 35, at 29–30. *See also* 11 *Treaties and Other International Agreements of the United States of America 1776–1949* 1193 (1971) [hereinafter *Treaties and Other Agreements*]. Predictably, France took the opposite position with respect to her relations with Italy. 2 O'Connell, *supra* note 35, at 30.
- Annexation of Hanover and Nassau by Prussia (1866)—The United States took the position that its treaties with the Kingdom of Hanover and the Duchy of Nassau were extinguished when those states were incorporated into the Kingdom of Prussia in 1866. 2 O'Connell, *supra* note 35, at 30; *see also* 8 *Treaties and Other Agreements, supra*, at 27–40, 67.
- Colonization of Madagascar by France (1896)—France took the position that the treaties between the United States and Madagascar were no longer valid, and the United States apparently acquiesced in that view. 2 O'Connell, *supra* note 35, at 34; *see also* 8 *Treaties and Other Agreements, supra*, at 746.
- Annexation of Hawaii by the United States (1898)—The United States considered the new territory's treaties with foreign states to have been automatically extinguished. On this occasion, the Secretary of State noted that:

  > the history of Europe, of America, of the whole world is full of examples from remote periods to our own days, where independent States have ceased to be such through constrained or voluntary absorption by another, with attendant extinction of their former treaties with other States. It needs no stipulation in a formal annexation treaty to work this result, for it attends de facto annexation, however accomplished.

  2 O'Connell, *supra* note 35, at 34.
- Annexation of Korea by Japan (1910)—The United States appears to have accepted the extinction of its treaty of peace and amity and commerce with Korea when that state was annexed by Japan in 1910. 2 O'Connell, *supra* note 35, at 36–37.
- Annexation of Austria by Germany (1938)—At the time Austria was annexed by Nazi Germany, the United States took the position that a friendship and commerce treaty granting Austria "most-favored-nation" status had been extinguished. 2 O'Connell, *supra* note 35, at 38–39.

> the successor States are not pre-existing entities with their own commitments, but elements of the original legal order. What occurs in the case of dissolution is that the several legal orders of the elements of the union, which previously were integrated into a universal legal order corresponding to the powers of the union, have now been transformed into universal legal orders themselves, and there is a functional devolution in the performance of legal actions from the central to the local authorities.

2 O'Connell, *supra* note 35, at 164–65. The application of this rule to the Soviet Union's demise also supports a conclusion that the ABM Treaty did not survive its dissolution in 1991.

Despite its name, the Soviet Union was neither a confederate nor a federal state. It was one of the most centralized, unitary states in history. The Soviet "republics" were treated by the central government as entirely dependent units whose boundaries and authority could be changed at will. An excellent example of this attitude is the reassignment of the Crimean Peninsula from the Russian Soviet Socialist Republic to Ukraine in 1954. As one Russian scholar has written: "The political structures of the former Soviet Union could hardly be described as truly federal. The Union of Soviet Socialist Republics was, in fact, strictly centralized. Control in all spheres of life was concentrated in the hands of Moscow's ruling elite. In addition, all regional processes were also strictly controlled by the center." Irina Busygina-Traenert, *Federalism in the Post-Cold War Era: The Decay of the Pseudo-Federal Structures in the Former Soviet Union and the Formation of the Russian Federation*, 1995 St. Louis–Warsaw Trans'l 173 (1995); *see also* Joan Afferica, *Federalism in the Post-Cold War Era: The Decay of Federal Structures in the Former U.S.S.R.*, 1995 St. Louis–Warsaw Trans'l 169, 170 (1995) [hereinafter Afferica] ("The historical experience of autocracy determined the imperial substance of Soviet federalism. The federal arrangements served as instruments to enforce tight control from the center.").[43] When a totally centralized state like the Soviet Union dissolves, any "continuity" of treaties is much less defensible. As even Professor O'Connell—who strongly favored continuity of treaty obligations—noted: "State practice tends to presume continuity of treaties less in the case where a central polity is shattered than in that where a link between autonomous legal orders is formally dissolved." 2 O'Connell, *supra* note 35, at 164.

Moreover, even if a federative state dissolves, and it is considered appropriate for its constitutive parts to continue its treaty obligations, *the result is a series of bilateral treaties* between the new states and their predecessor's treaty partners—not the creation of a multilateral treaty regime. As O'Connell explained:

> The presumption in such circumstances is that treaties *which are compatible with the transformation of the respective legal orders* survive the change and that each of the successor States remains a party thereto. *A single bilateral arrangement may then be transformed, not indeed into a multilateral one, but into several similar bilateral arrangements.*

2 O'Connell, *supra* note 35, at 164–65 (emphasis added).

When applied to the ABM Treaty, any such arrangement would fundamentally alter the nature and scope of the rights and obligations undertaken by the original parties.[44] For example, if the Treaty were to survive as a series of bilateral agreements between the United States and each of the Soviet Union's former republics, each of those states would be individually entitled to deploy at least

43. Ironically, the Soviet Union's "Potemkin village" federalism may have contributed to its dissolution after the Communist collapse. As Professor Afferica noted: "On the one hand, these arrangements inhibited reform processes and contributed vitally to the ultimate weakening of the imperial center under the burden of its political and economic over-commitments. On the other hand, they provided parts of the empire with ready-made forms for establishing their national self-rule." *Id.* at 170.

one anti-ballistic missile defense system, as well as the radars allowed to the Soviet Union by the Treaty. This would potentially blanket the old territory of the Soviet Union with ABM defenses. This, in and of itself, would destroy the "nice adjustment of the political and economic relations which [the treaty] presuppose[d]." *See* 2 O'Connell, *supra* note 35, at 164.

4. Continuity With Russia Alone.

The President's May 21, 1998, letter to Chairman Gilman, as well as the Dellinger Memorandum, suggested that the Russian Federation could be identified as the successor to the Soviet Union under the ABM Treaty. *See* Clinton/Gilman 1998 Letter, *supra* note 12, at 2; Dellinger Memorandum, *supra* note 13, at 5. There are two fundamental flaws in this conclusion. First, the Russian Federation alone cannot carry out all of the Soviet Union's obligations under the ABM Treaty as it was originally agreed with the United States.[45] As explained above, the burdens and benefits of the ABM Treaty were calculated, and agreed upon, based on the assumption that one state would control and implement the Treaty within the entire territory of the Soviet Union. Russia no longer controls that territory and cannot, therefore, implement all of the Soviet Union's obligations under the Treaty. Second, when a continuity analysis is applied to the Russian Federation, it becomes clear that Russia has not continued the international legal personality of the Soviet Union.

At the time the Soviet Union dissolved in 1991, two events of historic importance took place. First, as will be discussed below, the Russian Empire—last of the great colonial empires created in the 18th and 19th Centuries—collapsed, finally following the example of the Spanish, British, French, Dutch, Portuguese, and German empires before it. The borderland territories in Europe and Asia, absorbed by the Russian State in the 18th, 19th, and 20th Centuries, regained—or established—their independence. In general, when such colonial possessions gain their independence from a metropolitan power, the identity and continuity of that metropolitan state remain unchanged. Thus, there is little question that Britain and France continue today the international legal personalities—if not the same territorial expanse—they enjoyed when the 20th Century began.

However, the breakup of the Soviet Union was far more extensive than this. Not only did Russia's 19th and 20th Century colonial empire dissolve, but also—far more significantly—*the Russian State itself collapsed*. Here, it is important to recall that the Russian State that formed the core of the Soviet Union (and the Tsar's Empire before it) was not Boris Yeltsin's Russia. Rather, it was the Russian State established over the past five hundred years by the Riurikid and Romanov tsars. That State consisted of Great Russia (generally the territory of the old Grand Duchy of Muscovy), White Russia (now Belarus, an area largely absorbed into the Russian State from territory belonging to the medieval Pol-

44. President Clinton acknowledged this fact in his November 21, 1997, letter to Chairman Gilman. At that time, the President stated: "Neither a simple recognition of Russia as the sole ABM successor (which would have ignored several former Soviet states with significant ABM interests) *nor a simple recognition of all NIS states as full ABM successors would have preserved fully the original substance and purpose of the Treaty as approved by the Senate in 1972*." (Emphasis added). *See* Clinton/Gilman 1997 Letter, *supra* note 12, at 2. It is unclear how the President might reconcile this view with his later assertion that Russia is currently the United States' ABM Treaty partner. See Clinton/Gilman 1998 Letter, *supra* note 12, at 2. In this regard, it is significant that, in recognition of the problems posed by any effort to devolve the bilateral U.S.–Soviet ABM Treaty into a set of bilateral "mini" ABM treaties between the United States and fifteen or fewer post-Soviet states, both the United States and Russia, as well as several former Soviet republics, opted to try to devise some multilateral ABM arrangement. Unfortunately, any such arrangement would still be plagued by two intrinsic problems. First, unless the new BMD combine covered the entire post-Soviet territory, it would be unable to deliver the essence of the 1972 bargain—free "access" to the entire Soviet territory for an American nuclear strike. Second, any multilateralized ABM Treaty would dramatically change, and even render unworkable, key provisions of the 1972 Treaty as discussed above.

45. President Clinton also admitted to this shortcoming in his November 21, 1997, letter to Chairman Gilman. *See supra* note 12.

ish–Lithuanian kingdom), and Little Russia or the Ukraine (now Ukraine), a territory joined to Muscovy in the 17th Century—an area that itself can claim to be the cradle of the medieval Russian State.[46]

When the Soviet Union collapsed, its metropolitan center also fragmented, as each of these ancient territories established themselves as independent states. Indeed, to appreciate fully the scope of the catastrophe that overtook the Russian State in 1991, it is necessary to imagine that the British and French colonial empires had not merely dissolved over the past fifty years, but that Britain and France also had fragmented into their ancient kingdoms, principalities, and provinces, *i.e.*, England, Scotland, and Wales, or the isle de France, Normandy, Brittany, Anjou, Poitou, and so forth. The Russian Federation cannot, therefore, be considered merely a continuation of the Soviet Union's international legal personality in the same manner that Britain and France are clearly the same states that once also were the metropolitan hubs of great empires.

In this regard, the Soviet Union's collapse in 1991 was unique. Never before had a great power so definitively dissolved in time of peace. Moreover, this collapse was also accompanied by a fundamental change in governmental and social systems, from totalitarian communism to an elected government committed to establishing a market economy. Ordinarily, a revolution does not destroy a state's international identity, and cannot be asserted as a justification for avoiding its treaty obligations. *See, e.g.*, *The Sapphire*, 78 U.S. 164, 168 (1871) (deposition of Napoleon III did not represent a change of national sovereignty, noting that "[a] deed to or treaty with a sovereign as such inures to his successors in the government of the country."); 1 John Bassett Moore, *A Digest of International Law* 249 (1906) ("Changes in the government or the internal polity of a state do not as a rule affect its position in international law. A monarchy may be transformed into a republic or a republic into a monarchy; absolute principles may be substituted for constitutional, or the reverse; but though the government changes, the nation remains, with rights and obligations unimpaired."). However, in any case—like that of the Soviet Union—when a movement from one form of government to another is *combined* with the dissolution of the state involved, a different situation is presented. As Marek wrote with respect to the dissolution of the Hapsburg Monarchy:

> It has been seen that, in principle, a State cannot survive the simultaneous impact of territorial loss and revolution, *since its entire delimitation under international law is destroyed by such a combined process, there being no elements left to carry on its continuity.* It has also been seen, however, that a State can survive such simultaneous blows on condition that the territorial loss involved is relatively small—in other words, on condition that the new revolutionary basic norm is valid for what is more or less the previously existing territorial and personal delimitation. This quantitative element provides the decisive criterion for the distinction between a secession, which even a revolutionary State can survive, and revolutionary dismemberment which it cannot.

Marek, *supra*, at 210 (emphasis added).[47]

5. The ABM Treaty Analyzed Under a Clean Slate Model.

As noted above, there is an alternative to the continuity model of state treaty succession. The "clean slate" approach to questions of treaty succession regained prominence in the wake of the two World Wars, as dozens of new states were born from crumbling European continental and colonial empires. Indeed, since World War II, international law has seen a very significant movement away

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46. *See generally* Janet Martin, *Medieval Russia 980–1584* 1–133 (1995); Nicholas V. Riasanovsky, *A History of Russia* 23–59 (4th ed. 1984).

from even a modified, case-by-case continuity model of treaty succession, and towards a "rule of non-transmissibility." This rule, simply stated, is as follows:

> When a new state emerges it is not bound by the treaties of the predecessor sovereign by virtue of a principle of state succession. . . . [A]s a matter of general principle a new state, ex hypothesis a non-party, cannot be bound by a treaty, and in addition other parties to a treaty are not bound to accept a new party as it were, by operation of law.[48]

This rule was adopted for "newly independent states" (states formerly subject to the control of another state with respect to their international relations) by the Vienna Convention on Treaty Succession, *reprinted in* Henkin et al., *supra* note 15, at 103.[49] However, the American Law Institute's Restatement (Third) of the Foreign Relations Law of the United States has adopted the clean slate analysis more broadly, for *all* cases in which "part of a state becomes a new state," regardless of whether the new state had been a colonial possession. Restatement (Third), *supra*, § 210(3).[50] As Professor Brownlie explained:

> The rule of non-transmissibility (forming part of general international law) applies both to secession of "newly independent states" (that is, to cases of decolonization) and to other appearances of new states by the union or dissolution of states. The distinctions drawn by the International Law Commission in this respect in its drafts and, subsequently, in the provisions of the Vienna Convention on Succession of States in respect of Treaties, adopted in 1978, are not reflected by the practice of states. This is not to deny that considerations of principle and policy may call for a different outcome in the case of a union of states. . . . However, the distinction between a succession and the dissolution of federations and unions is unacceptable, both as a proposition of law and as a matter of principle.

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47. The treatment of state succession issues raised by the Hapsburg collapse has been described as "controversial." 2 O'Connell, *supra* note 35, at 178. Austria denied its status as a continuation of the Monarchy, while Hungary claimed to continue the Monarchy's international legal personality (a claim that was disputed, *id.* at 179 n.1). Austria probably was correct in this conclusion as a matter of neutrally applied principles of international law. As Dr. Marek wrote: "The legal order of the Austrian Empire, identified by its basic norm, had been replaced by an entirely new legal order, valid for an entirely new territorial and personal sphere of validity. Of the delimitation of the old State under international law, there remained nothing." Marek, *supra*, at 235–36.

It should be noted, however, that the Allied Powers took the position that Austria was a continuation of the Hapsburg Monarchy, as it could not otherwise be subjected to the "war guilt" clause and reparations requirements of the peace treaties. However, they acted inconsistently with this position. Under both the Treaty of St. Germain-en-Laye (between Austria and the Allies) and the Treaty of Trianon (between Hungary and the Allies), specific listings of those multilateral treaties entered by the Hapsburg Monarchy to which Austria and Hungary would thereafter be bound were provided. Further, both treaties provided that Austria and Hungary would be bound by those Hapsburg bilateral treaties *that were selected by the Allies and other states to remain in force. See* Treaty of St. Germain-en-Laye, arts. 234 & 241, *reprinted in* 5 *Treaties and Other Agreements*, *supra* note 42, at 277; Treaty of Trianon, arts. 217 & 224, *reprinted in* 8 *Treaties and Other Agreements*, *supra* note 42, at 1044–45. Of course, if Austria or Hungary were honestly continuations of the Hapsburg Monarchy's international legal personality, then the provisions of these treaties would have been superfluous—both automatically would have been bound to the Monarchy's treaties.

Moreover, the other states established on the territory of the Dual Monarchy were not held to the treaties of Austria–Hungary. In particular, Czechoslovakia was treated as an entirely new state, and was not assumed to succeed to any of Austria–Hungary's treaties. It was, in fact, given the benefit of a "clean-slate," 2 O'Connell, *supra* note 35, at 180–81, even though it was composed of territories—the Kingdom of Bohemia and the Slovak lands of Hungary—that had been Hapsburg possessions since the 16th Century. Similarly, Poland, which obtained the province of Galicia (an 18th Century Hapsburg acquisition) from the Monarchy, did not consider itself—and was not considered—bound by the Monarchy's treaty commitments. *Id.* at 181–82.

Brownlie, *Principles of Public International Law*, *supra* note 36, at 668.

In some sense, the Restatement's adoption of a clean slate rule for *all* new states can be understood as a frank acknowledgment that, as suggested by Professor Brownlie, a continuity rule is unsupported by state practice. In fact, as a practical matter, the continuing viability of the continuity model is very much in doubt.[51] As noted above, a pure continuity rule of universal state succession is almost never followed, since such an approach would require that a new state undertake *each and every* treaty obligation of its predecessor automatically, without renegotiating the terms and conditions of individual agreements in any meaningful manner.[52] It is difficult to find examples where such a rule has been applied consistently, or even inconsistently, by the international community.[53] There are, in fact, both principled and practical reasons for applying some form of clean slate approach, whether strict or modified, to the newly independent states of the former Soviet Union, including the Russian Federation.

6. The Former Soviet Republics All Are "Newly Independent States" Subject to the Clean Slate Rule.

The clean slate approach has been favored in recent years because of the fundamental issues of fairness and legitimacy involved in imposing treaty obligations, negotiated and agreed by colonial powers, upon the states that have gained their independence in the past fifty years. As noted above, treaties are, of course, a species of contract between states. The consent of the parties is a fundamental aspect of all contracts, including those between sovereigns. *See, e.g.*, Vagts, *supra* note 38, at 281 n.31. This consent simply could not, and cannot, be inferred before rights of national self-determination have been exercised.[54]

This principle is highly relevant to the present situation. The peoples of the former Soviet Union are among the few who reached the last decade of the 20th Century without ever having had the opportunity to exercise their right of self-determination. The Soviet state was, in fact, the last of the great multinational empires to meet its end. Although it was ruled by the Bolshevik and then Com-

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48. Brownlie, *Principles of Public International Law*, *supra* note 36, at 668. As noted above, this rule was followed by the United States upon its own independence. Another prominent example of the application of this rule is Israel, which refused to be bound by treaties formerly applicable to British Palestine. *See* Beato, *supra*, at 539 n.56.

49. The general rule adopted by this convention for non-newly independent states would not, significantly, support a conclusion that the ABM Treaty survived the Soviet Union. As noted above, *supra* note 15, such a bilateral treaty does not survive if, as here, its application with respect to successor states "would be incompatible with the object and purpose of the treaty or would radically change the conditions for its operation." Although none of the Great Powers (including the United States) have ratified this convention, the Holy See (an institution that has itself witnessed the whole birth and development of international law) was an original party. Nevertheless, its accuracy as a definitive statement of customary international law has been questioned. As one scholar noted:

> Although some commentators consider the Vienna Convention to represent a codification of customary international law, it is generally considered that the Convention does not reflect customary international law but rather embodies a number of customary legal rules useful for the determination of treaty continuity. More specifically, the Vienna Convention reflects the customary trend to continue treaty rights and obligations, but it does not accurately reflect the divergent practices regarding the question of whether treaties automatically continue or whether the successor states must consent to their continuation.

Williams, *supra* note 33, at 8 (footnotes omitted).

50. Williams also notes that the Restatement "does not generally reflect the norms of customary international law" because it does not make a distinction based upon the character of a new state's birth, or of a predecessor state's extinction: "[it] does not reflect an understanding of the different circumstances that characterize the dissolution or the continuation of a state where the successor state is not a colony but rather an integral republic entity of the predecessor state." Williams, *supra* note 33, at 11.

munist Party only from 1917, the "Russian Empire" had a continuous existence from at least 1721 until 1991. That empire grew at the same time, and in the very same manner, as other European empires, including the British, French, Dutch, Spanish, and German. Control was progressively asserted over states or peoples that had previously been independent, autonomous, or merely unorganized tribesmen. *See generally*, Hugh Seton-Watson, *The Russian Empire 1801–1917* 430–45 (1967). The foreign affairs of these states and peoples were controlled by the central government of the Tsarist empire and then, after 1917, by the Soviet Union's Moscow-based central government. Given this historical background, the former Soviet republics are as much newly independent states as are any of the states of Africa or Asia once ruled from London, Paris, or Berlin.[55]

This, also, is true of the Russian Federation. As explained above, the Russia of today is not the Russian State that became the Soviet Union after the Bolsheviks seized power. It represents only a portion of that state. Given the unique history of the Russian State, it is entirely appropriate that the newly independent states that emerged when the Soviet Union dissolved in 1991 be treated under the clean slate doctrine. The events of 1991 marked the first time that the peoples, once subject to the tsars and then commissars, actually were in a position to contract on their own behalf. Of course, the obvious and necessary corollary is that, at least with respect to bilateral treaties, each of the treaty partners of the old Soviet Union must also consent to be bound by any treaty commitments to be undertaken by these new states. *See* Restatement (Third), *supra*, § 210(3).

7. *The Doctrine of "Rebus Sic Stantibus."*

Although the impact on treaty relations of the actual disappearance of one treaty partner would appear to be more appropriately analyzed under the impossibility analysis articulated by the *Terlinden* Court, and the related state succession rules of international law, application of the *rebus sic stantibus* rule also would result in a conclusion that the ABM Treaty was nullified by the Soviet Union's dissolution. Under this doctrine, states may assert that an unforeseen and fundamental change of circumstances, altering conditions the existence of which constituted an essential basis of the consent of the parties to the treaty, is a justification for declaring a treaty null and void. This rule has been articulated as follows:

> The validity of treaties ends "at the time of the essential change of such and such circumstance whose existence was supposed necessary by the two parties (clausula rebus

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51. Despite the stated position of the State Department with respect to the Soviet Union, the United States has taken a very different approach in other cases. For example, in reference to the possibility that an independent Quebec might automatically accede to the North American Free Trade Agreement between the United States, Canada, and Mexico, the Clinton Administration has rejected a continuity model out of hand. *See* Statement of Mike McCurry, Press Briefing of October 30, 1995 ("We've made clear that there is no automaticity to NAFTA participation in the event that Quebec was ratified as a separate entity.").

52. This is because the continuity model presumes that the successor state is a continuation of the international legal personality of its predecessor state.

53. A rigid continuity approach also has been rejected by the Legal Advisers to the Council of Europe, who have instead suggested that "bilateral agreements [like the ABM Treaty] should 'be dealt with in a practical way, irrespective of the theoretical point of departure (clean slate or succession). States should arrive at a common list containing agreements which should apply between them.'" *See* Williams, *supra* note 33, at 17.

54. There is no universally accepted definition of a "newly independent state." The Vienna Convention on Treaty Succession defines the term as follows: "'newly independent State' means a successor State the territory of which immediately before the date of the succession of States was a dependent territory for the international relations of which the predecessor State was responsible." Vienna Convention on Treaty Succession, *reprinted in* Henkin et al., *supra* note 15, at 103.

> sic stantibus), whether this condition was stipulated expressly or that it results from the very nature of the treaty."

40 Op. Att'y Gen. 119 (1941) (quoting Kluber, 29 Am J. Int'l L. Supp. 1097, 1098 (1935)). It was incorporated into the Vienna Convention on the Law of Treaties in the following manner:

> 1. A fundamental change of circumstances which has occurred with regard to those existing at the time of the conclusion of a treaty, and which was not foreseen by the parties, may not be invoked as a ground for terminating or withdrawing from the treaty unless:
>
> (a) the existence of those circumstances constituted an essential basis of the consent of the parties to be bound by the treaty; and
>
> (b) the effect of the change is radically to transform the extent of obligation still to be performed under the treaty.

* * *

See Vienna Convention on the Law of Treaties § 62, *reprinted in* Henkin et al., *supra* note 15, at 86, 100.

The disappearance of one treaty partner, and the absence of a successor state in a position fully to perform the treaty's requirements, would appear to constitute a change of circumstance that would justify application of the *rebus sic stantibus* rule—particularly in the case of a bilateral treaty. Indeed, Professor Brownlie has suggested that, in such circumstances, merely a change in the form of government involved (which ordinarily does not affect treaty relations) may be invoked to justify the termination of a treaty: "An example of a fundamental change would be the case where a party to a military and political alliance, involving exchange of military and intelligence information, has a change of government incompatible with the basis of alliance." *See* Brownlie, *Principles of Public International Law, supra* note 36, at 620.

In fact, the disappearance of one or more treaty partners as an independent international actor was identified by Acting Attorney General Francis Biddle in 1941 as one of the reasons that justified

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55. Some have suggested that all of the former Soviet republics (except for the Baltic States) may be held to the U.S.S.R.'s commitments because, "[a]though all the republics were subservient to Moscow, some of their nationals had the opportunity of going to Moscow to join the central government and Communist Party authorities who made decisions about foreign policy." *See, e.g.*, George Bunn and John B. Rhinelander, *The Arms Control Obligations of the Former Soviet Union*, 33 Va. J. Int'l L. 323, 330 (1993). However, these individuals did not go to Moscow as representatives of their states or peoples, but as Communist Party *apparatchiks* and collaborators. An excellent example is Stalin, who came originally from Georgia. Stalin's hostility to "nationalities," including his own, was intense. His policy, from well before he assumed supreme power, was to rigorously centralize power in Moscow where it was exercised by the Communist Party. *See* Richard Pipes, *Russia Under the Bolshevik Regime* 472–73 (1993).

Moreover, if the ability of provincials to participate in the Moscow power structure is to support the application of a continuity analysis to all of the former Soviet republics, then there is little reason to exclude the Baltic States. These areas were part of the Russian Empire for as long as, if not longer than, most of its other territories—with only a 22-year hiatus between the World Wars. Before 1918, the nobility and gentry of these states were accepted at the court of St. Petersburg and were eligible for the highest offices of state like their Great Russian counterparts. After 1940, communists from these states could participate in Soviet government like other non-Russian Party members.

Significantly, when Poland (most of which had been a part of the Russian Empire) regained its independence in 1918, it refused to acknowledge any continuity with the Russian State. *See* Brownlie, *Principles of Public International Law, supra* note 36, at 674. Similarly, when Finland declared its independence from the Russian State in 1919, it was not considered to be bound by either Tsarist or Bolshevik treaties. 2 O'Connell, *supra* note 35, at 99.

application of the *rebus sic stantibus* doctrine to the International Load Lines Convention. That treaty limited the load oil tankers could carry at sea. In 1941, President Roosevelt declared it no longer operative in United States ports. He based this declaration upon an opinion of Acting Attorney General Biddle, who concluded that the convention was no longer in effect because of the drastically changed circumstances brought about by the outbreak of World War II. In this regard, Biddle explained that the treaty was a peacetime agreement, and

> Conditions essential to the operation of the convention, and assumed as a basis for it, are in almost complete abeyance. Of the 36 governments which acceded to or ratified the convention prior to September 1 1935, ten . . . are at war. *Sixteen of the said 36 governments are under military occupation.* Others . . . may be said to be striving with varying success to preserve a precarious neutrality in the widespread armed conflict now prevalent. International shipping is not being carried on under normal conditions. . . .

40 Op. Att'y Gen. 119 (1941) (emphasis added). He concluded as follows:

> Under these circumstances there is no doubt in my mind that the convention has ceased to be binding upon the United States. It is a well-established principle of international law, *rebus sic stantibus*, that a treaty ceases to be binding when the basic conditions upon which it was founded have essentially changed.

Id.

There can be little doubt that the continued existence of the Soviet Union as a centrally controlled nuclear superpower was a fundamental basis upon which the ABM Treaty was entered by the United States. Unless a successor state can be identified that can undertake and perform all of the Soviet Union's obligations under the ABM Treaty as originally agreed, the United States would be entirely justified in considering the ABM Treaty to be null and void under the doctrine of *rebus sic stantibus.*[56]

C. The Legal Impact of Potential Senate Action Denying Advice and Consent to the September Agreements.

As explained above, the September Agreements would amend the provisions of the 1972 ABM Treaty by, among other things, replacing the Soviet Union with four other treaty parties. If the Senate refuses to give its consent to the ratification of these agreements, the ABM Treaty will not merely remain in effect. Regardless of whether a continuity or clean slate analysis is applied, the ABM Treaty cannot now be said to be in effect, and has ceased to be a legally binding document. Under either model, the Soviet Union had no successor state that can be said to continue the U.S.S.R.'s international legal personality or that can perform the substantive obligations of the ABM Treaty as *originally* agreed in 1972 and 1974.

The fact that four former Soviet republics—Russia, Belarus, Ukraine, and Kazakhstan—have indicated their willingness to be bound by the ABM Treaty, albeit with the modifications contained in the

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56. Ordinarily, when a treaty is to be terminated based upon application of the *rebus sic stantibus* doctrine, some notification would be required. *See* Vienna Convention on the Law of Treaties § 65, *reprinted in* Henkin et al., *supra* note 15, at 86, 101; Brownlie, *Principles of Public International Law, supra* note 36, at 620. The rule is not clear, however, where the relevant treaty partner has disappeared, and no clear successor, who might be bound by the treaty, can be identified. Attorney General Biddle's view in the International Load Line Convention matter was that notification would be unnecessary where circumstances—such as a state's being overrun by military power—made it impracticable. In this respect, he concluded that "There is no question of a declaration of the inoperativeness of a treaty *which is no longer binding because the conditions essential to its continued effectiveness no longer pertain.*" 40 Op. Att'y Gen. 119 (1941) (emphasis added).

September Agreements, is insufficient to resurrect the ABM Treaty. Under a continuity analysis, the Soviet Union's successor states could only be bound automatically to a series of *bilateral* agreements with the United States—assuming they could be said to represent continuations of the U.S.S.R.'s international legal personality and carry out the ABM Treaty's requirements as originally agreed. This would give each of these states the same rights enjoyed by the Soviet Union, which in and of itself would fundamentally alter the bargain originally struck with the United States in 1972 and 1974. As noted above, President Clinton has himself stated that such a result is legally unacceptable, since the "simple recognition of all NIS states as full ABM successors would [not] have preserved fully the original purpose and substance of the Treaty, as approved by the Senate in 1972." *See* Clinton/Gilman 1997 Letter, *supra* note 12, at 2.

Similarly, the ABM Treaty cannot be recreated without the Senate's consent under a clean slate analysis. The former Soviet republics are each new states, and cannot be bound to the Soviet Union's treaties unless they agree to be bound *and* obtain the agreement of the Soviet Union's treaty partners (in this case the United States) also to be bound. Because any such agreement by the United States also would fundamentally alter the terms of the ABM Treaty as originally agreed and ratified, the consent of the United States Senate would have to be obtained before it could again be ratified. Overall, the President can neither preserve nor reaffirm the ABM Treaty on his own authority.

1. *The President Cannot Arbitrarily Recognize One or More Former Soviet Republics as United States Treaty Partners Bound by the ABM Treaty.*

There is little doubt that the President has wide authority to conduct the nation's foreign affairs. He is vested by Article II, Section 1, of the Constitution with the "executive power," and has long been accepted as the "sole organ of the federal government in the field of international relations." *See United States v. Curtiss-Wright Export Corp.*, 299 U.S. 304, 318–19 (1936). This power includes a wide range of authority to formulate and implement American foreign policy, including the authority to make treaties, so long as two-thirds of the Senate approves, U.S. Const. art. II, § 2, cl. 2, and to recognize and establish diplomatic relations with foreign governments. *See United States v. Pink*, 315 U.S. 203, 229 (1942); *United States v. Belmont*, 301 U.S. 324, 330 (1937).

The President's power is not, however, unlimited. Even in the area of foreign affairs, it "must be exercised in subordination to the applicable provisions of the Constitution." *Curtiss-Wright Export Corp.*, 299 U.S. at 318–19. Although the President clearly has the prerogative to determine whether or not the United States should recognize a particular state as an independent and sovereign entity, and whether to establish diplomatic relations with such a state, he can do so only within the recognized boundaries of domestic and international law, as that law is understood and applied in the United States. The President is not a legislator. *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579, 587 (1952) ("[i]n the framework of our Constitution, the President's power to see that the laws are faithfully executed refutes the idea that he is to be a lawmaker."). His power, although plenary within its bounds, may not encroach on the clearly delineated constitutional authority of Congress, and particularly of the Senate, with respect to treaties.

Consequently, the President cannot merely continue to recognize the "Soviet Union" as the United States' ABM Treaty partner, and pretend that the U.S.S.R. continues to exist for these purposes, any more than he could recognize the Roman Empire as a U.S. treaty partner. American foreign policy is subject to the President's direction, not to his whim. As the United States Court of Appeals for the Ninth Circuit noted, the President as Chief of State is entitled to deference in determining questions of state succession, so long as such determinations are based upon the supporting facts. *Ivancevic v. Artukovic*, 211 F.2d 565, 573–74 (9th Cir. 1954) ("There is no exact formula by which it can be determined that a change of a nation's fortunes amounts to a continuance of the old or the beginning of a

new nation, there can be no better equipped vehicle for decision than the Chiefs of State of the countries concerned. If their agreed decisions, *when based upon supporting facts*, are not conclusive, they should at least weigh very heavily.") (Emphasis added.)

Moreover, the President's suggestion in his November 21, 1997, and May 21, 1998, letters to Chairman Gilman that, if the September Agreements are not approved by the Senate, the original ABM Treaty will remain in effect at least between the United States and Russia must be based upon the assumption that Russia automatically may be bound to the ABM Treaty without further Senate action. As discussed at length above, this does not appear to be the case. None of the former Soviet republics, including the Russian Federation (*as the President himself acknowledged in his November 21 letter to Chairman Gilman*) meet the international and domestic legal criteria articulated by the Supreme Court in *Terlinden*—they do not represent a continuation of the "sovereignty" or international legal personality of the Soviet Union, and are unable to carry out its obligations under the ABM Treaty in an "unimpaired" manner. The President cannot, therefore, merely recognize Russia as an ABM Treaty party without the Senate's consent.

2. *The President Must Obtain the Advice and Consent of the Senate to Transform the ABM Treaty from a Bilateral Treaty into a Multilateral Treaty.*

A President can make treaties only "by and with the Advice and Consent of the Senate . . . provided two-thirds of the Senators present concur." U.S. Const. art. II, § 2, cl. 2. Concomitantly, the President must also obtain the advice and consent of the Senate if he wishes to revise the substantive treaty obligations of the United States. *Amiable Isabella*, 19 U.S. (6 Wheat.) 1, 75 (1821) ("the obligations of the treaty [may] not be changed or varied but by the same formalities with which they were introduced; or at least by some act of as high an import, and of as unequivocal an authority."); *N.Y. Chinese T.V. Programs v. U.E. Enterprise*, 954 F.2d 847, 853–54 (2d Cir. 1992) ("A significant amendment to a treaty must follow the mandate of the Treaty Clause, and therefore must be proposed by the President, and ratified following the advice and consent of the Senate. . . . [A] treaty is 'amended' only if the obligations imposed by that treaty change."); *see also Treaties and Other International Agreements: The Role of the United States Senate*, S. Rep. No. 98–205, 144–51 (1984) ("Amendments to a treaty or international agreement require the same procedure as the original agreement, unless otherwise specified in the original agreement."); Restatement (Third), *supra*, § 339 cmt. a ("The President's power to terminate an international agreement does not imply authority to modify an agreement or to conclude a new one in its place.").

Any acceptance by the United States of Russia, Belarus, Ukraine, and Kazakhstan as parties to the ABM Treaty would constitute a substantive amendment to that treaty. Among other things, this act would transform a bilateral treaty between the United States and the Soviet Union into a multilateral treaty among the United States and four other countries. This alone would substantially alter the rights and obligations of the United States under the ABM Treaty—on the most basic level. As described above, the United States entered the ABM Treaty on the understanding that it was dealing with a single power capable of implementing its obligations under the Treaty. If the ABM Treaty were multilateralized, the United States would become dependent upon at least four separate states to implement the portions of obligations originally assumed and guaranteed by a single state—the Soviet Union. This would not only require the United States to accept a less advantageous bargain than was originally struck, but also would impose upon it the additional burden of assuring the compliance of four governments, instead of only one.

Similarly, the addition of several new parties to the ABM Treaty would significantly change the ability of the United States to obtain amendments and revisions to the Treaty. Under the original agreement, the United States was required to obtain the agreement of only one treaty partner, the

Soviet Union, to any modification of the agreement it might wish to make. *See* ABM Treaty, *supra* note 6, at art. XIV & art. XVI. If the Treaty is transformed into a multilateral agreement, the agreement of more than one, and potentially of all four, treaty partners would have to be obtained before modifications could be effected. In addition, the ABM Treaty's substantive terms—and in particular the benefits the United States would obtain and the burdens it would assume—were calculated based upon a treaty partner that controlled all of the territory of the former Soviet Union. As explained above, under the ABM Treaty, the United States agreed to expose its territory and population to nuclear ballistic missile attack. In return, the Soviet Union agreed to expose its territory and population to nuclear ballistic missile attack and to limit its use of warning, tracking, and battle management devices—radars—throughout the whole territory of the former U.S.S.R.

Overall, to preserve the original bargain struck by the United States and the Soviet Union in the ABM Treaty, in light of the new strategic realities, numerous substantive changes would have to be made in its terms if new parties are to be accepted. The Clinton Administration has effectively acknowledged this fact. As negotiated, the September Agreements with Russia, Belarus, Ukraine, and Kazakhstan would make significant changes in the ABM Treaty regime. For example, the Memorandum of Understanding Relating to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems of May 26, 1972, signed September 26, 1997, ("Succession Memorandum") would revise the territorial extent of the Treaty from the territory of the Soviet Union to the territory of the four new signatories.[57] In addition, and among other things, the four successor states would be permitted to use any BMD-related facilities subject to the provisions of the original Treaty but located in the territory of a non-party, although the non-party state would have no limitations on BMD deployments. As another example, the provisions governing the SCC would be revised to give each of the new treaty partners "equal legal status in reaching decisions in the Commission."

All of these provisions amend the original ABM Treaty and result in a bargain for the United States that is far less advantageous, and a Treaty regime that is overall more burdensome, than that originally agreed and consented to by the Senate in 1972. Appropriately, and like the original ABM Treaty, *see* ABM Treaty, *supra* note 6, art. XVI, the Succession Memorandum itself provides that it "shall be subject to ratification or approval by the signatory States, in accordance with the constitutional procedures of those States."

The requirement that the Senate's advice and consent be obtained before an arms control treaty may be ratified has, in fact, been the long-standing understanding and practice of both the Executive Branch and the Senate. S. Rep. No. 98-205, *supra*, at 149–51. Such established practice is accorded significant deference by the courts. *See The Pocket Veto Case*, 279 U.S. 655, 689–90 (1929). If the President were to go forward without the Senate's consent, and purport to multilateralize, and thereby revise, the ABM Treaty on his own authority—by Executive Agreement or by simply purporting to

57. The significance of this change as a treaty amendment can be effectively illustrated with the following hypothetical. Let us suppose that, before its dissolution in 1991, the Soviet Union had undergone a fundamental change in its governing structure, and that it also experienced a process of liberalization that proceeded unevenly throughout the country—with some republics continuing to be governed by the Communist Party *nomenklatura*. Let us further speculate that, in an effort to encourage further democratic progress, an American President decided to demonstrate that the less repressive the Soviet Union was, the more willing the United States would be to go beyond nuclear deterrence and to build relations with the "new" Soviet Union on an entirely different basis. Toward that end, the President decided to allow the deployment of ballistic missile defenses throughout certain portions of the Soviet Union's territory, thus fundamentally changing the territorial scope of the ABM Treaty's terms. Indeed, the President's apparent belief, articulated in the Clinton/Gilman 1998 Letter, that he can unilaterally release the eleven post-Soviet states from the ABM Treaty's strictures, amounts to precisely such an action. There is little doubt that such a change could have been achieved only with the Senate's advice and consent.

recognize one or more Soviet successor states as being bound by the ABM Treaty—he would be on the very thinnest of constitutional ice.

As explained by Justice Robert Jackson in his defining concurrence in *Youngstown Sheet & Tube Co.*, 343 U.S. 579 (1952), "Presidential powers are not fixed but fluctuate, depending upon their disjunction or conjunction with those of Congress." The President's authority is at its "maximum" when he acts "pursuant to an express or implied authorization of Congress." *Id.* By contrast, "[w]hen the President takes measures incompatible with the expressed or implied will of Congress, his power is at its lowest ebb." *Id.* Congress has, in fact, spoken to the issue of whether the President may enter arms control agreements in general, and whether he can multilateralize the ABM Treaty in particular, on his own authority. On both points, Congress has firmly denied the President this authority.

When Congress established the United States Arms Control and Disarmament Agency in 1961, it took care specifically to provide as follows:

> [N]o action shall be taken under this chapter or any other Act that will obligate the United States to reduce or limit the Armed Forces or armaments of the United States in a militarily significant manner, except pursuant to the treaty-making power of the President set forth in Article II, Section 2, Clause 2 of the Constitution or unless authorized by the enactment of further affirmative legislation by the Congress of the United States.

22 U.S.C. § 2573 (as amended).[58] Significantly, although the constitutionality of this provision has, occasionally, been questioned, *see, e.g.*, David A. Koplow, *When Is an Amendment Not an Amendment?: Modification of Arms Control Agreements Without the Senate*, 59 U. Chi. L. Rev. 981, 1033 n.281 (1992), the Executive Branch has never challenged the law in the courts. Moreover, it has, in the case of the ABM Treaty, and other major arms control agreements, scrupulously followed the law's injunction.[59]

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58. The undisputed purpose of this language was to make clear that "any action obligating the United States to disarm, reduce, or limit our Armed Forces or armaments, shall have congressional approval either in the form of a treaty ratified by the Senate or, in the case of an obligation other than a treaty, by a majority vote of the House and Senate." H. Rep. No. 863, *reprinted in* 1963 U.S.C.C.A.N. 1110, 1115.

59. Any attempt to modify the ABM Treaty without Senate participation also would violate the State Department's own regulations, as described in the *Foreign Affairs Manual*, governing questions of when an international agreement can be concluded only with the Senate's approval. Among the factors that must be considered in determining whether an agreement must have Senate approval are the following:

a. The extent to which the agreement involves commitments or risks affecting the nation as a whole;

* * *

d. Past U.S. practice as to similar agreements;

e. The preference of Congress as to a particular type of agreement;

f. The degree of formality desired for an agreement;

g. The proposed duration of the agreement, the need for prompt conclusion of an agreement, and the desirability of concluding a routine or short-term agreement; and

h. The general international practice as to similar agreements.

11 *Foreign Affairs Manual* § 721.3.

Each of these factors, and particularly those dealing with commitments or risks affecting the entire country, past U.S. practice, and the stated preferences of Congress, require that the ABM Treaty can be revived only by and with the advice and consent of the Senate. In this regard, the *Foreign Affairs Manual* also includes the following injunction:

> In determining whether any international agreement should be brought into force as a treaty or as an international agreement other than a treaty, the utmost care is to be exercised to avoid any invasion or compromise of the constitutional powers of the Senate, the Congress as a whole, or the President.

Id.

Congress also has spoken specifically with respect to any changes in the ABM Treaty occasioned by the U.S.S.R.'s dissolution. Under Section 232 of Public Law No. 337, 103d Cong., 2nd Sess., 108 Stat. 2700, Congress stated as follows:

> (a) REQUIREMENT FOR USE OF TREATY MAKING POWER—The United States shall not be bound by any international agreement entered into by the President that would substantively modify the ABM Treaty unless the agreement is entered pursuant to the treaty making power of the President under the Constitution.
>
> (b) ABM TREATY DEFINED—In this section, the term "ABM Treaty" means the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, signed in Moscow on May 26, 1972, with related protocol, signed in Moscow on July 3, 1974.[60]

Thus, if the President determines to revise the ABM Treaty by accepting the substitution of four former Soviet republics for the Soviet Union as a party to that Treaty, he must do so based upon his own authority which, in these circumstances, will be "at its lowest ebb." Given the fact that allowing these states to step into the Soviet Union's place in the ABM Treaty would fundamentally alter the bargain struck by the United States, and originally approved by the Senate, it is hard to discern a plausible legal justification for such a move.

3. The President Cannot Merely "Reinterpret" the Treaty to Create a Multilateral Instrument.

Among other things, the Dellinger Memorandum suggested that the ABM Treaty could, perhaps, be transformed from a bilateral agreement between the United States and the Soviet Union into a multilateral agreement among the United States and one or more former Soviet republics, through an exercise of the President's authority to interpret and implement treaties. *See* Dellinger Memorandum, *supra* note 13, at 6. This conclusion was unsupported by authority. It is, in fact, insupportable.

There is no question that the President has the constitutional authority to interpret and implement treaties.[61] However, despite the strong presidential prerogatives in this area, there are limits to this authority. In particular, the President cannot, *under the rubric of treaty interpretation*, amend treaty provisions without re-engaging the Senate. *See* Louis Fisher, *Constitutional Conflicts Between Congress and the President* 248 (4th ed. 1997) ("A President is primarily responsible for interpreting a treaty, but he may not interpret to the point where he amends the treaty or makes a new one. If that is the President's desire, he must submit such a proposal to the Senate to obtain its advice and consent through the regular constitutional process."). This principle is not controversial. The difficult question, of course, is at what point does presidential interpretation of a treaty's terms actually change the treaty's meaning such as to constitute an amendment of the treaty requiring the Senate's consent.

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60. Congress did not define an agreement that would "substantially modify" the ABM Treaty in this provision. The bill's conferees explained as follows in its legislative history:

> there is a wide range of views in the Senate on what might constitute a "substantive modification" to the ABM Treaty which would trigger a requirement to submit the agreement to the Senate for further advice and consent. . . .
>
> The conferees believe that the Executive Branch should consult with the Senate on any new agreements reached in the SCC or elsewhere concerning the ABM Treaty to carefully determine whether these new agreements meet the definition of a "substantive modification" to the Treaty, and are required to be submitted to the Senate for advice and consent under Article II of the U.S. Constitution.

H.R. Conf. Rep. No. 103-701 640, *reprinted in* 1994 U.S.C.C.A.N. 2224, 2245.

The very significant alterations in the benefits and burdens associated with the ABM Treaty for the United States if that Treaty is multilateralized support the conclusion that the advice and consent of the Senate is necessary before this can be accomplished under the provisions of this law.

Interestingly enough, in the context of the ABM Treaty, this issue was fully vetted during the late 1980s, after President Reagan suggested that the ABM Treaty could be interpreted to allow the United States to develop and test "exotic" space-based ABM technology using so-called "other physical principles," as distinct from ABM systems using 1972 ballistic missile defense technologies. The Reagan view was based upon an interpretation of the ABM Treaty's definition of "ABM system," which provided that "an ABM system is a system to counter strategic ballistic missiles or their elements in flight trajectory, currently consisting of [ABM interceptor missiles, ABM launchers, and ABM radars]." *See* ABM Treaty, art. II, *supra* note 6. The Reagan Administration would have read the words "currently consisting of" as limiting the definition to the technologies specifically identified there, rather than as merely illustrative of the types of systems covered. *See* Koplow, *supra*, at 1045.

Many Senators took exception to this "broad" interpretation, claiming that it effectively modified the Treaty in violation of the Senate's role in the treaty-making process and that the traditional "narrow" interpretation of the Treaty was constitutionally compelled. *See Hearings on the ABM Treaty and the Constitution, supra* note 2. A lively debate ensued both in Congress and in the academy. *See generally Arms Control Treaty Reinterpretation*, 137 U. Pa. L. Rev. 1351–1557 (1989). The Senate Foreign Relations Committee took action to enforce the "narrow" interpretation through passage of the so-called ABM Treaty Interpretation Resolution, which sought to limit and circumscribe the President's ability to reinterpret the 1972 ABM Treaty, by limiting its meaning to the understanding of the Treaty's provisions that the Senate possessed in 1972 at the time it exercised its advice and consent function. *See* David A. Koplow, *Constitutional Bait and Switch: Executive Reinterpretation of Arms Control Treaties*, 137 U. Pa. L. Rev. 1353, 1375 (1989). Congress ultimately used its power of the purse to enforce this view, by forbidding the use of defense funds for any BMD-related testing that it believed not to be in accordance with what it considered to be the original "narrow" interpretation of the 1972 Treaty. *Id.* at 1373 and n.80. In 1988, the Senate attached similar language, holding the Executive Branch to the "common understanding" of a treaty at the time the Senate consents to its ratification, as a condition of its consent to ratification of the Intermediate-Range and Shorter-Range Missile ("INF") Treaty. *Id.* at 1375–78.

This episode is highly instructive in addressing the current controversy. President Reagan's "broad" interpretation involved a plausible construction of three words in the ABM Treaty, backed up by compelling evidence drawn from the Treaty's negotiating history—apparently, the Soviet negotiators strongly resisted U.S. efforts to obtain a comprehensive ban on futuristic ABM systems—and would have allowed testing of BMD technology that did not exist in 1972 when the Treaty was originally signed. Significantly, the Senate's key argument against the "broad" interpretation was that it would have allowed numerous pro-BMD-related activities, thereby derogating from the effectiveness of the ABM Treaty as a bar against large-scale BMD deployments. By contrast, for President Clinton to revive unilaterally the ABM Treaty, transforming it into a multilateral treaty regime, would require fundamental alterations both to the assumptions upon which the ABM Treaty was based and to many

61. The constitutional bases of this plenary power are the so-called "take care" clause, U.S. Const. art. II, § 3, and, even more broadly, the so-called "vesting" clause, U.S. Const., art. II, § 1, which provides that "[t]he executive power shall be vested in a President of the United States of America." By contrast, the Senate has little role to play in interpreting treaties once it has consented to their ratification. As the Supreme Court stated in the leading case of *Fourteen Diamond Rings v. United States*, 183 U.S. 176, 180 (1901), "the meaning of the treaty cannot be controlled by subsequent explanations of some of those who may have voted to ratify it." *See also* L. Henkin, *Foreign Affairs and the Constitution* 136 (1972) ("Attempts by the Senate to withdraw, modify, or interpret its consent after a treaty is ratified have no legal weight, nor has the Senate any authoritative voice in interpreting a treaty by terminating it."). For a discussion of the roles of the President and the Senate in the treaty interpretation areas, *see, e.g.*, Lawrence J. Block, Lee A. Casey, David B. Rivkin, Jr., *The Senate's Pie-in-the-Sky Treaty Interpretation Power and the Quest for Legislative Supremacy*, 137 U. Penn. L. Rev. 1481–1509 (1989).

of the Treaty's most important terms. For example, and as discussed above, the territorial extent of the ABM Treaty (a key basis of the bargain between the United States and the Soviet Union) would be radically altered under any new ABM treaty; the September Agreements would include states covering only a portion of the Soviet Union's territorial extent. In addition, the Senate based its consent to the ABM Treaty on the assumption that the ABM Treaty partner of the United States would be the Soviet Union. It has not had the opportunity to assess the reliability of the former Soviet republics (including Boris Yeltsin's Russia) as potential ABM Treaty partners, or their likely ability to carry out any obligations they may undertake under an ABM treaty.

In fact, as explained above, the multilateralization of the ABM Treaty would, in and of itself, represent a significant amendment to that instrument. If new treaty partners are to be added to the ABM Treaty, the rights and obligations provided for in the original treaty, particularly with respect to allowable radars and BMD systems, would have to be reallocated among the new treaty parties. In addition, the ability of the United States to obtain amendments to any renewed agreement would be far more burdensome, since the agreement of several treaty partners (instead of the Soviet Union) would have to be obtained, parties that may themselves be mutually hostile to each other. Finally, the burden imposed on the United States in implementing the new treaty regime, particularly in the form of verifying treaty compliance by four new treaty partners, would be materially increased.

Significantly, the Executive Branch has previously recognized that the multilateralization of an arms control treaty requires the advice and consent of the Senate. The Treaty Between the United States and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Armaments, the Strategic Arms Reduction Treaty ("START I"), was signed by the United States and the Soviet Union on July 1, 1991. Before the START I agreement could be transmitted to the Senate for its advice and consent, however, the Soviet Union collapsed. Accordingly, President Bush negotiated a protocol to address succession issues with Russia, Belarus, Ukraine, and Kazakhstan, and transmitted this protocol to the Senate as well. As the Senate Foreign Relations Committee noted, "The Protocol, which amends and is an integral part of the START Treaty, was transmitted to the Senate for its advice and consent to ratification by the President." *See The Start Treaty, Report of the Comm. on Foreign Relations, United States Senate*, S. Rep. No. 102–53 at 7 (1992). The Senate duly consented, and the START I Treaty entered into force on December 5, 1994, when the five treaty parties exchanged the instruments of ratification. This protocol was very similar in form and content to the Succession Memorandum signed as part of the September Agreements.

Overall, the fundamental changes in the terms and character of the ABM Treaty that would be worked by the addition of four new parties simply cannot be accomplished under the guise of a presidential "interpretation." This could only be accomplished by and with the advice and consent of the Senate.[62]

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62. On this account, OLC's conclusion that multilateralizing the ABM Treaty would not necessarily constitute "a substantive modification" of the ABM Treaty "such as to require Senate advice and consent" is of doubtful validity. *See* Dellinger Memorandum, *supra* note 13, at 5. This opinion failed to analyze the ABM Treaty's underlying assumptions, negotiating history, and terms prior to reaching this conclusion. Yet, what amounts to an interpretation of a treaty, which the President can undertake on his own, versus a treaty modification, which the President cannot effect unilaterally, cannot be answered in the abstract. Instead, it requires a careful examination of the factual provisions of the treaty in issue, of the parties' negotiating history, of their implementation record, and of all of the relevant facts and circumstances. The following exchange between Professor Laurence Tribe and Senator Biden, undertaken in 1987 during a series of ABM Treaty hearings, illustrates the complexity of the issues involved. "Chairman Biden. How do we distinguish genuine interpretation from an amendment or a new treaty? Mr. Tribe. Well, Senator, if I could give you a 2-minute answer to that question, I would be 'Mr. Magician.' This is the fundamental question of all law: How does one tell whether an interpretation is simply a rewriting under another name?" *See Hearings on the ABM Treaty and the Constitution, supra* note 2, at 88.

4. The Effect of Senate Action Since 1991.

Although the Soviet Union dissolved in 1991, the United States has not yet taken a formal position on the ABM Treaty's status.[63] As noted above, the State Department continues to list the U.S.S.R. as America's ABM Treaty partner. In view of the time that has elapsed since the U.S.S.R. disappeared, it might be asserted that the United States in general, and the Senate in particular, has acquiesced in the substitution of one or more former Soviet republics (most likely Russia) as a party to the ABM Treaty. This argument would not, however, be well-founded.

As noted, the United States has refused to take a definitive position on the current status of the ABM Treaty, or on the question of which former Soviet republics are to be considered to be successor states to the Soviet Union's treaty obligations in general. The State Department has, in fact, taken a case-by-case approach to determining which former republics might be considered successors to particular treaties depending upon the facts and circumstances of each case. In the case of the ABM Treaty, the very fact that the Soviet Union is still "officially" listed as the only other ABM Treaty party is a definitive statement that the United States has not acquiesced in the substitution of one or more former Soviet republics as ABM Treaty partners. It would be difficult for any of these republics, and particularly the states that signed the September Agreements, to argue otherwise, since the very purpose of those agreements was to finally resolve this outstanding issue.

The fact that the United States Senate has not purported to resolve this issue since 1991 also does not constitute an acceptance of the substitution either of the September Agreement signatories, or of any other state, in place of the Soviet Union as an ABM Treaty party. As explained above, the President is the "sole organ" of American foreign policy. Moreover, as the United States Court of Appeals for the District of Columbia Circuit has observed, "in contrast to the lawmaking power, the constitutional initiative in the treaty-making field is in the President, not Congress." *Goldwater v. Carter*, 617 F.2d 697, 705 (D.C. Cir. 1979), *vacated on other grounds*, 444 U.S. 996 (1979). At the time the Soviet Union dissolved in 1991, performance of the ABM Treaty as originally negotiated and ratified became impossible, and whatever obligations the United States had under that agreement were discharged by operation of law. The fact that the Senate has not formally taken a position on the current status of the ABM Treaty in the past seven years has no legal significance. Under the constitutional division of the treaty-making power, it was, and continues to be, up to the President to renegotiate a new ABM Treaty with one or more of the Soviet Union's former republics, and then to submit that treaty to the Senate for its advice and consent.

Of course, neither the Senate nor Congress as a whole has been inactive with respect to the ABM Treaty and its current and future status. As noted above, Congress took action, in Section 232 of Public Law No. 337, 103d Cong., 2nd Sess., 108 Stat. 2700, to make clear that any attempt to modify the

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63. Similarly, the United States appears not to have taken an "official" position with respect to another major arms control treaty between the United States and the Soviet Union. The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles, the "INF" Treaty, was signed on December 8, 1987. The Senate gave its consent to ratification on May 27, 1988, and the treaty entered into force on July 1, 1988. By May 1991, all of the weapons systems slated to be eliminated under the INF Treaty were declared destroyed. The only obligations remaining under the Treaty were the residual verification arrangements, designed to ensure that no new prohibited weapons systems would be manufactured by either the Soviet Union or the United States. Following the Soviet Union's collapse, the United States chose to secure informal verification-related arrangements with a number of former Soviet republics, designed to ensure that the INF Treaty's original verification provisions would be substantially complied with—the treaty already having been effectively executed. These arrangements were not submitted to the Senate for its advice and consent, and this treaty continues to be listed in Treaties in Force as an agreement between the United States and the "Soviet Union." *See* Treaties in Force, *supra*, at 283.

ABM Treaty must be undertaken pursuant to the Constitution's Treaty Clause, requiring the advice and consent of two-thirds of the Senate.[64] For its part, the Senate also has definitely stated its position that any action by the President to add states as parties to the ABM Treaty, or to alter its geographic scope, must be accomplished only with its advice and consent. As noted above, the following condition was contained in the Senate's Resolution of Ratification of the Document Agreed Among the States Parties to the Treaty on Conventional Armed Forces in Europe ("CFE")—the so-called "CFE Flank Document":

> Prior to the deposit of the United States instrument of ratification [of the CFE Flank Document], the President shall certify to the Senate that he will submit for Senate advice and consent to ratification any international agreement:
>
> (i) that would add one or more countries as state parties to the ABM Treaty, or otherwise convert the ABM Treaty from a bilateral treaty to a multilateral treaty; or
>
> (ii) that would change the geographic scope or coverage of the ABM Treaty, or otherwise modify the meaning of the term "national territory" as used in Article VI and Article IX of the ABM Treaty.

Senate Report to Accompany Treaty Doc. No. 105–5, Flank Document Agreement to the CFE Treaty, 105th Cong. 20–21 (1997). The Senate unanimously approved the CFE Flank Document, and President Clinton accepted this condition.[65]

Thus, overall, if the President determines to attempt to revive the ABM Treaty by transforming it from a bilateral into a multilateral agreement, accepting the substitution of four former Soviet republics for the Soviet Union as a party to that Treaty without the Senate's consent, he must act on his own authority and that authority will be "at its lowest ebb." Given the fact that allowing these states to step into the Soviet Union's place in the ABM Treaty would fundamentally alter the bargain struck by the United States, and originally approved by the Senate, we believe that such action would be unconstitutional.

III

Conclusion:

When the Soviet Union dissolved in 1991, the ABM Treaty became impossible to perform in accordance with its original provisions. Because of the unique terms and conditions of the ABM Treaty, and the underlying assumptions of the parties, none of the states (including the Russian Federation) that emerged from the Soviet Union, either alone or with others, could carry out the U.S.S.R.'s obligations under the ABM Treaty. Consequently, the obligations of the United States under the Treaty were discharged at the time the Soviet Union disappeared.

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64. The 104th Congress also made clear that any amendment to the ABM Treaty, and particularly any attempt to transform it into a multilateral treaty, must be accomplished, if at all, through the same constitutional processes. *See* H.R. Conf. No. 104–724, at 684–86 (1996).

65. As noted above, *see supra* note 13, in his message to the Senate accepting the condition it imposed for CFE ratification, the President asserted that he could both recognize one or more successors to the Soviet Union, and make "adjustments" to the treaty to accomplish their succession. In this regard, he asserted that the Succession Memorandum "effected no substantive change in the ABM Treaty requiring Senate advice and consent." This assertion is surprising, given the fundamental changes in the ABM Treaty regime that the Succession Memorandum would work. However, since the President nevertheless accepted this condition in ratifying the CFE Flank Document, his assertion is unlikely to be tested.

Although a number of the former Soviet republics have indicated that they are prepared to undertake the U.S.S.R.'s role in the ABM Treaty regime, this willingness is insufficient to bind the United States. None of these states can claim to continue the Soviet Union's international legal personality, and therefore to be the automatic successor to its treaties in general, and to the ABM Treaty in particular, under a "continuity" analysis. In fact, whether a "continuity" or "clean slate" analysis is applied to the Soviet Union's dissolution, a case-by-case review of its treaties must be made to determine which of those treaties may become binding upon both the former Soviet republics and the Soviet Union's one-time treaty partners. In this process, each of those partners must agree to accept one or more of the former Soviet republics as its treaty partner, and to be bound by the relevant agreements in accordance with that acceptance.

In the United States, this renewed agreement to be bound can come only by and with the advice and consent of the Senate. The Constitution divides the treaty-making power between the President and the Senate, and a treaty may only be amended in accordance with the process by which it originally was concluded. The revisions involved in reviving the ABM Treaty and transforming it into a multilateral convention, from a bilateral one, will fundamentally alter the bargain originally struck by the United States in 1972 and then approved by the Senate. Accordingly, the United States can again be bound to the ABM Treaty only if two-thirds of the Senate agrees to those amendments, and the President then chooses to ratify them. If the President sought to reestablish the ABM Treaty regime, however modified, without the Senate's participation, his action would constitute an unconstitutional usurpation of authority. In that regard, the President's seeming belief, as articulated in the Clinton/Gilman 1998 Letter, that the Senate ratification of the September Agreements would "confirm" the ABM Treaty successor status of Russia, Ukraine, Belarus, and Kazakhstan and remove "ambiguity . . . about the extent to which states other than Russia are parties, and about the way in which ABM Treaty obligations apply to the successors to the Soviet Union," *supra* note 12, at 1–2, is both puzzling and troubling. In essence, the President seems to be suggesting that he can accomplish everything he needs to do to revive the ABM Treaty on his own authority, and that the Senate's role in this area is limited to clarifying and confirming the results of his actions. If the Senate failed to challenge this conduct, it would very likely do lasting damage to its own constitutional prerogatives.

David B. Rivkin, Jr.
Lee A. Casey
Darin R. Bartram

Mrs. CHENOWETH-HAGE. Thank you, Mr. Chairman.

While I am concerned about the development of National Missile Defense, I am not one that is overly concerned with test failures. Tests occur precisely to resolve problems before deployment of our National Missile Defense system. I have great faith in the ingenuity of our research scientists, and I rest easy knowing that America possesses the very best research scientists and laboratories in the world.

And with ongoing research into National Missile Defense, we are on the cusp of being able to protect America from rogue states like North Korea, Iran and Iraq. We cannot fail in our efforts to protect the American people.

So, Mr. Chairman, again thank you very much for holding this meeting. By exploring and exploding some of the myths surrounding the technical feasibility of National Missile Defense, we are providing an important service for the American people. Only through effectively addressing these myths will we ever be able to defend the United States against missile attacks.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you very much.

It would be my intention to recognize Mr. Allen and then Ms. Schakowsky and then Mr. Turner who is a member of the full committee and Mr. Kucinich, who is a member of the full committee. Both of you are equal participants. It just will be, your order will be after the regular members, but fully participate.

Mr. Allen.

Mr. ALLEN. Thank you, Mr. Chairman. I want to welcome all the panelists here today and begin by thanking our chairman.

When I was elected to Congress, this is what I thought committee hearings would be like. That is, you would have people with all different points of view coming before us and expressing their opinions, and we would have a chance to sort out the differences. But too often I have found that the panels are weighted so much to one side or another that we don't have that opportunity. So I particularly appreciate Chairman Shays' proceeding as he has with the variety of different panelists and perspectives that we will hear today.

Second, I do want to begin by saying, let's remember what this system is: This is a very limited system designed to protect against a handful of missiles launched by a rogue nation like—so-called rogue nation like North Korea or Iran or Iraq. That's it. It is not a shield that protects us from major nuclear powers like Russia. It is not a shield that would protect us against what China has or could develop in the future. It is aimed simply against those "states of concern," as they are now called.

If we are going to make a rational decision about how to proceed with a national missile defense and at what speed, I think we have to keep in mind the four factors that should guide us. They have been stated before, but they bear repeating.

First, the status of the threat at the time of the decision to deploy. There is no point in spending $50 billion or $60 billion on a system if there is no obvious threat that needs to be dealt with.

Second, here as we struggle with our budget on a regular basis, cost has to be a factor. Just within the last 12 months, the cost of this system has multiplied significantly.

Third, the state of the technology, and here I would say there are two technologies. First, there is the technology of being able to hit a bullet with a bullet, the ability to intercept a missile that is fired at the United States. But second, there is the technology of dealing with potential countermeasures. That subject has been given more attention in the last few months, but not in my view nearly enough, because if the countermeasures that are available to so-called "states of concern" are such that they could overwhelm the kinds of systems that we could develop, then the system will not work as advertised.

Finally, we have to pay attention to our arms control agenda, because in the last analysis, diplomacy, if it works, is always cheaper than an arms race. In this case, diplomacy should not be ignored or pushed aside as we move ahead.

I happen to believe that if a national missile defense system works as advertised and strengthens our national security, we should build it, but if a National Missile Defense system will not work as advertised or if it will diminish our national security, we should not deploy it, we should not proceed. It is the answer to that fundamental choice that I believe confronts us in Congress, and the American people as well, that I hope this hearing today will illuminate. And I again thank Chairman Shays.

Mr. SHAYS. I thank the gentleman.

Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman, very much for holding this hearing today to discuss our National Missile Defense program and its technological feasibility. I also want to thank Congressman Tierney for all of his work on this subject and for requesting this hearing today.

Last year, when the House of Representatives debated H.R. 4, a bill making it the policy of the United States to deploy a national missile defense system when technologically feasible, I stood on the House floor and warned my colleagues that this policy would not enhance the security of the United States, but that it could actually bring this Nation closer to war.

Since then, we have seen our neighbors around the world express opposition—NATO allies, Russia, China and others. Russia has warned that it would abandon arms reduction agreements if we go forward with the National Missile Defense program. China has warned it may increase offensive production, and I stand by the declaration I made last year.

Since the Reagan administration, we have been urged by wishful thinkers to deploy a system for which workable technology does not exist. Now many years and many billions of dollars later, we are still pursuing what I view as an irresponsible, likely unnecessary and unrealistic policy.

Believe me, I am pleased that President Clinton deferred the decision to deploy to the next administration. Had it not been for the sound advice of some of today's witnesses and others, the situation may have been different. To me, NMD is just another example of

the Department of Defense spending billions of taxpayer dollars on programs that are destined for failure or are not necessary.

As many of my colleagues know, I strongly believe we need a comprehensive strategic review of our defense policy, and I am pleased that today we can start by taking a closer look at national missile defense.

I would like to end with a quote which is from a document produced by one of our witnesses today, Mr. Coyle: "deployment," he says, "means the fielding of an operational system with some military utility which is effective under realistic combat conditions against realistic threats and countermeasures when operated by military personnel at all times of day or night and in all weather. Such capability is yet to be shown to be practicable for NMD."

Mr. Coyle, of course, will have an opportunity to elaborate, but to me that sums it up. Not only does deployment risk a whole new arms race and the alienation of our traditional allies and adversaries, it does not work. I know my constituents expect better.

Again, Mr. Chairman, I appreciate the opportunity to hear from our witnesses and look forward to a healthy discussion today.

Mr. SHAYS. Thank you.

The Chair recognizes Mr. Turner.

Mr. TURNER. Thank you, Mr. Chairman. It is a pleasure to be here with the subcommittee today, and I appreciate your allowing those of us who are not members of the committee to join with the committee. I, of course, take a great interest in the work of your subcommittee as a member of the full Government Reform Committee, as well as because of my work as a member of the Research and Development Subcommittee and the Procurement Subcommittee of the Armed Services Committee.

I had the opportunity to be an original cosponsor of the National Missile Defense legislation. I was pleased to do so. I thought it was the right thing to do. I also enjoyed the opportunity to go with a delegation of the Armed Services Committee, under the leadership of subcommittee Chairman Curt Weldon, prior to the consideration of that legislation by the House of Representatives, to Moscow to present a report to members of the Russian Duma that outlined the information that we had collected that indicated that there was a real threat to our national security from nations such as Korea and Iran.

That meeting was very productive. Though it did not result in our counterparts in the Duma concurring with our proceeding with such a defense system, I think it did represent a good-faith effort on the part of the Congress to present to the members of the Duma and their defense committee our thoughts and our reasoning and to present it prior to the passage of the legislation in the Congress.

We have, I think, today, a greater military superiority over any potential foe than we have possessed at any time in our history. I know there is a lot of discussion, particularly in the Presidential race, about our military readiness. Though we always have room for improvement, I am convinced that we do possess a military that is second to none, for which we should all be very proud, and we are very grateful to those who serve in the uniform of the armed services who defend us every day. It is in our national interest and

in the interest of world peace to maintain that unquestioned superiority.

National missile defense is, in my opinion, an essential element of achieving that objective. History teaches us that nations inevitably pursue the development of increasingly sophisticated weapons, and I think that the old adage, "Eternal vigilance is the price of peace," is one we must continue to be mindful of.

There is no question that this issue we are discussing today must be approached with reasoned judgment. There are legitimate issues that must be addressed, issues such as the scope and nature of the threat we face; the technological readiness for deployment and the diplomatic issues, including, of course, the impact on the ABM Treaty. I have no doubt that the threat is real, that North Korea is developing the ability to deliver a nuclear weapon to the continental United States. I think that threat may also exist from Iran and other nations, like Iraq.

There are those who desire to achieve military power through the use of nuclear weapons. That is not to say that the delivery of a nuclear weapon by a missile is the only method that may be chosen by a potential foe.

I also understand that it is important to be sure that the technology is sufficient to successfully deploy a system. Otherwise, we will pursue a reckless course, spending millions of dollars we would not otherwise have to spend. But I am convinced that we have the ability to be in a position to deploy—that the technology will and can be sufficient to accomplish the goal.

Finally, I also believe that as we pursue the diplomatic front, and we certainly should pursue it in every way possible, that at the end of the day our allies, as well as those who are potential foes, should be able to understand that this is an effort that we are making that is in the interest not only of our own security but in the security of world peace.

At the end of the day, if we do not achieve agreement with those other nations, I think it will still be in our national interest to deploy a limited system.

I concur with the President's decision to defer deployment until the next administration, not because I question the ability to achieve a system that will work, but because I have evidenced by the comments of Governor Bush and some of our Republican colleagues in the Congress that there is a debate that will take place regarding the type of system that should be deployed.

The information that I have indicates that the threat currently is a limited one, and that a system that has the capability of defending against limited attacks will be appropriate, but it is clear that there are others who choose a more, "robust approach," a more "Star Wars approach," as was advocated in the Reagan administration. I think that Congress should engage in that debate, and that issue deserves our attention.

So I am grateful, Mr. Chairman, that you have called this hearing today to give us all the opportunity to begin the course of making a reasoned judgment about a very important issue to the American people, and I appreciate the opportunity to share in this discussion.

Mr. SHAYS. Thank you, Mr. Turner. The committee is grateful to have your participation, and also Mr. Kucinich.

Mr. Kucinich, you can close up here.

Mr. KUCINICH. Thank you very much, Mr. Chairman, for holding this committee meeting. I certainly want to express my appreciation to Mr. Tierney and the other members of the committee for the work that they have done on this issue. As some of the members know, this is something that I have been working on for the last year, and I appreciate the fact that Mr. Shays has called the hearing, which I believe is one of the first opportunities we have had in this House to get into this issue.

I would like, in some brief remarks here, to pose a number of questions, and I think the first question that has to be asked is, is this trip necessary? Why are we asking the American people to even consider forking over an additional $60 billion when we have already gone a great distance since 1983, when the Reagan administration first proposed Star Wars, to prove that this concept doesn't work; that it is an idea in search of an enemy; that it would subvert any effort to be able to have fiscal responsibility in the Federal Government; that it would undermine our efforts to maintain nuclear nonproliferation; that it would violate the ABM Treaty; and that it would generally be a disaster on a scale that hasn't been seen in this country with respect to trying to maintain American leadership for peace in the world?

I would submit that peace through proliferation is an Orwellian construction which defies credibility; that you cannot tell the world, as we are in a new millennium, that the way that we can achieve peace is through an arms buildup.

Let's sweep aside for a moment the debate over whether or not this is technically possible, because it is not. Let's sweep aside for a moment the debate over whether or not we want to commit tens of billions of dollars to this, because I don't believe the American people do. Let's go right to the crux, what I think is the crux, of this overarching debate, and that is, do we really want to get into an era of nuclear proliferation?

Are we going to go back to the days of duck-and-cover drills, where our children are going to be told to get under their desks and get into a crouch and close their eyes and pray that they don't see the flash and pray that they aren't incinerated in some nuclear conflagration? Or are we going to use this opportunity and this debate to come back to the irreducible conclusion that the only way to peace is through diplomacy and the way to nuclear arms reduction is through reducing and eliminating nuclear arms, which was the central purpose of the Nonproliferation Treaty and of the ABM Treaty.

This hearing today isn't about castigating people who are serving our country well and who are dedicated to America. We are all good Americans. We all love our country. You don't run for Congress unless you love your country. You don't serve in the military unless you love your country.

This isn't about whether we love our country. We all love America and we can all love peace in the world, and we have different views about how to achieve peace in the world. But I think that when we get away from our titles—Congressman, General, Colo-

nel—and just get to being people shopping at the West Side Market in Cleveland, people just want to live, they want to survive and they don't want their government putting them in a position where the peace of the world can be at risk.

And that's actually, as Ms. Schakowsky said earlier, that's actually where we are going with this. Over a whacky idea that will never work, we are engaging in discussions that can actually create destabilization on the issue of peace.

Now, when we get into the questions and answers, I am going to get into the cost discussions, because the American taxpayers are interested about whether their money is being wasted or not. But I just appreciated a moment here to just try to interject a note of just playing straight out from the shoulder discussion about an idea whose time should have been long past and about an idea that for some reason, like the movie "The Alien," just when you think it is gone, it comes out of some compartment.

So thank you for all being here. I certainly look forward to the discussion today, and I look forward to this continuing debate inside the House of Representatives and across the country.

Thank you very much.

Mr. SHAYS. Thank you. I appreciate the panel's patience, and we have just a little housekeeping to take care of and then we will get right to the witnesses.

I ask unanimous consent that all members of the subcommittee be permitted to place an opening statement in the record, and that the record remain open for 3 days for that purpose; and without objection, so ordered.

I ask further unanimous consent that all witnesses be permitted to include their written statements in the record and without objection, so ordered.

I ask unanimous consent that written statements from the following individuals be included in the record: Ambassador Henry F. Cooper, board chairman, High Frontier; Dr. Burton Richter, director emeritus, Stanford Linear Accelerator Center; and Mr. Joseph Cirincione, director, nonproliferation project, Carnegie Endowment Diamond for International Peace.

I will just introduce our witnesses and they can begin their testimony. We have a panel of four individuals, three of whom will testify and we have two panels: Mr. Phillip Coyle, Director, Operational Test and Evaluation, Department of Defense; testimony from Lieutenant General Ronald Kadish, Director of Ballistic Missile Defense Office, Department of Defense, accompanied by the Honorable Edward Warner, Assistant Secretary of Defense Strategy and Threat Reduction, Department of Defense; and our third testimony is from the Honorable Avis Bohlen, Assistant Secretary, Bureau of Arms Control, Department of State.

The way we are going to do this is we are going to have a 5-minute, and we will roll it over for another 5 minutes, giving you 10 minutes each for your testimony and then we will get right to questions.

I will be absent for about 25 minutes, and we will give the floor to Mrs. Chenoweth to start.

Mr. Warner, you may start.

Mr. WARNER. I don't have an opening statement, sir.

Mr. SHAYS. I am sorry. Mr. Coyle, we are starting with you and then we are going to Mr. Kadish and then we will go to Ms. Bohlen.

Mr. COYLE. Chairman Shays——

Mr. SHAYS. I am sorry. I do need to swear you in before I go, if you would stand.

Is there anyone else who may be testifying that is accompanying you, who may answer a question? If so, I would invite them to stand.

It will just be the four of you? OK.

[Witnesses sworn].

Mr. SHAYS. I note the record that all four plus one have sworn and affirmed.

Thank you. You may be seated and, Mr. Coyle, you may begin.

STATEMENTS OF PHILLIP COYLE, DIRECTOR, OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE; LIEUTENANT GENERAL RONALD KADISH, DIRECTOR, BALLISTIC MISSILE DEFENSE OFFICE, ACCOMPANIED BY EDWARD WARNER, ASSISTANT SECRETARY OF DEFENSE, STRATEGY AND THREAT REDUCTION, DEPARTMENT OF DEFENSE; AND AVIS BOHLEN, ASSISTANT SECRETARY, BUREAU OF ARMS CONTROL, DEPARTMENT OF STATE

Mr. COYLE. Chairman Shays, Mr. Tierney, members of the committee, thank you for the opportunity to discuss the testing of the National Missile Defense system this morning. I have not had the opportunity to address this committee before, and I appreciate the opportunity to do so.

You requested that today's testimony focus on the impact of the test results to date, on technological maturity and deployment schedules. You also asked that we address the relationship between the Anti-Ballistic Missile Treaty and the current proposals to design, test and deploy an effective missile system. First, I would like to briefly discuss the progress so far. The NMD program has demonstrated considerable progress toward its defined goals in the last 2 years. The battle management, command, control and communication systems have progressed well. The potential X-Band radar performance looks promising as reflected in the performance of the ground-based radar prototype.

A beginning systems integration capability has been demonstrated, although achieving full systems interoperability will be challenging.

The ability to hit a target reentry vehicle in a direct hit-to-kill collision was demonstrated in the first flight intercept test last October. However, in this test, operationally representative sensors did not provide initial interceptor targeting instructions, as would be the case in an operational system. Instead, for test purposes, a Global Positioning System signal from the target RV served to first aim the interceptor. We were not able to repeat such a successful intercept in the two subsequent flight intercept tests. Also, the root cause of the failure in the most recent flight intercept test has not been determined.

Because of the nature of strategic ballistic missile defense, it is impractical to conduct fully operationally realistic intercept flight

testing across the wide spectrum of scenarios. The program must, therefore, complement its flight testing with various types of simulations.

Overall, NMD testing is comprised of interrelated ground, hardware and software in-the-loop testing, intercept and nonintercept flight testing, computer and laboratory simulations and man-in-the-loop command and control exercises. Unfortunately, these simulations have failed to develop as expected.

This, coupled with flight test delays, has placed a significant limitation on our ability to assess the technical feasibility of the NMD system.

The testing program has been designed to learn as much as possible from each test. Accordingly, the tests so far have all been planned with backup systems so that if one portion of the test fails, the rest of the test objectives might still be met.

Developmental tests in a complex program, especially those conducted very early, contain many limitations and artificialities, some driven by the need for specific early design data and some driven by test range safety considerations.

Additionally, the tests are designed so that they will not produce debris in orbit that will harm satellites.

Also, the program was never structured to produce operationally realistic test results this early. Accordingly, it was not realistic to expect these test results could support a full deployment decision now, even if all the tests had been unambiguously successful, which they have not been.

Notwithstanding the limitations in the testing program and failures of important components in all three of the flight intercept tests, the program has demonstrated considerable progress.

Compliance with the ABM Treaty has not had an adverse impact to date on the developmental testing of the NMD system. In the future, we desire additional ground-based interceptor test launches from more operationally representative locations than the existing Kwajalein Missile Range. Additional target launch sites which are not restricted by the treaty would expand the test envelope beyond that currently available, as recommended by the Welch panel, to validate system simulations over the rest of the operating regimes.

Furthermore, we need a radar to skin track the incoming RV, reentry vehicle, rather than tracking a beacon transponder as has been done with a radar on Oahu. We need this during early, midcourse flight in order to support creation of the Weapon Task Plan which first aims the interceptor.

Some of the options for these improvements could raise ABM Treaty issues. Any NMD test activity must be sufficiently well defined in order to properly assess the ABM Treaty implications and determine whether the activity can be conducted under the existing treaty.

Under the program of record, test results are not likely to be available in 2003 to support a recommendation then to deploy a C–1 system in 2005.

This is because the currently planned testing program is behind, because the test content does not yet address important operational questions and because ground test facilities for assessment are considerably behind schedule.

NMD testing needs to be augmented to prepare for realistic operational situations in the operational test phase and is not yet aggressive enough to keep pace with the currently proposed schedules for silo and radar construction and missile production. The testing schedule, including supporting modeling and simulation, continues to slip while the construction and production schedules have not.

Important parts of the test program have slipped a year in the 19 months since the NMD program was restructured in January 1999. Thus, the program is behind in both the demonstrated level of technical accomplishment and in schedule.

Additionally, the content of individual tests has been diminished and is providing less information than originally planned.

I am especially concerned that the NMD program has not planned or funded any intercept until IOT&E operational testing with realistic operational features such as multiple simultaneous engagements, long-range intercepts, realistic engagement geometries, and countermeasures other than simple balloons. While it may not be practical or affordable to do all of these things in developmental testing, selected stressing operational requirements should be included in developmental tests that precede IOT&E to help ensure sufficient capability for deployment.

For example, the current C-Band transponder tracking and identification system alluded to earlier, which is justified by gaps in radar coverage and range safety considerations, is being used to provide target track information to the system in current tests. This practice should be phased out prior to IOT&E; this will ensure that the end-to-end system will support early target tracking and interceptor launch.

There is nothing wrong with the limited testing program the Department has been pursuing, so long as the achieved results match the desired pace of acquisition decisions to support deployment. However, a more aggressive testing program with parallel paths and activities will be necessary to achieve an effective interim operational capability by the latter half of this decade. This means a test program that is structured to anticipate and absorb setbacks that inevitably occur.

The NMD program is developing test plans that move in this direction.

The time and resource demands that would be required for a program of this type would be substantial, as documented in the Congressional Budget Office report on the budgetary and technical implications of the NMD program. The Safeguard missile program conducted 125 flight tests; the Safeguard program was an early version of NMD. Similarly, the full Polaris program conducted 125 flight tests, and the full Minuteman program conducted 101 flight tests.

Rocket science has progressed in the past 35 years, and I am not suggesting that 100 or more NMD flight tests will be necessary. However, the technology in the current NMD program is more sophisticated than in those early missile programs, and we should be prepared for inevitable setbacks.

It is apparent that in these early programs an extensive amount of work was done in parallel from one flight test to another. Failures that occurred were accepted and the programs moved forward

with parallel activities as flight testing continued. As in any weapons development program, the NMD acquisition and construction schedules need to be linked to capability achievements demonstrated in a robust test program, not to schedule per se.

This approach supports an aggressive acquisition schedule if the test program has the capacity to deal with setbacks. On three separate occasions, independent panels chaired by Larry Welch—General, Air Force, retired—have recommended an event-driven not schedule-driven program. In the long run, an event-driven program might take less time and cost less money than a program that must be regularly rebaselined due to the realities of very challenging and technical operational goals.

Aggressive flight testing, coupled with comprehensive hardware in-the-loop and simulation programs, will be essential for NMD. Additionally, the program will have to adopt a parallel fly through-failure approach that can absorb tests that do not achieve their objectives in order to have any chance of achieving fiscal 2005 deployment of an operationally effective system. As noted by the CBO, the Navy's Polaris program successfully took such an approach 30 years ago.

Deployment means the fielding of an operational system with some military utility which is effective under realistic combat conditions against realistic threats and countermeasures, possibly without adequate prior knowledge of the target cluster composition, timing, trajectory or direction and when operated by military personnel at all times of the day or night and in all weather. Such a capability is yet to be shown practicable for NMD. These operational considerations will become an increasingly important part of tests and simulation plans over the coming years.

In the full statement of my testimony, which has been provided to the committee, I make a series of recommendations to enhance the testing program. This includes more realistic flight engagements, tests with simple countermeasures beyond those planned, flight intercept tests with simple tumbling RVs and tests with multiple simultaneous engagements.

Madam Chairman, I would be pleased to answer any questions you may have.

[The prepared statement of Mr. Coyle follows:]

Statement by

The Honorable Philip E. Coyle

Director, Operational Test and Evaluation

Before the

House Committee on Government Reform

Subcommittee on National Security, Veterans Affairs,

and International Relations

National Missile Defense

September 8, 2000

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INTRODUCTION

Mr. Chairman, members of the Committee, thank you for the opportunity to discuss the testing of the National Missile Defense (NMD) system. I have not had the opportunity to address this Committee before and am pleased to do so.

You requested that today's testimony focus on the impact of the test results to date on technology maturity and deployment schedules. You also indicated we address the relationship between the Anti-Ballistic Missile (ABM) Treaty and the current proposals to design, test, and deploy an effective missile defense system. First, I would like to briefly discuss the progress so far.

PROGRESS SO FAR

The NMD program has demonstrated considerable progress towards its defined goals in the last two years. The Battle Management Command, Control, and Communications (BMC3) system has progressed well. Potential X-Band Radar (XBR) performance looks promising, as reflected in the performance of the Ground Based Radar-Prototype (GBR-P). A beginning systems integration capability has been demonstrated, although achieving full system-of-systems interoperability will be challenging.

The ability to hit a target reentry vehicle (RV) in a direct hit-to-kill collision was demonstrated in the first flight intercept test last October. However, in this test, operationally representative sensors did not provide initial interceptor targeting instructions, as would be the case in an operational system. Instead, for test purposes, a Global Positioning System (GPS) signal from the target RV served to first aim the interceptor. We were not able to repeat such a successful intercept in the two subsequent flight intercept tests. Preliminary analysis has been completed on the root cause of the failure in the most recent flight intercept test, but has not been fully determined.

TESTING LIMITATIONS

Because of the nature of strategic ballistic missile defense, it is impractical to conduct fully operationally realistic intercept flight testing across the wide spectrum of possible scenarios. The program must therefore complement its flight testing with various types of simulations. Overall NMD testing is comprised of interrelated ground hardware and software-in-the-loop testing, intercept and non-intercept flight-testing, computer and laboratory simulations, and man-in-the-loop command and control exercises. Unfortunately, these simulations have failed to develop as expected. This, coupled with flight test delays, has placed a significant limitation on our ability to assess the technological feasibility of NMD.

The testing program has been designed to learn as much as possible from each test. Accordingly, the tests so far have all been planned with backup systems so that if one portion of a test fails, the rest of the test objectives might still be met. Developmental tests in a complex program, especially those conducted very early, contain many limitations and artificialities, some

driven by the need for specific early design data and some driven by test range safety considerations. Additionally, the tests are designed so that they will not produce debris in orbit that will harm satellites. Also, the program was never structured to produce operationally realistic test results this early. Accordingly, it was not realistic to expect these test results could support a full deployment decision now, even if all of the tests had been unambiguously successful, which they have not been. Notwithstanding the limitations in the testing program and failures of important components in all three of the flight intercept tests, the program has demonstrated considerable progress.

Compliance with the ABM Treaty has not had an adverse impact to date on the developmental testing of the NMD system. In the future, we desire additional Ground Based Interceptor test launches from more operationally representative locations than the existing Kwajalein Missile Range. Additional target launch sites which are not restricted by the Treaty would expand the test envelope beyond that currently available, as recommended by the Welch panel, to validate system simulations over the rest of the operating regimes. Furthermore, we need a radar to skin track the incoming RV (rather than tracking a beacon transponder as has been done with the FPQ-14 radar on Oahu) during early mid-course flight in order to support creation of the Weapon Task Plan which first aims the interceptor. Some of the options for these improvements could raise ABM Treaty issues. Any NMD test activity must be sufficiently well defined in order to properly assess the ABM Treaty implication and determine whether the activity can be conducted under the existing Treaty.

SCHEDULE ISSUES

Since the program was restructured in January 1999, the NMD program has experienced numerous program development delays, while the construction and production schedules have not slipped. To the program's credit, the flight test program has been event driven, with tests conducted only when the Program Office felt ready. As a result, Integrated Flight Test (IFT) IFT-3 was conducted 18 months behind the original 1996 schedule and four months behind the 1999 schedule. More recently, as illustrated in Figure 1, additional significant test slips have occurred since the January 1999 program restructure. In particular, IFT-5 was to be conducted about six months before a June 2000 Deployment Readiness Review (DRR) but was actually executed on July 8. This forced the DRR to be moved to August 2000. IFT-6, which had also been planned to precede the DRR, is expected to occur in January or February 2001.

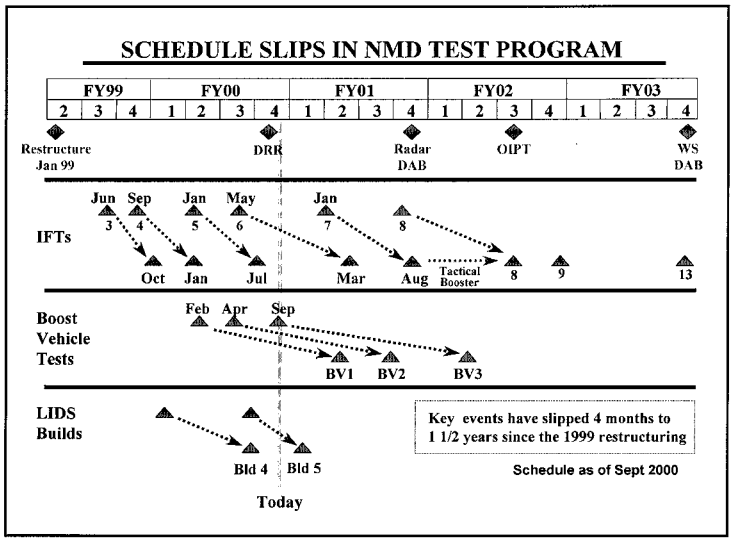

Figure 1. Schedule Slips in the NMD Test Program

Development delays have already caused schedule slips of flight tests of the tactical booster to beyond the DRR. Boost Vehicle (BV) test #1 was originally scheduled for February 2000, then July 2000, and now second quarter of FY01. BV2 has slipped about a year. BV3, the first test to integrate the Exoatmospheric Kill Vehicle (EKV) with the booster, is behind about a year and a half. Additionally, the first use of the operational booster stack in an intercept test will now occur in IFT-8, vice IFT-7 as originally planned. As a result, the authorization of long lead acquisition for the Capability 1 (C1) interceptor system will have to be delayed commensurate with that testing.

Delays in the flight test program are the most visible, but developmental problems in simulation and ground test facilities may have an even greater impact. Since the flight test scenarios are severely constrained, ground testing and simulation are critical to evaluating system performance and the fulfillment of Operational Requirements Document (ORD) requirements.

Integrated Ground Tests (IGTs), using the computer processor-in-the-loop Integrated System Test Capability (ISTC) simulation, were to provide operationally realistic data on 13 "design-to" scenarios. A high fidelity digital simulation, the Lead Systems Integrator (LSI) Integration Distributed Simulation (LIDS), was to have been used by the contractor and Operational Test Agency (OTA) team to perform analysis of an even broader set of scenarios to demonstrate that the entire United States would be adequately defended. The ISTC proved to be too immature to provide reliable estimates of performance, and the development of the digital

simulation, LIDS, is behind schedule and was not available to support analyses of overall system performance as originally intended.

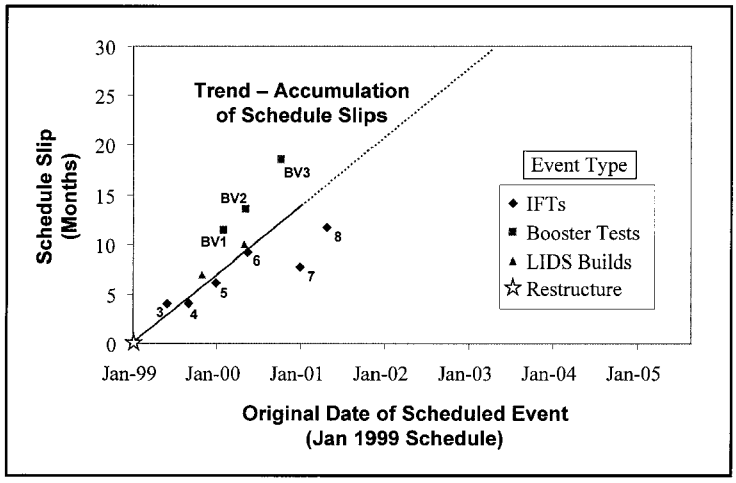

Figure 2. Accumulation of Slips in Test and Development Schedule

Unless these trends are reversed, an Initial Operational Capability (IOC) in FY05 appears unlikely. Figure 2 illustrates the trend of development schedule slips and estimates schedules slipping at a rate of 20 months every three years. If these trends persist and efforts by the NMD Joint Program Office (JPO) to "buy back" schedule are unsuccessful, the first flight test with a production representative interceptor (IFT-13), scheduled for the first quarter of FY03, would slip about two years.

TEST RESULTS

TEST PROGRAM

The NMD Test and Evaluation Program is being planned and executed by the NMD Lead System Integrator, Boeing, under the direction of the NMD Joint Program Office. The test program is derived from the current NMD Test and Evaluation Master Plan (TEMP) and aims to demonstrate, incrementally, progress toward C1 capability by fulfilling the following objectives:

- Demonstrate end-to-end integrated system performance, including the ability to prepare, launch, and fly-out a designated weapon; and kill a threat-representative target through body-on-body impact.

- Demonstrate end-to-end target detection, acquisition, tracking, correlation, and handover performance.
- Demonstrate real-time discrimination performance.
- Demonstrate NMD system kill assessment capability.
- Demonstrate the ability of the NMD battle management software to develop and coordinate battle engagement plans; prepare, launch, and fly out a designated weapon, and kill a threat representative target.
- Demonstrate integration, interface compatibility, and performance of system and sub-system hardware and software.
- Demonstrate human-in-control operations of the NMD system.
- Demonstrate system lethality.

In the first three years of the NMD program – the Initial Development Phase – test events consisted of Integrated Ground Tests (IGTs) 3, 4, and 5; IFTs 1A, 2, 3, 4, and 5; Modeling and Simulation activities; Risk Reduction Flights (RRFs); and User Exercises. This phase culminates with the DRR. Near-term test and evaluation focuses on the ability to provide accurate test information and data in support of the DRR. Test and evaluation activities are also essential for the development and maturation of system elements.

The NMD program activities following the DRR will focus on completing the development of the NMD C1 expanded system. The test and evaluation activities during this period consist of Integrated Ground Tests, Integrated Flight Tests, Modeling and Simulation, Risk Reduction Flights, and User Exercises – as for the initial development phase – and are intended to support developmental activities and future DAB decisions if the next President decides to authorize deployment. The next DAB will decide whether to proceed with the Upgraded Early Warning Radar (UEWR) Upgrade, XBR build, and BMC3 integration into the Cheyenne Mountain Operations Center, and two years later, the DAB will decide if the weapon system is ready for production.

LIMITATIONS ON INTEGRATED FLIGHT TESTS

The flight test program has demonstrated basic functionality of the NMD system elements. The most notable achievements have been the hit-to-kill intercept of IFT-3 and significant "in-line" participation in IFT-4 and IFT-5 by system elements. However, the configuration of the NMD system during both IFT-4 and IFT-5 remains a limited functional representation of the objective system, as discussed below.

Early integrated flight tests, like IFT-4 and IFT-5, make use of surrogate and prototype elements, because the NMD program is still in its developmental phase. As such, element maturity in near-term flight testing is limited:

- An interim build of the BMC3 – Capability Increment 3A – will be utilized in all integrated flight tests through IFT-6. It is a build with about 60 percent of the planned functionality but has the basic engagement functions necessary to execute a mission. The next build, Build Increment 1, may not add any new functionality but will begin

the re-hosting of the software onto a Defense Information Infrastructure / Common Operating Environment and Joint Technical Architecture compliant architecture. IFT-7, scheduled in FY01, will be the first time Build Increment 1 is used in an integrated flight test.

- Defense Support Program (DSP) satellites, which provide launch warning to the BMC3 in the form of Quick Alert messages, act as the Space Based Infrared System (SBIRS) element. DSP satellites are not able (and were not designed) to perform surveillance and boost track functions at the levels necessary to meet NMD ORD system effectiveness requirements and, therefore, will be replaced by SBIRS satellites. DSP messages are not currently in NMD tactical format and, during integrated flight testing, require message translation by range assets at the Joint National Test Facility[1] before being forwarded to the BMC3.
- The Payload Launch Vehicle, a two-stage booster system consisting of modified Minuteman II motors and supporting subsystems, has been the surrogate for the interceptor booster in all integrated flight tests to date. The tactical booster[2] was scheduled to be flown in IFT-7, see Figure 2, but schedule slips in Boost Vehicle testing have delayed the first flight of the tactical booster to IFT-8.
- The Ground Based Radar Prototype, located at Kwajalein Missile Range (KMR), supports integrated flight tests as the prototype element for the X-Band Radar. GBR-P participation in integrated flight tests is limited, because as discussed below, its siting at KMR precludes it from adequately supporting weapon task planning by the BMC3. As a result, Global Positioning System (GPS) instrumentation and/or a C-band transponder on the target reentry vehicle are the sources of information for weapon task planning by the BMC3.

In part, the operational realism of integrated flight testing has been limited by having located the GBR-P at KMR. As illustrated in Figure 3, the GBR-P is not sufficiently forward in the test geometry, as it would be in many operational scenarios,[3] requiring that other sensors provide data to the BMC3 for weapon task planning. In the integrated flight tests conducted to date and for the foreseeable future, these "other sensors" are either GPS data sent from the RV and/or the FPQ-14 radar receiving data from a C-band transponder on the target RV. The FPQ-14 radar located on Oahu, Hawaii, picks up the C-Band signal radiating from the target RV and provides the BMC3 with target track information as though it were from a UEWR. Similarly, as in IFT-3 and IFT-4, the GPS can provide the BMC3 with target track information as though it were from an X-Band Radar. In tests to date, the BMC3 was required by the concept of operations to generate a Weapon Task Plan only after the threat object – the RV – had been resolved by

[1] The Joint National Test Facility is located at Shriever Air Force Base near Colorado Springs, Colorado.
[2] The tactical booster is a Commercial-off-the-Shelf (COTS), three-stage, ICBM-class missile that has a burnout velocity nearly 2.5 times that of the Payload Launch Vehicle. Launched from central Alaska, the tactical booster must be powerful enough to engage threats, in a timely manner, targeted at the East Coast.
[3] Missiles launched from eastern Asia would generally come into the X-Band Radar's field of view much earlier than in test scenarios. Missiles coming over the North Pole or from the Middle East would generally have to rely on other sensors for generating the Weapon Task Plan.

ground based radars.[4] Although the GBR-P acting as the XBR surrogate can acquire the target *cluster* soon after radar horizon break, the GBR-P alone is not capable of supporting the Weapon Task Plan generation because, in the test geometry, the target RV cannot be discriminated early enough.

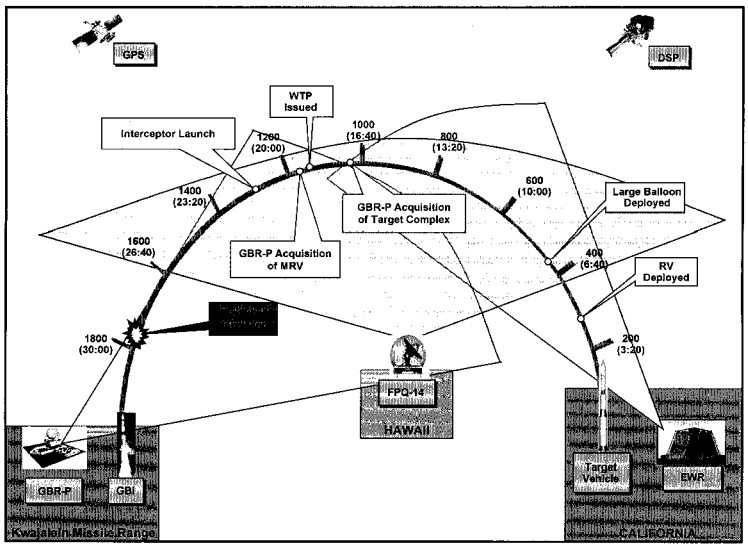

Figure 3. Integrated Flight Test Geometry

Another critical function performed by the BMC3 is the generation and uplink of In-Flight Target Updates (IFTUs) – target data sent to the EKV while in flight – to correct for any targeting errors. In the "on-line" portion of IFT-3, the GBR-P acting as the XBR surrogate was not required nor planned to be the sole provider of track data to the BMC3 for IFTU generation. Rather, GBR-P track data was augmented by FPQ-14 data for IFTU generation. GBR-P participation in IFTU generation – especially of IFTUs sent late in the engagement timeline – has increased in recent flight tests. In particular, the BMC3 generated all three IFTUs exclusively from GBR-P data in IFT-5.

Characteristic of ballistic missile defense flight tests, limitations associated with developmental testing impact the operational realism of integrated flight tests. Safety concerns about intercept debris and range constraints impose limitations on engagement scenarios. While a

[4] The NMD system is required to engage the threat under one of three "categories" of operation: (A) resolved and discriminated RV; (B) cluster track of threat complex; or, (C) space-based sensor data of boosting missile.

successful intercept during any future flight test will be a significant achievement in the development of the NMD system, it should be seen in context of the caveats enumerated above as well as the following limitations:

- **Engagement Conditions**. Test target launches from Vandenberg Air Force Base (VAFB) and interceptor launches from KMR place significant limitations on achieving realistic engagement conditions. A target missile cannot be launched from a "threat country" toward the United States. Test targets are outbound from the United States rather than inbound relative to early warning radars. Consequently, during flight tests, early warning radars track the target complex during phases of its flight different from what is expected during a true engagement. The target missile launched near the early warning radar presents an easy target for detection and is tracked during its boost phase. Other limitations on engagement conditions include the fact that interceptor flyout range and time of flight are short,[5] intercept altitudes are low (for debris containment), and closing velocities during the endgame are not stressing. These limitations would be mitigated somewhat with the addition of a new test geometry to the flight test program - for example, target launches from Kauai or Wake Island and interceptor launches from Kodiak Launch Complex in Alaska, or target launches from Kodiak and interceptor launches from KMR.
- **Target Suite Reduction**. The target suites flown in IFTs 3, 4, and 5 each contained only two objects – a Medium Reentry Vehicle (MRV) and a Large Balloon – a significant reduction in complexity from the original plan. Target requirements listed in the JPO-signed 1997 TEMP called for nine to ten objects in flight tests IFT-1 through IFT-5, suites that contained both unsophisticated and sophisticated decoys. In 1998, target requirements were pared down to three balloons (one large and two small balloons) and the MRV. Then, in July 1999, less than three months before IFT-3, the target suite was further reduced to two objects, as indicated above. In all cases, the deployment bus is in the field of view of the EKV seeker and also has to be discriminated.
- **Target Suite Complexity.** The NMD test program is designed to test within the C1 threat space, which means that target suites in flight tests will have at most unsophisticated countermeasures, even though the threat from accidental or unauthorized launches could employ sophisticated countermeasures. Currently, the most stressing intercept flight tests will fly target suites consisting of a mock warhead and a collection of simple balloon decoys. The target suites flown in IFT-3, IFT-4, and IFT-5 were each limited to an MRV and a Large Balloon. Signature simulations show that since the large balloon and deployment bus have infrared (IR) signatures very dissimilar to the MRV, the EKV can easily discriminate the MRV from these objects.
- **Multiple Simultaneous Engagements (MSE).** NMD system performance against multiple targets is not currently planned for demonstration in the flight test program, although multiple engagements are expected to be the norm in NMD system operation. The Joint Program Office has plans for constructing a second interceptor silo at

[5] An issue related to the short interceptor flyout is that the COTS booster is nearly too powerful for flight testing with short GBI flyout ranges. The LSI and JPO are considering options – e.g., not firing the third stage or initiating extreme general energy management – to resolve this issue.

Kwajalein Missile Range as well as a second missile silo at VAFB, therefore, some of the additional infrastructure cost for performing such testing is already in the NMD budget. From a technical viewpoint, Multiple Simultaneous Engagement testing is considered essential for the following reasons:

- There may be unanticipated synergistic effects between simultaneously deployed EKVs; many questions or issues simply cannot be resolved from the testing of 1-on-1 engagements. Debris, BMC3 workload, discrimination, etc., all make extrapolating from 1-on-1 to more likely scenarios uncertain.
- Effectiveness requirements pertaining to M-on-N engagements will be carried out through modeling and simulation. In order to have traceability to the real world, these simulations need "anchoring" and validation from M-on-N flight-testing.

Operational engagements for the NMD C1 System are expected to cover a much larger engagement space than what can be achieved during integrated flight tests. Figures 4, 5, and 6 illustrate the differences. Figure 4 shows that targets launched from VAFB in California toward KMR in the Western Pacific occupy one point of the target-apogee vs. target-range parameter space. Figure 5 underscores the fact that interceptor flyout in the VAFB-KMR engagement is on the very low end of the engagement space – a flyout range of roughly 700 kilometers – and at a fixed intercept altitude of 230 kilometers. And, Figure 6 compares the flight envelope – closing velocity vs. interceptor ground range – of the test program to that of the C1 engagement space. The engagement space of the test program occupies nearly a single point.

Integrated ground testing using simulated environments and full threat scenarios will be used to evaluate the performance and effectiveness of the NMD C1 system throughout the engagement envelope. These ground activities, along with modeling and simulation, are planned to mitigate flight test limitations described above. Unless additional points in the flight envelope of Figure 4 are flown in integrated flight tests, the scope and validity of system performance estimated in ground testing would remain limited.

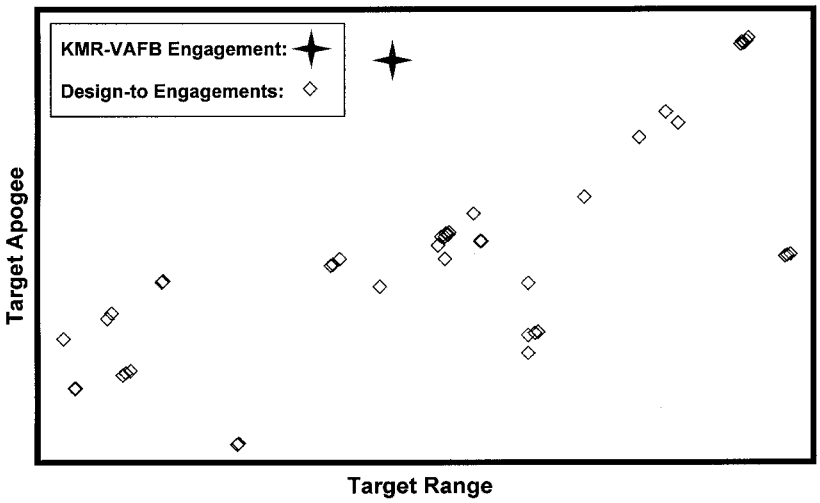

Figure 4. Target Apogee vs. Target Range Parameter Space

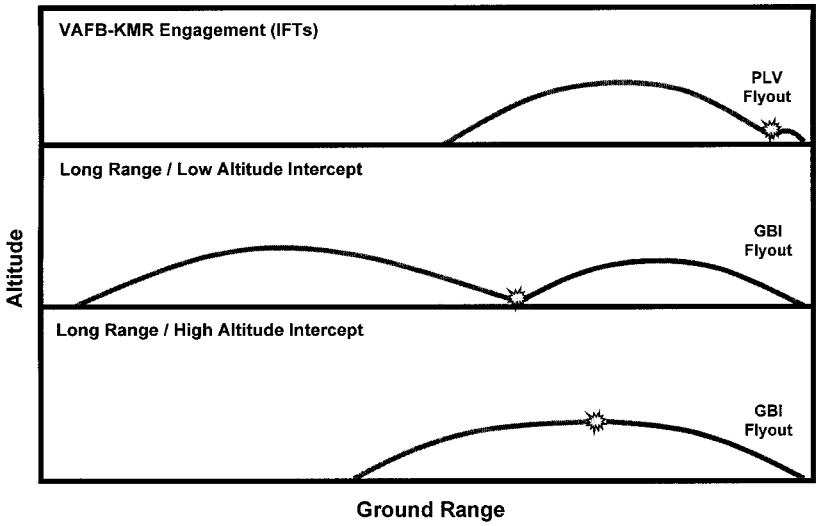

Figure 5. Interceptor Flyout Comparisons

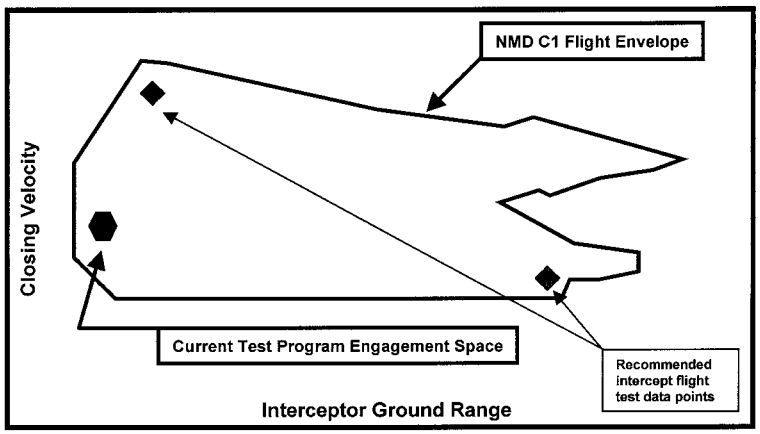

Figure 6. Closing Velocity vs. Interceptor Ground Range Parameter Space

FLIGHT TEST RESULTS

Integrated Flight Test 1A – Boeing EKV Flyby

Integrated Flight Test 1A (IFT-1A), conducted on June 24, 1997, was the first flight test of the NMD Test Program. A test was attempted in January 1997 (IFT-1) but was aborted because the surrogate for the ground based interceptor booster failed to launch. The primary objective of IFT-1A and the subsequent test, IFT-2, was to provide a basis for down-selecting candidate EKVs built by competing contractors, Boeing and Raytheon.

IFT-1A assessed the performance of the Boeing EKV sensor, collected phenomenological data used for post-test analysis of the onboard discrimination algorithms, and collected functional data on the dynamic flight-test environment and its effects on the EKV. Range assets and surrogate hardware – GPS and the FPQ-14 radar tracking a C-band transponder – were used to guide and deliver the EKV to a point in space where it began executing sensor functions; the BMC3 element played no role in the execution of IFT-1A. Since the EKV did not have propulsion capabilities, it was incapable of intercept but came to within 5,200 feet of the target reentry vehicle.

The principal component of the Boeing EKV design is a multiple-waveband IR sensor that allows the EKV to acquire, track, and collect data on objects of the representative threat target suite. The sensor payload consists of a focal plane array of highly sensitive silicon-based sensors and a cryogenic cooling assembly at the end of an optical telescope.

The EKV sensor payload was launched from Meck Island in the Kwajalein Atoll and set on a trajectory that permitted it to view a pre-planned target scene. The target suite was launched from VAFB using a specially configured Minuteman II booster and consisted of nine objects: one medium reentry vehicle, two medium rigid light replicas, one small canisterized light replica, two canisterized small balloons, two medium balloons, and a large balloon. Viewing objects of the target suite, the EKV seeker successfully gathered signature and phenomenology data which, in turn, were used to verify predictions made by corresponding models and simulations. One of the medium balloons did not fully inflate.

- Nine of ten objects of the target suite (including the deployment bus) were detected. For some unknown reason, one of the canisterized small balloons was not observed. As stated in the GBI 60-Day Report for IFT-1A, "No object detected on the focal plane could be correlated with the white canisterized small balloon; therefore, no seeker measurements for this object are available."
- Space (exoatmospheric) operation of the silicon seeker was verified.
- The EKV seeker collected IR signature data that were downlinked to ground receiving stations. Predictions from target signature models match seeker measurements acquired in flight for both IR bands.
- Using IR signature data collected by the EKV, post-test execution of discrimination algorithms were able to discriminate successfully the medium reentry vehicle as the threat object of the target suite. The successful discrimination of the medium reentry vehicle should not be viewed as a verification of the discrimination algorithms in an operational engagement, but rather, as a successful experiment.

Integrated Flight Test 2 – Raytheon EKV Flyby

Integrated Flight Test 2 (IFT-2) conducted on January 16, 1998, was the second flight test of the NMD Test Program. The objectives of IFT-2 were the same as that for IFT-1A, namely, to assess the performance of the EKV sensor built by the second EKV contractor, Raytheon Missile System Company. The same target suite of nine objects was flown.

EKV seeker data was downlinked and used for evaluating sensor performance and for performing post-test discrimination and signature analyses of the target suite. Range assets and surrogate hardware – GPS and the FPQ-14 radar tracking a C-band transponder – guided the EKV to a point in space where it began executing sensor functions; the BMC3 element played no role in the execution of IFT-2. As in IFT-1A, the Raytheon EKV did not attempt to intercept the medium reentry vehicle since it had no propulsion capabilities.

The principal component of the Raytheon EKV design is a multiple-waveband, Visible/IR sensor payload that allows the EKV to acquire, track, and collect data on objects of the representative threat target suite. The sensor payload consists of an HgCdTe focal plane array and a cryogenic cooling assembly at the end of an optical telescope. As in the launch of the Boeing EKV, the Raytheon EKV sensor payload was launched from Meck Island at KMR and set on a trajectory that permitted it to view a similar target scene of ten objects (nine objects of the target

suite plus the deployment bus). And, as in IFT-1A, one of the medium balloons did not fully inflate.

IFT-2 was successful in collecting target object data, and post-test analyses demonstrated that the MRV could be discriminated from the other objects of the target suite. Because the discrimination algorithms were not executed in real time and relied on simulations that were anchored by IFT-2 test data, the successful discrimination of the medium reentry vehicle should not be viewed as a verification of the discrimination algorithms in an operational engagement, but rather, as a successful experiment.

At the recommendation of the Lead System Integrator (Boeing North American), the NMD Joint Program Office opted to down-select to a single EKV design prior to IFT-3, which afforded more intercept test opportunities before the DRR. The Joint Program Office selected Raytheon as the EKV contractor over Boeing.[6]

Integrated Flight Test 3 – Intercept Achieved

The first NMD *intercept* attempt of a target reentry vehicle by the Raytheon-built EKV was successful, albeit with significant limitations to operational realism, on October 2, 1999. IFT-3 began with the launch of a Minuteman-based booster from VAFB and the subsequent deployment of its target payload – MRV and Large Balloon – for reentry near KMR. An interceptor was launched from Meck Island to engage the MRV, and EKV intercept of the MRV occurred at an altitude of 230 km, 1,782 seconds after target liftoff. IFT-3 was planned and jointly executed by the NMD Joint Program Office and Boeing, the LSI. Future flight tests are being planned and executed by Boeing.

IFT-3 was an element test of the Raytheon-built EKV, not an Integrated System Test. IFT-3 was comprised of two concurrent test activities: an "in-line" test that focused on the performance of the EKV, and a simultaneous "on-line" or shadow test that focused on assessing NMD functionality as an integrated system using prototype elements that approximate the objective system. The principal objective of the on-line test was to demonstrate integration and operation of system elements as a risk reduction effort for future flight tests, IFT-4 and IFT-5.

IFT-3 In-Line Test (EKV Flight Test)

The in-line or flight test part of IFT-3 was a test of the Raytheon-built EKV. GPS track information of the target RV was used to guide and deliver the EKV to a point in space where it began executing mission-critical functions: midcourse guidance, target-complex acquisition, real-time discrimination, target selection, active homing, and intercept. Although the EKV successfully intercepted the MRV, acquisition of the target complex by the EKV was accomplished in an off-nominal manner because of a malfunctioning Inertial Measurement Unit (IMU) onboard the EKV. The IMU problem was caused by a vendor calibration procedure error, which was corrected for IFT-4.

[6] Originally, the EKV down-selection was to occur after IFT-3 and IFT-4, intercept attempts of a target RB by the Boeing and Raytheon EKVs, respectively.

Because of the problem with IMU operation, the EKV was forced to utilize its "step-stare" capability that is activated only during off-nominal situations.

- The IMU was unable to measure angular position (pointing) of the EKV with sufficient accuracy to allow for nominal target acquisition. Large angular slew rates of the EKV, performed during star shots to refine angular navigation, were directly responsible for the malfunction of the IMU. The anomalous behavior of this IMU should not be seen in future flight tests, because a new tactical IMU – built by Fibersense – will be used in the C1 EKV design and flown in integrated flight tests beginning with IFT-6 in January 2001.
- When the EKV "opened its eyes," no object of the target complex was in its field of view. The EKV executed the "step stare" procedure to extend its field of view and, subsequently, acquired the Large Balloon, deployment bus, and MRV. Had the Large Balloon not been deployed with the target suite, the EKV probably would have acquired the deployment bus and, subsequently, acquired and intercepted the MRV.
- Discrimination and target selection of the MRV from the Large Balloon and deployment bus were successfully accomplished. The guidance, navigation, and control functions were performed without incident and resulted in the intercept of the MRV.

IFT-3 On-Line Test (Shadow Test)

The on-line portion of IFT-3 ran in parallel with the in-line test to assess the performance of NMD functionality as an integrated system using prototype and surrogate elements. Elements operating on-line did not affect the operation of the in-line test but did demonstrate NMD functionality in a configuration more representative of the integrated system that might be deployed. The most notable results of the IFT-3 on-line test pertained to BMC3 and GBR-P performance.

The BMC3 successfully demonstrated integrated system performance through the coordination of system elements operating in shadow mode. It performed engagement planning that ultimately led to a successful (simulated) mission. GBR-P performance was generally poor and unsuitable for anchoring associated radar simulations. GBR-P track quality was adversely affected by a software error in the antenna mount motion equation. A software fix was implemented and later verified in the target of opportunity flight, RRF-7, which was conducted in November 1999, and in IFT-4 and IFT-5.

Integrated Flight Test 4 – Intercept Not Achieved

Integrated Flight Test 4, which was conducted on January 18, 2000, was the first *end-to-end* NMD flight test attempting a hit-to-kill intercept of a target reentry vehicle. Whereas IFT-3 was an element test of the Raytheon-built EKV, IFT-4, using surrogate and prototype elements, strived to demonstrate NMD system integration in a configuration more representative of the system that might be deployed. In particular, both the BMC3 and the GBR-P participated in the flight test "in-line." The FPQ-14 radar located in Oahu, Hawaii, was to have used the C-Band transponder data from the MRV to provide the BMC3 with target track information as though it were from a UEWR. The FPQ-14 data, however, was (erroneously) judged in real time to be of

poor quality. Instead, GPS track data of the MRV was used in IFT-4 after being translated into XBR format. The geometry of the test scenario of IFT-4 was identical to that of IFT-3.

The EKV failed to intercept the MRV, a failure directly traceable to the cryogenic cooling system of the EKV. The primary cooling line that delivers krypton to the IR focal plane arrays was restricted with either frozen moisture or other contamination, and the IR sensors were prevented from cooling down to their operating temperatures. Consequently, the IR sensors did not acquire or track target objects for terminal homing and intercept.

IFT-4 demonstrated the successful operation and integration of NMD elements. Data analysis of IFT-4 has been completed, and the following assessment of test results can be made:

- **Battle Management, Command, Control, and Communications**. The non-tactical flight test version of the BMC3 operated in a fully functional, dual node configuration (Commander-in-Chief and Site). In particular, the BMC3 demonstrated end-to-end tracking of the target complex and successfully generated Weapon Task Plans, Sensor Task Plans, one of three In-Flight Target Updates, and a Target Object Map.
- **Defense Support Program**. DSP satellites successfully acquired the boosting Minuteman II target vehicle and sent Launch Alert and Boost Event Reports to the BMC3.
- **Early Warning Radar Test Article**. Post-mission analysis indicates that the EWR provided the BMC3 with sufficiently good track data of the target cluster for successful GBR-P cueing. It must be noted, however, that the EWR test article is located up-range and has the advantage of tracking targets at close range as opposed to longer ranges expected in typical NMD engagements. At close range, the radar return signal is large, which enables the radar to generate higher quality tracks of deployed objects.
- **Ground Based Radar-Prototype**. The GBR-P participated in IFT-4 as a surrogate X-Band Radar element. Its participation in IFT-4 as an *integrated* element of the system was limited, since its track data and discrimination information was not utilized by the BMC3 for the generation of the Weapon Task Plan. The GBR-P was successful in many respects: it acquired the target complex, tracked and resolved all objects of the target complex, and correctly discriminated all tracked objects as either tank-like, debris, or RV. In addition, the GBR-P supplied track information used by the BMC3 for the generation of one IFTU.

Integrated Flight Test 5 – Intercept Not Achieved

Integrated Flight Test 5 was conducted on July 8, 2000. It was to be an end-to-end NMD intercept flight test nearly identical to IFT-4 and aimed to demonstrate NMD system integration with surrogate and prototype elements in a configuration representative of the system that might be deployed. The most prominent new feature of the test was the participation of the In Flight Interceptor Communications System as the communication link between the BMC3 and EKV. As in all previous intercept tests, a Minuteman-based target system was launched from VAFB, and its target payload consisting of an MRV was deployed for reentry near KMR. The target payload also included a Large Balloon, but it was never deployed because of some unknown failure of the

deployment mechanism. Then, at 1,294 seconds after target liftoff, an interceptor was launched from Meck Island to engage the MRV. The planned intercept, which did not occur, was to have been at an altitude of 230 km, 1,782 seconds after target liftoff, identical to the planned intercepts on IFT-3 and IFT-4.

The failure to intercept the MRV is the direct result of the EKV not separating from the upper stage assembly of the Payload Launch Vehicle, the surrogate for the interceptor booster. Preliminary failure analysis of the telemetry data indicates that the EKV did not receive a second-stage burnout message, a prerequisite for initiating the separation sequence. The cause of this failure has not yet been determined but appears to be isolated to the Payload Launch Vehicle. A notable consequence of the failure is that all EKV events subsequent to separation, e.g., sensor operation and divert and attitude activities, did not occur. Therefore, none of the EKV primary objectives were met.

The FPQ-14 radar located at the Kaena Point Satellite Tracking Station in Oahu, Hawaii, which tracked the C-Band transponder on the MRV, played an important role in IFT-5. Unlike IFT-4 in which GPS track data was the source for Weapon Task Plan generation, the BMC3 generated the Weapon Task Plan using FPQ-14 transponder data. GPS was still used, however. The FPQ-14 data, prior to being used to generate the Weapon Task Plan, was checked against the GPS track for accuracy; GPS data could have been used in the event that FPQ-14 data was of poor quality.[7] The Weapon Task Plan directed the launch of the interceptor at 1,294 seconds time after liftoff (TALO).

The GBR-P, the prototype X-Band Radar, successfully participated in IFT-5 as an integrated element of the system. It received target cluster cues from the BMC3, tracked all objects of interest, and correctly performed real-time discrimination on all target objects. The GBR-P tracking and discrimination timeline of IFT-5 closely matched the timeline predicted by pre-mission simulations, except that MRV acquisition occurred earlier than predicted. GBR-P participation in integrated flight tests is increasing. In IFT-5, all In Flight Target Updates (IFTUs) including the backup IFTU were generated solely from GBR-P track data. However, GBR-P track data was prevented from entering the BMC3 element until after the Weapon Task Plan had been sent to the Weapon System and, therefore, did not contribute to Weapon Task Plan generation.[8]

IFT-5 demonstrated integrated system performance through the operation of the non-tactical, flight-test version of the BMC3. The BMC3 provided end-to-end tracking of the target complex utilizing multiple sensor sources and demonstrated all operations of engagement planning and real-time communications. It successfully generated the Weapon Task Plan, Sensor Task Plans, Communication Task Plans, and IFTUs. Failure of EKV operation precluded the successful in-line operation of the In-Flight Interceptor Communications System (IFICS) – closure of the BMC3-EKV communication link – and, thus, associated objectives were not fully achieved, e.g., the receipt of In Flight Status Reports from the EKV were not evaluated. System integration of early warning elements with the BMC3 was achieved: DSP satellites successfully acquired the

[7] In IFT-4, the FPQ-14 transponder track data was judged to be of unsatisfactory quality and, therefore, only GPS data was used to generate the Weapon Task Plan.

[8] The GBR-P is unlikely to resolve and discriminate the RV from other objects in the target cluster early enough to generate a weapon task plan. The test plan for all intercept tests to date calls for launching the interceptor only after the RV has been resolved and identified.

boosting Minuteman II target vehicle and sent Quick Alert and Boost Event Reports to the BMC3. The EWR also acquired and tracked the target complex, including spent fuel tanks, early in the mission timeline.

INTEGRATED GROUND TESTS

Boeing is performing ground testing to mitigate the risks associated with the limited flight test program. Ground testing can exercise the system through variation of threat characteristics such as launch point, aimpoint, trajectory, apogee, number of RVs, target type, and environmental effects. This ground testing is done in month-long phases called Integrated Ground Tests. IGT-4 and IGT-5 occurred in 1999; IGT-6 will not occur until after the DRR.

These ground tests use the ISTC at the U.S. Army Space and Missile Defense Command's Advanced Research Center in Huntsville, Alabama. ISTC provides test execution and control, threat and environment data, and test drivers for some NMD elements. Each NMD element is represented at a standalone computer station called a node. Each node incorporates system element mission and communications processors, which run prototype element software. ISTC supplies the nodes with simulated inputs – threats and associated environments, natural and man-made – which are nominally consistent for each NMD element in the scenario.[9]

IGTs use a combination of models, software-in-the-loop, and hardware-in-the-loop to test the NMD engagement space and threat in an operational environment. They are supposed to validate the functionality and functional interfaces between the elements, subject the system to stressing environments and tactical scenarios, and evaluate target-intercept boundary conditions. IGTs can help to identify "unknowns" in an interactive system context and verify interoperability of NMD system elements.

There was very little operational hardware or software used in IGT-4 or IGT-5. The BMC3 was a prototype, flight-test version of the operational BMC3; it included some real communications hardware (T1 links). It is *possible* that some of the software in the UEWR representation could eventually be used in the operational UEWR. Also, some of the EKV digital signal processing software and data processing software might be used in the operational EKV.

The element hardware components are represented digitally in the Processor Test Environment. It duplicates the real-time tactical interfaces in order to inject the perceived data into the test article. For example, the Processor Test Environment for the GBR-P element contains simulation software that represents the transmitter, receiver, antenna, signal processor, measurement generation, beam volume, detection response, and radar status.

IGT-4 and IGT-5 had a number of limitations. For example, the threat apogees were unrealistically high in IGT-4, which provided optimistic assessments of timelines and radar detections. Because the simulation had limited processing capability, Boeing (LSI) eliminated most of the threat objects in many of the scenarios, which was unrealistic for testing discrimination, radar resource management, and BMC3 processing capabilities. In addition, all of the element representations suffered from limitations that produced significantly different

[9] One exception is the gravity model, which is different for the EKV and the other elements.

performance than is expected from the NMD C1 system. These limitations included, but were not limited to:

- Only five high-fidelity representations of the EKV were available. There were 15 low fidelity models, but the two representations could not be used together. Thus, a full-up scenario involving multiple RV attacks could not be represented.
- UEWR representations did not include pulse integration, leading to lower than expected signal-to-noise ratios and objects not being tracked.
- UEWR tracking accuracies often failed to meet specifications.
- The XBR was represented by a modified GBR-P model that differed in power-aperture product, field-of-view, sensitivity, slew rate, etc. Work-arounds such as increases to target cross sections were implemented to mitigate some, but not all, of these limitations.

The primary goal of IGT-4 and IGT-5 was to demonstrate the integration of BMC3 with the UEWR and XBR. Boeing successfully demonstrated integration between these three NMD elements in the two IGTs. The secondary goal of the IGTs was to assess the C1 architecture and performance against a limited set of C1 scenarios. This goal was less successful, in part because of the immaturity of the element representations in IGT-4 and IGT-5. The exact amount attributable to element model immaturity is currently undefined and will remain so until truly element-representative models are installed in ISTC.

Boeing demonstrated integration between the BMC3 and radars by generating and recording messages between the elements. They confirmed that the planned messages had been exchanged between the BMC3 and the GBR-P and UEWR, and measured the time delays between the messages.

The radar performance in IGT-4 and IGT-5 was generally poor. In IGT-4 the XBR had reasonable position track performance but the velocity track performance was much worse than specifications. The XBR improved in IGT-5 and usually met the track accuracy performance. The UEWR failed to detect a significant number of RVs in IGT-4 and IGT-5. Once an RV was acquired, the performance of the UEWR representation at a given time was generally much better than specifications in both position and velocity tracking. However, the UEWR rarely succeeded in maintaining the specified track accuracies against RVs throughout an engagement. The probability of track maintenance was well below the NMD system specification requirements for both the XBR and UEWR. The XBR discrimination results were also well below the NMD system specification requirements.

The ISTC hardware and software used to date in the IGTs are immature and do not provide an adequate representation of the NMD C1 architecture. None of the major NMD elements – BMC3, XBR, UEWR, Weapon System, and DSP/SBIRS – are mature enough to provide a good assessment of the C1 system. The 1997 TEMP discussed the consequences if the representations were not mature before the DRR: "The validity and credibility of the surrogates and the representations must be fully characterized with respect to the NMD system and element requirements prior to making any decisions based on data drawn from tests using these systems. Without this information, the results of the tests will be inconclusive at best and misleading at

worst." IGT-4 and IGT-5 did demonstrate the integration of the BMC3 with the UEWR and XBR (not with the weapon system, however), but these tests provided only limited data to support an evaluation of the effectiveness of the initial, proposed NMD C1 system at the DRR.

BATTLE PLANNING EXERCISE 99-5 AND BMC3 ASSESSMENT

Battle Planning Exercise 99-5 (BPEx 99-5) was conducted in the BMC3 Element Laboratory at the Joint National Test Facility on September 28-30, 1999. Conceived in 1998 by U.S. Space Command (USSPACECOM/J35), BPEx events enable the User to examine and assess as-built BMC3 operational functionality for the purpose of influencing future development of the BMC3 element. The OTA Team was invited by USSPACECOM to co-lead BPEx 99-5 to benchmark BMC3 behavior in support of the Deployment Readiness Review.

The primary objective of BPEx events is to identify operational defects of the BMC3 element to be corrected in future builds. BPEx 99-5 was performed, in particular, to evaluate BMC3 element behavior in support of the OTA Team's early operational assessment of Key Performance Parameters #2 and #3 – human in control (HIC) and automated battle management – for the DRR. The evaluation of Key Performance Parameter #1, effectiveness of the NMD system to defend the United States against ballistic missile attacks, was not an objective of BPEx 99-5. The test environment representing the NMD system consisted of the following components:

- Two representative nodes of the BMC3 element – CINC and Site – running Capability Increment 3A software.
- Trained military personnel – from USSPACECOM, NORAD, Army Space Command, and Air Force Space Command – were assigned specific roles as BMC3 operators during the exercises. These operators are known as "Smart Rounds" and underwent intensive training before the exercises were conducted.
- A "simulation cell" provided simulated external input from the national command authority (NCA) and Integrated Tactical Warning/Attack Assessment (ITW/AA) to the CINC BMC3 node.
- The BMC3 Test Exerciser simulated the remaining elements of the NMD system: DSP/SBIRS, Upgraded Early Warning Radar, X-Band Radar, and the Weapon System.

Notable BMC3 Behavior

The following BMC3 behavior was observed during BPEx 99-5 execution:

- **Phantom Tracks (Track Splitting).** For scenarios in which the tracking of a threat object transitions from the XBR to a UEWR, the correlation algorithms of the BMC3 treat the UEWR returns as originating from a new, lethal object. In other words, the track of the "old" threat object splits into two tracks thereby creating a phantom track. Whenever there is sufficient battlespace for an engagement, the BMC3 battle manager would automatically allocate interceptors against this phantom object.
- **Battlespace (Time-to-Go) Bars.** The BMC3 software provides visual displays – blue horizontal bars – illustrating the time that remains for engaging a given threat object. These "time-to-go" graphics bars did not provide accurate situational awareness to the

operator, because kinematic capability of the interceptor is the only constraint defining the time-to-go. The graphics bars do not reflect limitations from solar exclusion, IFICS loading, interceptor launch rates, intercept spacing, and nuclear weapons effects avoidance, for example.

- **Kill Assessment.** Whenever the BMC3 cannot make a kill assessment for a given engagement – because of a lack of radar coverage – an alarm is sounded and the target is treated as a "leaker." With the current radar architecture, kill assessments are frequently not available. Hence, the operator is led to believe that there are actual leakers and is dependent upon nuclear detonation reports from external sensors for situation awareness.

BMC3 Assessment

The BMC3 element is currently at an early stage of development and noted shortcomings are likely to be addressed before the initial operational capability. NMD operators had difficulty with resource management, engagement control, and situation awareness.

- **Resource management.** In the majority of scenarios, more interceptors than nominally required by the ORD were expended to defeat threat objects. For example, in a scenario with two RVs, 15 interceptors were launched. The reason for such behavior is two-fold:
  - Interceptors were launched against phantom tracks.
  - The BMC3 was very conservative during the exercises. Anything with a lethality-value greater than 0.02 (out of a maximum of 1.00) was engaged.
- **Engagement control.** When NMD operators believed that interceptors were allocated against phantom tracks, they tried a variety of techniques to override the automated battle manager to prevent the launch of interceptors.
  - Management-by-exception (MBE)[10] holds were placed on phantom tracks to prevent interceptors from being launched. Although such actions should have worked, they were unsuccessful in all cases. The system simply was not behaving according to operator actions. In any event, MBE was not intended by BMC3 developers to be used as a resource management tool.
  - The only successful technique used to prevent interceptors from being launched against phantom tracks was to allocate all remaining interceptors to reserve status.
- **Situation Awareness.** BPEx 99-5 indicated a lack of situation awareness on the part of NMD operators.
  - As mentioned above, battlespace graphics bars did not give NMD operators an accurate estimation of all times a threat object could be engaged. Engagements with short timelines were most problematic. There were scenarios for which the battle manager did not allocate interceptors – because the system did not have the

[10] MBE is defined as the capability of the Human-in-Control to make inputs influencing the system engagement behavior on a track-by-track basis.

battlespace to engage the threat – even though the associated graphics bars indicated positive battlespace. This was particularly frustrating to the operators who could not control the engagement to launch interceptors.

- The possibility of phantom targets stemming from radar-to-radar handover tended to make NMD operators anxious. There was no tool that could definitively warn operators when a phantom track appeared, so the operators were forced to rely on their judgement in this regard. In the end, the operators tended to discount information derived from the UEWRs.
- The identification of threat objects as leakers for engagements without kill assessments forced operators to speculate on whether the engagement was successful.

The LSI is developing the BMC3 with maximum automation. Inherently, the BMC3 is designed to preclude direct launch control by the operator. Rather, positive control is exercised through Rules-of-Engagement development, battle-planning development, and management by exception. The BPEx, therefore, reflects the outcome of these efforts and can be frustrating to an operator attempting real time control.

MODELING AND SIMULATION

Restrictions on realistic operational flight testing, and the complexity of the operational engagements, require the T&E program to rely heavily on integrated ground testing and the execution of digital simulations for assessing the operational suitability and effectiveness of the NMD system concept. Integrated ground testing was of limited utility in assessing the potential performance of the NMD system. Late delivery of LIDS – a high fidelity, system-level digital simulation of the NMD system – precluded its use for making a credible assessment of potential NMD system performance.

LIDS model development is taking much longer than expected. It was to be the principal digital simulation tool providing DRR support. Modeling and simulation in general and LIDS in particular were supposed to be employed to repeat hypothetical experiments in order to improve the statistical sample and to determine the values of key technical parameters unable to be measured by testing. Boeing released a beta version LIDS Build 4 at the end of April 2000. There was not enough time before the DRR to accredit LIDS and perform the required system analyses. As a result, the Service Operational Test Agencies do not have a simulation that they can use to assess the potential system effectiveness.

LIDS build 4 has serious limitations, so even if it had been released on time there would still be major issues in using LIDS to assess the potential performance of the NMD system. One problem is that LIDS users will not be able to generate their own scenarios. Boeing will provide users with canned scenarios, including fixed launch points, aim points, Inter-Continental Ballistic Missile (ICBMs), debris, and apogees. The Operational Test Agencies had been planning to run hundreds of digital simulation scenarios, varying such parameters as raid size, trajectories, atmospherics, debris, nuclear effects, threat launch and impact points, threat types, and Penetration Aids. LIDS will not have the flexibility to support such studies.

LIDS will allow users some flexibility. They will be able to change the location and number of the various NMD elements. Users will also be able specify such parameters as the reliability of GBI boost phase completion, the probability of target acquisition by the EKV sensor, the probability of the EKV correctly identifying the RV, the probability of hitting the RV given correct discrimination, and the probability of killing the target given a hit. Such analyses will be useful but not sufficient to adequately assess the potential performance of the C1 system. LIDS does not simulate any of the element prototypes or surrogates currently used in flight testing. Consequently, use of the IFTs to provide traditional model validation data will not be possible until the actual system elements finally work their way into the intercept flight test program. This limits the confidence that can be placed on LIDS predictions in the foreseeable future.

Boeing is using a number of low-fidelity simulations in their development of the NMD system. One is NMDSim, which estimates the interceptor launch windows for different scenarios. The NMDSim does not simulate discrimination functionality, does not generate weapon task plans, has no interceptor flyout representation, and does not perform kill assessment. It can be a useful tool for planning engagements in higher-fidelity models or simulations, but it is too limited to credibly assess the potential performance of the NMD system.

LETHALITY TESTING

NMD lethality testing and analysis activities before the DRR have focused on the development and accreditation of version 8.1 of the Parametric Endo-Exoatmospheric Lethality Simulation (PEELS). PEELS is the only lethality simulation to be accredited for endgame evaluation of NMD intercepts. In effect, it is the simulation used in both lethality and effectiveness analyses to assess whether an NMD hit on a threat target results in a target kill. To develop an NMD-capable version of PEELS, the database of empirical results that anchors the simulation for theater ballistic missiles had to be expanded to include lethality information for intercepts of NMD-type targets by the EKV in the velocity regime expected for NMD engagements. Because there is no capability to run ground tests at the upper end of NMD intercept velocities, a series of hydrocode analyses were used to generate the bulk of the "empirical data" for NMD EKV intercepts.

A total of 490 hydrocode simulations are planned, covering the quarter-scale Light Gas Gun test projectile, warhead and aeroshell damage, and different threat targets and intercept parameters. Of these, 218 have been completed to date, namely, 178 for the Attitude Control Reentry Vehicle target and 20 for Medium Lethality Reentry Vehicle target. The main purpose of the quarter scale Light Gas Gun series was to generate instrumentation data and damage data, which are used to anchor the hydrocode prediction methodology for varying hit points, velocities, and impact angles.

A series of 20 quarter-scale light-gas-gun impact tests were conducted at the Arnold Engineering Development Center in Tennessee in 1999 against Attitude Control Reentry Vehicle targets, and a second series of 20 shots have begun testing in FY00 against the Medium Size Reentry Vehicle, Long Range Nuclear Threat, and Attitude Control Reentry Vehicle targets. These tests employ a quarter-scale surrogate of the EKV launched against a quarter-scale replica of the target at a nominal velocity of 7 km/s. FY99 test results are described in the U.S. Army

Space and Missile Defense Command Test Report. A report comparing test results to hydrocode predictions, originally scheduled for publication in April 2000, is still pending.

Besides providing a backup for the hydrocode prediction methodology, the 1999 tests provided the following information:

- The damage capability of the EKV against the Attitude Control Reentry Vehicle payload for a variety of intercept conditions (two different impact velocities, five different impact angles, and various hit locations on the target).
- The sensitivity of damage level to impact velocity (two different impact velocities).
- The validity of the lethality criteria used in the NMD-capable version of PEELS for the tested intercept conditions.
- The post-impact debris characteristics.
- The sensitivity of the lethality results to different target fabrication techniques.

Additional testing is being done to improve and validate the hydrocode simulations. Sandia National Laboratory is conducting a set of high-speed impact tests using a three-stage Light Gas Gun to develop the equations of state – the characterization of the physical phenomena that occur during impact – of several aerospace materials present in the test targets and EKV at impact velocities of 6 km/s and 12 km/s. The materials studied are silica phenolic, E-glass, and graphite epoxy. Testing is expected to be completed later this year. If significant differences between the new empirically-derived equations of state and inputs used for the hydrocode runs are found, the hydrocode analysis will be corrected and PEELS modified accordingly. Results to date suggest that such modifications will not be necessary.

Sandia is also performing a series of hydrocode analyses for the Attitude Control Reentry Vehicle and Medium Target Reentry Vehicle targets. Their objective is to characterize the lethal volume for aerothermal structural kills. Aerothermal structural kills could occur if the target incurs sufficient damage from an EKV impact and suffers aerothermal demise during atmospheric reentry. As of March 2000, 93 hydrocode runs had been made. The analyses are expected to continue through 2000.

Based on the accumulated data from lethality tests and analyses, PEELS 8.1 was accredited by the Accreditation Working Group (AWG) on April 4, 2000. In the accreditation report dated April 28, 2000,[11] the AWG recommends accreditation of PEELS 8.1 for the following experiments:

- Determination of RV negation given the parameters that specify the RV, kill vehicle, and intercept conditions.
- Determination of Technical Performance Measures (TPMs) as specified in the Detailed Analysis Plan:
  - **TPM#23.** Probability of Single Shot Kill.

[11] Joint Program Office, National Missile Defense, *The Parametric Endo/Exoatmospheric Lethality Simulation (PEELS) Accreditation Report for the National Missile Defense System (U)*, 14 April 2000, UNCLASSIFIED.

- **TPM#24.** Probability of Hitting Target within Specified Aimpoint Accuracy. Note: This TPM cannot be calculated by PEELS alone, since PEELS can only predict the probability of kill given a hit point and miss distance.
- **TPM#25.** Probability of the NMD System Meeting its Objective.

- Determination of aimpoint selection to support DRR. However, the user should be aware of the disproportionate lethal volumes for the three targets currently modeled. Specifically, the Long Range Nuclear Threat does not contain an expanded lethal volume. In addition, the lethal volumes are expected to change in the future when late-time structural effects are included. Therefore, the optimum aimpoint suggested by PEELS 8.1 may change in subsequent versions.

The accreditation report has specified the following caveats under the recommendation for accreditation approval.

- PEELS 8.1 is not suitable for the calculation of endgame maneuvers undertaken by the EKV to achieve intercept.
- PEELS 8.1 lethal volumes contain no velocity dependence.
- PEELS 8.1 provides limited probabilistic outputs. Generally, the user feeds system 6-DOF data into PEELS 8.1 for engagement-by-engagement target negation calculations and then post-processes the data to provide a complete $P_{kill/hit}$ solution.
- PEELS 8.1 does not contain all C1 threats. PEELS 8.1 only contains those threats that have been officially released by the Defense Intelligence Agency (DIA) (Attitude Control Reentry Vehicle, Medium Lethality Reentry Vehicle, and Long Range Nuclear Threat).
- Because of time constraints, hydrocode runs against the Long Range Nuclear Threat have not been performed. Therefore, the expanded lethal volume used in PEELS 8.1 for the Attitude Control Reentry Vehicle and Medium Test Reentry Vehicle are disproportionate to that used for the Long Range Nuclear Threat.
- The EKV model and target models are not user changeable. Any significant change to the EKV design will require review by the Department of Energy to determine any possible changes to the lethal volume data.
- PEELS 8.1 does not calculate post-impact damage to an RV that survives impact.

Lethality Assessment

The quarter-scale Light Gas Gun testing conducted to date utilized a low fidelity surrogate of the EKV that matched the average mass properties of both the Raytheon and Boeing EKV concepts but not their precise structure or materials. The results obtained could be representative of the grosser aspects of NMD's direct hit lethality against the Attitude Control Reentry Vehicle target. The tests showed that damage to NMD targets from direct hit by the EKV will depend on the location of the impact within the payload. *Not every hit would necessarily result in a kill.*

The hydrocode analyses provided predictions of expected NMD lethality against threat targets in the hypervelocity regime and supported the development of the lethal volume in PEELS version 8.1 and enabled its use as a tool for DRR analysis.

After DRR, the development of the Live Fire Test and Evaluation (LFT&E) program will be addressed in the NMD Lethality IPT under the joint leadership of the JPO and the LSI. Although the LFT&E strategy is yet to be finalized, it is expected to include three flight tests: reduced-scale light gas gun tests, hydrocode analyses, and PEELS analyses.

FUTURE TEST PLANNING

Under the program-of-record, test results are not likely to be available in 2003 to support a recommendation then to deploy a C1 system in 2005. This is because the currently planned testing program is behind, because the test content does not yet address important operational questions, and because ground test facilities for assessment are considerably behind schedule.

NMD developmental testing needs to be augmented to prepare for realistic operational situations in the Initial Operational Test and Evaluation (IOT&E) phase, and is not yet aggressive enough to keep pace with the currently proposed schedules for silo and radar construction and missile production. The testing schedule, including supporting modeling and simulation, continues to slip while the construction and production schedules have not. Important parts of the test program have slipped a year in the 19 months since the NMD program was restructured in January 1999. Thus, the program is behind in both the demonstrated level of technical accomplishment and in schedule. Additionally, the content of individual tests has been diminished and is providing less information than originally planned.

I am especially concerned that the NMD program has not planned nor funded any intercept tests until IOT&E with realistic operational features such as multiple simultaneous engagements, long-range intercepts, realistic engagement geometries, and countermeasures other than simple balloons. While it may not be practical or affordable to do all these things in developmental testing, selected stressing operational requirements should be included in developmental tests that precede IOT&E to help ensure sufficient capability for deployment. For example, the current C-band transponder tracking and identification system, justified by gaps in radar coverage and range safety considerations, is being used to provide target track information to the system in current tests. This practice should be phased out prior to IOT&E. This will ensure that the end-to-end system will support early target tracking and interceptor launch.

There is nothing wrong with the limited testing program the Department has been pursuing so long as the achieved results match the desired pace of acquisition decisions to support deployment. However, a more aggressive testing program, with parallel paths and activities, will be necessary to achieve an effective IOC by the latter half of this decade. This means a test program that is structured to anticipate and absorb setbacks that inevitably occur. The NMD program is developing test plans that move in this direction.

The time and resource demands that would be required for a program of this type would be substantial. As documented in the Congressional Budget Office (CBO) report on the budgetary

and technical implications of the NMD program,[12] the Safeguard missile program conducted 165 flight tests. The Safeguard program was an early version of NMD. The SPRINT program conducted 42 test firings in a five-year period between 1965 and 1970, **more than 8 per year**, before its first intercept-like test. Over the next three years, SPRINT flew 23 intercept-type tests before production. The Spartan program fired 15 missile tests between 1968 and 1969 before conducting 24 intercept-type tests over the next five years. Similarly, the Polaris program conducted 125 flight tests, and the Minuteman program conducted 101 flight tests. Rocket science has progressed in the past 35 years, and I am not suggesting that a hundred or more NMD flight tests will be necessary. However, the technology in the current NMD program is more sophisticated than in those early missile programs, and we should be prepared for inevitable setbacks. More recently, in the 1980s, the Peacekeeper (MX) program launched 15 missiles in the four years before its IOC, ramping up from three flight tests per year to five flight tests per year between 1983 and 1986. It is apparent from these test schedules that an extensive amount of work was done in parallel from one flight test to another. Failures that occurred were accepted, and the programs moved forward with parallel activities as flight testing continued.

As in any weapons development program, the NMD acquisition and construction schedules need to be linked to capability achievements demonstrated in a robust test program, not to schedule per se. This approach supports an aggressive acquisition schedule if the test program has the capacity to deal with setbacks. On three separate occasions, independent panels chaired by Larry Welch (General, USAF Retired) have recommended an event driven, not schedule driven, program. In the long run, an event driven program may take less time and cost less money than a program that must regularly be re-baselined due to the realities of very challenging technical and operational goals.

OBSERVATIONS AND CONCLUSIONS

Aggressive flight testing, coupled with comprehensive hardware-in-the-loop and simulation programs, will be essential for NMD. Additionally, the program will have to adopt a parallel, "fly through failure," approach that can absorb tests that do not achieve their objectives in order to have any chance of achieving an FY05 deployment of an operationally effective system. As noted by CBO, the Navy's Polaris program successfully took such an approach 30 years ago.

Deployment means the fielding of an operational system with some military utility which is effective under realistic combat conditions, against realistic threats and countermeasures, possibly without adequate prior knowledge of the target cluster composition, timing, trajectory or direction, and when operated by military personnel at all times of the day or night and in all weather. Such a capability is yet to be shown to be practicable for NMD. These operational considerations will become an increasingly important part of test and simulation plans over the coming years.

[12] CBO Papers, *Budgetary and Technical Implications of the Administration's Plan for National Missile Defense*, April 2000.

In particular, more work is needed in the following areas:

The target sets for the three intercept flight tests conducted so far have only included a single target RV with a single large balloon that did not resemble the target RV in those features which the NMD system might use for discrimination and which an enemy might try to employ. The large balloon is an unrealistic representation of the threat, and operational NMD capability has not yet been demonstrated against the simplest of realistic, unsophisticated countermeasures. No tests against such decoys are planned until IFT-10, now scheduled for the first quarter of FY03, at the earliest, when balloons alone may be flown that may have signatures but not shape, or motion, similar to the target RV.

The NMD Program is planning flight intercept tests with different balloon types and sizes which become more difficult to discriminate as the testing program moves forward. In addition, the NMD Program is planning tests with other types of decoys in non-intercept "risk reduction" flights. Eventually, intercept flight tests with such decoys will be needed as well. For example, no flight intercept tests have been conducted or are scheduled with tumbling target reentry vehicles or decoys designed to resemble tumbling RVs, perhaps the easiest RV for an enemy to deploy.

Intercept tests so far have used essentially identical trajectories, where the intercept points were known and planned in advance, as required for range safety. More operationally realistic scenarios will need to be developed, including long range intercepts and multiple simultaneous engagements.

Like the kill vehicles, X-Band Radars should be able to deal with unsophisticated decoys that resemble the target RV in signature, shape, and/or motion. We have not yet determined the operational ability of X-Band Radars to discriminate target RVs from such decoys in an intercept flight test. Also, new sensors may be required on the ground or in space on satellites. Again, these sensors have not been tested as part of the NMD architecture.

In the flight intercept tests so far, GPS or C-band beacon transponders have been used by the BMC3 to create the Weapon and Sensor Task plans which first aim the interceptor and the GBR-P. These sensors will need to be separated from the operational system in future tests prior to IOT&E.

Much of the operational context for assessing NMD is to be provided by end-to-end simulation tools which have not progressed as planned. The Lead System Integrator Integration Distributed Simulation (LIDS) has not achieved the planned level of operability or realism which was to have been available to support the DRR. Other alternative simulations have been pieced together to assess the potential of the NMD system. The Integrated System Test Capability processor-in-the- loop facility is not yet adequate to produce valid Integrated Ground Test results for system effectiveness assessment. Hardware-in-the-loop facilities need to be developed in time to support meaningful testing against countermeasures. Overall, modeling and simulation efforts are considerably behind schedule and also have not yet produced results that would support a recommendation to deploy.

We have no flight intercept test results yet to demonstrate the residual capability of a C1 system to handle the unsophisticated countermeasures that would be expected to be contained in accidental or unauthorized launches.

The test results to date also do not support a recommendation to deploy an expanded C1 capability by 2007 with additional interceptors and radars. Initial capability C1 interceptors may need to be upgraded for the expanded capability, as new test results emerge and as new information becomes available about the threat.

RECOMMENDATIONS

FLIGHT TESTING

Testing Complexity

Testing is currently designed to accommodate an aggressive pace of development. Flight testing, however, needs to aggressively increase in complexity to keep pace with NMD C1 development and to adequately stress design limits, particularly for the missile system.

- Target suites used in integrated flight tests need to incorporate challenging unsophisticated countermeasures that have the potential to be used against the NMD C1 system (e.g., tumbling RVs and non-spherical balloons). Use of the large balloon should be discontinued, as it does not mimic in any way the current test RV. True decoys that attempt to replicate RV signatures as well as balloon-type countermeasures that have been examined by the Countermeasures Hands-On Program (CHOP) need to be integrated into flight test target suites.
- Engagement times of day and solar position need to be planned to stress the acquisition and discrimination process by all of the sensor bands. Additionally, the effects of weather on radar, telemetry, and satellite operations need to be tested either during intercept or risk reduction flight tests or other targets of opportunity. Radar discrimination, IFICS transmission/reception, and DSP/SBIRS launch detection may be operating at their technical limits, and heavy rain or dense cloud conditions may have significant effects on their performance.
- Category B engagements are engagements in which an interceptor is launched against a target cluster (based on radar track) before the threat RV is resolved and discriminated. Since such engagements are expected to be common during NMD missions, this capability will need to be demonstrated in an integrated flight test before IOC. Such engagements are currently not included in the defined test plan.
- Multiple engagements will be the expected norm in tactical situations, therefore, simulated extrapolation from 1-on-1 scenarios to M-on-N need to be validated through intercept flight testing. Multiple engagements of at least 2-on-2 scenarios need to be flight tested, as too many technical challenges to the system exist beyond merely the command and control software. Identifying the impact of the interaction of one kill vehicle to another and assessing the performance of ground tracking systems in M-on-N scenarios lead to several questions:

  How will an EKV respond to another EKV in its field of view, or multiple RVs in its field of view?

How is the performance of an EKV seeker affected by a thrusting EKV or another EKV intercepting an object in its field of view?

Can the X-Band radar simultaneously track multiple RVs that require different antenna orientations?

Can the IFICS communicate with multiple KVs?

- Radar discrimination with limited *a priori* knowledge of the target complex needs to be flight tested prior to the FY01 radar decision. This type of test ("pop quiz" type) of flight test needs to be executed, at least during a risk reduction flight. This test should employ multiple decoys designed to mimic the RV radar signature but should not provide unrealistically detailed target or decoy information to the GBR-P radar prior to the engagement.

Testing Artificiality

Current test range limitations need to be removed to adequately test the NMD system.

- Use of the FPQ-14 range radar as the source of Weapon Task Plan data needs to be phased out. Target trajectories or radar surrogate locations need to be changed to permit the organic NMD system to provide early radar cueing with the appropriate degree of position and velocity accuracy.
- Engagement geometries need to be devised that will provide higher speed engagement conditions for the EKV, as would be expected in the C1 timeframe with the tactical booster.

Operational Realism

Avoidable limitations to operational realism must be removed before conduct of IOT&E.

- Rehearsed engagements with *a priori* knowledge of target complex, target trajectory, and time of launch need to be discontinued during operational testing. Situations employing lack of *a priori* knowledge also need to be examined in Developmental Testing to assure acquisition and discrimination algorithms are properly designed.
- The flight testing artificialities addressed above must be eliminated for IOT&E. Alternative intercept test scenarios must be devised that employ inbound or crossing targets rather than outbound relative to the Early Warning Radar. GPS and midcourse radar tracking using a transponder cannot be used by the NMD system to perform its mission. The Weapon Task Plan must be prepared based on organic NMD tracking systems. Options must be investigated for testing higher speed intercepts and other stressing engagement parameters.
- Deployed element usage needs to be maximized for IOT&E. The X-Band Radar and/or Upgraded Early Warning Radar should be used. Deployed IFICS ground antennas and tactical communications should also be tested as part of the IOT&E.

- Multiple engagements must be accomplished during IOT&E. Furthermore, this type of engagement should be flown in IFTs before IOT&E to maximize the chance of success in IOT&E.

Spares

Plans for providing adequate spares should be developed, especially for targets where current target components can be as much as 30 years old.

- Adequate GBI booster spares need to be procured as a risk reduction effort, to preclude further schedule slip should a failure occur in preflight booster testing.
- NMD is currently employing what is referred to as a "rolling spare" concept for its targets. It can take up to six weeks to prepare for and reset the IFT launch date. A "hot spare" approach for which an additional target is prepared at the target launch site would eliminate the need to stand down operations at the interceptor launch site in the event of a failed target launch. This could be more significant as flight testing becomes more complex or critical, such as in the small number of OT shots, when a failed target launch might be much more costly to the program. The delay to the target launch during IFT-5 is a strong example of this potential problem. If the last minute target problems could not have been corrected, IFT-5 would have slipped an additional month.

GROUND TESTING AND SIMULATION

Hardware-in-the-Loop (HWIL)

An innovative new approach needs to be taken towards HWIL testing of the EKV, so that potential design problems or discrimination challenges can be wrung out on the ground in lieu of expensive flight tests.

- HWIL development needs to focus on the EKV, since this is the most challenging technical area for NMD hit-to-kill. Funding and development needs to be accelerated or the required capability in this area will not be available to support C1 testing.
- The HWIL facility and test approach needs to be done at the highest level of EKV system integration achievable, so that all component interaction, from sensors to the divert systems, can be examined simultaneously.
- An innovative approach should be taken that provides an interactive scene generation capability that adapts to changes in EKV and target aspect angles.
- Scene generation should have the capability to challenge target acquisition by the EKV, discrimination and homing algorithms with anticipated or potential countermeasures.

Lethality

Current analysis of exoatmospheric lethality is limited to computer simulations and light gas gun tests.

- New techniques or facilities need to be developed to achieve higher speed intercepts on the ground in full scale to validate hydrocode simulations and ¼ scale light gas gun tests.
- Investments need to be made in the Holloman High Speed Test Track to permit lethality testing of medium to high fidelity representations of the kill vehicle to at least the low end of the range of potential intercept velocities.

Simulation

LIDS development has taken much longer than originally promised. Additionally, it is practically a hard-wired simulation that only the Boeing developers can modify. This precludes independent, government sensitivity analysis and assessment.

- LIDS needs to evolve to a fully validated high fidelity simulation. It should be flexible enough to allow both the Director, Operational Test & Evaluation and Service Operational Test Agencies to examine subsystem drop-outs and graceful degradation or other areas of sensitivity or design margin analysis. There is currently no apparent plan by the LSI to do this.

PROGRAMMATIC ISSUES

Performance Criteria

Discrimination by the radar and weapon system (EKV) should be given more weight in performance criteria. All other aspects of the NMD performance requirements appear to be within the state of the art of technology. Discrimination by the EKV on the other hand will be the biggest challenge to achieving a hit-to-kill intercept. Decoys that provide a close representation of the RV or modify the RV signature have only been minimally investigated.

ORD Reliability Requirements

The NMD requirements for reliability, availability, and effectiveness are specified in the NMD ORD. When these requirements are allocated to the individual elements of the NMD system, the resulting reliability performance standards are unrealistically high as well as difficult to test. As the program develops, it may be necessary to re-examine the overall requirements for NMD reliability and availability.

Risk Reduction Efforts

The following programs can make significant contributions to risk reduction efforts if properly utilized.

- Minuteman Missile Operational Evaluation testing needs to continue to be leveraged, not only for IFT rehearsal, but also to look at the impact of countermeasures to ground radar systems.
- Ballistic Missile Critical Measurements Program tests need to be conducted to examine countermeasure signatures and discrimination algorithms.

Countermeasures Hands-On Program (CHOP)

The Ballistic Missile Defense Organization sponsors a red team approach to the possible development of countermeasures. Operated at very modest funding levels, CHOP develops and demonstrates Rest-of-World (ROW) countermeasures that could be challenging for U.S. missile defense systems. By charter, CHOP does not try to develop "sophisticated" countermeasures. However, the unsophisticated, ROW countermeasures they do develop are realistic and challenging and should be included as an integral part of the NMD flight testing and ground test HWIL simulation programs.

- The CHOP program needs to be supported for aggressively examining the potential of states of concern to develop more sophisticated countermeasures.
- The Defense Intelligence Agency needs to begin tracking CHOP experiments. They should then investigate and bound the ability of states of concern to develop and apply the technologies that the CHOP teams use in their experiments to counter an NMD system. This information should then be fed back to CHOP management for planning and executing CHOP developments.

Operations in a Nuclear Environment (OPINE)

The NMD Program Office chartered a red team to look at OPINE testing and facility requirements for the EKV. The red team found the Raytheon-proposed test and parts screening program to be inadequate.

- OPINE testing needs to be conducted at the EKV system level in nuclear environments that replicate expected operational conditions, including expected flux levels.
- OPINE test facilities at Aberdeen Proving Ground and Arnold Engineering Development Center need to receive appropriate and timely funding to support EKV OPINE testing required to begin in FY02.

Hit to Kill

The NMD Program Office should investigate lethality enhancement options for dealing with potential countermeasures, using relatively simple techniques, that try to alter the effective RV size or shape in an attempt to foil discrimination and aimpoint selection.

Mr. Chairman, I want to thank you again for the opportunity to discuss these matters today. There are many important issues which justify the oversight of this Committee.

Much progress has been made, and much remains to be learned and accomplished.

A key to success will be a vigorous and robust testing program.

ACRONMYS

ABM	Anti-Ballistic Missile
AWG	Accreditation Working Group
BMC3	Battle Management Command, Control, and Communications
BMD	Ballistic Missile Defense
BPEx	Battle Planning Exercise
C1	Capability 1
C2Sim	Command and Control Simulation
CBO	Congressional Budget Office
CHOP	Countermeasures Hands-On Program
CINC	Commander-In-Chief
COTS	Commercial Off The Self
DAB	Defense Acquisition Board
DIA	Defense Intelligence Agency
DoD	Department of Defense
DOT&E	Director, Operational Test and Evaluation
DRR	Deployment Readiness Review
DSP	Defense Support Program
EKV	Exoatmospheric Kill Vehicle
FY	Fiscal Year
GBI	Ground Based Interceptor
GBR-P	Ground Based Radar-Prototype
GPS	Global Positioning System
HIC	Human-in-Control
HWIL	Hardware in the Loop
ICBM	Inter-Continental Ballistic Missile
IFICS	In-Flight Interceptor Communications System
IFT	Integrated Flight Test
IFTU	In Flight Target Update
IGT	Integrated Ground Test
IMU	Inertial Measurement Unit

IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IPT	Integrated Product Team
IR	Infrared
ISTC	Integrated System Test Capability
ITW/AA	Integrated Tactical Warning / Attack Assessment
JPO	Joint Program Office
KMR	Kwajalein Missile Range
LFT&E	Live Fire Test and Evaluation
LIDS	LSI Integration Distributed Simulation
LSI	Lead System Integrator
MBE	Management-by-Exception
MRV	Medium Reentry Vehicle
MSE	Multiple Simultaneous Engagement
NCA	National Command Authority
NMD	National Missile Defense
NMDSim	National Missile Defense Simulation
NORAD	North American Aerospace Defense Command
OPINE	Operations in a Nuclear Environment
ORD	Operational Requirements Document
OTA	Operational Test Agency
PEELS	Parametric Endo-Exoatmospheric Lethality Simulation
PLV	Payload Launch Vehicle
ROW	Rest-of-World
RRF	Risk Reduction Flight
RV	Reentry Vehicle
SBIRS	Space Based Infrared System
TEMP	Test and Evaluation Master Plan
TPM	Technical Performance Measure
UEWR	Upgraded Early Warning Radar
USSPACECOM	U.S. Space Command
VAFB	Vandenberg Air Force Base
XBR	X-Band Radar

Mrs. CHENOWETH-HAGE [presiding]. Thank you very much, Mr. Coyle, for your testimony.

The Chair now recognizes General Kadish for his testimony.

General KADISH. Madam Chairman, members of the committee, thank you for the opportunity to testify on the National Missile Defense program this morning and to discuss the impact of the test results to date on our technological maturity and the challenges we face. I have not had the privilege of appearing before your committee until today, and I am pleased to be able to do so.

In general, there are basically two ways to look at the program's progress to date, and they could be termed the "glass half-full" and the "glass half-empty." While our objective is to make the glass completely full, my assessment at the moment is that it is half full. I say this because we have made remarkable progress and substantial technical progress, despite two high profile test failures.

As you know, we have been aggressively pursuing the development of the NMD system to achieve operational status as soon as practicable.

Mrs. CHENOWETH-HAGE. General, excuse my interpretation. Would you pull your microphone closer?

General KADISH. Our complex goal of fielding a system within a short timeframe is not unprecedented. Indeed, it has been compared with the urgent programs to deploy our Nation's first nuclear ICBM force.

On average, it took 4¾ years for the Poseidon, Polaris, Trident I and——

Mrs. CHENOWETH-HAGE. General, would you please start over.

General KADISH. OK.

Mrs. CHENOWETH-HAGE. Thank you very much.

General KADISH. In general, there are two ways to look at the program's progress to date, and they could be termed the "glass half-full" or the "glass half-empty." While our objective is to make the glass completely full, my assessment at the moment is that it is half full. I say this because we have made remarkable and substantial technical progress despite two high-profile test failures.

As you know, we have been aggressively pursuing the development of the NMD system to achieve operational status as soon as practicable.

Our goal of fielding a complex system within a short timeframe is not unprecedented. Indeed, it has been compared with the urgent programs to deploy our Nation's first ICBM force. On average it took 4¾ years for the Poseidon, Polaris, Trident I and II sea-launch ballistic missile programs and a Minuteman I, II and III ICBM programs to field the capability. That is from the engineering, manufacturing and the development stage to the achievement of initial operational capability.

While the proposed NMD system is in some ways a more complex system than its predecessors, each of these earlier programs had its own significant managerial, technical, schedule and political challenges to meet. In other words, our goal of defending the entire country against an emerging threat by an NMD system on an aggressive acquisition schedule does not represent an unprecedented divergence from the way we have procured some major systems in the past. However, it does represent a major divergence from the

way we have normally pursued weapon system programs over the past 20 years.

I should also point out that all development programs experience problems, especially in their early stages and when pioneering new military capability. The Atlas ICBM program experienced 12 failures in its 2½ year flight testing history and the Minuteman I program suffered 10 failures in a 3½ year testing program. The Corona program in the early sixties to deploy our first strategic reconnaissance satellite survived 12 failures and mishaps before the first satellite could be successfully orbited. Its engineering challenges included mating an unproven satellite to a booster, launching a multistage rocket, separating the payload in space, ensuring the right orbit, orienting and operating optical sensors and coordinating the ejection of film capsules, and recovering the undamaged capsule after reentry.

The point is that birthing a revolutionary technology and making it useful is a tough engineering job that requires discipline, patience and vision. To expect all activities to be successful is unrealistic given the history of such endeavors. When our Nation faced great need, program support by our national leadership persisted despite frustrations resulting from test failures and technical difficulties. As a result, once troubled programs have made profound contributions to our national security.

Over the past 11 months the NMD program has had two failures in the three intercept flight tests conducted so far. While these were disappointments, we were able to collect valuable information on the integration of the system and we have a full schedule still ahead.

Let me briefly discuss a little different perspective on operational testing. These early integrated flight tests that I mentioned do not meet the generally accepted definition of operational realistic testing that Mr. Coyle pointed out. They were never intended this early in the development phase. Ours is "walk before you run" approach. We have just recently entered the fully integrated testing phase after which the tests in our current plan will become progressively more stressful. The increasing complexity of our tests will involve among other things greater discrimination challenges, longer ranges, higher closing speeds and day and nighttime shots. The way our current testing program is planned, we will do a series of tests that become increasingly operationally realistic by the time the final independent operational test assessments must be made. This occurs years later in the program test series.

Now I'd like to discuss some other fact of life testing issues, specifically range limitations.

Range limitations are an inescapable reality and a direct result of the fact that our test range extends over about 4,000 square miles of the Pacific Ocean. These test restrictions include safety constraints on missile overflight and impact areas. I'm sure we'd hear about it if the missile parts came raining down on Californians or Hawaiians or startled fishermen in the Pacific Ocean. We also don't want to add to the space debris, that it might threaten orbital or space launch paths. The effect of these restrictions is that we are permitted to flight test in only a limited part of the designed operating envelope and along different geometries than

those from which potential missile threats might appear. We have to use robust simulations that are firmly anchored on and updated from data from earlier ground and flight tests to test the system under conditions our test ranges cannot permit.

These restrictions were highlighted in both General Welch's and Mr. Coyle's independent reports and we need to address them as we proceed with the program. We are doing that. It's not that we don't want to change the restrictions but the cost, risk and policy issues must be resolved. These fact of life constraints, however, do not represent a problem for the near term, but we can increase our confidence in the system as we proceed if they are addressed now.

Just to give you an example, let's consider the necessary role of the so-called C band beacon transponder and the global positioning system [GPS], equipment attached to the target warheads. These are necessary outgrowths of our testing limitations. None, I repeat none, of this equipment in any way aids the kill vehicle in finding, discriminating or intercepting the target during the final stages of the flight test.

The C band beacon is necessary for the surrogate radar in Hawaii to act as if it were an upgraded early warning radar since we do not have one down range for the test. The GPS system allows the manager controlling the test to monitor the location of the target for range safety. It also provides the engineers examining post test data a critical source of validation information. It helps us to know what we saw or thought we saw at any precise time during the engagement.

These beacons answer two of the most critical needs of any test program, ensuring the safety of all in the area, in this case the South Pacific, and ensuring we receive a comprehensive and adequate set of data. Should our other tracking systems fail during the test and thus not provide the target's location adequately, we would as a last resort use the GPS data to direct the kill vehicle to its sensor acquisition area in order to salvage the end game aspects of the test. In this case, we recognize it would no longer be a successful integrated system test, but it would provide more and useful information on the autonomous homing and discrimination capability of the kill vehicle. Again, this is only as a backup in the event of radar failure in the middle of what is a very expensive flight test.

Finally, I'd like to discuss countermeasures. Countermeasures and counter-countermeasures are part of the continuing interaction of offensive and defensive systems throughout history. They are not new, nor are they unforeseen or unplanned for. The NMD system is itself a countermeasure against the threat of ballistic missiles. The United States understands the challenge of missile countermeasures. We've been in the missile business for a number of decades now and we've developed some very sophisticated sensors, computers and discriminants. We are continuing to refine these capabilities.

But it is fair to say that we have not fully tested the NMD systems against countermeasure suites we expect. It's too early in our development effort. Our early test objectives are focused on accomplishing the basic technology of hit to kill. We do, however, have great confidence based on the testing and analysis we have done

so far that we will be effective against the countermeasures we expect, and our future testing will confirm that confidence.

Still, critics continue to fuel the skepticism surrounding the issue by using a simple technique, theory and practical application are the same. In other words, countermeasures may be easy science on paper, but effective ones are not all that simple to develop and even less simple to implement. The engineering challenges are very substantial. Structural issues can affect range, accuracy and payload, and no nation can place confidence in the effectiveness of its program without testing. Those who argue that a system can be defeated by countermeasures usually base their argument on assumptions that favor the offense while downplaying the capabilities of our emerging defensive system.

In my view, credible, sophisticated countermeasures are costly, tough to develop, and difficult to make effective against our NMD design. Simple, cheap attempts can be readily countered by our system. I have made more extensive comments on this countermeasure issue in my written comments.

In summary, Madam Chairman, I believe our glass is half full. We have made remarkable progress. We have shown that the foundation of our system hit to kill is achievable. While the test failures we've had so far are certainly disappointments, they are not unprecedented for the program of this scope.

We have major challenges ahead as we work to continue to fill the glass and my goal is to fill it, but our progress to date has been solid. The challenges are no longer ones of basic science or technology. We know our fundamental design can work. The challenges before us are those of engineering and integration and building reliability into the system.

Engineering, the schedule challenges and the technology integration tasks are tough. We are, however, ready to proceed aggressively.

Thank you.

[The prepared statement of General Kadish follows:]

Statement of

Lieutenant General Ronald T. Kadish, USAF

Director, Ballistic Missile Defense Organization

Before the

House Subcommittee on National Security,

Veterans Affairs, and International Relations

Committee on Government Reform

Friday, September 8, 2000

Good morning. Mr. Chairman and Members of the Committee, it is my pleasure to appear before you today to highlight the progress we have made and address challenges we face in our National Missile Defense program. I have said all along that our optimism with respect to this high-risk program must be tempered by realism. The goals we have set are demanding, and this is part of the reason we have not hit the mark in all of the areas where we expected to make progress. Nonetheless, Mr. Chairman, it is also true that, despite the many constraints we face, the progress we have made over the last two years has been remarkable. This morning I would like to describe briefly the NMD program and speak to a few of the more significant challenges we face.

The NMD Program in Historical Context

The charter of the Ballistic Missile Defense Organization (BMDO) is to develop, demonstrate, and deploy when directed a system to defend all fifty states against a limited attack involving intercontinental ballistic missiles (ICBMs) with unsophisticated countermeasures launched by states of concern, such as North Korea, Iran, and Iraq. The most recent National Intelligence Estimate provides no indication that this threat has diminished. In response to Congressional and Administration direction, we are aggressively pursuing the development of the system, and we will achieve operational status as soon as directed to do so.

The NMD program is on an admittedly high-risk schedule. It has been compared with the urgent programs to deploy our nation's first nuclear ICBM force. But the goal of fielding a complex system within a short time frame is not unprecedented.

On average it took 4 ¾ years for the Poseidon, Polaris, Trident I and II SLBM programs and the Minuteman I, II, and III ICBM programs to field a capability—that is from the engineering, manufacturing and development stage to achievement of initial operational capability (IOC). While the proposed NMD system is in some ways more complex than those listed above, each of the programs I cited had its own significant technical and schedule challenges to meet.

In other words, our goal of defending the entire country against an emerging threat by developing an

NMD system on an aggressive acquisition schedule does not represent a radical divergence from the way we have procured some major weapon systems critical to national security. Moreover, most development programs have problems associated with them, especially when they are set up in order to pioneer the introduction of a new military capability. As a rule, we expect problems to emerge during developmental testing. It is not unusual for such problems to cause test failures. The Atlas ICBM program experienced 12 failures in its 2 ½ year flight-testing history. And the Minuteman 1 program suffered 10 failures in a 3 ½ year testing program.

Our national space programs also have experienced critical problems that have caused many in this country to raise serious concerns about our ability to access space. Indeed, a series of launch mishaps occurred in the 1980s and 1990s involving several of America's operational space launch vehicles. Between 1984 and 1987, catastrophic failures and mission-ending glitches in our Atlas, Titan, Delta, and Space Shuttle launchers destroyed or rendered useless critical satellite payloads for enhancing national communications, intelligence-gathering, and weather-monitoring missions. The tragic loss of the Challenger and its crew in 1986 caused the entire shuttle fleet to be grounded for many months thereafter. Indeed, for much of 1986, as a result of these failures, the United States lost its ability to place heavy objects in orbit.

A similar string of failures in recent years reminded us that launching rockets and missiles remains a challenging and risky business. The years 1998 and 1999 were not good years for the Titan force. A Titan IVA exploded shortly after launch in August 1998, destroying a critical national payload. A malfunction in its upper stage in April 1999 caused a Titan IVB to place a DSP satellite in the wrong orbit. Later that same month, another failure in a TitanIVB upper stage put a Milstar satellite in a useless orbit. The Delta 3, which was attempting its first successful launch, failed twice. This most recent series of space launch mishaps in old and new launch systems destroyed or rendered useless billions of dollars in intelligence, early warning, and communications satellites.

From my point of view, the once-secret Corona program is very instructive in this regard. The managers of one of our earliest space programs had to survive 12 failures and mishaps (and a partially successful mission to recover the first object from space) before they orbited this country's first operational reconnaissance satellite (Discoverer 14). I find some of the parallels between Corona and our NMD program to be particularly striking. Among other things, booster development was in its infancy, and today, although we have come a long way, building reliable boosters for our missile programs continues to be a challenge.

Other engineering and integration challenges in the Corona program included: designing a technologically unproven satellite payload and marrying it with a booster; launching a multistage rocket and separating from the payload in space; achieving an orbit appropriate for the mission; operating and orienting optical sensors for maximum effectiveness over the operational lifetime of the satellite; sending telemetry for the successful capture of the film capsule by the recovery aircraft; and protecting the film capsule from reentry to return undamaged film to Earth for processing and analysis.

Through it all, program support by our national leadership persisted despite frustrations resulting from these technical difficulties, and as a result, this national priority program made profound contributions to our security. In fact, despite difficult technical problems, all of the programs I mentioned worked very aggressive schedules and went on to produce reliable and effective systems, and follow-on systems, that have served the nation well for decades. The point is that birthing a revolutionary system and making it useful is a tough engineering job that requires discipline,

patience, and vision, and to expect all development activities to be successful is unrealistic given the history of such endeavors.

NMD Development Challenges

Our current plan is to develop an initial system, consisting of 20 interceptors, as soon as possible. This threshold system will be expanded to meet the evolving threat. Within two years of achieving IOC, we plan to expand the system to include 100 ground-based interceptors (GBIs) based in Alaska. We refer to this more capable system as the Expanded Capability 1, or Expanded C1. The initial C1 architecture will incorporate upgrades to the five existing ballistic missile early warning radars and an advanced X-Band Radar (XBR) based in Shemya, Alaska. The NMD system will use the Space Based Infrared System (SBIRS) High, which eventually will replace the existing Defense Support Program satellite constellation to detect initial launch.

The legacy of technologies employed in the NMD system can be traced back at least to the 1980s. Development of our ground-based sensor elements, namely the X-Band Radar (XBR) and the Upgraded Early Warning Radars (UEWRs), in fact may be traced back to the development of the Ballistic Missile Early Warning System (BMEWS) in the 1960s. Non-nuclear ground-based interceptor technologies owe a great deal to the successes we had in the 1984 Homing Overlay Experiment, the Exoatmospheric Reentry Interceptor System (ERIS) program, and the current Patriot Advanced Capability-3 (PAC-3) and Theater High Altitude Area Defense (THAAD) programs. Space-based sensors for early warning have a program history dating back to the Defense Support Program begun in the early 1970s. We also have capitalized on subsequent space-based sensor development programs, so that today we look forward to the deployment of very powerful Space-Based Infrared Systems (High and Low). Similarly, our battle management and advanced information processing and handling capabilities have a legacy running back to the late 1980s.

In other words, we are not awaiting some technological breakthrough in order to proceed with NMD system development. The technologies we are using in our elements—our sensors, interceptors, and BM/C3—are not what make this a high-risk program. Rather, it is our short development schedule that compels us to work with so much risk. High risk means that a significant failure or delay in one element of the system will not allow me to maintain the current schedule. The technical challenge before us has more to do with "system integration" than it does with "technology development." The key development challenge, therefore, is to design and test a system that integrates all of the elements into a reliable system of systems on an aggressive schedule.

NMD Test Program

One of the critical challenges the NMD program faces is ensuring that adequate testing takes place within the schedule in order to provide the data and confidence in technology to support acquisition decisions. Each program milestone must be preceded by key performance milestones, which will be measured in our test and evaluation activities.

The NMD program has a multifaceted and comprehensive element and system test program that extends out through Initial Operational Test and Evaluation. This test program will demonstrate the ability of the elements to operate as an integrated system. It includes numerous integrated flight and ground tests, several risk reduction flights, software and hardware-in-the-loop tests, and many other ground tests and simulation exercises. Most of our testing activities will continue to take place "off center stage," by which I mean that these activities tend to receive much less public attention than our

intercept flight tests. Notwithstanding their relatively low profile, these other testing activities provide us with critical development information that gives us confidence that we are proceeding nearly as we had intended in our overall program.

A key component in the final review for initial operational capability will be the assessment of the independent operational test agencies as to the operational effectiveness and suitability of the system. A decision to declare the NMD system operationally capable will not occur without adequate testing and assessment. Naturally, because the testing program is an integral part of our acquisition plans, further significant slips in the testing program would be expected to have an impact on the overall schedule.

This past June, before our last integrated flight test, the NMD Independent Review Team (IRT), chartered by the Secretary of Defense and led by retired Air Force General Larry Welch, finished another thorough review of the NMD development program. The IRT identified a number of challenges associated with it but concluded that, given the adjustments to the schedule that have been made, "the technical capability to develop and field the limited system to meet the defined C1 threat is available." It also expressed concern about the continued high-risk schedule. The team noted with some concern that the flight test restrictions on trajectories, impact areas, and debris in space restrict our ability to test overall system performance limits. I would like to run through a few of the challenges cited by the IRT and a few others that I believe are significant.

While the NMD testing program has experienced delays in development and testing, ground and flight tests to date have demonstrated about 93% of the system's critical engagement functions and shown the ability to integrate the system elements. We had planned to be at about 94% by this stage, so we are very nearly where we expected to be.

We have made good progress. The elements that are the system's "eyes," "nerve network," and "brain" continue to perform at or above expectations. Our major element sensors, or "eyes," which include the existing Defense Support Program satellites (scheduled to be replaced by SBIRS High), provide early warning data and cue the ground-based radars. In all of our tests to date, DSP satellites have provided the necessary alerts to begin the engagement process. The ground-based radars also have performed within design parameters. The EWR has shown repeatedly its ability to acquire and classify the targets, and the prototype XBR (GBR-P) has demonstrated remarkable detection accuracy and sensitivity.

Communications are managed by a complex Battle Management Command, Control, and Communications (BM/C3) system that updates the engagement plan every 10 seconds. The BM/C3 system, the system's "brain" and the core of a "nerve network" that reaches out to all of the elements, passes data and commands throughout the system and meets our human-in-control requirements. It also has met expectations. An additional element, the In-Flight Interceptor Communications System (IFICS) transmits the target object map to the in-flight Exoatmospheric Kill Vehicle (EKV). During the last integrated flight test, the IFICS sent accurate target updates to the kill vehicle. Given the separation failure in the interceptor, however, we were unable to confirm the EKV's ability to receive and process that data. Our ground tests, however, give us confidence that the IFICS-EKV communications and associated data processing will not pose a significant problem. Finally, based on the successful intercept test last October, we also have confidence that the EKV can discriminate and differentiate the simulated RV from other objects in a simple target cluster and execute internally processed commands to guide itself to the target RV and collide with it. We expect future tests to demonstrate that the EKV is equally effective against more complex target clusters.

IFT-3, a partially integrated intercept test, demonstrated our ability to do hit-to-kill as well as on-board discrimination and target selection. Integrated Flight Tests 4 and 5 were our first integrated system tests, and our second and third hit-to-kill tests. IFT-4, which occurred in January of this year, was partially successful. Although we failed to achieve an intercept, we did test and demonstrate the integrated functionality of the major NMD system elements, the operation and performance of the ground sensors, operation and functionality of the BM/C3 system, and EKV performance up to the last seconds in its flight. The EKV acquired and tracked the RV and decoy but, because of a plumbing failure in the cryogenic cooling system, the infrared sensors lost sight of the target objects. The disabled EKV was unable to intercept the RV.

The most recent intercept test took place on July 7. IFT-5 had the same test objectives and scenario as IFT-4, with one difference. We added the in-flight interceptor communications system element designed to facilitate transmittal of message traffic to the EKV from the battle management system. Following the launch of the target missile from Vandenberg Air Force Base, the EKV, mounted atop a surrogate booster, launched normally out of Kwajalein Missile Range and headed toward the projected intercept area. Because the EKV failed to separate from its booster following second stage burn-out, no interceptor objectives were completed. However, a great deal more data was gathered on the functionality of all of the other elements, including the IFICS, which was able to send information to the boosting EKV.

While the intercept flight tests arguably are the most important tests we can run, mainly because they are most representative of how an operational system would have to perform, they are only one source of the enormous amount of data we have collected. The IFT-4 and 5 test failures that have captured the public eye must be viewed in this context. The important point to take away from these two high-profile failures is that the troubles associated with each were unrelated, meaning that the problems are fixable. The problems we have experienced reflect process problems in basic engineering and fabrication, not underlying flaws in the core NMD technologies or design.

IFT-5 was a disappointment because it did not substantially advance our knowledge of system performance. The test did support what we learned from previous tests and served to validate the integration of the system. For intercept purposes, IFT-5 did not provide us any more information than we would have obtained from any of our risk-reduction flights. Integrated Flight Test 6 will give us the opportunity to do what we had hoped to do this past July. Nevertheless, in the context of our development program, we are one for three in the intercept column. This is not where we expected to be with respect to our flight-tests, but I look at where we are today in this program as a "glass half full," even though the two failed intercept attempts have resulted in disappointment and frustration.

Our Integrated Ground Tests (IGTs) remain critical to our program because they are not subject to flight test restrictions and can run numerous engagement scenarios over the course of a few consecutive weeks. Our ground test capabilities are growing and becoming increasingly representative of NMD production elements as the NMD program matures. The most recent IGTs successfully demonstrated the integration of BM/C3 with the UEWR and XBR and partially succeeded in testing the performance of the C1 architecture against some C1 scenarios.

As I have stated already, this is a high-risk program for the very reason that a significant failure or delay in one element might not allow the program to meet a near-term deployment date. The delays in operational booster production are a cause of some concern and threaten to be that major problem that could significantly impede development progress. While parts of the booster have been used

individually in space launchers, they have never been integrated into one system. We are aggressively exploring ways to restructure the NMD program to fix these delays and reduce schedule risk.

As I mentioned earlier, the NMD program executes a series of Risk Reduction Flights in addition to Integrated Flight Tests. These are very significant tests involving all of the elements of the NMD system, except the GBI. Some of these tests are aimed specifically at assessment of the NMD ground-based radars. In these tests, target payloads are launched, and the system elements tested to further prove the design and effectiveness of the system and weed out any problems before we execute the tests involving the EKV. Risk Reduction Flights are essentially rehearsals that strive to stress the sensors in the system well beyond their required capacities for the early intercept tests.

As part of our Risk Reduction Flight program, we also execute what we call Radar Credible Target scenarios, where we use objects that do not have as many data handling devices on them and we place many more objects in the cluster. These flights test the maturity of our X-Band prototype based at Kwajalein as well as the west coast Early Warning Radar. Following the current schedule, we are running on average two to three Risk Reduction Flights per year. Two more such flights are scheduled to take place before the end of FY01.

We also look for other flight opportunities to test the system elements. For example, in FY99 the U.S. Air Force launched two test rockets from facilities on Kodiak Island in Alaska that released multiple objects on a trajectory that ran along the west coast of the United States. We used these launch opportunities to further test the capability of our west coast EWR. We then took that data and ran an analysis as to how the upgraded early warning radar would have responded. In May 2001, the NMD program will launch its own target complex out of Kodiak as one of its Risk Reduction Flights.

Delays in ground-testing and in our primary modeling and simulation tool, the Lead System Integrator Integrated Distributed Simulation (LIDS), need to be fixed. Although no other system can provide all the integration and functionality of LIDS, numerous test beds, hardware-in-the-loop facilities and NMD simulation and tools are available to support our engineering and integration efforts. We have other model and simulation tools, for example, that address the element-level rather than the system level of operation.

Testing Constraints and Operational Realism

Based on the testing guidelines developed within and approved by the Department in 1999 and a recognition that we are still early in the development testing phase, we have demonstrated substantial progress.

The DoD-directed NMD Independent Review Team concluded that confidence in the assessments of the operational effectiveness of the NMD system is impacted by the variety of real-world, fact-of-life test restrictions concerning missile overflight, impact area, and space debris. The result of these restrictions is that we are permitted to test the system in only a limited part of the required operating envelope. These restrictions do not present a problem in the near-term, but we can increase our confidence in the system as we proceed with the program if they are addressed now.

The testing restrictions that we face and the safety concerns we have are tied to the reality that we must demonstrate the planned NMD system on what, in effect, is a global test range. The boundaries of the range we currently use cover more than 4,000 miles and extend in a southwesterly direction from the west coast of the United States out over the Hawaiian islands and across the Pacific ocean,

ending in the vicinity of the Kwajalein Atoll, which is located in the Marshall Islands. Within this range, the trajectories of our target missiles fly well over 100 miles in altitude, reaching out and touching the fringe of outer space. The geographic expanses we must work with are enormous, and the speeds at which our target missile and the ground-based interceptor must travel, which are measured in thousands of miles per hour, mean that the engagements we plan take place within a matter of minutes. You can see the challenge that this presents for the tester, who must be able to use existing launch ranges and sensor assets as well as deploy a far-flung network of element prototypes and surrogates to create stressing testing conditions that approximate as closely as possible real-world engagement scenarios.

Yet even this expansive test range is relatively small when compared to the distances and altitudes involved in missile flights towards the United States from, for example, the Middle East. Assuming ground-based interceptors based in Alaska, a Middle Eastern engagement scenario involving a missile heading towards Florida would take place across a geographic expanse that spans roughly half the globe—from Alaska to the Middle East. An intercept at this range, and at even shorter ranges, would take place in Earth orbits that come close to points in space used by many satellites.

Our current policy to minimize space debris, moreover, restricts our tests to lower altitudes and modified trajectories. The debris that could result from a collision at higher altitudes may produce fragments that could remain in orbit for many years. The higher an object is in orbit, the longer it will take for it to reenter. Test results to date show that, with a direct hit, the target would be shattered into very small pieces. Given the sizes of these pieces, they would easily burn up once they reentered the atmosphere, minimizing to some extent the concern about space debris. But during testing we could not guarantee a hit in the "sweet spot" of the target in every instance, and, as a result, larger fragments may persist in orbit. So the concern about space debris resulting from our tests is one of the reasons we must limit our demonstrations of hit-to-kill to lower altitudes. At these lower elevations, any fragments or parts of the EKV or target RV that survive impact would burn up relatively quickly upon reentry into the Earth's atmosphere.

Given the truncated flight range from Vandenberg Air Force Base on the west coast to Kwajalein, we must restrain our interceptor velocities in order to stay within the bounds of the Kwajalein Missile Range. Added to this are range safety concerns (that is, the safety of ocean vessels and residents in Hawaii and the Marshall Islands), which restrict us to a limited number of trajectories and intercept altitudes and velocities that are on the low end of how we would like to test.

All of these constraints introduce a degree of artificiality into the NMD testing program. In order to strive for greater operational realism, the NMD program constructed a prototype X-Band Radar (the GBR-P within the KMR test range) and uses an EWR surrogate (the FPQ-14, which is an existing range asset located in Hawaii) in order to watch, track, and discriminate the approaching target. The GBR-P radar capability, and its proximity to the interceptor launch site, does not allow it to provide tracking information as early in the flight test as would an operational XBR (the GBR-P location prevents midcourse tracking because the Earth's curvature blocks its view).

Since production-representative hardware is not now available, the NMD program used surrogates and prototypes to support early developmental testing to provide a basis for system functionality assessments. As the elements mature, the prototypes will be upgraded to reflect the production configuration and in some cases, be replaced by the maturing element. The GBR-P will serve as the XBR prototype, receiving software upgrades, and will be replaced by the XBR at Shemya, in the initial system. The BM/C3 is involved in testing today and will continue to receive software up-

grades throughout program development. The Ground Based Interceptor is represented today by the Exo-atmospheric Kill Vehicle and Payload Launch Vehicle, but will be replaced by the Ground Based Interceptor in FY02. The DSP satellites represent the SBIRS element, and will continue to do so until SBIRS-High is deployed. The Early Warning Radar and FPQ-14 radar represent the UEWR in testing and the FPQ-14 radar, which is also required for range safety, serves as a source of midcourse target information for Weapon Task Plan formulation.

The use of prototypes and surrogates is common practice during flight tests for most weapon systems and play an important role in early developmental testing. The use of surrogates, however, should not be confused with the need to employ systems that help us to meet range safety requirements. The use of the systems like the FPQ-14 and GPS satellites, in other words, should not be construed to imply that the tests are rigged. In reality, the GPS is used for truth data and as a back-up should ground based radars fail to provide adequate information for Weapons Task Plan development. GPS will continue to be used in this manner as an essential backup system to allow a test to continue should a radar problem occur during a test. As it turned out, we did not need GPS to track the target during IFT-4 and IFT-5--our radars did all of that work.

The FPQ-14 radar is also used for range safety (we do not want to launch a RV without knowing where it is at all times) and post-test analysis as well as a source of mid-course target tracking (i.e., as a UEWR surrogate). We are exploring alternatives to the use of FPQ-14 as a surrogate for an NMD system element. The FPQ-14 radar, however, would remain a necessary part of the range safety architecture.

Other surrogates we must use at this phase in our scheduled tests are the DSP satellites (which will be replaced by the SBIRS-High constellation) and the Minuteman-derived Payload Launch Vehicle, which will serve our purpose until we bring the production booster on line.

Test range limitations and the use of surrogates are constantly under scrutiny to determine how to maximize our return on the existing investment while leveraging them to meet future operational test requirements. Some testing artificialities will be minimized as the system matures and we introduce production representative elements. It is our goal to incorporate more realistic scenarios, including long-range intercepts and intercepts with greater closing velocities, and we are currently assessing ways to do so. A significant investment in test range infrastructure will be required to achieve tactically representative flight test scenarios. We also are currently developing launch infrastructure at the Kodiak launch facilities in Alaska, which will allow us to fly the target missile towards KMR, which will add additional engagement geometries.

Yet other restrictions on operational realism will never go away. For obvious safety reasons, we do not want to test our system capabilities by launchinig an ICBM towards the United States, nor do we want to test our ability to counter a live nuclear warhead. The fact that we have testing assets out in the Pacific also will mean that we can only launch target missiles in one direction—westward. Our present inability to launch target missiles in the opposite direction restricts our ability to assess the impact the Earth's rotation might have on the flights of the target missile and GBI.

We also have been criticized for not making our intercept flight tests more realistic with the addition of realistic decoys. But as I will outline below, the NMD test program will become increasingly operationally realistic by 2004. In general terms, our testing approach is to test individual system components, one by one, and then gradually link them for partially-integrated and, later, fully-integrated flight testing. The tests also will become progressively more stressful, involving, among

other things, greater discrimination challenges, longer ranges, higher closing speeds, and day and nighttime shots. The results from each test are fed into subsequent tests and models, so that incremental improvements may be made to the elements and the system.

The NMD flight test program is structured to provide targets of increasing threat realism as testing progresses through development testing to operational testing, within range, safety and test asset limitations. The flight test program began with seeker characterization flights. In IFT 1A and 2 we sought to identify the different capabilities of two competing suites of EKV sensors. The Boeing sensor suite flew on IFT-1A and the Raytheon sensor suite, the one we chose to go into our operational system, flew on IFT-2. The testing objectives for these first two flight tests were different from and, in some ways, much simpler than the testing objectives of the integrated flight tests that followed because they tested only how well the two competing sensor suites could see the dummy warhead and countermeasures. Hit-to-kill was not attempted in these first two tests. The NMD team evaluated EKV performance on the basis of their ability to collect target data to validate our discrimination capability.

The target clusters released in space for the first two flight tests contained the reentry vehicle, nine decoys, and the target deployment bus. This significant countermeasures package contained more objects than the countermeasures packages we employed during IFTs-3, 4, and 5 because we wanted to see how well the EKV sensors could discriminate within the target complex and identify the warhead.

We have been criticized for using only a single large balloon in subsequent integrated flight tests. Consistent with our early flight test objectives, we dramatically reduced the number of objects in the target complex because our testing objective in IFTs-3, 4, and 5 changed from one of simply seeing and discriminating among the objects to one of maneuvering at very high speeds and ramming into the warhead's "sweet spot" as well as seeing the objects, discriminating among them, evaluating them, and selecting the warhead instead of the decoy or rocket stage. In other words, we were testing our ability to do hit-to-kill in the last three intercept flight-tests. These tests were not set up to evaluate the ability of the system to discriminate real world countermeasures. The goals in these tests were very different and the challenge (because we were attempting to hit the target RV) was much greater than in the first two tests.

With respect to defeating future likely countermeasures, General Welch's independent panel concluded that, while there is extensive potential with the designed system to grow greater discrimination capabilities, the NMD program needed to test beyond the C1 design discrimination capabilities. We agree and plan a number of tests that go beyond the C1 requirement.

NMD Counter-Countermeasures Capability

Aside from the technical and schedule challenges I have just mentioned, one major area of controversy concerns the NMD system's susceptibility to countermeasures. So I would like to take some time this morning to address the countermeasures problem. Before I begin, though, I would like to emphasize the fact that many of the discrimination technologies and techniques the proposed NMD system relies on cannot be discussed in an open forum. There are legitimate national security concerns about divulging our counter-countermeasure capabilities, so that our objective must continue to be one of preventing access to information by potential adversaries concerning the design specifications of our counter-countermeasures system.

Countermeasures are part of the natural evolution of any military capability. Every weapon system we have today is susceptible to a countermeasure. All weapon systems will be scrutinized by potential adversaries and probed for weaknesses. The NMD program itself represents our attempt to reduce the advantage held by potential foes armed with long-range offensive weapons and is a "countermeasure." So, given that we can expect this kind of interaction today and in the future, we will face countermeasures that will try to confuse the system about the real threatening target. The question is: what do we do about it?

Discrimination, or our ability to find the target in the presence of countermeasures, is a major technical challenge. The ability to discriminate between decoys and RVs has always been a part of our design criteria. Our initial capability will be able to handle simple countermeasures, with significant capability inherent for more sophisticated countermeasures as they present themselves.

We are designing a system that allows each element to gather and share data throughout the engagement in order to enhance discrimination and improve kill probability. We have designed a system of systems that uses more than the kill vehicle to discriminate among countermeasures. Major advances in focal plane array technology and computer processing allow us to deploy extremely sensitive "eyes" in space and on the ground. Space-based infrared sensors would detect and project a tracking path and monitor such things as booster burnout, which might help identify the type of missile. Information from Defense Support Program satellites, and later Space Based Infrared System "High" satellites, will be handed over to the ground-based radars. EWRs would acquire and classify the target complex. The discrimination capability of EWRs would be refined over the length of time that it viewed the target cluster, helping to distinguish and do initial characterization of objects.

The cluster is then tracked and information handed over to the XBR or the in-flight EKV. The XBR would discriminate using a variety of techniques to determine, in some cases very precisely, the number, characteristics, and movements of objects in the cluster. By way of illustrating a portion of its capability, the XBR will be powerful enough to distinguish a golf ball 2,400 miles away, or the distance between Washington, D.C. and Seattle.

Using increasingly fast, small, and powerful computers, the NMD battle-management system processes large volumes of data in order to integrate operations, sort through and prioritize tracking and cueing information, and control multiple intercepts. Using refined data fed to it by ground sensors and the command center, the EKV acquires the target cluster, and further discriminates and characterizes the objects using IR and optical sensors. Once the EKV's internal processing unit identifies the target, it uses this information to set up a collision course with the target object. Using its sensors and other advanced hit-to-kill technologies (including advanced thrusters), the EKV refines its path to the target and rams into the RV, destroying both itself and the target.

What this means is that the baseline NMD discrimination toolbox can do precise measurements using multi-frequency, multi-aspect composite discrimination. With the addition of the SBIRS-Low satellite constellation, a capability to view payload deployment would be added, providing dual-phenomenology, multi-aspect SBIRS-radar composite discrimination, for an even greater advantage against states of concern. It is important to understand the countermeasures released in the midcourse part of the trajectory will not just instantaneously appear to confront the on-coming EKV. The NMD system of sensors is capable of "watching" a missile and the deployment of its payload, including countermeasures, from the early stages of flight through the terminal phase.

I am confident that countermeasures initially deployed by states of concern will not be sophisticated enough to fool all of the discrimination capabilities employed by the planned NMD system. Each of the elements contributes uniquely to the discrimination mission using various measures and extrapolating additional information derived from physical principles (e.g., launch trajectories), which can then be processed on the ground and by the EKV. What might fool a XBR might not, for example, fool the planned UEWRs, SBIRS-Low, or the EKV. The system is redundant and synergistic, so that the total capability is greater than the sum of the parts. This synergy among the elements should be expected to improve as the system evolves by upgrading software and hardware, increasing the number of existing elements, and augmenting the system using additional platforms in other geographic environments.

In April of this year, critics from the Union of Concerned Scientists released a widely publicized and frequently cited report on the susceptibility of the NMD system to even the simplest countermeasures. I have read the report carefully and I am impressed with the scientific effort put forth. But as in any scientific analysis, you must look very carefully at the underlying assumptions. I believe the report's conclusions are based on assumptions that tilt in favor of the offense and against the defensive system we are developing. I do not believe the report gives proper credit to the capabilities of the proposed NMD system, nor does it take into account that our discrimination and lethality capabilities will evolve as the threat matures.

Indeed, the report's conclusions are based on assumptions that would indicate more 'knowledge' than anyone--even I--have regarding the capability of the more far-term "C3" NMD system, a system for which we do not yet have finalized plans. Moreover, I also believe these critics base their conclusion on erroneous assumptions about the threat, that they grossly overestimate the countermeasure capabilities of countries like North Korea, Iran, and Iraq yet minimize our ability to respond. Nevertheless, we have been and are continue to solve the countermeasures challenge, both in terms of gaining a better understanding of what potential adversaries would actually be able to do and evaluating our system's ability to handle them.

The technical and operational challenges facing potential adversaries are several. If an attacker were to have any confidence in the operational effectiveness of his countermeasure package, that attacker would have to have access to NMD technology and understand the concept of operations. The critical defense functions that need to be overcome include: detection; track and aimpoint prediction; discrimination; acquisition; homing; intercept; and kill assessments. The attacker, after all, has the difficult task of assessing and responding to BMD systems designed specifically to counter his threat.

Unless they purchase more sophisticated ICBMs, states of concern will have to go through an evolution in the development of their missile systems. There are significant challenges in designing and building the booster, integrating guidance, navigation, and control, and engineering the RV. All of these elements then have to be integrated into the whole system. The development of warheads is especially difficult, mainly because of the challenges posed by atmospheric reentry and the requirement to use technologies not commercially available.

Add to this the challenge of employing effective countermeasures. Countermeasures, unless purchased, must be engineered and built. They must be deployed and positioned among the missile forces to be effective. They must be configured to work properly in space or the atmosphere depending on the missile's range. Developing an effective, reliable countermeasure requires a great deal of time and testing, not only to ensure robust performance, but to verify that the countermeasure

has not inadvertently degraded the performance of the missile, the deployment process of the reentry vehicle, or other countermeasures. But most countries do not have test ranges, not to mention a network of sensors to measure results. If the attacker desires to reach some level of perfection in the construction and use of his countermeasures, he would not be capable of testing the chosen countermeasures without revealing telltale characteristics to the NMD system. And even if states of concern get past the development and deployment steps, it is not automatically true that they can use them and use them effectively.

Different phases of development will accommodate the introduction of different types of countermeasures. In the earliest phases of missile development, a state would have limited spacing on its warhead bus to accommodate the payload and the countermeasures. The added payload weight of countermeasures would reduce the missile's range capabilities. Thus, a potential adversary would face a difficult decision as to whether to accept the additional technical risk and give up a portion of the missile's throw-weight to add countermeasures with unknown effectiveness, side effects, and reliability. The absence of a capability to put several warheads or constructed decoys on a bus would mean that it might not be possible for the state of concern to launch much more than small lightweight decoys, such as balloons, together with the payload.

The chemical weapon early release submunitions highlighted in the Union of Concerned Scientists' report are expected to present the NMD system with more targets than it could handle. But even free-flying submunitions pose engineering, dispersal, and lethality hurdles that we must not assume states of concern will overcome with ease. The weights of the reentry heat shields, fusing, and dispersal mechanism may be expected to severely restrict the available volume and weight for chemical agents. The agents in early release submunitions also will have to survive atmospheric reentry.

For submunitions carrying chemical agent to be effective, however, they must have a sufficiently dense distribution within the impact area. To accomplish this, they need to be released from the missile at a relatively low altitude above the target. In that case, a mid-course defense could kill the incoming RV prior to the release of submunitions. However, if released early in the missile's trajectory, in the ascent phase, for example, the submunitions would disperse over a wide area and might not achieve the lethal concentration levels required near the target. Therefore an aggressor employing submunitions would be faced with the choice of delaying release and leaving the missile vulnerable to intercept or employing early release submunitions that would have reduced effectiveness. If our defense forced a state of concern to adopt submunitions, we would have succeeded in preventing that state from using nuclear weapons, which cannot be deployed in this way.

If the attacker is going to succeed using erected or inflated decoys, there are other engineering considerations. Once they are released and erected or inflated in space (bearing in mind that emerging missile states do not yet have a capability to launch multiple RVs on a single bus), these decoys must maintain their RV-like characteristics throughout their mid-course flight so that they would look the same to the many sensors employed by the NMD system.

Conversely, the adversary could attempt to hide RV-like characteristics by enveloping the warhead in a balloon (to mask or simulate a false target), but he must hide those characteristics reliably and throughout the duration of flight. The complexity of surrounding an RV with a balloon and having it mimic decoy balloons is a technically challenging operation. The adversary also would have the challenge of having the decoy balloons mimic the balloon carrying the RV.

Similarly, the "cooled shroud," posited by the Union of Concerned Scientists to be a "simple" countermeasure, would present daunting engineering and integration challenges. The concept behind this countermeasure is that it would circulate a cryogenic fluid around the RV within a hollow shroud so that the RV could escape detection by infrared sensors. Yet even if the technical hurdles associated with designing and employing this rather sophisticated countermeasure could be overcome, it would be ineffective against NMD radar and optical sensors, which are designed to gather and refine information on the target throughout the course of its flight and pass information on the target's characteristics and location through the IFICS to the EKV up until just moments before impact.

Many ground and flight tests and numerous modeling and simulation exercises have been conducted by the United States and its allies to learn about the effectiveness of the full range of penetration aids, a practice that has helped us to understand the current counter-countermeasures challenge. In the 1970s and 1980s, the United Kingdom took more than ten years and spent around $2 billion to modify their submarine-launched strategic missile system to include countermeasures, and they had to use U.S. ranges to test it. The British were able to do a lot of ground testing of countermeasures, but in fact there was no alternative to testing their system on U.S. ranges. The flight- and ground-testing and experimentation accomplished over several years has filled in many knowledge gaps and provided the designers of BMD systems some level of confidence in the effectiveness of their systems, including the sensors that gather the information, the software algorithms that categorize and prioritize it, and to the computational power required to make required comparisons in near-real-time.

The experience of the United States with BMD countermeasures, including balloon-encased RVs, submunitions, and cooled shrouds, is extensive and several decades old. Extensive experience tells us that these things, purposefully altering characteristics in space so as to fool different sensor types, are not easily done by states like North Korea, Iran, and Iraq. U.S. flight-testing has uncovered weaknesses in many simple and more sophisticated countermeasures. Many objects designed to be countermeasures cannot be relied on to act as RVs would act, even in the near vacuum of space. At a more basic level, just because a countermeasure is "simple" does not mean it is simple to engineer or employ.

Moreover, it is also important to observe that ICBM forces among states of concern likely will not likely grow to be very large over the next ten years. Emerging missile states, therefore, will lack the missile inventory that is needed to saturate or suppress our proposed 100-interceptor NMD system, which could launch salvoes of interceptors to engage attacking missiles and any unresolved target objects.

Of course, many robust countermeasures to the NMD system may be possible (and still many more can be imagined on a blackboard), but estimates are that, if they were available, they probably would not be used effectively by states of concern within the timeframes under consideration. Advances in sophistication in missile development, and therefore in countermeasures capability, require experience in applied science, engineering and implementation as well as access to testing ranges and the necessary sensors, computers, and software.

In my view, credible, sophisticated countermeasures are costly and difficult to develop and make effective against this design, whereas simple, cheap attempts can be readily countered by the NMD system. Given our extensive toolbox and the forty years of experience the United States has with offensive and defensive weapon systems, we know how to play the countermeasure/counter-countermeasure game. And we know how to win.

Summary

To summarize, Mr. Chairman, it is important to understand the entire context of our development and testing programs in assessing the progress in NMD technology development and the impact of the test failures we have experienced on our program schedule. We will continue to test our NMD system based upon the disciplined, proven, and scientific methods learned over more than four decades of missile development, deployment, and operations. There is no technical reason at this point, validated by independent review teams, indicating that we could not develop an effective NMD system.

We have a tough engineering job before us, but we do not believe we need technological inventions to make it work. The technologies we require are in hand. Our critics still think that we are dabbling in science and they cannot let go of the unfounded idea that what we are attempting to engineer is a "Star Wars" missile defense system to take on the major nuclear powers of this world. But, in fact, this is a real but limited program with a firm grounding in science and engineering. We can develop and eventually deploy a real capability, a capability we do not presently have, against a very real and growing ballistic missile threat.

Some critics also have challenged the integrity of this program, implying that we will cheat in our testing program. Yet the NMD program is unique for the amount of attention and intense scrutiny it receives daily. The very scrutiny that the program has received, still receives, and will continue to receive, may be its surest way to ensure we are doing the right things. Daily attention from the American people, the Executive and Legislative branches of government, U.S. industry, and independent analysts, together with the sheer numbers of good, honest, and hard-working people inside the program representing various and independent public and private entities, help ensure the integrity of the information we use to affirm our system engineering approach.

The fact is, Mr. Chairman, many people, thousands of people, have worked diligently on this program and remain dedicated to developing this country's first operational national missile defense system. To be sure, the failures we have had in our flight-test program to date have been a bitter disappointment to us all. We all would have hoped for more at this stage. Yet we should not lightly dismiss the significant progress we have made. I believe that we can all be confident in the prospect that the hard work and diligence that has brought us this far, together with the engineering ingenuity and scientific know-how displayed time and time again by the people of this country, will enable us to achieve this historic goal.

Thank you, Mr. Chairman. I would be happy to answer any questions you and the members of the committee might have.

Mrs. CHENOWETH-HAGE. Thank you, General Kadish, for your testimony. The Chair now recognizes Ms. Bohlen for her testimony.

Ms. BOHLEN. Thank you, Madam Chairman. Madam Chairman, Mr. Tierney, members of the committee, I thank you for the opportunity to appear before you today to discuss our national missile defense program and how it relates to the Anti-Ballistic Missile Treaty.

It is this administration's position that we should not move forward with deployment of an NMD system until we have full confidence that that system will work and until we have made every reasonable diplomatic effort to minimize the cost of deployment and to maximize the benefit. I am obviously not in a position to speak on the technical or programmatic issues related to this system. General Kadish and Mr. Coyle have authoritatively addressed those aspects of the program. Instead, Madam Chairman, I will focus my brief remarks on the diplomatic and political context in which we have pursued the development of an NMD system and the diplomatic and foreign policy ramifications of deploying such a system.

When the President decided last summer for planning purposes on an initial NMD architecture, he stated that he would make a decision on whether to deploy this system based on four criteria; our assessment of the threat, technological feasibility, cost and the overall impact on national security. A week ago today, as you know, the President announced that the NMD program is sufficiently promising and affordable to justify continued development and testing but despite impressive progress, that there is not sufficient information about the technical and operational effectiveness of the entire NMD system to move forward with deployment at this time.

In making this decision, the President took into account the four criteria I just mentioned, and he made clear that we will continue to work with our allies and with Russia and with China to strengthen their understanding of and support for our efforts to meet the emerging ballistic missile threats and to explore, where appropriate, creative ways we can cooperate to enhance their security against this threat as well.

Let me say just a few words about the diplomatic and foreign policy context of NMD. At the end of the day, as the President has repeatedly stated, no country can exercise a veto over a decision that he or a future President might conclude is in the best interest of the United States. But as he also noted in his speech last Friday, while an effective NMD can be an important part of our national security strategy, it can never be the sum total of that strategy or of a strategy to deal with nuclear and missile threats. We cannot fail to take the views and security requirements of our friends and allies into account as we move forward on this program. We have an obligation to do what is necessary to achieve consensus within the NATO and Pacific alliance which are essential to our own security and to reassure others of the steadfast commitment of the United States to preserving the international arms control regimes that they have come to rely on for their own security.

To quote the President again, "Over the past 30 years, Republican and Democratic Presidents have negotiated an array of arms

control treaties with Russia. We and our allies have relied on these treaties to ensure strategic stability and predictability with Russia to get on with the job of dismantling the legacy of the cold war and to further the transition from confrontation to cooperation with our former adversary in the most important arena, nuclear weapons." We continue to believe that the ABM Treaty is, "a key part of the international security structure we have built with Russia and therefore a key part of our national security."

For that reason, we have sought to strengthen and preserve the treaty even as we pursue our efforts to develop a national missile defense. We continue to believe that strategic stability based on mutual deterrence between ourselves and the Russians is still important in the post cold war period because we and the Russians still have large nuclear arsenals. The ABM Treaty provides a framework for ensuring strategic stability between our two countries, reducing the risk of confrontation and providing a basis for further strategic reductions.

Clearly, deployment of the NMD system we are developing would require changes to the ABM Treaty. The deployment of an ABM radar at Shemya, AK, of 100 ground-based interceptors and 5 upgraded early warning radars for the defense of all 50 States would violate the obligation contained in article I of the treaty not to deploy an ABM system to defend national territory. Such activities would also be inconsistent with the locational restrictions of article III of the treaty.

We of course do not believe that the proposed system would violate the core purposes of the treaty and in fact believe that updating the treaty to permit a limited NMD would strengthen it. Accordingly, since last summer we have engaged at the highest levels in extensive discussions with Russia with the objective of reaching agreement on modifications in the ABM Treaty which would permit us to move forward with the limited NMD system proposed by this administration within the ABM Treaty. We have to this end provided to Russia a draft protocol to the treaty.

Among U.S. allies, support for NMD is strongly conditioned on first securing Russia's agreement to cooperatively amend the ABM Treaty. In the broader international community as well, support for U.S. non-proliferation objectives on other foreign policy priorities is also often linked to preservation of the ABM Treaty.

The degree to which other nations perceive that they have a stake in preserving the ABM Treaty was clear during this year's MPT review conference. For our allies and others the ABM Treaty is a touchstone of U.S.-Russian strategic stability. It is clearly perceived as an important foundation of the whole structure of international strategic security.

In the consultations that Under Secretary John Holum has conducted with his Russian counterparts, as well as discussions at other levels, we have addressed three broad areas designed to meet specific Russian concerns. First, we have made clear to Moscow that in deploying a limited NMD system we are responding to a new threat from long-range ballistic missiles in the hands of states that threaten international peace and stability and we're not seeking to change the core foundation of strategic stability with Russia. We have told our Russian intelocutors that we believe the ABM

Treaty should be preserved and strengthened by adapting it to a new strategic environment that did not exist in 1972, using the amendment procedures that are established by the terms of the treaty itself. We have proposed only those treaty changes that we believe are necessary to allow the United States to address those threats we expect will emerge in the near term while also establishing the basis for further adaptations of the treaty in the future should the emerging threat warrant.

Second, we have sought to demonstrate to the Russians that a limited NMD system will not threaten their strategic deterrent and cannot be made to have that capability. Indeed, criticism by Russian officials of our NMD program has not focused so much on the impact of our proposed system on their deterrent but rather on their concerns that these deployments would establish an infrastructure that would allow future breakout.

Finally, we have proposed to the Russians a series of confidence building and transparency measures. To date, as you know, the Russians have not agreed to our proposals to amend the ABM Treaty, but we have come considerably closer to agreement on some key aspects of the problem; for example, on the nature and reality of the threat. This progress is reflected in the joint statement on a Strategic Stability and Cooperation Initiative that was signed by Presidents Clinton and Putin in New York on Wednesday, and I have copies of that initiative if the members of the committee have not had a chance to see that yet and would be happy to submit it for the record.

[The information referred to follows:]

JOINT STATEMENT

Strategic Stability Cooperation Initiative

President William Jefferson Clinton of the United States of America and President Vladimir Putin of the Russian Federation met today in New York and agreed on a Strategic Stability Cooperation Initiative as a constructive basis for strengthening trust between the two sides and for further development of agreed measures to enhance strategic stability and to counter the proliferation of weapons of mass destruction, missiles and missile technologies worldwide. In furtherance of this initiative, the two Presidents approved an implementation plan developed by their experts as a basis for continuing this work.

The Strategic Stability Cooperation Initiative builds on the Presidents' agreement in their two previous meetings. The Joint Statement on Principles of Strategic Stability, adopted in Moscow on June 4, 2000, and the Joint Statement on Cooperation on Strategic Stability, adopted in Okinawa on July 21, 2000, establish a constructive basis for progress in further reducing nuclear weapons arsenals, preserving and strengthening the ABM Treaty, and confronting new challenges to international security. The United States and Russia reaffirm their commitment to the ABM Treaty as a cornerstone of strategic stability. The United States and Russia intend to implement the provisions of the START I and INF Treaties, to seek early entry into force of the START II Treaty and its related Protocol, the 1997 New York agreements on ABM issues and the Comprehensive Nuclear Test Ban Treaty, and to work towards the early realization of the 1997 Helsinki Joint Statement on Parameters on Future Reductions in Nuclear Forces. The United States and Russia also intend to seek new forms of cooperation in the area of non-proliferation of missiles and missile technologies with a view to strengthening international security and maintaining strategic stability within the framework of the Strategic Stability Cooperation Initiative between our two countries.

The Strategic Stability Cooperation Initiative could include, along with expansion of existing programs, new initiatives aimed at strengthening the security of our two countries and of the entire world community and without prejudice to the security of any state.

START III Treaty and ABM Treaty. The United States and Russia have presented their approaches to the principal provisions of the START III Treaty and on ABM issues. The United States and Russia have held intensified discussions on further reductions in strategic offensive forces within the framework of a future START III Treaty and on ABM issues, with a view to initiating negotiations expeditiously, in accordance with the Moscow Joint Statement of September 2, 1998, the Cologne Joint Statement of June 20, 1999 and the Okinawa Joint Statement of July 21, 2000 by the two Presidents. They will seek to agree upon additional measures to strengthen strategic stability and confidence, and to ensure predictability in the military field.

NPT, CTBT, FMCT, BWC, and Nuclear Weapon-Free Zones. The United States and Russia reaffirm their commitment to the Treaty on the Non-Proliferation of Nuclear Weapons as the foundation of the international nuclear non-proliferation and nuclear disarmament regime.

The United States and Russia will seek to ensure early entry into force and effective implementation of the Comprehensive Nuclear Test Ban Treaty. They will continue to work to begin negotiations to conclude a Fissile Material Cutoff Treaty and to strengthen the Biological Weapons Convention. They will continue to facilitate the establishment of nuclear weapon-free zones in the world, based on voluntary agreements among states in the relevant region, consistent with the relevant 1999 Report of the United Nations Disarmament Commission, as an important avenue for efforts to prevent nuclear weapons proliferation.

Discussions of issues related to the threat of proliferation of missiles and missile technology. The United States and Russia are prepared to expand their discussions of issues related to the threat of proliferation of missiles and missile technologies. These discussions will include annual briefings based on assessments of factors and events related to ballistic and cruise missile proliferation. Annual assessments will address potential threats to international security. With a view to preventing the proliferation of missiles and weapons of mass destruction, political and diplomatic measures will be discussed and undertaken, using bilateral and multilateral mechanisms.

Cooperation in the area of Theater Missile Defense. The United States and Russia are prepared to resume and then expand cooperation in the area of Theater Missile Defense (TMD), and also to consider the possibility of involving other states, with a view to strengthening global and regional stability.

The sides will consider as specific areas of such cooperation:

- Expansion of the bilateral program of joint TMD command and staff exercises.

- Possibility of involving other states in joint TMD command and staff exercises.

- Possibility of development of methods for enhanced interaction for joint use of TMD systems.

- Joint development of concepts for possible cooperation in TMD systems.

- Possibility of reciprocal invitation of observers to actual firings of TMD systems.

Early warning information. The United States and Russia, in implementation of the Memorandum of Agreement between the United States of America and the Russian Federation on the Establishment of a Joint Center for the Exchange of Data from Early Warning Systems and Notification of Missile Launches signed in Moscow on June 4, 2000, intend to establish and put into operation in Moscow within a year the joint center for exchange of data to preclude the possibility of missile launches caused by a false missile attack warning. The Parties will also make efforts to come to an early agreement on a regime for exchanging notifications of missile launches, consistent with the statement of the Presidents at Okinawa on July 21, 2000.

Missile Non-Proliferation measures. The United States and Russia intend to strengthen the Missile Technology Control Regime. They declare their commitment to seek new avenues of cooperation with a view to limiting proliferation of missiles and missile technologies. Consistent with the July 21, 2000, Joint Statement of the Presidents at Okinawa, they will work together with other states on a new mechanism to integrate, inter alia, the Russian proposal for a Global Control System for Non-Proliferation of Missiles and Missile Technologies (GCS), the U.S. proposal for a missile code of conduct, as well as the MTCR.

Confidence and transparency-building measures. Bearing in mind their obligations under the Treaty on the Non-Proliferation of Nuclear Weapons, the United States and Russia will seek to expand cooperation related to the Comprehensive Nuclear Test Ban Treaty (CTBT) to promote a mutually beneficial technical exchange that will facilitate the implementation of the CTBT after its entry into force. The United States and Russia are prepared to discuss confidence and transparency-building measures as an element of facilitating compliance with, preserving and strengthening the ABM Treaty. These measures could include: data exchanges, pre-notifications of planned events, voluntary demonstrations, participation in observations, organization of exhibitions, and strengthening the ABM Treaty compliance verification process.

The Presidents of the United States and Russia have agreed that officials from the relevant ministries and agencies will meet annually to coordinate their activities in this area, and look forward with interest to such a meeting in the near future.

The United States and Russia call upon all nations of the world to unite their efforts to strengthen strategic stability.

THE PRESIDENT OF THE
UNITED STATES OF AMERICA:

THE PRESIDENT OF
THE RUSSIAN FEDERATION:

New York City

September 6, 2000

STRATEGIC STABILITY COOPERATION INITIATIVE

Implementation Plan

- *Discussions of issues related to the threat of proliferation of missiles and missile technologies*

  The U.S. will brief Russia on the update of the National Intelligence Estimate of the ballistic missile threat that has just been completed, and Russia will provide its latest assessment.

- *Cooperation in the area of Theater Missile Defense*

  The United States and Russia agreed to conduct a U.S.-Russian planning and simulation exercise in February, 2001 at Colorado Springs, Colorado and a U.S.-Russian field training exercise at Fort Bliss, Texas by late 2001 or early 2002. Planning meetings for the 2001 exercise will continue in Moscow in September and November-December at the Joint National Test Facility in Colorado Springs. Joint TMD exercise expert talks will also discuss the possibility of reciprocal invitation of observers to actual firings of TMD systems.

- *Early warning information*

  By the end of this fall, the United States and Russia expect to begin preparation of the Moscow site for the Joint Data Exchange Center (JDEC) and begin renovation of the building that will house the center, as well as begin drafting concept of operations and standard operating procedures documents. The United States and Russia intend to commence operations at the JDEC in June of 2001, with full operations to begin in September 2001. Regular meetings of working groups under the Joint Commission will take place in coming months.

  The United States and Russia have agreed to set as an objective the completion of a bilateral agreement on a pre-launch notification system for launches of ballistic missiles and space launch vehicles by the APEC summit in November, while also reaching agreement on how the system will be opened up to the voluntary participation of all interested countries. They will meet to intensify negotiations in September.

- *Missile Non-Proliferation measures*

  The United States and Russia will work to reach consensus among MTCR partners at the October 9-13 Plenary, as well as with other countries, on plans for a global missile non-proliferation approach.

- *Confidence and transparency-building measures*

  Experts will meet this fall to review and approve additional warhead safety and security issues for expanded cooperation related to the CTBT. Experts will meet before the end of this year to consider expanded cooperation in the area of computations, experiments and materials. Experts in CTBT monitoring and verification will be scheduled to meet in late 2000 or early 2001 to consider expanded cooperation in this area.

Ms. BOHLEN. We have also been pursuing close consultations with our NATO and Pacific allies who have all made clear that they hope the United States will pursue strategic defense in a way that preserves the ABM Treaty. Their support is important to us for a number of reasons. Our European and Asian allies are crucial to our efforts to counter the proliferation of weapons of mass destruction, including ballistic missiles and missile technology, efforts which continue to be a strong line of defense against the threat of missile proliferation. Moreover, an effective NMD will require the consent of two allies to upgrade the radars that are situated on their territory.

Our allies have uniformly welcomed the President's decision to defer a decision on deployment as providing more time for discussion of the emerging ballistic missile threat and the role of ballistic missile defense in responding to that threat. We will continue this dialog with our allies in the months ahead. We have also made clear to China that our national missile defense efforts are not directed against them.

In sum, Madam Chairman, the President's decision has given us more time to work toward narrowing our differences with Russia and to involving our allies in shaping a coordinated response to the emerging ballistic missile threat. We continue to believe that an effective NMD system can be developed and deployed within the context of resolving the concerns of our allies and the objections of Russia.

Let me conclude by reiterating a point the President made in his speech last Friday. He said, "No nation can have a veto over American security. Even if the United States and Russia cannot reach agreement, even if we cannot secure the support of our allies at first, the next President may nonetheless decide that it is in America's national interest to go forward with deployment of NMD. But by the same token, since the actions and reactions of others in the world bear on our security, clearly it would be far better to move forward in the context of the ABM Treaty and allied support. America and the world will be better off if we explore the frontiers of strategic defenses while continuing to pursue arms control, to stand with our allies and to work with Russia and others to stop the spread of deadly weapons."

Thank you.

Mrs. CHENOWETH-HAGE. Thank you, Ms. Bohlen, for your testimony, and the Chair now first recognizes Mr. Tierney. We are in a section now where each member will be recognized for 5 minutes for their questions. Mr. Tierney.

Mr. TIERNEY. Thank you, Madam Chairwoman. Mr. Coyle, thank you for your testimony.

As I mentioned during my remarks earlier, I am particularly concerned about the issue of countermeasures. Let me make sure that I understand your written testimony. You stated that targets in flight tests will have at most unsophisticated countermeasures and that they will employ only simple balloon decoys. Did I get that right?

Mr. COYLE. That's correct.

Mr. TIERNEY. Are you talking about just flight test prior to the deployment readiness review or all flight tests with test programs?

Mr. COYLE. Both. The tests prior to the Development Readiness Review only had a simple balloon as the decoy, and the tests that are projected out into the future, that is, for the flight intercept test I should say, only use simple balloons as decoys.

Mr. TIERNEY. So other countermeasures that are readily available, cooled shrouds, for example, that reduce the radiation emitted by warheads, there's no planned tests for that?

Mr. COYLE. Those would not meet the definition of an unsophisticated threat. The C1 system is designed only to meet the so-called unsophisticated threat, and so a countermeasure like a cooled shroud that you mentioned would have to be dealt with with future versions of the NMD system called C2 or C3.

Mr. TIERNEY. Those types of countermeasures do exist, yet there's no plans made to deal with them, at least in the C1 stage. And now would that also be true for tumbling RVs and things of that nature, other countermeasures?

Mr. COYLE. A tumbling RV is a different matter that actually might be the simplest thing for a nation to deploy. The easiest thing of all is don't even spin up the RV, just let it plop off the end. It's not as accurate when you do that but it is simpler, and so that's one of the reasons why I've recommended, and so has General Welch's panel, that we try some tests with tumbling RVs along the way.

Mr. TIERNEY. On the balloon decoys that are scheduled for tests later in the program, to your knowledge, will they have a shape or motion similar to the target reentry vehicle?

Mr. COYLE. Some of the balloons will be about the same size, but they won't have the same motion as the reentry vehicle.

Mr. TIERNEY. What about our radar on the ground, has the X-Band radar been tested during a flight test to determine whether it can deal with sophisticated or unsophisticated decoys?

Mr. COYLE. So far the only decoys we have used have been a single, simple balloon. Later on, there will be tests with balloons that have radar absorbing material on them but just balloons.

Mr. TIERNEY. Just balloons.

General KADISH. Mr. Tierney, can I add to that a little bit?

Mr. TIERNEY. Sure.

Mrs. CHENOWETH-HAGE. General Kadish.

General KADISH. The flight test program we have does not only consist of intercept flight tests. We have other flight tests that we call risk reduction flight tests that we fly against the radar and other sensors separately, and we have done a number of those tests against a wide range of countermeasures, including jammers. So although they were not intercept tests they were against our sensors and we'd be glad to provide that data to you in the appropriate context.

[The information referred to follows:]

HOUSE GOVERNMENT REFORM COMMITTEE
NATIONAL MISSILE DEFENSE
SEPTEMBER 7, 2000

INSERTS FOR THE RECORD

Page 60, Line 1353

The information follows:

To date, three NMD RRFs (RRF-6, RRF-8, and RRF-9) were conducted using countermeasures against the Ground Based Radar-Prototype (GBR-P). RRF-6 and RRF-9, were Radar Credible Target (RCT) flight tests specifically designed to test the performance of the GBR-P Radar. RRF-8 was a target of opportunity to exercise the GBR-P against available countermeasures.

RRF-6/RCT-1 – This test was conducted on 20 August 1999. The primary test objectives were to acquire and track the target complex while in the GBR-P field of view, observe the chaff experiment, perform baseline target classification on all targets (as well as any debris tracked by GBR-P), and collect data for post test analysis of the Phase Derived Range Algorithm and precision discrimination on three spin stabilized targets. The target sets consisted of one small re-entry vehicle, two small rigid lightweight replicas, and two reentry vehicles. The results of this test showed that the GBR-P successfully acquired and tracked the target complex from acquisition of signal to splashdown. All test objectives were achieved except for one threat classification objective. Within the threat classification objective, four of five threat target objects were successfully discriminated.

RRF-8 – This test was conducted on 28 May 2000 in conjunction with the Orbital/ Suborbital Program Demonstration flight test. The test objectives were to evaluate GBR-P medium band track and to collect wide band discrimination data on target objects. The target set consisted of one heavy simulated re-entry vehicle mass, four medium (0.9 meter diameter) balloons, one canisterized medium (0.9 meter diameter) balloon with a lightweight instrumentation system, and one canisterized large (2.2 meter diameter) balloon. RRF-8 served as a risk reduction flight for IFT-5. The GBR-P successfully acquired and skin tracked the target complex, collected discrimination data, and transmitted the track data to the BMC3 Node for building in-flight target updates. All test objectives were achieved.

RRF-9/RCT-2 - This test was conducted on 28 September 2000 and provided an opportunity for real-time testing of current/additional GBR-P functionality, namely, tracking in a dense target environment with moderate to heavy loading of radar resources. The primary test objectives were to demonstrate target discrimination within the bounds of main-loop algorithms, to gather data for development of advanced discrimination algorithms, and to assess wide band capabilities against closely spaced and crossing objects. The target set consisted of one target deployment structure, one small rigid lightweight replica, three large canisterized uninstrumented (0.9 meter diameter) balloons, three small canisterized uninstrumented (0.6 meter diameter)

balloons, six radar cross section matched spheres, and six traffic debris pucks. Data from this test is being evaluated. Preliminary indications are that GBR-P successfully discriminated threat from non-threat target objects and all test objectives were achieved.

In summary, during the above referenced flights, the GBR-P and the EWR were tested against a variety of countermeasures. All test objectives were achieved in each test except for one mis-classification during RRF-6/RCT-1. Future RRFs and Integrated Flight Tests (IFTs) using additional countermeasures are planned.

Mr. TIERNEY. I assume Mr. Coyle has that data.

Mr. COYLE. Yes, and those are fine tests to do. We certainly support them, but they're not intercept tests and so they only go as far as they go.

Mr. TIERNEY. I guess what I'm talking about here is two things. One is effectiveness, whether or not you test, see if it works. One is level of confidence in any of this. If you test and it works once, that doesn't give us a great deal of confidence as it might if you tested several times or test all the different permutations that we could expect to see.

Mr. Coyle, in your testimony you stated there might be different synergistic effects when multiple missiles are deployed. What did you mean by that?

Mr. COYLE. Well, we probably should assume that if a so-called rogue state were to send intercontinental ballistic missiles toward the United States that they wouldn't just send a single missile, that they might send two or more, maybe several, and so part of the challenge would be to see that you could deal with more than one incoming missile at once.

Mr. TIERNEY. Does the current flight test plan test against multiple targets at all?

Mr. COYLE. So far there are no tests like that planned.

Mr. TIERNEY. Now the Rumsfeld Commission reported that countries with the technology to develop missiles most likely have the technology to develop countermeasures. So I am assuming you would agree that this is not a side issue to be dealt with somewhere down the road.

Mrs. CHENOWETH-HAGE. Gentleman's time is up.

Mr. TIERNEY. May I finish the question?

Mrs. CHENOWETH-HAGE. Yes, please do.

Mr. TIERNEY. Thank you. You would agree with me, sir, that this is not a side issue to be dealt with somewhere down the road, that this is a fairly integral part of our determination of whether or not this system is going to be effective and whether or not we'll have a sufficiently high level of confidence in the system?

Mr. COYLE. Yes. That's why we've been recommending that these other kinds of tests would need to be done.

Mr. TIERNEY. Thank you. Thank you.

Mrs. CHENOWETH-HAGE. Thank you, Mr. Tierney.

Ms. Bohlen, I guess I need to have you explain to me like Vince Lombardi used to, this is a football, because the issue of the viability of the ABM Treaty still troubles me. The original ABM Treaty of course was signed with the Soviet Union, the Union of Soviet States, and that no longer exists, and while the Confederation of Independent States is who our administration is working with, a new treaty with a new signator has not been accomplished that has been ratified by the U.S. Senate. How is it then that the administration is relying so heavily on an ABM Treaty that has not been ratified or the old treaty, that one of the two signators no longer exists?

Ms. BOHLEN. Madam Chairman, I will answer your question in two parts if I may. First of all, obviously this is a complex issue with many, many parts to it, and I think the administration's posi-

tion is well-known but to have a complete answer, perhaps the best thing would be to submit a question in writing.

But I would just add to that I think we have operated on the general principle that, as a matter of international law, agreements in force between the United States and the Soviet Union at the time of the dissolution of the Soviet Union are presumed to continue in force with respect to the Soviet successor state, and I think there is a long record on this going back to the Bush administration. So that is the second part of my answer, but if you would be pleased to submit a question we would be very happy to answer it.

Mrs. CHENOWETH-HAGE. Thank you. I will, Ms. Bohlen. I think it troubles many Americans that we're engaging in a contract or a treaty where one of the two signators no longer exists, and it is an assumption on the part of the administration, but the Senate has a role here, as do the American people, and having the administration produce a signed treaty that must be ratified by the Senate. Is there—and I thank you for your answer and I will submit my question in writing and look forward to your written answer.

Is there anyone else on the panel who would like to address this issue?

I want to thank you for your testimony and while I agree that diplomacy is exceedingly important, I guess I just have to think that as we move from a nation whose major military policy was mutual assured destruction to a new vision in the future, not so new, since the 1980's, of protecting and defending Americans from foreign attack as our No. 1 priority, I hope in the future, I think it's a very worthy, worthy goal, and I guess I just have to echo what my former boss, former Senator Steve Symms used to say, I'm a dove, I just think we ought to be the best armed doves on the planet, and I think that—he said that back in the 1980's and I think it still holds true.

General Kadish, your testimony was very informative, a very interesting study, but I do want to ask you. As you know, the President announced, and this has been referred to in testimony today, that he was deferring to the next administration the decision on whether to deploy the planned national missile defense system. Now, neither the President nor the Department of Defense provided information on the effect that this decision will have on the near term national missile defense options for our next President, whomever that might be. General Kadish, what was your organization's recommendation to the administration regarding the decision to defer to the next administration the decision on whether to deploy the planned NMD system?

General Kadish.

General KADISH. Madam Chairman, we in the program office and at the Ballistic Missile Defense Organization worked very hard to provide all the information required for the decision, and we presented that information as factually as possible up through the decisionmakers, and we did not provide a specific recommendation but an integrated assessment of the status of the program.

Mrs. CHENOWETH-HAGE. I see. My time is up and I now recognize Mr. Allen for his questions.

Mr. ALLEN. Thank you very much.

Let me return quickly to the subject of countermeasures. In your testimony, General Kadish, you said that this is a system to defend all 50 States against a limited attack involving intercontinental ballistic missiles with unsophisticated countermeasures launched by states of concern such as North Korea, Iran and Iraq. Well, buried in the word "unsophisticated" is an important issue. It seems to me that we—almost any state—let me back up for a moment.

The Rumsfeld Commission some time ago warned us that North Korea was proceeding more rapidly than some in our Intelligence Community had expected with the development of missile technology. It is easier, so far as I can tell and you can react to this, to determine how a country is proceeding on its missile technology than on its countermeasure technology, and it seems to me that we have limited information, classified, about the countermeasure technology that states of concern may have or may acquire in the future and on the other hand our own sensors, the technology surrounding our own sensors and our ability to discriminate among countermeasures, such as decoys of one kind or another, is also classified and yet if an adversary that can build an ICBM has sophisticated and not unsophisticated countermeasures, this system may not work at all. And if you would react to that I'd appreciate it.

General KADISH. Mr. Allen, as I tried to point out, there is no military system that I'm aware of that is perfect either on the offense or the defense. So with that as a basic assumption, some of them, however, are pretty good, and the basic architecture that we laid out for the national missile defense program is that we would start with an initial capability that we termed for purposes of discussions C1, for unsophisticated countermeasures based on the Intelligence Community's best estimate of what we would expect to see in the timeframe that we're talking about, in the 2005 or mid-decade area. In addition, the system has inherent capability to go beyond that, even though we would not necessarily design and test aggressively to some of the more sophisticated countermeasures in the early phases. But we had always planned to have followon phases, at one time called capability two, or capability three as we now refer to it, where the sophisticated countermeasures would be incorporated into our testing and design activities.

So you need to look at the National Missile Defense program not as an end item that is static forever. If you do, we miss the point here because we will never be successful against the countermeasure issue. We do not view it that way. We view it as an ongoing aggressive activity that addresses the countermeasures in an action response method based on our best intelligence and the inherent capability of the system.

Mr. ALLEN. If I can get one more question in, we've had all this conversation about Shemya, the construction of radar facilities at Shemya, AK. Let's suppose that through negotiation or otherwise North Korea abandons its missile program. Of what use against Iran or Iraq would be a radar facility at Shemya, AK?

General KADISH. Iran and Iraq, there would be little use. It's in the wrong spot, and the curvature of the Earth plays a major activity.

Mr. ALLEN. Let me make just one—this is not a question but one comment. One, it's maybe beyond the scope of these hearings today, but one concern I have is that it seems to me that advocates of missile defense are not taking account of the logical and necessary responses that some others in the world would have to make, and it is not just Russia, it's not just the ABM Treaty. It is also China, and China now has about 20 ICBMs, a very limited force. It seems to me that an almost automatic response by the Chinese to the development of this system would be to increase their missile force. That sets off potentially a chain reaction with India and Pakistan, causes me great concern. As I say, maybe, Ms. Bohlen, if that's something you feel you could address today, I'd appreciate it.

Ms. BOHLEN. My first answer to that would be that China is already, independently of our national missile defense program, as you know, engaged in a strategic modernization program. This is unrelated to what we have done so far and this will considerably increase their force, increase their survivable force.

China's objections are well-known. They have been very public. We have had a dialog with them also to try to persuade them that the system is not in any way directed against them or against their deterrent.

Obviously in their minds it becomes very much linked with the whole issue of Taiwan and theater missile defenses in the region. So we have tried to establish a clear boundary between those, those two issues and we will continue those efforts at dialog. But we also anticipate that whatever is decided about NMD, the Chinese strategic force will be considerably larger in a few years than it is now. Thank you.

Mr. WARNER. If I might comment also, Mr. Allen, just on the link of India and Pakistan, China has a range of missiles of varying ranges, ones of a theater character, ones they are expanding substantially, for instance, and those that are opposite Taiwan. It is really theater range missiles that pose the main threat to South Asia as they would see it. So the growth in their ICBM capability is unlikely to be that directly relevant.

I believe that growth is underway very much as Ms. Bohlen just described. The strategic modernization of China's force has been well underway for well over a decade. We anticipate expansion and greater technological capability over time, the South Asia piece, not lessening it at all, but it tends to be more related to the pattern at which China modernizes its intermediate range missiles which can easily range into those countries.

Mr. SHAYS [presiding]. Thank you. Mr. Kucinich, you have the floor for 5 minutes. We'll be coming back with a 10-minute round after Members have gone the first time, and I would like to note that the chairman of the full committee Mr. Burton is here and we'll go to you after Mr. Kucinich.

Mr. KUCINICH. Mr. Shays, I'd be happy to yield to Mr. Burton, at least yield, you know, my place to him if you would come back to me.

Mr. BURTON. Thank you, Mr. Kucinich. I don't want to be redundant. I just got here so if I cover some ground that has not yet, or that has already been covered, please forgive me.

One of the things that's concerned me as the chairman of the committee and as a Member of Congress, and I think my colleagues as well, has been the theft of nuclear secrets at Los Alamos and Livermore, and a lot of people have said that the theft of those secrets could be analogous to what happened with the Rosenbergs back in the fifties. I mean, it's a major, major problem and we've talked to a number of people about that. As I understand it, the W–88 warhead technology is now in the possession of the Chinese Communist Government and they also have other technology through their connections with Loral and Hughes and other companies regarding their space satellite technology. They now have the ability to build an ICBM, and they also have the ability to put multiple warheads on one missile and they also have the technology to put that on a mobile launch vehicle that could be hidden in woods or someplace else which would be very difficult for our spy satellites to pick up.

And the question I have, and I address this to any one of you, is that how long will it be before they, and I know this is an estimate or guesstimate, how long will it be before they have a mobile launched ICBM or permanently fixed ICBM silos with multiple warheads such as the W–88 warhead where they can put 8 to 10 on one missile, how long will it be before they have one of those operational, and what does it mean for U.S. security, and do we have any way, do we have any way right now or in the foreseeable future to intercept and shoot down the multiple warhead missile if it's launched at the United States? In other words, how long is it going to take for them to perfect it, in your estimation? Once it's perfected, if they launched at the United States do we have any defense for it? And also because of the MIRVing, because they got as many as 10 warheads on it, once those split apart in the outer atmosphere, could we shoot down all 10 of those smaller missiles with the W–88 warhead or would we just lose a bunch of cities in the United States?

I know it's a pretty big question, but I'd like to have an answer if I could. Thank you, Mr. Chairman.

Mr. WARNER. There has been a recent national intelligence estimate on these matters, and it's at the classified level. I could—let me just generally say, the Chinese have been—their next generation capability, both of intermediate range and long range, is mobile in character, one of their main efforts. So they have a mobile missile capability in train. I don't have the unclassified date so I won't speculate on that, but we can certainly make an arrangement to make that available to you.

Similarly, we've long believed that the Chinese have the capability to move toward multiple independent reentry capability in the years ahead, and I'm virtually positive that also is examined in that estimate and we would be happy to bring it to you.

Mr. BURTON. How about the last part of the question, let's say for instance—and I'm not asking you to divulge any classified information because you don't want to give the exact timetable—and any one of you can answer this. Let's say, for instance, that they do in 5 years have an ICBM that is mobile launched or in a silo that has multiple warheads and they launch it at the United States. Do we have any defense capabilities that would shoot down

those incoming ICBM missiles, the MIRV warheads, and if we don't they could hit as many as what, 8 or 10 cities, and I presume that would amount to a real devastation of our economy and also cost us maybe 20, 30, 40, 50 million people?

Mr. WARNER. Let me turn to General Kadish on the scheduling and timing but put a couple of things quickly into context. First, of course the primary objective of the NMD system being—that has been examined and developed by this administration has been linked to the question of the so-called states of concern like North Korea, Iran, Iraq. It is a fact that it inherently has capability to also intercept missiles from nations like China or Russia or it would have when it were available.

On when it is available now will depend, as President Clinton made the decision last week, now on the next President. We have a program underway that will provide an option for the next President to have such a capability in the middle part of this decade if he chooses to move in that direction, whoever that may be.

Mr. BURTON. So what you're saying is if we—the next President were to move very expeditiously on this some time within 5 or 6 years we could have a system that could intercept and shoot down multiple warhead missiles coming in?

Mr. WARNER. The C1 capability is generally aiming at—the C1 and C1 enhanced is somewhere between a handful to a few tens of reentry vehicles in flight. So by the time the C1 enhanced were deployed, which could be in 2006, 2007 timeframe. Now as to the issue of whether it would include—it would depend on the degree of the countermeasures that might accompany the Chinese attack because this one, as we've just talked about, is against simpler countermeasures.

Mr. BURTON. Thank you, Mr. Chairman.

Mr. SHAYS. Be happy to have you respond.

Ms. BOHLEN. Could I just add to that? I think it's worth pointing out that we have no defenses against China's present strategic system. It's not the addition of a mobile system that will make us more vulnerable. A more important point is I think you need to focus on the limited size of the force and of the modernization. Clearly we are not looking at a modernization that would in any way or dimension approach the size of the Russian force which is still arrayed against us or has been arrayed against us.

Mr. BURTON. If the chairman would just give me just a second, I know, but that begs the issue. One missile launched at the United States, hitting New York City or Chicago or Los Angeles, would be devastating as far as loss of population and what it would do to our economy, just one, and so whether or not they have the capability to launch 30, 40, 50 or 60 missiles at one time really isn't the issue. Do we have the ability to shoot down or stop a missile of that type from hitting the United States? We do not have at the present time and, according to what was just said, we're looking at the middle of the decade at the very earliest, the next decade. That is if the President, the new President, gets on the stick and gets the daggone thing underway.

So the big concern that I have is, you know, we don't anticipate conflict with anybody in the future, but you don't know what might happen, and so it seems to me that the responsible thing to do

would be to get on with it as quickly as possible, and unfortunately, that's not what's happening right now.

Thank you very much. Thank you, Mr. Chairman.

Mr. SHAYS. Thank you.

Mr. Kucinich.

Mr. KUCINICH. Thank you very much, Mr. Chairman. I'd like to direct my first question to Mr. Coyle. In your testimony on page 27 under observations and conclusions, you come up with—you say, additionally the program will have to adopt a parallel, quote, fly through failure approach that can absorb tests that do not achieve their objectives in order to have any chance of achieving a fiscal year 2005 deployment of an operationally effective system. I want everybody to think about this for a moment.

Now, where I come from, Cleveland, OH, if something fails, it doesn't fly or if something doesn't fly, it fails. You can't keep flying if you keep failing. Now, right here in your comment, you talk about a fly through failure approach which implies that it fails but it keeps flying. Do you want to help me with that?

Mr. COYLE. Yes, sir. The only point I was trying to make there was that there will be failures in the test program, and if everything is in series, every time you have a failure, it sets back the whole program and the whole program will take longer and longer and longer. If the country expects to be able to achieve the kind of capabilities we're talking about on a 2005, 2006, 2007 time scale, we'll have to do things in parallel, such that if you have a failure in one test you can in parallel go ahead with the second one.

Mr. KUCINICH. I understand what you're saying now, except what it implies is that, well, General Kadish was saying we are going to walk first, then we are going to try to run. What you're saying is even if we haven't learned how to walk, we're getting ready to become an Olympic sprinter. It's kind of an interesting construction that you have there because I think through all of this we need to explore the illogic that is laden heavily throughout all of these propositions advancing this system.

Now, I wonder, Mr. Coyle, is there any maximum monetary threshold above which you would recommend that the NMD is not a cost effective weapons system?

Mr. COYLE. I think that's a question for somebody else. I'm just a test person.

Mr. KUCINICH. OK. Well, let me ask it to someone else. General Kadish, is there any maximum monetary threshold above which you would recommend that the NMD is not a cost effective weapons system?

General KADISH. In the program management business and development business, Congressman, there's a balance between cost, schedule, risk and deploying and making weapons systems work, and that's an integrated process. Basically, what I can do is provide you our best estimates.

Mr. KUCINICH. What's the maximum? Just give me a maximum number? Is it $60 billion, $100 billion, $200 billion? What would it be?

General KADISH. I think, again, I could provide estimates of what we think a particular program——

Mr. KUCINICH. We're just here among friends. Give me a number.

General KADISH. I agree wholeheartedly with Mr. Coyle.

Mr. KUCINICH. Well, is there anyone here that has any numbers at all, anyone? I have a document that was handed here, national missile defense cost estimate increases 1996 to the year 2000. It started off, I think Mr. Tierney was the one that was able to come up with this. It started out with an amount of $9 to $11 billion and it's now at $50.5 billion. Now, you all remember that Star Wars took us into the stratosphere of spending on R&D of over $60 billion. We're now including all the estimated costs into the troposphere fiscally of over $100 billion and more. I just wonder, General, is there any level of spending on NMD technology that could cause the Department of Defense to sacrifice procurement of other weapons, paying for operations and maintenance of the aging and increasingly expensive arsenal of planes, ships, etc?

General KADISH. As a taxpayer, we're all concerned, certainly I am, about what things cost and work hard every day to do that and make sure that we are proper stewards. Our current estimates for the program which are under a major revision now because of the President's decision was in the neighborhood of a $20 billion acquisition cost of which $5.7 has already been spent and about a $32 billion life cycle cost for 20 years. Now, the CBO has done estimates and included more of the system elements than we would have included, but it's of that magnitude that we currently have as an estimate, and as we go through the congressional appropriations process and the way we do our budgeting, it's for the Congress and the administration to decide whether that's adequate.

Mr. KUCINICH. I appreciate that. I would like to submit for the record this attachment. How much time do I have? Do I have another minute?

Mr. SHAYS. Your time is over now, but you will have a significant amount of time in your followup.

Mr. KUCINICH. OK. Thank you.

Mr. SHAYS. I'm told that the decisions I make today will have impact 10 years from now and that what we have today were made by Members of Congress, Senate, the President 10 years earlier, and so it's hard for me to kind of visualize that. We're in a world 10 years from now, but I sure want to make sure I'm making the right decisions now.

I had voted against deployment of SDI and GPALS. I had voted for research. I represent, I guess, kind of in the middle here. My colleagues to my right didn't vote for the National Missile Defense Act of 1999, and my colleagues on—to my left, my other Republicans probably voted for deployment earlier, but this is the law. It is the policy of the United States to deploy as soon as technologically possible an effective national missile defense capable of defending the territory of the United States against limited missile, ballistic missile attack. Mr. Warner, I want to know if you believe that this is in fact the law.

Mr. WARNER. Yes, sir. It was signed by the President.

Mr. SHAYS. Does it have your total support?

Mr. WARNER. Yes, sir.

Mr. SHAYS. General Kadish.

General KADISH. Yes, Mr. Chairman.

Mr. SHAYS. Mr. Coyle.

Mr. COYLE. Yes, sir.

Mr. SHAYS. Ms. Bohlen.

Ms. BOHLEN. Yes, sir. I would only add that the President issued a statement at the time that made clear this was to be taken in a context of arms control developments and appropriations—I'm sorry, I don't have the exact language, but I think the two things have to be seen together. That represents administration policy.

Mr. SHAYS. Mr. Warner, is it your view that now it is not technically possible but it will be?

Mr. WARNER. We have a program underway that we believe has made great progress that has demonstrated the fundamental technologies that in light of the recent testing difficulties and some other issues has greater schedule risk than we would have hoped; that is, the date at which it would be available, but certainly it is our belief that we should, as the President directed, continue the development to in fact see if we can meet the test that—remember, we talked about the four tests that the President has laid out. One of them is the one directly related to this law, and that is, is it technologically feasible. I believe for limited national missile defense we as a Nation can develop that capability and will be able to do so within the next several years.

Mr. SHAYS. General Kadish.

General KADISH. I would agree with that assessment, Mr. Chairman. We—at this point in time we've been aggressively testing the system that we have put together over the last 24 to 36 months, and we continue to do so and, as we continue to test it, will get more confidence in it. But we do have confidence we can move this system along within a very short period of time.

Mr. SHAYS. Mr. Coyle.

Mr. COYLE. Mr. Chairman, my job is to make sure that military equipment is adequately tested in realistic, operational situations. It's not unusual for new military systems to do quite well in early technical testing, early developmental testing and then have great difficulty when they get to more realistic operational testing.

Mr. SHAYS. I hear you there, but it's not a question of whether we're going to deploy, it's when, and the when depends in part on whether the technology is there. My question is, you don't believe the technology is present but do you believe it will be?

Mr. COYLE. As I said in my testimony, that's yet to be shown to be practicable. By that I meant able to be reduced to practice so that you could depend on it in a realistic operational situation, and that's why I said it the way I did, and so my view is it's too early to tell and we won't know the answer to your question until we get to operational testing.

Mr. SHAYS. Thank you. I am going to come back for a followup. Ms. Bohlen, I would guess I'd still like to ask your opinion, whether you think it will be technologically possible.

Ms. BOHLEN. Mr. Chairman, with due respect I don't feel I'm the most competent person to address that question. I defer to my colleagues. I would note that the President said in his speech last Friday that there is not sufficient information about the technical and

operational effectiveness of an NMD system to move forward at this time.

Mr. SHAYS. Let me just say, Mr. Burton, I don't need to yield you time because I'll give you full time to start as chairman, then we'll go to Mr. Tierney. So you have time to ask your questions.

Mr. BURTON. Thank you, Mr. Chairman. I won't take much time. First of all, I appreciate very much your—and Mr. Tierney, I will be through here in just about 1 minute but I really appreciate you yielding to me.

One of the things that staff has just brought to my attention which really concerns me is there is opposition by some people in the Congress and in the country for us building a missile defense system, but as I understand it, China in 1993 purchased from the Russians the S–300, which is a missile defense system, and they're currently negotiating to buy the Russian S–400 system, and our question is, why would it be logical for us to expect the Chinese, who could potentially be a problem for us down the road, to build a missile defense system around Beijing when we in the United States can't or won't build a missile system? Does that seem logical to you?

Ms. BOHLEN. Mr. Chairman, I will defer to my colleague, Mr. Warner, but I would just note that we have a theater missile defense system. I think the systems you were talking about fall in that general range.

Mr. BURTON. I'm not talking about——

Ms. BOHLEN. And we are permitted under the ABM Treaty to have a site which we have chosen not to exercise.

Mr. BURTON. I'm not talking about a theater missile defense system. I'm talking about a fully launched missile defense system that would protect the United States, the continental United States.

Mr. WARNER. The point—the illustrations that you cite of the S–300 and S–400 are Russian theater missile defense systems. The Chinese—the Russians are enthusiastically seeking to merchandise those systems and have been for the last decades.

Mr. BURTON. But we have none around American cities or around any part of the continental United States?

Mr. WARNER. We have theater missile defense systems under development. Our general purpose, our explicit purpose for them is to deploy them to protect our troops in the field.

Mr. BURTON. But none around the United States or planned around the United States or anything?

So what we could do is Beijing, around Beijing and around major cities in China, they can deploy a theater missile defense system like the S–300 or the S–400. But around Washington, DC, Los Angeles, Chicago, New York we cannot deploy a theater missile defense system or any kind of a missile defense system so they protect Beijing. Washington, DC, is fair game.

Mr. WARNER. They protect Beijing against theater missile threats, shorter-range missiles from somewhere near their territory.

Mr. BURTON. Would those theater defense missile systems be effective in any way against an ICBM?

Mr. WARNER. They would not.

Mr. BURTON. You are sure?

Mr. WARNER. We have looked at that very carefully.

Mr. BURTON. OK. Thank you very much.

Mr. SHAYS. Mr. Tierney, you have 5 minutes. We will roll it over for another 5 minutes.

Mr. TIERNEY. Thank you, Mr. Chairman.

Let me get back to one issue that you brought up, Mr. Chairman, a little while ago about what the policy is in this country. We talked about the policy of deploying a system as soon as technologically possible. But I think it also goes on to talk about an effective system. The fact of the matter is if the system cannot be shown to be effective, then perhaps we shouldn't deploy it, and, again, I go back to the issue of having confidence in the effectiveness. It's not enough to show that it works once or it works twice. In order to have it do us any good at all, it's going to have to be shown that it works to such a degree that we can have confidence to employ it and to deal with it as if it was going to work sufficiently, regularly to be effective. Also the whole policy is subject to the annual authorization of appropriations, so the Congress very much has something to say about where we go on this.

In section 3, the third section of the legislation that also we mention, which talks about the need to seek continued negotiated reductions in Russian nuclear forces, the idea being that now we have a conflict, it doesn't say how we are going to resolve the conflict, if there is one, between deploying the system and negotiating reductions, and we have to work and decide that.

I think there are circumstances that we can see that would serve to actually encourage proliferation and undercut the effectiveness of the national missile defense system if we're not careful in how we proceed on this. So I think we have to be on record in discussing and considering all of those aspects in determination of whether or not we go forward.

Mr. Coyle, maybe it would be helpful if you briefly discussed or described what your office does and what your responsibilities are as the primary advisor to the Secretary of Defense on testing and evaluation issues.

Mr. COYLE. Yes, sir. My responsibility and the responsibility of my office is to oversee the testing programs that are conducted of military equipment, and in particular to be sure, as I said earlier, that they're adequately tested in realistic operational situations, which can mean, you know, in the mud and the rain and the dirt or against countermeasures, all of the things that can arise in real combat. I approve the test and evaluation master plans that are submitted by the military departments for each of these testing programs. I approve the operational test plans when we get to that phase, when we get to operational tests—we're not there yet with national missile defense—and I report to the Secretary and to others, to the Congress as well, on the results of such tests.

Mr. TIERNEY. So I think it would be fair to say that Congress created your position outside the weapons program offices to ensure that their testing and evaluation are up to par?

Mr. COYLE. That's correct.

Mr. TIERNEY. How would you rate the technological difficulty of this program in relation to other defense acquisition programs?

Mr. COYLE. I think this is probably the hardest thing we've ever tried to do. This is more difficult than the F–22 fighter aircraft; more difficult than the Comanche helicopter; more difficult than any aircraft carrier or submarine or tank or truck that we've ever tried to build.

Mr. TIERNEY. With respect to the President's four criteria in deciding whether or not there is going to be deployment, how would you say the program is faring to date?

Mr. COYLE. I would say the progress to date is about what I would have expected. What was difficult was that we faced a deployment readiness review, with implications there in the word "deployment," when we were still very early and are still very early in the developmental test program.

Mr. TIERNEY. Well, you have raised concerns, I think, in your role as director of IOT&E. In 1999, your report, for example, stated that "undue pressure has been placed on the program and that test conditions do not suitably stress the system in a realistic enough manner to support acquisition decisions."

Did you also make a formal report during the deployment readiness review?

Mr. COYLE. I did, yes, sir.

Mr. TIERNEY. What was your recommendation in that report?

Mr. COYLE. That report pointed out the limitations in the tests that have occurred so far. Much of that discussion is in my long statement for this hearing. So that report pointed out the limitations in the tests so far, and also pointed out the ways in which the tests were not realistic, the ways in which the testing program had slipped and other matters that I alluded to in my short statement.

Mr. TIERNEY. Can you provide the subcommittee with that report?

Mr. COYLE. Certainly.

Mr. TIERNEY. Mr. Chairman, I would ask that it be accepted on the record.

Mr. SHAYS. Without objection.

Mr. TIERNEY. In the context of the deployment readiness review, I have a hard time seeing how anyone examining the information could possibly make a decision to deploy at this particular point in time, especially when nowhere in the testing program are there flight tests against some very basic countermeasures of multiple warheads. And I think our intelligence agencies tell us that those will be the norm. Why isn't the Department of Defense listening? Having read your report, why are they still going forward recommending deployment at this stage while it seems, to me at least, that your report was very well-founded on some logical information?

Mr. COYLE. It might be better if General Kadish or Mr. Warner answered that question.

Mr. TIERNEY. General Kadish, can you tell me—assuming that you've read Mr. Coyle's report, and assuming that all that he says in there is accurate, why it is that the Department of Defense still made a recommendation to deploy when it seems fairly clear that it's very, very premature at this point?

General KADISH. I think it's helpful to understand how the program is structured and the confusion that surrounds this word "deployment." What we have done and offered to the Congress and the President was to say that we have a development program that's aggressively ongoing even today that it is trying to bring this technology into the field. In order to meet a date early in this mid-decade, we have to back up from 2005, the date we establish as the earliest we could do this program, at the same time that we're developing it and build the system at the same time we're testing it and designing it. That's the way national programs of importance in a very short time have to be done, so that you make decisions to move to the next build cycle on an incremental basis based on the results of your test, and that's the program we constructed.

And this thought of deployment is that—is the decision to build the system. That could be done incrementally, or it could be done all at once, but you take a risk in any military program when you design and build it at the same time. You need to do that, unfortunately, because of the way the world works in order to meet a shorter time horizon for a program of this nature. If you want to do as Mr. Coyle suggests and wait until you're all finished with the development, do operational testing with real soldiers under realistic conditions, which we intend to do, and then build the system, then you have an automatic delay of at least 4 to 5 years before you can have a useful capability in the field. So that's the problem.

Mr. TIERNEY. Or under your plan, General, we can build something that doesn't work, and then we're really up the river, huh?

General KADISH. In the plan that we have put forth, there were event-based milestones that checked our progress, and we just passed one of those, the DRR if you will, that would check our progress, and the country could make the decision whether it was worthwhile to proceed.

Mr. TIERNEY. And we decided in this instance at least it's not yet?

General KADISH. The President made his decision based on the information we provided.

Mr. TIERNEY. Based on the failures to date and the other considerations that were there.

I think there's some concern about the significant delay in various aspects of the program, General, but let's talk first about the booster.

As I understand it, the flight test was supposed to be integrated, right?

General KADISH. [Nodding in the affirmative.]

Mr. TIERNEY. They haven't yet used the launch vehicle that was intended for this system, right?

General KADISH. That's correct. We never planned to use that launch vehicle because we started the program very aggressively, and we used a surrogate booster for our first test.

Mr. TIERNEY. So it's not integrated to that extent?

General KADISH. It is not integrated to that extent. And that was the way it was planned.

Mr. TIERNEY. But even the surrogate booster failed, is that right, in the IFT–5?

General KADISH. That's correct.

Mr. TIERNEY. Now, the new booster is supposed to undergo its first boost vehicle test in February of this year, so the results could be factored into the deployment readiness review, but that test was delayed at least originally until July, right?

General KADISH. That's right.

Mr. TIERNEY. And now subsequently it's been scheduled for when?

General KADISH. Right now early next year in the January/February timeframe. We haven't really scheduled a test at this point in time.

Mr. TIERNEY. So this first booster was—has not occurred, it's been delayed over a year, it's not available for deployment readiness review at this point?

General KADISH. Right. And never planned to be so.

Mr. TIERNEY. Well, then, it wasn't very integrated I guess is my point.

Mr. Coyle, why is it important that the actual booster be tested with the system rather than a surrogate?

Mr. COYLE. The actual booster will subject the kill vehicle on top of it to faster speeds, higher speeds and greater accelerations, and so you would want to make sure that this very energetic new booster doesn't, in effect, hurt the kill vehicle when it's launched.

Mr. TIERNEY. The third booster test, the one where you actually combine the booster and the kill vehicle, how far has that been delayed now?

Mr. COYLE. My recollection is over a year.

Mr. TIERNEY. And I think, Mr. Coyle, that you mentioned that even a greater impact might be felt with delays in the simulation and ground test facilities. Can you tell us what the LIDS system is and what it's supposed to do?

Mr. COYLE. It's a, if you will, computer simulation system which allows various aspects to of the overall system to be played, to be tried out in simulation.

Mr. TIERNEY. And the use of this system, at least initially, was supposed to be available for the deployment readiness review?

Mr. COYLE. That's correct.

Mr. TIERNEY. And how long has the development of that system been delayed now?

Mr. COYLE. Again, my recollection is at least a year.

Mr. TIERNEY. Now, I think both of those were being developed by Boeing; is that right?

Mr. COYLE. Yes, sir.

Mr. TIERNEY. General, is it true that you recently withheld part of Boeing's bonus because of delays in the booster in the LIDS program?

General KADISH. Among other things, yes.

Mr. TIERNEY. How much in dollar numbers were they docked for that?

General KADISH. I would have to get back to you with the specific dollar amount if I take that for the record, but it was about a 50 percent reduction.

Mr. TIERNEY. So about $20 million?

General KADISH. I believe that's the range.

[The information referred to follows:]

Modication P00053, which incorporates the award fee amount awarded for the 4th Award Fee Period, reduced the total amount awarded for the 4th Award Fee Period by $21,058,307.

Mr. TIERNEY. I'll get back to this.

Mr. SHAYS. Thank you.

Mrs. Chenoweth-Hage.

Mrs. CHENOWETH-HAGE. Thank you, Mr. Chairman.

General Kadish, I am impressed with your testimony because as we move in this Nation from a policy of mutual assured destruction to a policy of mutual assured survivability, there is nothing more important that the military and the Congress can engage in in accomplishing that vision. And very often the military, like Members of Congress, catch an awful lot of flack, but I appreciate the perseverance that you have demonstrated. Perseverance is the key to America's survivability and to America being able to achieve peace through strength. And I appreciate your testimony very much.

I did want to ask Mrs. Bohlen, the administration, as you have testified to, has been negotiating with the Russians to amend the ABM Treaty. These attempts, as we know, have been unsuccessful, and the Secretary of Defense also said that development and deployment of the boost-phase intercept systems for the national defense would not obviate the need to amend the ABM Treaty.

I would like to direct this question to both you, Ms. Bohlen, and Mr. Warner. My question is, what specific changes need to be made to the ABM Treaty to deploy the limited ground-based national missile defense system now planned; and that is to say, after it's been ratified by the U.S. Senate?

Ms. Bohlen.

Ms. BOHLEN. Thank you. Clearly at some point or another, deployment of the national missile defense system, which has been under development and testing in this administration, would require changes to the ABM Treaty. Just to recall what I said in my statement, the deployment of an ABM radar at Shemya, of 100 ground-based interceptors and 5 upgraded early warning radars for the defense of all 50 States—this is just the C–1 program—would violate the obligations contained in article I of the treaty not to deploy an ABM system to defend national territory. These activities would also be inconsistent with the locational restrictions of article III.

What we have proposed to the Russians is a draft protocol to the treaty which would in effect amend the treaty in such a way as to permit these activities, to render them not contrary to the treaty, while at the same time retaining the provisions of the treaty that underpin the relationship between us of strategic stability.

I think if I could take that a little bit farther, and I would be happy to talk with you further about the specifics, I think what we're trying to do with the ABM Treaty is to preserve those elements which we continue to think are valuable, which are those that define our strategic relationship with the Russians. I don't think that even those who support a more robust national missile defense want to really take issue with that relationship of strategic stability. It is very important in this post-cold war world. We continue to have large nuclear arsenals, and we do not want to send a signal that we are trying to undercut the effectiveness of the

other country's offense. So that is the core of the ABM Treaty that we're trying to preserve.

At the same time it is clear that we have moved into a new strategic environment with the threat that is coming from the ballistic missile potential of the countries of concern that we have talked about this morning, and we need to be in a position to respond to that threat. And it is by the way, a threat that threatens not only the United States, but the Russians and our European allies as well.

So our problem is not to throw the baby out with the bath water. We think that the core of strategic stability, which is at the heart of the ABM Treaty, is something good and something we want to preserve, but it needs to be adapted to new conditions, and that is the essence of the task that we've been trying to do in our discussions with the Russians over the last year.

Mrs. CHENOWETH-HAGE. Thank you, Ms. Bohlen.

Mr. Warner.

Mr. WARNER. I would like to reinforce the last issue that Ms. Bohlen was just speaking about. We believe that mutual deterrence with Russia is still a very important dimension of our relationship in the world, and we want to sustain it. What we're really saying is that these are not mutually exclusive. We can sustain mutual deterrence with Russia because the limited national missile defense system we would deploy even in its two phases is one that would not threaten the Russian retaliatory deterrent. And that is different, and I am just being clear, that's quite different than the vision that, for instance, President Reagan had in the 1980's.

On the question of changes to the ABM Treaty, there was one additional element that came up as well. One of them was the question of covering the whole 50 States or national territory. That's banned by the treaty in article 1. We would have to amend that. Another one was location not in Grand Forks, which is currently what we've declared as our ABM area. There's also a technicality that the location of the X-Band ABM radar was going to be a lot more widely separated from the interceptors. Even when we went to Alaska, we put the radar in Shemya, and we would plan to put the interceptors in central Alaska. So we needed relief not only being in Alaska, but in the separation between radar and interceptors.

There was a third element, and that is we would upgrade the five early warning radars, the three that were the classical ballistic missile early warning radars in Alaska, Greenland and the United Kingdom, and two that are in the United States, one in California, one in Massachusetts.

We understand our plans would make those radars capable of helping effect an ABM intercept. That's different than the role they play today when they are just warning. So we also had to propose, and did in the proposed protocol, changes to article 6 and article 9 that would anticipate that these early warning radars could, in fact, play a role in ABM intercept engagements.

Mrs. CHENOWETH-HAGE. Thank you, Mr. Warner.

Mr. Chairman, I guess our major concern as I hear across America is we don't—we're nervous. The American people are nervous about an ABM Treaty with Russia constraining us from protecting

the American people from a missile defense attack from rogue nations. And so that's why I've really zeroed in on this particular issue. And I don't want to get particularly political on you, Mr. Chairman, but I know as a woman that the No. 1 issue that women are concerned about in America today is this issue. I can tell you it's not a health issue. It is where will America be in 10 years. And is our military providing for the defense of America?

Thank you very much, Mr. Chairman. I yield back the balance of my time.

Mr. SHAYS. I thought you were going to bawl me out for calling you Hage-Chenoweth instead of Chenoweth-Hage.

Mr. Allen.

Mr. ALLEN. Thank you, Mr. Chairman.

Mr. Coyle, General Kadish said a few moments ago that in light of the President's decision, there would have to be some reassessment of the projected cost of this program. And in your testimony—I may have heard him wrong, but I can come back to that. In your testimony you said you had some recommendations for additional testing to deal with some of the complexities that we're talking about, and just to run through them quickly, in your testimony you said there should be—you said the target suites used in integrated flight tests need to incorporate challenging, unsophisticated countermeasures that have the potential to be used against the NMD C–1 system; for example, tumbling RVs and nonspherical balloons. And you recommend use of the large balloon be discontinued because it doesn't mimic in any way the current test RV, the reentry vehicle.

The second, you said engagement times of day and solar position need to be planned to stress the acquisition and discrimination process by all the sensor bands, and you have to look at the effects of weather.

Then you said, third, when an interceptor is launched against a target cluster before the RV is actually identified, it is resolved and discriminated against, you have to do some testing there. And then you said at least—since it's not likely that only one missile would be fired by a state of concern that somehow believed its cause, its interest would be advanced by firing missiles at the United States, that you ought to do at least some engagement with two, at least two, incoming missiles.

My question to you—and you had another example as well—have—does this mean some additional time and some additional cost in the program if your recommendations are accepted? I am not asking you how much, but—Mr. Coyle's office is looking at the costs for these proposals, both the proposals that I've made and that General Welch's panel made, and he perhaps should be the best to comment about that, whether or not it would take additional time will depend on how you do it. And as I said earlier, if you do everything in series, certainly it will take longer, which is why if the country intends to achieve dates on the order of 2005 or 2006 or 2007, I would recommend that the testing program be done with more things happening in parallel.

Mr. Allen, General Kadish, do you have a comment?

General KADISH. We have taken Mr. Coyle's as well as General Welch's and other recommendations internal to the program to en-

hance our ability to test the system, and we've taken those very seriously. They do cost money, and in some cases a lot of money. And we are now in the process of trying to balance the schedule, the cost and the technical risks associated with those. But I can assure you we're taking every one of those seriously and will continue, because as this program is in development phase, as long as we are allowed to continue, there will be more discoveries of things we ought to do that would make sense. So we are proceeding along those lines.

Mr. ALLEN. Do you foresee at some future time, weeks or months in the future, that you would come back and say, we've rethought the system, here's a new schedule, here's a new estimate of cost? Is that something you're planning to do?

General KADISH. Yes, Congressman. We do that as a matter of course. And I insist on us always trying to improve what we're doing. And we're looking very carefully at the way we're doing business now and where we will make the required adjustments based on what we see so far to make it as effective as we can.

Mr. ALLEN. Do you have any date in mind in which you might——

General KADISH. Yesterday was good for me, but the process is a comprehensive one, so it's going to take some weeks. And as we go, we will be talking to Mr. Coyle, Dr. Gansler and all the leadership at OSD.

Mr. ALLEN. Thank you.

I have one other question. And in looking at some of the press—this is more for you, Ms. Bohlen, than anyone else.

In looking at some of the press reflecting the debate in the administration over what it takes, what would be—what work at Shemya would be a violation of the ABM Treaty?

It sounded as if there were three interpretations depending in part on which agency, but also maybe crossing agencies. One interpretation that Mr. Cohen advanced was that the United States would not violate the treaty until workers had laid rails to support the Shemya radar. That's a move that wouldn't happen until 2002. I gather that another legal interpretation was that the United States would be in violation at the point when workers begin pouring concrete, which was previously scheduled to occur in May. And a third interpretation was that the violation would not occur until the concrete foundation for the radar site is complete, somewhere in between the two times.

You know, if you look back at history, in 1983 we, the U.S. Government, objected to the Soviets' construction of a large-phased array radar near Krasnoyarsk in Siberia. And the Reagan administration argued that the radar was a violation of the ABM Treaty. They said Krasnoyarsk was a symbol of Soviet duplicity. And in 1989, the Soviets admitted that that radar had been built at a location not permitted under the ABM and was a technical violation of the treaty, and they subsequently dismantled it.

Is the Department of State and the Pentagon as well taking a look at—let me rephrase that. Has this dispute within the administration lawyers been resolved, to your knowledge, or are there still these three interpretations of what would constitute a violation of the ABM Treaty?

Ms. BOHLEN. Mr. Allen, at this point I would say the point is moot because the President has decided not to proceed with construction of the Shemya radar at this time.

There were a number of options which are under review, but there was no decision made with respect to any of them, and at this moment, as I say, the question is moot. When Secretary Cohen spoke, he was expressing his views on this. It was not—there is no administration position on this.

Mr. ALLEN. Would you agree with me that the question will no longer be moot when another administration is confronted with the same issue? Of course, I think your response is going to be, that will depend on the state of our negotiations with the Russians, and I wouldn't accept that as an answer.

Ms. BOHLEN. I think the question will certainly arise again, and if the next administration decides to go forward with the present plans which include the construction of the Shemya radar, it will certainly arise.

Mr. WARNER. The point on timing and options is exactly as she said. We made clear, of course, whatever the Rubicon you cross, where you have, in fact, begun construction, we made no—we made clear to the Russians we understand putting an ABM radar on Shemya is a violation of the treaty. So I mean, unlike Krasnoyarsk, we are not going through any charade as they did for quite a time and sort of claimed that the radar that was coming in at Krasnoyarsk is not relevant. Whatever the point is at which it might violate the treaty, we understand that a treaty violation will occur when you finally have this radar.

Mr. ALLEN. Thank you all very much.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you.

Mr. Kucinich, you have 5 minutes, and then it will roll over for another 5 minutes.

Mr. KUCINICH. Thank you, Mr. Chairman.

Mr. Chairman, to General Kadish, do you believe that a nuclear war would have devastating consequences for all mankind?

General KADISH. I believe any war has devastating consequences.

Mr. KUCINICH. What about a nuclear war?

General KADISH. Of course.

Mr. KUCINICH. And do you think that effective measures to limit antiballistic missile systems would be a substantial factor in curbing the race in strategic offensive arms and would lead to a decrease in the risk of outbreak of war involving nuclear weapons?

General KADISH. Congressman, I am a developer of weapons systems, and I feel a little out of my lane to answer that type of question. Perhaps Mr. Warner would tell you. Those are serious policy questions that are out of my responsibility at this point in time.

Mr. KUCINICH. So what you're saying then is that all you do is build the weapons whether there's a war or not?

General KADISH. What I am saying is I might have personal opinions about those issues, but in my official responsibilities, my primary responsibility is to develop the missile defenses for this country as directed.

Mr. KUCINICH. Thank you.

The reason why I asked that question, I actually developed those two questions from the preface of the ABM Treaty. And so if we look at where all this started years ago in 1972, an ABM Treaty—the purpose of the ABM Treaty was specifically to limit antiballistic missile systems that would be a factor in curbing the race of strategic offensive arms and to lead to a decrease in the outbreak of war involving nuclear weapons. Now, I would like to ask the administration's representative here, how does the administration's position square with article 5 of the treaty which says that each party undertakes not to develop tests or deploy ABM systems, etc. Haven't you already violated the treaty?

Ms. BOHLEN. No, it is not our view that we've already violated the treaty. I think all the development and testing activities we've conducted—but I would defer to General Kadish and Mr. Coyle on that.

Mr. KUCINICH. You haven't answered my question, and I want to go to Mr. Warner.

Mr. Warner.

Mr. WARNER. Article 5——

Mr. KUCINICH. I want to go to Mr. Warner with a question here.

You said that according to the work on this treaty you're doing with the Russians, that you can have a shield that would not threaten Russia's retaliatory deterrence. Did you say that?

Mr. WARNER. I did.

Mr. KUCINICH. OK. I just want to follow the logic of this. So we're asking American taxpayers to pay for a missile shield that can be by definition penetrated by Russia?

Mr. WARNER. That is, in fact, the proposal; a limited national missile defense, not a comprehensive defense.

Mr. KUCINICH. OK. I just want to make sure that I understand what's being advanced here.

Mr. WARNER. Could we answer your article 5 question?

Mr. KUCINICH. I have just 5 minutes, and we will have more time. I want to ask General Kadish a question.

As you know, it's illegal to misuse the classification system, to hide allegations of fraud or to reclassify previously unclassified information. That's Executive Order 12958 at subsection 1.8(a) and 1.8(c). Now, as you know, someone at the Department of Defense classified documents produced by Professor Postal of MIT that alleged that every NMD test has failed and that—secondly, that there was considerable evidence that NMD contractor TRW had defrauded the government.

Why has the Department of Defense classified Professor Postal's allegations of fraud, and do you consider Department of Defense's classification of these allegations of fraud to be proper?

General KADISH. We take all allegations of fraud very seriously. And we have aggressively, in my view, investigated them across—not only within our purview, but also with outside agencies including the Department of Justice. So—and that applies to beyond Dr. Postal's particular allegations.

In that particular case I would prefer to talk to you offline a little bit about the details, but I will say in general the classification of Dr. Postal's information was not to the allegations he made, but some of the information upon which it was based. So we need to

discuss that further in closed session, but I'll be glad to do that with you, Congressman.

[The information referred to follows:]

If a closed hearing were to be held the Ballistic Missile Defense Organization would have participants representing the legal, security, and technical perspectives. In addition, representatives from OSD Policy and TRW corporate should be invited. However, as there is currently a General Accounting Office (GAO) investigation underway, we believe that it will provide all desired insight into this issue, eliminating the need for a closed hearing or other meeting.

Mr. KUCINICH. Well, actually, General, with all due respect, it's been my experience that it's better to have these discussions in public.

General KADISH. My only—excuse me for interrupting you. My only comment along that line is not to—it gets into classified information. That's the reason why.

Mr. KUCINICH. Of course. But knowing there's an Executive order against classifying allegations of fraud, what steps are you taking to investigate whether the Executive order was violated by Department of Defense employees?

General KADISH. The Department is taking steps to look at those issues across a broad front.

Mr. KUCINICH. It's been—it's my understanding that the Department of Defense's inspector general is not investigating, that he's waiting for a GAO report. Do you know anything contrary to that?

General KADISH. As far as the DOD IG, I am not specifically aware of any activity they are doing, but GAO is looking at it as well as other looks, as far as I know.

Mr. KUCINICH. So if there's reasonable grounds to conclude that there has been a violation of law regarding classification of allegations of fraud, would you refer—if you found that out—the case to the Attorney General?

General KADISH. To the proper authorities immediately.

Mr. KUCINICH. I would like to go to this issue of states of concerns, which a few months ago were rogue nations, which a few months before that were terrorist states, which a few months before that may have been countries getting money from the United States. Which of the rogue nations are you getting ready to defend against, General? Who are the rogue nations?

General KADISH. The direction we have is North——

Mr. KUCINICH. States of concern.

General KADISH. The direction we have in terms of the capability of the system is for North Korea and the Middle East, Iran, Iraq and possibly Libya.

Mr. KUCINICH. So if any of these nations become our friends in the next few years, will you disband the program?

General KADISH. The responsibility that I have is to continue a development program unless directed otherwise and possibly deploy. So I would defer that to a national decision.

Mr. KUCINICH. Sure.

Now, if a state of concern or a rogue nation or previously unfriendly nation intended to harm the United States, which mode of weapons delivery is most likely? For example, smuggling a suitcase of radioactive material and explosive detonator in a commercial freighter to a U.S. port, using the—or using the most advanced and

expensive weapons technology to launch and successfully target a U.S. city with an intercontinental ballistic missile, which is most likely?

General KADISH. I think the Intelligence Community as well as the President stated that the most likely would be other means of delivery.

Mr. KUCINICH. So you would say the less expensive, less complex delivery method would be most likely?

General KADISH. If the question is most likely. I would point out, however, that there is a reason why countries develop ballistic missiles, and it's not to threaten only their neighbors.

Mr. KUCINICH. And how would NMD protect against less complex, less expensive threats?

General KADISH. I may defer to Mr. Warner, but from my point of view, in the development phase there are other means of protection this country has that even exist today for the terrorist threat. You can argue about how good those means are, but they do exist.

In the case of ballistic missiles, there is no defense if one should be launched, so the country has to decide whether that is a worthwhile, even though unlikely, event to protect ourselves against.

Mr. KUCINICH. And according to what Mr. Warner said previously, if Russia—we would look to a treaty where Russia would be able to have a retaliatory ability against our shield.

I would just like to conclude with this thought until we get to the next round. When I sit in these hearings, I get a sense of—with all due respect, because I know you're trying to serve the country as best you can, and you're not making the policy. Somebody is making the policy though. If they're not in this room, someday they ought to be hauled before a congressional committee and made to account. But I get a feeling that I'm seeing the development for a trailer for the second version of Dr. Strangelove, because what we're doing here is we're really trying to condition the American people to accept a new climate of fear. And I have to say, just as one American, one Member of Congress from Cleveland, OH, I don't like that. I think that we can do better as a country in creating a world that believes that peace is possible, not that war is inevitable. And this idea that somehow that we will prepare for peace through spending tens of billions of dollars, Mr. Chairman, for preparation for war is hard to take. I just have to mention that until I get my next opportunity to speak.

Mr. SHAYS. Let me just say that I am going to exercise my 10 minutes, and then Mr. Tierney has some questions he wants to ask, and then we do want to get on to the next panel. I appreciate the patience of the next panel.

I would like to touch on a number of issues. I'm sorry we're jumping around a bit, but hopefully there will be a sense of completeness to this. It's my sense that we've moved from SDI to GPALS—Global Protection Against Limited Strikes—to now a system of national missile defense that is somewhat limited attempting to deal with rogue nations and maybe an errant missile from China or the Soviet Union.

It's also my understanding that the ABM Treaty under article 14 allows each party may propose amendments to this treaty, and agreed amendments shall enter into force in accordance with the

procedures governing the entry into the force of this treaty. So, I mean, we wrote into the ABM the fact that we may someday want to amend it. It also allows each party shall, in exercising its national sovereignty, have the right to withdraw from this treaty if it decides that extraordinary events related to the subject matter of this treaty have jeopardized its supreme interests. This is article 15.

So this is not—while it is a significant untaking, it is certainly within the agreement of the ABM. And it is logical that Members would be concerned about a national missile defense system because the concept of ABM is deterrence, that logically one group would say, after your first strike, we can obliterate you, so you're not going to want to do the first strike. But there is obviously a concern with rogue nations.

I, like my colleague from Cleveland, fear the possibility of a nuclear weapon being literally brought in the trunk of a car or the back of a truck or put on a ship and brought to port in the United States and detonated, or chemical weapons. I mean, those are possibilities. But I also fear that 10 years from now I would have voted against a limited national defense, and a missile is on its way, and I think to myself what kind of decision did I make today?

And obviously costs are a factor in destabilization, but I would love to just understand what it takes to get the Russians to sit down. And it would seem to me that one of things it might take to get them to sit down, to realize they have a benefit in this since it is a limited national missile defense, is for us to have moved forward with the radar in Alaska. And I would like to know why did the President decide not to move forward with the radar since the technology is clearly, I think, there to move forward? And maybe I'll just throw it open to the floor. I would like that explained to me.

Mr. WARNER. Well, as he announced it in his speech a week ago at Georgetown, the main factor was, to him, that there were now questions about the technical feasibility. He wanted the development program to go ahead.

Mr. SHAYS. Not of the radar.

Mr. WARNER. No, but of the overall system; that those tended to, in his view, shove the initial operating capability out a year—he spoke of how it was capable of now being fielded in 2006 or 2007—and given the fact that now that this deployment would probably be a year later, there was not the same pressure to get the radar construction under way that there would have been if you were trying to make 2005.

Mr. SHAYS. I'll follow that up, but, General Kadish, do you have a comment, Mr. Coyle, about the radar itself? Is the radar technologically there?

General KADISH. I think you have to look at this as an entire system, and we've tried to evaluate it as an entire system.

Mr. SHAYS. We will do that after you answer my question, if you would.

General KADISH. The radar has progressed very well in the overall testing. It is probably one of the better elements in terms of our expectations.

Mr. SHAYS. Mr. Coyle.

Mr. COYLE. I would agree with that.

Mr. SHAYS. So there was really no technological reason why we needed to wait on the radar.

Now, you wanted to make your point that we need to look at this as a whole, but, Ms. Bohlen, isn't it true that if we moved forward, we would be calling the question, which the Russians seem to be forcing us to do? Are they sitting down with us?

Ms. BOHLEN. They were sitting down with us, Mr. Chairman. And as I indicated earlier, I think we have made some progress, not as much, obviously, as we hoped. But in the sense that they now accept that there is a threat, this was stated clearly in the joint statement of the two Presidents at the Moscow summit in June, there was absolutely explicit recognition that there is a threat out there of missile proliferation, and that it poses a threat to international stability.

The Russians are seized with the issue. I think they will certainly look at the totality of the system, and they will look at what the next administration does on this.

Mr. SHAYS. By a vote of 317 for it, Congress and the President signed into law the fact that we will have a national missile defense system. That's going forward. Now, it is subject, obviously, to annual appropriations of Congress, but I thought we got beyond the issue of whether, and the question is when. And so it would strike me that we had a viable part of the system that we could begin to implement, and that there would be a positive side effect to that, and that would simply be to force the Russians to know we're serious. I don't think they think we're serious. I think they think that we're going to back off.

And as far as our allies not being for the system, I don't think they fear what we fear, and I think they may have reason not to fear it, but we have a reason to fear it. We think those missiles will be directed at us, not them.

Ms. BOHLEN. Well, I would say that for the allies certainly the threat in time is more immediate for them, the threat from the Middle East, and I think we have gotten their attention on this issue. There are many concerns out there, as you know. They are concerned about what happens if we can't get the Russians to agree to amend the ABM Treaty. They are concerned about what this does to strategic stability. They are concerned about decoupling. They are concerned about what steps they should take to protect themselves.

So I think this gives us more time to pursue that dialog, and I think it's very important that we have allied support.

Mr. SHAYS. My fear is that it will convince them that we're not serious. I mean, we had one part of the program we could begin to implement that we know works, and we decided not to, and I still am wondering why. Maybe one of you could tell me why we needed to stop there when we could have begun to build it?

Ms. BOHLEN. I think as Mr. Warner just said, we would not—the delay in the radar——

Mr. SHAYS. Let Mr. Warner say. I am not hearing it right now.

Ms. BOHLEN. We won't have a system.

Mr. WARNER. If the overall system is not going to be available until 2006, and we think that there is a challenging but achievable

path to build the radar in Shemya, operationally test it and have it ready in about 4 years, then you can delay the beginning of that whole construction until the summer, the spring/summer of 2002 instead of the spring/summer of 2001.

Mr. SHAYS. I know you can do that. I'm just wondering why we're——

Mr. WARNER. I am saying the context was that if there was no pressure to get started, why take that step now? The Russians are clearly waiting for the new President. There is no doubt about that. They began to signal that, in my view, to us in our talks with them certainly by the spring of this year, if not earlier. I mean, they know there's an election coming. They know that this, the legacy of whatever this President had done, would be subject to review by the next President. So, in a sense, we could never escape from the fact that there was going to be a new occupant of the White House. And the Russians in a sense said, once we've looked at the balance of all of this, we'll wait and see who that is and what he wants to do. And that, to my view, is where we stand on the question.

And the Russians were willing to do some things in the interim. They did, in fact, acknowledge the threat. They've joined us in a series of cooperative activities, an agreement signed in New York just 2 days ago, but on the whole they're saying, we'll wait and deal with the next administration.

Mr. SHAYS. Right. But your testimony still stands that the technology exists now that we could have moved forward?

Mr. WARNER. I want to clarify that. My personal judgment is that overall we will be successful, but it will have to be demonstrated. In that sense, I mean, I completely agree with Mr. Coyle. I think we have the fundamentals to do the job, but I can't say we've yet fully demonstrated it.

Mr. SHAYS. I'm talking about the radar.

Mr. WARNER. I'm sorry. About the radar? The radar is in. We believe it has come along very well to do the task we have asked of it.

Mr. SHAYS. I just want the record to show that there is no technological reason not to move forward with the radar.

Mr. WARNER. That was not cited by the President as one of the issues that he took into consideration, any difficulty with the radar.

Mr. SHAYS. Thank you. I will yield to the ranking—not yield, but give the ranking member—excuse me. Would the gentleman mind if I just yield?

Do you have a question?

Mrs. CHENOWETH-HAGE. I do. I have a comment, Mr. Chairman, that I would like to make for the record, in response to Mr. Kucinich's question. I think it was a very interesting and probing question about terrorism versus realistic attack of an ICBM.

In making my statement I would like to enter into the record officially an article entitled, "Facing The Risks. A Realistic Look at Missile Defense," by John Train, who has been appointed as a contributing editor of Strategic Review and has received appointments from Presidents Reagan, Bush and Clinton. And to sum up his testimony, he answers Mr. Kucinich's question. He said, "The administration may settle for a shallow and vulnerable missile defense that might not bother the Russians or some of the potential aggres-

sors it's supposed to protect us from. An fanatic can attack the U.S. using other weapons, notably biological and chemical, against which we must defend ourselves. But many unstable countries are also at great expense building missiles that can hit the U.S. in coming years. One reason to erect defenses is to reduce the temptation for their use."

He concludes by saying, "We are likely to be attacked at our weakest point and should leave no inviting apertures."

I think that sums it up, especially in view of the fact that we know North Korea is spending far more money on building a missile defense system than they are feeding their starving people.

Thank you, Mr. Chairman.

Mr. SHAYS. Without objection, we will put that in the record.

[The information referred to follows:]

Strategic Review
Summer 2000
Pg. 4

Facing The Risks: A Realistic Look At Missile Defense

By John Train

In Brief: The administration may settle for a shallow and vulnerable missile defense that might not bother the Russians - or some of the potential aggressors it's supposed to protect us from. A fanatic can attack the U.S. using other weapons, notably biological and chemical, against which we must defend ourselves, but many unstable countries are also, at great expense, building missiles that can hit the U.S. in coming years. One reason to erect defenses is to reduce the temptation for their use. A sea-based defense may be the best of all.

I was once talking to Mac Bundy about the original Star Wars conception. Although by no means infallible in all things, Mac had a good insight about this one. "It'll cost $30 billion, and then it won't work," he said, bluntly. That was in the Reagan days, when the extremely bright General Abrahamson was beavering away in many directions with immense sums of money, and holding briefings about the exciting prospects on the horizon. For a while, everybody was buzzing about deep space sensors, blinding the observation satellites, pinging the decoys, zapping the bus in the boost phase, the hedgehog, point defense, Brilliant Pebbles, SPRINT.... But alas, although tens of billions were spent, so far it hasn't worked. However, a limited prospect is finally opening up, and it's quite certain that with enough additional time and much more money, there will be results.

I've never known whether President Reagan really believed in an overall anti-missile defensive umbrella. Probably, after two or three years, he didn't, since almost nobody else did, and he had access to the best advice. On the other hand, to the Soviets he surely looked convinced. His hatred of the "Evil Empire" was intense. So our Strategic Defense Initiative was a challenge to which they had to respond. There was only one trifling problem: They didn't have the money. At the same time that the U.S. was experiencing the huge Reagan economic boom (stimulated by the huge Reagan deficit), the Soviet economy was a wreck and their subject peoples were becoming rebellious. There was not nearly enough money to prime the economic pump at home and placate a grumbling satellite population, and not even remotely enough to support a bet-your-country arms spending race against our vastly more powerful economy. The American eagle on our Great Seal used to face the lightning bolts in one claw, and then was swivelled around to face the olive branch in the other one. Now it had turned back toward the lightning bolts. For the Soviets, a nightmare!

Every government always contains a peace party and a war party. The Soviets were no exception. Stalin thought that war wasn't entirely a bad thing, since from the ashes might emerge the triumph of communism, as it did in Russia after World War I. But in the course of negotiating arms control agreements, the Soviet marshals had come to realize that everything they had worked and sacrificed for would go up in the mushroom clouds of World War III, and that the first-strike capability they had spent immense sums on was unattainable, thanks to the invulnerability of our Trident SSBNs. Now, with Star Wars, they faced ruin, whether or not Reagan really believed in it, and indeed whether or not they really believed in Marxism.

In the old West, you had table stakes poker, where you could not be asked to bet more than the chips you were showing, and also unlimited poker, where you had 24 hours to raise the funds to meet your opponent's bet. If you were confident enough, you mortgaged your farm. But facing our Star Wars bet, and with no chance it was a bluff, the Soviets were like a cowhand playing unlimited poker opposite J.P. Morgan, who disposed of more cash than any cowpoke could ever hope to get together.

The Soviets had already made one costly bet, a plausible threat to invade Western Europe, to which the West had responded with a nuclearized NATO. Now the West had made its own bet, raising the stakes out of sight. If Reagan really was implacably determined to create an effective SDI, the Soviets would

have to respond, even if it meant putting their economy on a mobilization footing. So it was time to get out of the game, if possible.

In fact, though, as long as the Soviets were willing to forgo aggression, the West was prepared to wind down the arms race reciprocally. When it became apparent that this really was possible, Reagan stopped talking Evil Empire and let Soviet decomposition run its natural course. Thus, we are no longer looking into the barrels of each other's revolvers, and instead have at least a chilly understanding with the Russians.

Armed Fanatics

Today, though, we face another problem, armed fanatics. What do you do when your half-wit neighbor starts walking up and down the street in front of your house cursing at you and waving a pistol? Call the police, of course. But in the international arena we're the police. Perhaps you buy a bulletproof vest and look for a weapon.

Anyway, here are the North Koreans, Iranians, Libyans, Chinese and others busily assembling three-stage intercontinental missiles and cursing at us. Last December Mubarak's # 2 called for a Muslim bomb! In time, they'll tip them with nuclear warheads. What to do? We have several courses available:

1. Particularly as to the North Koreans, make deals with their neighbors to influence their behavior, and then try to talk them out of going ahead, offering carrots and sticks as needed. In a word, diplomacy: the best solution, if it works.

2. Make it clear that we'll strike back instantly: Incoming missiles carry a return address, and a few minutes into their flight we can obliterate their country of origin.

But one should remember that these days there are a lot of non-state actors in this business, whose missiles may not have a clear postmark. What's the address of the Mafia? Or of Bin Laden? Until recently, the Aum sect of sarin notoriety would have been glad to hit us hard from a number of hideouts, and there seem to be plenty of self-germinating Muslim fanatics in the world. A missile doesn't have to be nuclear to be nasty: It can carry a biological or chemical payload that could be painful. Although weaponizing such agents to cover a large area is probably not now possible for such groups, 15 or 20 years from now, when a missile defense should have reached a good degree of effectiveness, dangerous lunatics whom we don't dream of today will stalk the world. We see many terrorist groups with specific objectives: North Africans in France, the Tamils, the Basque ETA. Now, however, we confront a number of fanatics that don't want a place at the negotiating table at all, but instead want to blow it up!

Against such terrorists our dominance in spy satellites is comparatively ineffective. We need saturation intelligence on the ground. The CIA's present guidelines forbid it from recruiting human rights violators as agents, absent specific permission from the DDO. That's as though the FBI couldn't recruit the Mafia informants on which it depends. Our sources within the Soviet Union were mostly good people who hated the system. A source in Hezbullah, though, has wanted to be in it, and is almost certainly a violator of somebody's human rights. Congress will need to straighten this one out.

3. Another strategy is to add to the foregoing a defensive shield, so that a fanatic who in a mad spasm decides to blow up Seattle doesn't know if he'll succeed at all. On the grounds of global stability, I can see great advantages to this approach over the pure retaliatory strategy. Just as we ask not to be led into temptation, so too should we avoid tempting others. One would have to be crazy to launch a minor attack on a first-class nuclear power, but people do commit national suicide. Think of dictator Lopez of Paraguay in the nineteenth century, whose lunatic campaign against his neighbors killed four-fifths of Paraguayan men, including him; or, in a way, Hitler's Berlin bunker Götterdämmerung; or, indeed, the increasingly popular Jonestown type of collective suicide. One can conceive of such a gesture by a fanatic who is heedless of the consequences.

In any event, while the threat of retaliation stabilizes the relationship between major nuclear powers, it would be terrible to lay waste to a Third World country - which our public would demand - because a

demented group had attacked one of our assets. Deterrence through defense is more humane.

4. Another approach is preemption, the way the Israelis attacked and flattened Iraq's Osirac nuclear reactor a number of years ago, or the way we throttled Cuba in the missile crisis: Nip the threat in the bud through a preemptive strike - or the threat of one. I am entirely satisfied that absent another solution we would indeed try to take out an imminent potential attacker if we learned about it in time.

The then-National Security Advisor a while back once explained to me the paradox of preemption: "Suppose the President asks me, 'Have they got it or don't they?'- meaning a useable A-bomb. And suppose I have to answer, 'Mr. President, we just don't know.' At that point it's too late." He meant that if we attacked North Korea's nuclear sites believing they didn't yet have a useable nuclear weapon, and they did after all, and in a spasmodic riposte they hit Tokyo or Seattle, our error would have been catastrophic. So we can't take that risk. In this situation an adequate missile defense would be very helpful indeed. You punch with one glove and ward off with the other.

Alternative Threats

Next, the question of alternative means of attack. If we develop a light missile defense, goes the argument, can't the North Koreans, or whoever, set off a nuke already hidden here (the "Federal Express" scenario) or threaten to, or put chemicals in the New York City Reservoir, or release anthrax or other nasty bugs somewhere? Couldn't a passing freighter with or without authorization (the "mad captain" scenario) lob a cruise missile at Baltimore? Can't they blow out our communications with cyber attacks? Answer: Very possibly. And to that end the government is making a vast effort on many fronts to plug as many holes as possible - much more than the public realizes. Threats of such actions are made and coped with constantly. There remains a long way to go. One does the best one can. Bioterrorism is very difficult, though: the complexity of raising anthrax and the like from lab grade to weapons grade and delivering it effectively is much more daunting than most people realize, while reservoirs are monitored continually.

One effective use of chem/bio weapons would be against a point of embarkation - sea or air - during hostilities abroad. The civilian workers - or pilots or sailors - would refuse to enter a contaminated area.

As to cyberterrorism, the Department of Defense is attacked 250,000 times a year as it is! Most important civilian communications have robust defenses, constantly being challenged and strengthened.

An exceedingly important aspect of defense against these types of attack will be an intense effort to infiltrate potential offenders, using HUMINT. It means so much to us that we can afford to spend almost anything to get adequate warning, as we did in the Cold War to seek warning of a Soviet attack.

Incidentally, those in the business believe that attacks by domestic extremists are more likely than by foreign groups. And one must maintain [redacted]: [redacted] A [redacted] successful terrorist attack might kill several hundred or even thousands, bad, but not compared to the hundreds of thousands every year whom smoking kills prematurely.

What About the Russians?

Next, the Russians and Chinese. They are grumbling quite loudly about our missile defense plans. The Chinese, who now have 20-odd ICBMs of their own, describe our national missile defense plan as an "offensive act," curiously enough. They claim that if we have less to fear from their ICBMs we'll feel more free to intervene in the Taiwan Strait, for them an internal matter. Some strategists argue in response that the Chinese can build enough missiles to overwhelm our proposed light defense, so they can't reasonably suppose that it's really directed against them, as distinct from North Korea. Others say that in practice they can't, but that their huffing and puffing won't change matters.

Still, a high Russian official pointed out to me that since Russia is already selling modern arms to China, an ABM deployment could well precipitate a more active common Russian-Chinese effort against us. It was a serious and repeated warning, and should be borne in mind.

The Cox Committee reported last year that China has stolen our ballistic missile guidance technology, and provided it to North Korea, Libya, Iran, and Pakistan, among others: also that it has stolen design information on our latest thermonuclear weapons, which could be adapted to China's next generation of ICBMs. China has sold over 100 CSS-8 intermediate-range missiles to Middle Eastern countries. China's ten-story high CSS-4, with a range of 8,000 miles, is already deployed. So an important element of survival in a dangerous world is much better security against Chinese espionage.

As to Russia, the present state of the world resembles the 1920s. R~~ussia is an unsatisfied country and no more stable than the Weimar Republic.~~ So we need to be worried about it. At the same time we don't want to alarm it by seeming to undercut its deterrent. A very tricky problem! (It might reassure the Russians if some of our interceptors were based on Russian territory.) Any effective defense must be layered - on land and sea and in space. The deep space aspect particularly concerns the Russians. One possibility would be a U.S.-Russian ABM treaty amendment coupled with deployment of a shallow and vulnerable defensive system based in Alaska. Some hold that while protecting against attack from North Korea and China, it might work less well against Iran, Iraq or Libya. (Lt. Gen. John Costello, the Army boss of this effort, tells me it would cover attacks from those directions.) It would boost the Gore campaign if the administration came to an agreement with Russia and could announce a diplomatic success, even though the system was second-rate. We would presumably need to offer to reduce our overall nuclear arsenal as part of this deal.

As to the legalities of the ABM treaty, there is a distinction between dispositive treaties - buying Alaska - and renunciation treaties - I won't eat garlic if you don't. The former, but not the latter, binds a successor state. That doesn't mean the Russians won't pound the table if we break out. They will.

Sentiment Overseas

And Europe? There is a feeling there - and elsewhere in the world - that the U.S. is simply too big, too powerful. The French, particularly, are taking the line that the U.S. is a hegemon. (Other Europeans frequently point out, though, that this French posturing is in part a display to distract public opinion from the scandals that have been emerging there, from both the Mitterrand regime and the present one.) In any event, we must carefully manage our NMD relationship with Europe to assuage hostility. The British should be able to help smooth the process.

Seen from Europe, the ABM treaty is a basis for stability between the U.S. and Russia. The Europeans fear that if we develop an effective missile defense we will be less concerned with Europe - will "decouple." However, Europe will face a missile-capable Libya or Iraq long before we do, so they should be more concerned than they are. For that matter, strategists are already contemplating scenarios of a nuke-armed madman threatening the U.S. by hitting one of our friends, or threatening to. "Frighten the monkey by killing the chicken," the Chinese say. The Europeans should recognize that our reliability in defending their homeland is diminished to the extent that we can be intimidated by Iranian missiles. Anyway, the Europeans can be confident that we will share our technology with them.

Conclusions

Popular discussion of nuclear missile defense often gives surprisingly little weight to the sheer cost element. Is this the best way to spend many tens of billions of dollars? ~~That sum buys an immense amount of conventional military hardware and R&D that we can be confident we~~ really will need. On the other hand, NMD outlays would be spread over many years, and considered that way seem tolerable - probably two percent or so of our military budget. And we shouldn't need as many bombers or carriers against the asymmetric threats we can expect to face 10 or 15 years out. So if at long last a limited system will work, we should start. In the dangerous decades ahead, we'll be glad of it. Either way, though, I'll bet that in coming decades the threat of chemical, biological or cyber terrorism will put a damper on the more assertive manifestations of our foreign policy.

The Navy's Theater-Wide System (NTW) deserves much more attention in the national missile defense context. It builds out from its Navy Area Defense System, which should be deployed on 40 ships by

2003. Tests of its missiles and shipboard radar have been successful. The NTW can perhaps be turned into a significant part of a national defense system, with the advantage that its elements could be moved around rapidly to block threats from different directions as they arose. (However, using advanced sensors it could look like a national, not a theater, system.)

To sum up, I reason that the United States should have a light defense against Third World missiles simply because fanatics are building them. It's like the police donning bullet-proof vests when they expect trouble - not total protection, but far better than none. The Third World fanatics are also developing chemical and biological weapons, which we will counter as best we can. But if they are pursuing the ICBM option they must consider it realistic, so we should defend against it. We are likely to be attacked at our weakest point, and should leave no inviting apertures.

The Honorable John Train, Senior Contributing Editor of Strategic Review, has received part-time appointments from Presidents Reagan, Bush and Clinton. He founded Train, Smith Investment Counsel in New York. He has written editorial features on military and foreign affairs for The Wall Street Journal, writes a column in London's Financial Times, and sponsors the annual meeting of the Joint Chiefs of Staff at the Council on Foreign Relations and the Strategic Debate series at the International Institute for Strategic Studies in London.

Mr. SHAYS. Mr. Tierney.

Mr. TIERNEY. Thank you, Mr. Chairman.

General, let me just pick up a little bit on the cost, if I can, for a second. As I understand it, this program started with an estimate of around $9 to $11 billion. I have a CRS report that tells us the estimate in January 1999 was $10.6 billion, but yet CRS said by February 2000, about a year later, this estimate rose to $26.6 billion. What caused that sharp increase?

General KADISH. When you're dealing with cost estimates, you have to define the time period and the elements that are included in the cost.

Mr. TIERNEY. Well, this was from 1999, when it was $10.6 billion, to February 2000, when it was $26.6 billion. So I think we're asking what elements changed to get that increase?

General KADISH. I would probably be better off if we did this in response to the record, but just in general what I would say is that the $20 billion figure, that includes $5.7 billion from 1991 to the present as well as what our best estimate at the time of what the ground-based system, the NMD system, was going to take to build. That gets you to about a $20 billion figure. Now, those elements are, of course, under review right now based on the decisions that have been taken. But that—and I would like to be more specific for the record to make sure that we line up what the CBO and the CRS say versus what our estimate is, because the time horizons as well as the elements are very important.

[The information referred to follows:]

The difference between the estimates is attributable primarily to a difference in the number of fiscal years included and the number of missiles fielded by the program.

The FY00O President's Budget submission (dated Feb 99) included $10.5B (cumulative total for FY1999-FY2005). $26.2 billion can be derived from the estimate that supported the FY01 President's Budget submission (dated Feb 00) and is the cumulative total for FY1991-FY2015. Additionally, the $26.2 billion included funding for: an additional 80 interceptors which expanded the number of interceptors in the missile site from 20 to 100, upgrades for X-band radar in Alaska that was added as part of the C1 expanded program, and for implementing the Welch Panel (Independent Review Team) recommendations.

Mr. TIERNEY. Well, it jumped up that much by February 2000. But the CPO in April 2000 said it was going to be $29.5 billion. And then the CPO—the JOA—GAO, rather, in May 2000 said it was going to be $36.2 billion. So, I mean, all these figures keep jumping.

General KADISH. Right. And a large part of the reason for what is implied as massive changes in the cost estimate, significant changes, is because we added missiles. The original cost estimate, as I recall, that we did was for 20 missiles in 2005, and that was it, our so-called C–1 capability. But when we went to the expanded C–1 where there were 100 missiles by 2007 under the old program, then the cost estimates, of course, had to be included for those new missiles that we added to the program.

Mr. TIERNEY. GAO says that added about $2 billion. Would that be about right?

General KADISH. About $2 billion is about the number I remember for a large part of the missiles, right.

Mr. TIERNEY. So that still leaves a significant jump from $10.6 billion to $26.6 billion on that. Do you have some idea what the rest of that was all about?

General KADISH. Again, I would like to be able to line those up in a more disciplined manner to show you comparisons than I can here in testimony.

[The information referred to follows:]

HOUSE GOVERNMENT REFORM COMMITTEE
NATIONAL MISSILE DEFENSE
SEPTEMBER 7, 2000

INSERTS FOR THE RECORD

Pag126, Line 2907

The information follows:

The difference between the estimates is attributable primarily to a difference in the number of fiscal years included.

In April 2000, the Congressional Budget Office (CBO) reported the cost of the Expanded C1 NMD architecture at $29.5B, based on one-time costs and operating costs from FY 1996 through FY 2015. In the FY 2001 President's Budget, DoD estimated those costs at $25.6B for FY1996 through 2015. However, the CBO estimate included $0.6B for 35 interceptors beyond DoD plans, $1B in additional military construction costs, an additional $1.5B for 20 additional flight tests, and $0.8B representing 15% cost growth above DoD's expected 5% growth. These differences account for most of the $3.9B difference in the CBO and Pentagon estimates.

The $36.2B cost figure reported in the May 2000 General Accounting Office (GAO) report represents BMDO's Program Life-Cycle Cost Estimate for the Expanded C1 NMD System from 1991 to 2026.

The program cost did not jump from $10.6 billion to $26.6 billion as the two figures differ in both the number of fiscal years included and the number of missiles fielded by the program. The FY00 President's Budget submission (dated Feb 99) included $10.5Bwhich is the cumulative total for FY1999-FY2005. $26.2 billion can be derived from the estimate that supported the FY01 President's Budget submission (dated Feb 00) and is the cumulative total for FY1991-FY2015. Additionally, the $26.2 billion included funding for: an additional 80 interceptors which expanded the number of interceptors in the missile site from 20 to 100, upgrades for X-band radar in Alaska that was added as part of the C1 expanded program, and for implementing the Welch Panel (Independent Review Team) recommendations.

Mr. TIERNEY. More recently as you went into the deployment readiness review, your office was charged with evaluating the program as it stood in July or perhaps August of this year. I think you came up with a new cost estimate for the DRR of $40.3 billion, right?

General KADISH. There were a range of cost estimates done not only by us, but by independent estimators within the Department.

Mr. TIERNEY. But yours was $40.3 billion, right?

General KADISH. The actual number, I can't remember exactly what it is, but it was around the $36—life cycle cost, it was about $36, as I recall.

Mr. TIERNEY. If I give you a copy of your National Defense Review Agenda, your internal document, would that help you, because that has it at $40.3 billion.

General KADISH. All right. If you take the cost comparison that we did, the FYDP or the future years defense program, the acquisition costs, total acquisition costs, and put it from 2001 to 2028, from fiscal year 2001 to fiscal year 2028, and then your dollars, which means fully inflation-adjusted, if you add an additional $5.7 from the earlier timeframe, from 1991, which then gets you from 1991 to 2028, it's $40.3.

Mr. TIERNEY. And that's the number you came up with on your internal review?

General KADISH. That's right.

Mr. TIERNEY. But the cost analysis improvement group, can you tell us who they are?

General KADISH. They are an independent cost estimating agency within the Department of Defense.

Mr. TIERNEY. They came up with $43.2 billion, right?

General KADISH. They came up with about $1 billion more than what we did.

Mr. TIERNEY. We came to $43.2 billion. That's a little more than $1 billion more.

General KADISH. Well, I guess I'm talking about the acquisition costs.

Mr. TIERNEY. So if we were to take their number, we are at $43 billion, and I understand there are other costs that aren't included in those estimates, one of them being the operational requirements document interoperability requirements. Those aren't in your numbers, am I right?

General KADISH. We did a full cost——

Mr. TIERNEY. As much as I would like to get an explanation, either it was or it wasn't. Was that in your number, the interoperability?

General KADISH. Yes, it was.

Mr. TIERNEY. So that's in your $40.3 billion?

General KADISH. Yes.

Mr. TIERNEY. OK. As I read your internal document, it does not reflect that it is but that's fine. How much were Mr. Welch's adjustments?

General KADISH. We did our best estimate of what those elements would cost, and those are in our estimates as of this time. But all these estimates are under review, based on what the Presi-

dent's decision is, and we need to do an awful lot of work to make sure that we get the best estimate we can on the program.

Mr. TIERNEY. Does your figure also include the alternative booster program costs?

General KADISH. No.

Mr. TIERNEY. That's another billion dollars or so.

General KADISH. Should we decide to do that, that decision has not been taken.

Mr. TIERNEY. Does it include restructuring of the program to remedy any testing delays?

General KADISH. No, it does not.

Mr. TIERNEY. It does not, all right. OK.

General KADISH. Well, let me make sure I get that question right. For the test delays, yes. OK? For the additional time required in the extension of the program, no.

Mr. TIERNEY. Well, with regard to the extension of the program, Mr. Coyle, you provided on page 5 of your testimony a figure too that shows graphically I think the slips in the flight test, the booster test and the LIDS that you identified earlier in that development. You also provided a general estimate of the range of slippage. I think basically the program is losing ground at the rate of 20 months every 3 years; is that correct?

Mr. COYLE. Yes, sir, that's correct.

Mr. TIERNEY. If you extend that out, by what date would the program be able to field all 100 intercepters?

Mr. COYLE. If the program were to continue to slip at the current rate, it would extend the date another couple 2½ years.

Mr. TIERNEY. So 100 interceptors due 2007, and that's 7 years; 20 months for every 3 years would be 47 months. So a 4-year delay, right?

Mr. COYLE. Yes.

Mr. TIERNEY. So actually, 2007 becomes 2011?

Mr. COYLE. Yes, sir.

Mr. TIERNEY. OK. Now GAO reported that the program cost increased by $124 million every month the program slips. So by your calculation, that would add about another $5.8 billion?

Mr. COYLE. The arithmetic sounds right to me.

Mr. TIERNEY. Well, I did it in advance just to make sure. That's not my strong suit.

OK. Let me just finish up here then. Ms. Bohlen, the State Department has obviously been conducting negotiations on the system and if we just disregarded the concerns of our NATO allies as some people have proposed, and that would abrogate the ABM treaty, is it likely that England and Denmark would allow us a place to forward deploy our radar sites?

Ms. BOHLEN. I think that's a very real question, Mr. Tierney.

Mr. TIERNEY. In all likelihood, they wouldn't if we just went against their wishes?

Ms. BOHLEN. I think we can't absolutely say because you can't predict the circumstances under which this might happen.

Mr. TIERNEY. But it is a pretty good bet?

Ms. BOHLEN. But we cannot take it for granted that we would have their permission, either to upgrade the early warning radars

that we are talking about for the present system or building the X-band radars that we want for the later phase.

Mr. TIERNEY. Without them, certainly that prevents us from being able to field the kind of proposed missile defense system that we are envisioning?

Ms. BOHLEN. Well, I would defer to General Kadish and Mr. Coyle on whether there are alternatives.

Mr. TIERNEY. Well, Mr. Coyle, if we didn't have the support and England and Denmark didn't allow us to place our forward deployed radar sites on their territory, would that pretty much do away with our ability to field the system as it is currently envisioned?

Mr. COYLE. Perhaps there would be some other alternative. I don't know.

Mr. TIERNEY. Ms. Bohlen, I have seen a copy of an article from Jane's Intelligence Review that quotes several top level Russian officials. One is Defense Minister Igor Sergeyev, who declares that Russia must develop new weapons capable of neutralizing any U.S. ABM system. Another, Major General Vladimir Dvorkin, director of the Russian Defense Ministry's Central Research Institute suggests that Russia could redeploy its real mobile ICBMs if our defense system goes ahead. So I think that people argue a little simplistically that while Russia shouldn't have a veto over U.S. defense policy—I think we would all agree on that—but don't you think that those statements or statements like that should at least let us know that our actions have potential repercussions and we should at least take them into account? I assume your department would say that.

Ms. BOHLEN. I would certainly agree that our actions will have potential repercussions. What the Russians might do in reality if a future President decided to withdraw from the ABM treaty, again, it would depend very much on the circumstances.

I hark back to what was said earlier, what Mr. Warner said. I think the Russians realize that they will have to face up to the problem, and I think they are waiting for a new administration to see exactly what the dimensions of the issue will be and what they will have to negotiate on.

I think we would certainly not want to minimize the consequences if we were to withdraw from the ABM treaty, and I think that was certainly a factor that weighed in the President's decision.

Mr. TIERNEY. Thank you. General, let me just say, isn't it fairly accurate—the 1999 National Intelligence Estimate said that one potential effect of our deploying a National Missile Defense system in violation of the ABM treaty would be for Russia or China to actually sell sophisticated countermeasures to other countries. Isn't that a real potential, that even though some of these so-called rogue nations may not have sophisticated countermeasures at present, that they could be purchased on the market from a ready seller at some point?

General KADISH. That would be part of a proliferation regime, obviously. The challenge, however, even if countermeasures are sold, we have the ability to go through our C–3, our upgrade of the system, to handle that, and I would assert that just getting coun-

termeasures is not enough. They have to integrate them into the total weapons system that they have and that is not a trivial challenge.

Mr. TIERNEY. I will let you go on that because the chairman wants to move along, but I have a problem with the idea that we always assume that it's going to be too difficult for the rogue nations to have a missile system—to have countermeasures, but not too difficult for them to have missiles.

General KADISH. We don't assume it would be too difficult. We assume that we could handle them based on our system design.

Mr. TIERNEY. Which we don't provide the testing on, but thank you.

Mr. SHAYS. I thank all four of you. I would welcome you each to make a closing remark if you would like to, if you have any comments to make. You have been very patient with this committee and we appreciate it, and we look forward to getting to the next panel. Thank you very much.

Our next panel is the Honorable Lawrence J. Korb, vice president and director of studies, Council on Foreign Relations; Dr. Lisbeth Gronlund, senior staff scientist arms control program, Union of Concerned Scientists; Dr. William Graham, chairman and president National Security Research, Inc.; and Dr. Kim Holmes, vice president and director the Kathryn and Shelby Cullom Davis Institute, the Heritage Foundation.

I welcome you all to stand so I can swear you in.

Mr. KORB. Mr. Chairman, I have a statement for the record.

Mr. SHAYS. No, we are going to swear you in, Mr. Korb.

Mr. KORB. You have to swear us?

Mr. SHAYS. You took my hand signal. You don't have to put your hand up yet. You are like me here. You are eager.

I hope we have four witnesses. If you would raise your right hands. Thank you.

[Witnesses sworn].

Mr. SHAYS. I note for the record that all of our witnesses have responded in the affirmative.

Have I left out a witness here? I am sorry. I should have pointed out, Mr. Baker Spring, research fellow is with the Heritage Foundation.

Mr. Spring, you are welcome to respond to questions as well.

Maybe we could slide in a little bit to get you into this group just a speck. Here. We are set. Thank you.

Mr. Korb, you are going to start out. I think we realize that you have waited a while and I appreciate you being here.

Yes, Dr. Graham?

Mr. GRAHAM. Mr. Chairman, I have a concern with my schedule. I had originally been told I would be able to leave by noon.

Mr. SHAYS. Let me ask you this.

Mr. GRAHAM. I deferred my schedule to 12:45, but I have a hard cutoff.

Mr. SHAYS. We are going to accommodate you. Dr. Korb will be happy to accommodate you. Correct? Or do you have a problem, too?

Mr. KORB. I do, too, but I was told we would be out by noon.

Mr. SHAYS. That's what we thought.

Let me ask you, do you have a flight or do we have a flight here? Do you want to negotiate between the two of you?

Dr. Graham will go, and if you could keep it to 5, maybe and we will go from there.

Mr. GRAHAM. Thank you, Mr. Chairman. I will go as quickly as I can and then I must excuse myself.

Mr. SHAYS. I understand. I apologize.

STATEMENTS OF DR. WILLIAM GRAHAM, CHAIRMAN AND PRESIDENT NATIONAL SECURITY RESEARCH, INC.; LAWRENCE J. KORB, VICE PRESIDENT AND DIRECTOR OF STUDIES, COUNCIL ON FOREIGN RELATIONS; DR. LISBETH GRONLUND, SENIOR STAFF SCIENTIST, ARMS CONTROL PROGRAM, UNION OF CONCERNED SCIENTISTS; AND DR. KIM HOLMES, VICE PRESIDENT AND DIRECTOR THE KATHRYN AND SHELBY CULLOM DAVIS INSTITUTE, THE HERITAGE FOUNDATION, ACCOMPANIED BY BAKER SPRING, RESEARCH FELLOW, THE HERITAGE FOUNDATION

Mr. GRAHAM. I have been asked to testify on test failures, technology development and ABM treaty provisions.

Let me state by way of background that I believe both General Kadish and Dr. Coyle are exceptionally able individuals. On the other hand, I am not here to defend the current program. I believe that based on an assertion by Dr. William Perry when he was Secretary of Defense, that if the United States ever needed a national ballistic missile defense system the country could take 3 years to develop it and 3 years to deploy it, the infamous three-plus-three system. I could find no substance to that plan when it was proposed by Dr. Perry and none now. I believe it was probably designed to respond to congressional critics of the lack of any NMD program by the administration in the mid-1990's, and they are now struggling with a three-plus-five variant of that program, and their testimony is evidence to that struggle.

Is there a need for ballistic missile defense? I served as a commissioner on the Commission to Assess the Ballistic Missile Threat to the United States, the Rumsfeld Commission. Its findings were very different from those put forward by the intelligence community at that time, and I believe they are well enough known that I won't go into those, although I believe the testimony did show, for example, that China is building new land-based and submarine-based ballistic missiles; Iran is building ballistic missiles; North Korea, Syria, Libya, and probably Iraq as well.

Some believe that these ballistic missile developments by countries potentially hostile to the United States can best be handled by nuclear deterrence, arms control and diplomatic means. The problem with this approach is that it has been practiced for decades and has led to a current world situation where both missile and weapons of mass destruction, nuclear, chemical, biological threats continue to grow and proliferate. This, in turn, gives rise to potential situations where deterrence, as we traditionally understand it, may no longer be effective.

The answer to a failing policy is not more of the same but the formulation of a new policy.

While nuclear deterrence and diplomacy will continue to play an important role in U.S. counter proliferation policy, missile defenses and other military measures will strengthen U.S. counter proliferation policy, providing substance and therefore diplomatic leverage. Arguments to the effect that U.S. development and deployment of ballistic missile defense systems will trigger a new arms race are specious in view of the fact that the proliferating nations are already racing at full speed. What we must now do is try to counter that growing threat.

Let me address technical feasibility for a moment. Many have questioned the feasibility and the testing methodology of the ballistic missile defense systems. This is especially the case with the national defense rather than the theater defense systems, since I believe as a result of U.S. coalition and Israeli experience of being attacked by ballistic missiles during the Gulf war, the need for theater missile defenses is now widely understood and accepted.

The technical feasibility can be addressed from the vantage points of both U.S. experience and technology. And I will summarize this very quickly, but I will say that the purpose of testing, such as Dr. Coyle accurately described, is several fold, but the earliest part, the developmental testing, is to try to validate and improve the models that are used in the development of the system and to detect and compensate for any items or characteristics that were overlooked in the development of the models.

You would expect and look for failures of the models and, to some degree, failures in the tests during that time. In fact, in insistence on low risk early successes in the developmental testing, I believe poses severe threat to U.S. leadership in the development of advanced technology in general, and cutting edge technology weapons systems in particular.

This was a matter of direct concern to me when I was a science advertiser to the President and one I have had a continuing interest in. Systems that are required to be low risk from the outset must avoid the introduction of new and frequently untested technologies. Since the development and introduction of new technologies is, in fact, America's strong suit and one we have invested a great deal of money in, insisting on low risk complete early test success is tantamount to giving up much of the strong, unique advantage that the United States has acquired through its enormous investment in science and technology.

The time to hold weapons systems to a high standard of test success is in the late phases of engineering development and especially in operational test and evaluation. By this time, the problems encountered in system development should have been worked out. A system should be ready for deployment.

I believe Dr. Coyle's testimony, in fact, in reality, has pointed out that the administration has substantially underfunded operational tests and evaluation assets and capability for national missile defense systems, and that underfunding and under support should be rectified.

On the other hand, while it isn't surprising there have been failures to date, there is an unusual disturbing aspect to the failures encountered so far. In most cases, they have not occurred in the new cutting edge technology aspects of systems tested, but rather

in technologies that were developed decades ago and are now well understood features of rocket and missile design. The failures to date are typical of those caused by a lack of systems integration experience, rather than a lack of knowledge of missile and rocket design, and may be related to several characteristics of the defense industrial base today. These include rapid downsizing of the defense industry over the last decade; a small number of new systems that have been developed during that time period; the absence of new systems being produced, deployed and operated for several decades in the ballistic missile defense area, particularly national missile defense; and the inability of the defense industry to attract new technical talent and mentor its technical work force in the face of strong economic competition from the high technology commercial sector.

The United States is learning once again that engineering, programmatic and operational experience is a difficult and expensive capability to acquire and an easy capability to lose.

Nonetheless, as I summarize in the——

Mr. SHAYS. How much more do you have? I am conscious of Dr. Korb as well.

Mr. GRAHAM. About 2 or 3 minutes, Mr. Chairman.

Mr. SHAYS. And I am just going to let you get on your way afterwards.

Mr. GRAHAM. Thank you. I have given in my paper a table of 15 different programs, such experiences which are typical of high tech missile and rocket-based programs that experienced a great deal of difficulty in the first stage and since then, have become some of our most successful systems.

I would also like to point out that the hardest part of the way we do ballistic missile defense is the hit-to-kill aspect, one the Russians don't deal with because they use nuclear warheads on their interceptors and their Moscow defense system and also on their S–300 and S–400 systems that they have deployed around other parts of their country.

However, something like 80 percent of the time that we have gotten our hit-to-kill technology in the terminal homing phase, it has actually proved to be successful. I think that's actually a remarkably good record.

I give in my paper several—a whole list, in fact, of places where the ABM treaty is interfering with or compromising the development of our ballistic missile defense system.

I would point out that in addition to the treaty now having been substantially violated by the Soviet Union, as was discussed earlier, and being a unilateral constraint on the United States, it is, in fact, playing a major role in limiting what we can do. Many of the criticisms of the current system's performance can be traced back to ABM treaty limitations. I give those in my paper, but I won't take the time to go over them in the testimony.

Finally, I would like to say that a system design that would be effective would be different from the current system design. It would be a multilayer ballistic missile system design. It would involve ground-based components, sea-based, air-based and in the foreseeable future, space-based components. Virtually all of those are ruled out by the ABM treaty.

But, in fact, with the ability to develop the full range of ballistic missile defense aspects and take advantage of the fact that we have the world's best instrumentation for observing foreign missile tests, and therefore, know today and will know in the future much more about the real world performance of their countermeasures than they will know, and be able to adapt to those when they test their countermeasures, if not before. I have no concern with our ability to overcome their countermeasures program, but I believe a foreign country deploying a countermeasure against us should have a real worry that we will know more about his countermeasure and its actual performance based on our ground, sea, air and space-based sensors, than he will have about the performance. This doesn't often come up in the discussion, but it is a very real worry to any potentially hostile country.

So I don't believe the countermeasures is a limiting factor on what we can deal with. I believe it is a serious concern. I always have. I believe we should deal with it. We are dealing with it. We had an extensive experiment called MSX in which we put a satellite on orbit with a large array of sensors, fielded a large number of countermeasures against it, not just a few but a large number; not just simple but very sophisticated. We have the data on that. No one else does.

So I would like to say, in conclusion, that if the United States were to carry forward a national program, drawing on our best capability from all of industry, not just from one contractor or a contractor and a few subcontractors but all of our capability, and had the constraint of the ABM treaty lifted from us, I have no doubt that we could develop an effective ballistic missile defense system and it would tend to discourage and deter other countries from building ballistic missiles rather than encouraging them to build them.

Thank you, Mr. Chairman, and I apologize for having to excuse myself.

Mr. SHAYS. Well, I understand. You told the committee staff that you did have to leave. It just didn't get relayed to me. Thank you.

Mr. GRAHAM. Thank you.

Mr. SHAYS. Thank you for staying.

[The prepared statement of Mr. Graham follows:]

TESTIMONY BEFORE THE
HOUSE OF REPRESENTATIVES
COMMITTEE ON GOVERNMENT REFORM

SUBCOMMITTEE ON NATIONAL SECURITY,
VETERANS AFFAIRS, AND INTERNATIONAL
RELATIONS

NATIONAL MISSILE DEFENSE:

TEST FAILURES AND TECHNOLOGY DEVELOPMENT

William R. Graham

September 8, 2000

CONGRESSIONAL TESTIMONY ON NMD TESTING FOR THE HOUSE COMMITTEE ON GOVERNMENT REFORM

Mr. Chairman and distinguished members, it is an honor to appear before your Committee. I have been asked to discuss with the Committee the subject of National Missile Defense (NMD): Test Failures and Technology Development. As part of this testimony I will also explore the relationship between the ABM Treaty provisions and current proposals to design, test and deploy an effective missile defense system as well as the need for that capability.

THE NEED FOR NATIONAL AND THEATER MISSILE DEFENSE SYSTEMS

The debate over the development and deployment of national and theater missile defense capabilities (NMD/TMD) by the United States essentially boils down to two fundamental issues. First, is there a need for such capabilities and second, can effective missile defense systems be built within a reasonable time frame?

In 1998, I had the privilege to serve on the Commission to Assess the Ballistic Missile Threat to the U.S., better known as the Rumsfeld Commission. As you may recall, the prevailing National Intelligence Estimate on the ballistic missile threat to the U.S., NIE 95-19, forecast the emergence of new ballistic missile threats to the U.S. over a fifteen-year period. The Rumsfeld Commission, made up of individuals appointed by Majority and Minority Leadership of the House and Senate, concluded after reviewing the data that a ballistic missile and associated WMD threat to the U.S. was developing much more rapidly. Furthermore, the report went on to conclude that several nations unfriendly to the U.S. and its allies were developing both short and long-range ballistic missile capabilities that could be used to threaten the U.S within a few years.

In view of the rapidly emerging ballistic missile threat to the U.S. and our allies around the world, the need for the development and deployment of both theater and national missile defense systems by the US is driven by five major factors. 1) The preservation of U.S. freedom of action in the world by preventing ballistic missile blackmail. 2) The maintenance of U.S. security guarantees and alliances. 3) The deterrence of nuclear, biological and chemical warfare. 4) The deterrence of missile and weapons of mass destruction (WMD) proliferation and 5) Denial of an enemy's political/ military objectives if deterrence fails.

The first three factors are directly related and stem from a very important lesson that was learned by much of the world as a result of America's overwhelming victory in the Gulf War. This lesson was that the key to deterring U.S. military intervention in a region or effectively fighting the US in a war was to avoid conventional conflict and instead resort to asymmetric warfare using such weapons as ballistic missiles armed with WMDs. The coercive power of asymmetric weapons could be especially effective if the US homeland could be threatened. Consequently, to avoid international blackmail and self deterrence from asymmetric weapons or from an actual attack by nuclear, biological and/ or

chemical weapons, the US and its allies must expediously develop and deploy highly effective national and theater missile defense systems. Other types of asymmetric warfare, such as cyber, terrorist attacks and suitcase bombs are also real possibilities and will require still other types of defenses.

When the U.S. makes the commitment to deploy robust missile defenses, two additional benefits will result. The first is that many of our potential adversaries are likely to be deterred from further ballistic missile proliferation activities. This will occur because they will be unable to match the level of technology and resources the U.S. can devote to the problem and will find ballistic missile and WMD proliferation to be an increasingly futile endeavor with rapidly diminishing returns. In essence, U.S. deployment of NMD and TMD systems will deter proliferation by diminishing the single biggest incentive to proliferate: the relatively cheap, easy and high leverage nature of acquiring ballistic missiles. The second is that for those adversaries who remain undeterred, the U.S. will eliminate a major vulnerability and deny any potential military advantage from possession of these types of weapons. This in turn will restore the importance of our conventional military advantage and diminish the threat of both war and escalation.

While the need for the development and deployment of effective missile defense systems by the U.S. and its allies is self-evident to many given the growing ballistic missile and WMD threat, this perception is not universally held. Some believe that while this threat exists it can best be handled by nuclear deterrence, arms control and other diplomatic means. The problem with this approach is that it has been practiced for decades and has led to the current world situation where both the missile and WMD threat continues to grow and proliferate. This in turn has given rise to potential situations where deterrence as we traditionally understand it may no longer be effective. The answer to a failing policy is not more of the same but the formulation of a new policy.

While nuclear deterrence and diplomacy will continue to play important roles in U.S. counter-proliferation policy, missile defenses and other military measures will strengthen U.S. counter-proliferation policy, providing substance and therefore more diplomatic leverage. Arguments to the effect that U.S. development and deployment of BMD systems will trigger a new arms race are specious in view of the fact that the proliferating nations are already racing at full speed. What we must now do is try and counter the growing threat.

THE FEASIBILITY OF NATIONAL AND THEATER MISSILE DEFENSE SYTEMS

Many missile defense critics have questioned the technical feasibility and testing methodology of ballistic missile defense systems. This is especially the case for NMD rather than TMD, since as a result of the U.S., Coalition, and Israeli experience of being attacked by ballistic missiles during the Gulf War, the need for theater missile defenses is now widely understood and accepted.

Technical feasibility and testing questions can be addressed from the vantage points of both U.S. experience and technology. There is in my view no technical reason to doubt the ability of the U.S. to deploy several NMD and TMD systems that would be highly effective against the existing and foreseeable ballistic missile forces of all potential adversaries with the possible exception of Russia. This view may seem to be at odds with much of the U.S. missile defense testing to date, but that testing must be considered in a realistic context.

The testing of systems, subsystems and components, especially early in the developmental cycle of a program, is designed to achieve two fundamental objectives. The first is to validate the engineering models that have been used in the design of the system, subsystems and components, and the second, is to find and characterize things that were not included in the models but need to be considered. In short, the purpose of system testing, especially in the demonstration/validation phase of a program, is to learn and improve the design rather then achieve immediate success. The more complex the system being developed, the more rapid and funding-constrained the development, and the less experience the developers have with similar systems, the more system testing failures one should expect. All of these conditions apply in some degree to the tests that have been conducted to date for both theater and national ballistic missile defense systems using "hit to kill" technology.

In essence, a politically driven insistence on low risk and early success in developmental testing poses a severe threat to U.S. leadership in the development of advanced technology in general and cutting edge technology weapon systems in particular. Systems that are required to be low-risk from the outset must avoid the introduction of new and frequently untested technologies. Since the development and early introduction of new technologies is America's strong suit, insisting on low risk and complete early test success is tantamount to giving up much of the strong, asymmetrical advantage that the U.S. has acquired through its enormous investment in advanced science and technology. The time to hold weapon systems to a high standard of test success is in the late phases of engineering development and especially in operational test and evaluation. By this time the problems encountered in system development should have been worked out and the system should be nearly ready for deployment.

In view of the above observations, it should not be surprising that TMD and NMD systems have had several failures in their developmental testing programs. However, there is an unusual, disturbing aspect to the failures encountered so far. In most cases they have not occurred in the new, cutting-edge technology aspects of the systems tested, but rather in technologies that were developed decades ago and are well understood features of rocket and missile design. The failures to date are typical of those caused by a lack of systems integration experience rather than a lack of knowledge in missile and rocket systems design, and may be related to several characteristics of the U.S. defense industrial base. These include the rapid down-sizing of the defense industry over the last decade, the small number of new systems that have been developed in that time period, the absence of new systems being produced, deployed, and operated for several decades and the inability of the defense industry to attract new technical talent and mentor its

technical workforce in the face of strong economic competition from the high-tech commercial sector. The U.S. is learning once again that engineering, programmatic, and operational experience is a difficult and expensive capability to acquire, and an easy capability to lose.

What is also clear is that hit-to-kill missile defense systems have performed very well in their terminal homing and hard body intercept phases when the target is "in the basket" of the terminal seeker and the interceptor is operating under autonomous control. This is, from a technical perspective, the newest and most challenging part of hit-to-kill intercept, and therefore the aspect in which test failures are most likely to occur. To date, the results have been very encouraging. For targets "in the basket", hard body intercepts have occurred in the majority of the tests, which is an excellent record at this point in the development of the technology. Collectively, almost 80% of the time "hit to kill" interceptor technology has worked when given a chance to perform its mission.

Some missile defense critics have claimed that the reason for the 80% success rate of "hit to kill" interceptors is that missile defense testing is rigged. This charge is based on a misconception of how a proper test program is structured. A successful weapon system test program begins by trying to demonstrate proof of principle for both the system concept and its underlying technology. Frequently, this is done by adopting a building block approach to system testing which progresses from easier to more difficult testing objectives. The predecessor tests to the current NMD program, HOE and ERIS, used cooperative targets in a few of their tests to demonstrate proof of principle. For THAAD and the current NMD testing regime, non-cooperative targets have been used. While using representative threat targets today, future testing will become even more rigorous as both systems move through their development programs. For NMD there are at least 16 more flight tests planned before the initial system is deployed, and very stressing targets will be used in the later phases of the test program.

Even with the anomalous character of the system test failures to date, if missile defense systems are evaluated by the normal testing standards for weapon systems rather then the "unique" testing standard the critics want to hold these systems to, their track record compares favorably with most defense programs. The following chart graphically illustrates this point by comparing the developmental testing results of missile defense programs to date with some of the most successful rocket, missile and satellite programs in history.

EARLY TEST RESULTS FOR ROCKET AND MISSILE-RELATED SYSTEMS

EARLY FLIGHT TEST HISTORY

Program	No. of Attempts	Successful	Unsuccessful
Polaris (total program)	123	57	66
Poseidon	20	4 full / 9 Partial	7
Trident	18	13	5
AIM-9 Sidewinder	13	0	13
Stinger Rmp	12	1	11
ATLAS	8	5	3
Sprint	10	2	8
HOE	4	1	3
ERIS	2	1	1
Arrow	6 Non-Intercept/ 6 Intercept	5 Successful / 3 Partial	3 / 3
LEAP	4	0	4
NMD	3	1	2
THAAD	3 Non-Intercept / 8 Intercept	3 Non-Inter /2 Intercept	6 Intercept
FLAGE/ERINT/PAC-3	16	8 intercept/5 non intercept	3
CORONA	14	2	12

It has also been asserted that missile defense systems, and especially the NMD system, are being "rushed to failure". This charge ignores the fact that the ballistic missile threat is real and growing dramatically. In addition it ignores the fact that the U.S. has, in an on-again, off-again manner, been developing and trying to deploy missile defense systems for over 40 years, with the last 20-year period devoted to the development and deployment of non-nuclear systems. The principal reason for this long gestation period is not technology and engineering problems, but political problems having to do with consistency of purpose and the associated funding commitment. The critics like to point out that since 1983 alone when the SDI began the U.S. has spent over $ 50 billion on missile defense programs with very little to show for it. This contention fails to acknowledge the fact that the US was ready to deploy an effective NMD system based on ERIS/GBI, GBR and GSTS as early as 1996 before funding was cut and the programs reduced from system development to technology base status in 1993. With consistency of purpose and reliable funding levels, the U.S. can still deploy highly effective and robust TMD and NMD architectures by 2010, with the initial capabilities fielded around 2005. Unfortunately, the President's recent decision to defer construction of ground-based NMD facilities this year will delay the fielding of an initial NMD capability by at least one additional year.

Missile defense critics also frequently assert that missile defenses and especially NMD systems must achieve near-perfect levels of effectiveness. This is usually accompanied by warnings that if one or more nuclear tipped warheads penetrate the defense shield, the results will be catastrophic, and therefore a 90%-95% effective system would not be worth deploying. While even one nuclear warhead landing on the US is certainly

catastrophic, the argument overlooks some basic realities. First, the primary purpose of any missile defense system, and particularly NMD, is deterrence. Once such a system is in place and especially if it is multi-layered, it will be impossible for a potential adversary to predict beforehand if any of its warheads would penetrate U.S. defenses and which warheads would reach their intended targets. Consequently, given the huge uncertainties involved, the effect of such an attack would be unknown to the attacker, thereby strengthening deterrence. If on the other hand the adversary is an irrational or desperate actor and is impossible to deter, then missiles defenses become America's best insurance policy!

The best way to increase the effectiveness of any missile defense system to high levels is to layer the system. However, this option is currently prevented by the constraints of the ABM Treaty, which severely biases the type of NMD architecture the U.S. can deploy. The current NMD system architecture calls for a single battle management radar and no more than 100 land-based interceptors located in Alaska, a location chosen in large part for its proximity to trajectories of missiles launched from North Korea. This system architecture approximates some but not all of the features of a single site ballistic missile defense deployment permitted under the terms of the ABM Treaty as amended at Vladivostok in 1974. A more robust U.S. NMD architecture would be based on a multi-layered system similar to what is being developed for TMD, with ground, sea, and air-based systems working together in a synergistic manner for maximum near term capability, and space-based elements, including lasers, added as soon as possible to further increase overall effectiveness.

Unfortunately, the options available to the U.S. to create even a modestly robust NMD architecture are forbidden by the ABM Treaty. While the current NMD architecture is not as easily defeated as the critics assume, there is also no doubt that the current architecture could be strengthened. Some of the most important NMD architecture options and measures that are constrained by the ABM Treaty are as follows. The Treaty:

- Prevents the full- scale development, testing and deployment of a territorial defense system for the U.S.
- Prevents the full- scale development, testing and deployment of sea-based NMD systems.
- Prevents the full-scale development, testing and deployment of both air-based and space-based NMD systems, including kinetic energy and directed energy weapons.
- Prevents the full-scale development, testing and deployment of interceptors with more then one warhead on them, thereby inhibiting the ability of the defense to handle the sub-munitions threat.

- Limits the NMD deployment to no more than a single site with no more then 100 interceptors and prevents deployment of that site at any location other than in defense of the national capitol or an ICBM missile field.
- Prevents the deployment of radars at Shemya Alaska or other additional locations if they perform ballistic missile defense functions.
- Prevents all sensor systems (SBIRS Low, sea-based radars etc) other then the fixed ground based battle management radar from communicating directly with the interceptor thereby significantly reducing the interceptor's battle space and defended area footprint.
- Prevents the full-scale development, testing and deployment of mobile ground-based or sea-based battle- management radars or other sensor systems that could be substituted for radars, thereby rendering the NMD system more vulnerable to defense suppression attacks against the fixed ground based battle management radar.
- Limits the testing of TMD systems against certain long range theater ballistic missiles like the Taepo Dong 2 and prevents the upgrading of TMD and air dense systems into NMD capable systems.
- Limits, depending on treaty interpretation, the burnout velocity of certain TMD systems with a proposed demarcation being 3km per second for safe versus treaty questionable systems.

Partially in response to the above ABM Treaty limitations, missile defense critics have asserted that missile defense systems and especially the proposed NMD system would be easily defeated by simple countermeasures. While certainly a cause for concern in view of the constraints imposed by the ABM Treaty, the countermeasures argument ignores a number of technical realities. The addition of countermeasures takes up offensive warhead payload weight and adds deployment complexity to an offensive ballistic missile, providing an immediate benefit from the defense. Furthermore, while it is easy to assert that countermeasures built by developing countries would work reliably, U.S., allied and Russian experience has been the opposite. For example, the press accounts of the last NMD test note that one of the target's decoy balloon failed to deploy properly, which is one of many problems frequently encountered with even "simple' countermeasures.

Another implicit assumption that the critics make is that U.S. NMD systems will remain technologically static while any adversary develops sophisticated countermeasures. The current U.S. NMD program has a number of government sponsored threat teams and countermeasures programs such as BMDO's Hercules countermeasures program to challenge it. In addition, the U.S. has one of the finest technical intelligence capabilities in the world, and as our potential adversaries test their countermeasures, the U.S. will be

able to observe those countermeasures with much more sophisticated radar and optical sensors, based on ship, land, air, and space-based platforms, than the adversary will be able to build or deploy. Therefore, we will have better real-world performance characteristic data than the countermeasure developer will have, allowing us to fully understand and adapt to both obvious and subtle features of the countermeasures, some of which will not be known even to the countermeasures builders, while the countermeasures are still in development.

In conclusion, the effect of a multi-layer architecture, when deployed and on alert, would be a strong deterrent to the threat of ballistic missile attack from any country with the exception of a full-scale attack from Russia. The U.S. can develop and deploy a robust, multi-layer ballistic missile defense architecture if the political commitment is made to do so.

This concludes my testimony. Thank you, Mr. Chairman.

Mr. SHAYS. Dr. Korb, thank you for your patience.

Mr. KORB. I have a statement I would like to be made a part of the record.

Mr. SHAYS. Put the mic in front of you. Is it on?

Mr. KORB. I will make a few comments. First of all, I would like to commend you for holding this hearing and I think the testimony, particularly of Mr. Coyle earlier, demonstrates the wisdom of Congress in setting up that separate Office of Test and Evaluation.

My testimony was prepared before President Clinton's decision, but I do support that decision as a victory for common sense, given the technological and diplomatic problems that we were having with the system.

I point out in my testimony that the system we are talking about today has five components. All, to a certain extent, are pushing the technological frontiers and all must work all of the time in order for this system to be effective. I would also like to point out that in this system, two of the five phased array radars, as was pointed out by Congressman Tierney, are in other countries, and they are not going to let us use their nations unless they support the deployment. Ms. Bohlen, I think was quite diplomatic, but the fact of the matter is Denmark and Britain have said they will not let the United States do it, that is increase the power of the phased array radars if you violate ABM.

In terms of technological challenge, as people always point out, we did the Manhattan project, we built the ICBM, we went to the moon. But the fact of the matter is nobody was defending the moon when we went there. This is a much greater technological challenge.

I am sure with enough time and money, we could get an NMD system that's 85 percent effective with a 95 percent confidence rate, which as my colleague Dick Garwin, who worked on the hydrogen bomb and was a member of the Rumsfeld Commission, points out, is what you need with this system. This is not just any weapons system. NMD has to work and it has to work well when you use it.

I am sure that with enough time and money we could hit a high speed warhead in outer space under controlled circumstances, but that's not what the Pentagon is doing. NMD is a concurrent weapons development program, and the last one I was involved in was called B–1, it happened when I was in government, in the early 80's and that darn thing still doesn't work because we rushed it into production. NMD has not yet really been tested, in my view, in a realistic battle environment.

Again, as my colleague Dick Garwin notes in order to be confident that the system would work, you would need 20 successes. If you have three failures, then you need 47 successes, and we are nowhere near meeting those cirteria.

Every time one system doesn't work supporters turn to another system. I have lived through Excaliber, Brilliant Eyes, Brilliant Pebbles and now I hear people talking about new, more robust systems. I recently debated former CIA Director Jim Woolsey on boost-phase. If the Pentagon is going to go to that system, it will need a new, more advanced intercepter as well as more sophisticated radar and command systems. In order to develop and test that sys-

tem precisely; as we should, it will take 5 to 7 years. When supporters talk about a more robust and layered system, they should know the devil is in the details. I think it is important to find out what specifically they are talking about.

Supporters of NMD are arguing that it doesn't have to be that reliable. But, this is not just any weapons system. Don't forget that we have spent $100 billion already and we have nothing, we have no guarantee that spending another $100 billion will produce something that is technologically acceptable.

The ABM treaty is still valid. President Bush was the one who wanted to make the Russians the Soviet successor state. In fact, Secretary Baker demanded that they do and the President made the statement. So if you want to go against it, you are going to have to modify it. It still is in effect and, in fact, Congress, in 1996 basically, by talking about modifications to ABM, implicitly recognized that the Russians were the Soviet—were the successor state.

And then finally, I would like to quote a man who I had the privilege of serving for 5 years, President Reagan. When he came up with this, he dictated no timetable and did not prejudge any specific technology.

Thank you.

[The prepared statement of Mr. Korb follows:]

TESTIMONY OF LAWRENCE J. KORB
on
NATIONAL MISSILE DEFENSE: TEST FAILURES and TECHNOLOGY DEVELOPMENT

before the

HOUSE SUBCOMMITTEE on NATIONAL SECURITY, VETERANS AFFAIRS, and INTERNATIONAL RELATIONS

September 8, 2000

Mr. Chairman, members of the Subcommittee, I appreciate the opportunity to appear before you today to discuss the critical issue of National Missile Defense (NMD) technology development. I am honored to be in the company of those who have the challenging task of managing and overseeing this critical program. As you requested, I will focus my testimony only on the impact of test results to date and what they mean for the deployment of an NMD system. But as we all know, there are many other critical factors that will impact a deployment decision, and I would urge you and your colleagues to consider these factors at some future time.

I commend the Subcommittee for holding this hearing because it is difficult for an executive agency to evaluate objectively a program which it is developing. Indeed, that is why Congress in the early 1980s established a separate Director of Operational Test & Evaluation within the Department of Defense (DOD).

Before discussing the results of the tests, which have been conducted, it is important to be clear, first of all, of exactly what specific NMD system we are assessing. Too often, people engaged in the debate talk past one another because they are discussing different NMD systems, e.g., land or sea-based, or space-based, or some combination thereof, or different components of a particular system.

The proposed NMD system, which we are assessing today, would use ground-based interceptors (GBI) deployed initially at one site and eventually at two sites, supported by an extensive network of ground-based sensors and space-based infrared sensors. This system will have five (5) key components.

1. **Space-based early warning satellites deployed in a geosynchronous orbit some 36,000 km above the earth. Their role is to detect an ICBM within a minute of launch and provide missile launch location and targeting information.**

2. **Ground and space-based sensors which are the key to the effectiveness of the NMD because they track the warheads, as well as discriminate the warhead from any decoys. These sensors include band ground-based phased array radars (a prototype is in place in Kwajelein and is being used in the current testing of the NMD system); five large phased array radars (located in Alaska, California, Massachusetts, Greenland and Britain) which will be upgraded to track incoming warheads accurately enough to guide interceptors; and, a space-based missile tracking system known as SBIRS-LOW which will not be ready before the scheduled 2005 initial deployment.**

3. **Command, Control and Communication Centers in Cheyenne Mountain in Colorado and at the interceptor basing sites. The Centers are supposed to determine when the interceptors will be launched and update the information to them during their flight.**

4. **The Ground-Based (GBI) Interceptor, a three-stage rocket, which must be capable of accelerating the payload or weapon to speeds of 16 to 18 thousand miles per second.**

5. **Exoatmospheric Kill Vehicle (EKV) is a 130-pound package of miniature rocket motors, computers and sensors which is to be released by the GBI and coast through space and search for its target and kill it by colliding with it at speeds of up to 34,000 miles per hour.**

All five components, to various degrees, are pushing technological frontiers and to state the obvious, in order to have an effective NMD, all five components of the NMD system must work all the time. For example, the July 7, 2000 test failed because the GBI did not function properly.

The current plan calls for deploying by 2005, twenty interceptors in central Alaska, a new X band radar in Shemya in the western Aleutians, and an upgrade of the existing early warning radars in Alaska, California, Massachusetts and Britain. By 2007, the number of interceptors in central Alaska would grow to 100. The complete NMD system with some 200 missiles and the other components would be in place by 2010, if construction in Alaska begins in the spring of 2001.

If the proposed system is to enhance United States security and be worth the tremendous monetary and diplomatic cost, it must work and work well. There will be no second chances. Unlike the Safeguard ABM system, which we deployed in 1974, the proposed system is single shot as opposed to a layered defense. Thus, if this NMD system fails to work the first time it is used against a deliberate attack by a rogue state or an accidental launch by another nuclear power, the nation will have wasted some $100 billion, and caused unspeakable damage to its populace.

Many people argue that the United States has overcome difficult technological challenges in the past 50 years: the Manhattan Project to develop the atomic bomb in the 1940s; the development of the ICBM in the 1950s; and, the Apollo program of the 1960s. There is no doubt that this nation has the technological capacity needed to build a homing kill vehicle that can hit a high-speed warhead traveling through outer space. And, given enough time and money, the Department of Defense could

do this with a high degree of reliability on the test range, i.e., 85 percent effectiveness at a 95 percent confidence level against a small-scale missile attack.

But, this is not what we are doing. In order to meet the initial deployment date of 2005, the Ballistic Missile Defense Office (BMDO) is doing concurrent weapons development—researching, testing and building all at the same time. It is compressing the work of 12 - 16 years into eight. This has lead to what General Larry Welch's panel aptly describes as a rush to failure. It is no wonder that two of the last three have been complete failures and one only a marginal success. The last major concurrent weapons development program undertaken by the Pentagon was the B-1 Bomber. In the early 1980s, the Department of Defense began production of the B-1 three years before its development testing was completed. This rushed development led to chronic problems with the aircraft's electric system which persist 20 years later.

Moreover, the current testing program does not simulate real world conditions, i.e., the type of countermeasures likely to be employed by an enemy with the capability to launch an ICBM thousands of miles. Rather, the three tests of the proposed system have been against cooperative targets and even under these less demanding requirements, two of three tests have failed. Remember that the Patriot anti-missile system had a perfect record (17 out of 17) in tests, but failed almost completely against Iraqui Scuds during the Persian Gulf War because of inadvertent Iraqui countermeasures (the missiles broke apart during reentry). Since the proposed system will have to hit its target in space, and since in the vacuum of space, both heavy and light objects travel on nearly identical trajectories, large numbers of cheap decoys most likely would be deployed along with the warhead by the attacking nation.

To obtain a 95 confidence level that the kill probability will be 85 percent, the proposed system should be tested successfully in a development mode a minimum of 20 times against the type of countermeasures that could be used by an attacker. (By way of contrast, the Sentinel System was tested over 100 times and Safeguard 42 times.) If there are three failures in a test series, 47 tests would need to be successful in order to provide 95 percent confidence that there would be an 85 percent probability of a single shot kill probability.

What is the record to date? Overall, since 1976, when research on hit-to-kill weapons began, attempts to destroy mock warheads have failed more than 70 percent of the time. Since last October, the proposed system has been tested on three occasions against limited countermeasures (one decoy rather than nine). Two of the tests have been outright failures: in January 2000, a leak of sensor coolant made the EKV miss the target altogether and in July 2000, the EKV failed to separate from the booster rocket. Even the one successful test in October 1999 raises doubts about the effectiveness of the system. The EKV drifted off course and actually was homing in on a large balloon (decoy) when the warhead drifted into its path.

By any reasonable criteria, we have not come close to meeting the 95 percent confidence level that there is an 85 percent probability that this proposed system will be effective, and even the strongest proponents of NMD do not favor deploying this system. Some of these advocates are now recommending that we switch to a Boost-Phase system which would attempt to destroy an enemy missile soon after its launch, before its warhead deploys. But, this is easier said than done and involves developing a new, more advanced interceptor, as well as more sophisticated sensor, radar and command systems than now exist. In my view, this will take a minimum of seven years of vigorous research and development *before* we can make an informed deployment decision.

Lawrence J. Korb
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LJK:ja
9/7/00

Mr. SHAYS. I have just come to the conclusion that if you want to change a bland statement to one that's quite forceful, just keep the person waiting awhile. Your statement is said almost tongues compared to the way you spoke just this past few minutes.

What kind of schedule do you have, Dr. Korb?

Mr. KORB. Well, I am OK now, thanks to one of your crackerjack assistants here.

Mr. SHAYS. OK. I know that you had another meeting. I appreciate you adjusting that. Thank you.

I think we now go to Dr. Graham. Oh, Dr. Graham has left. He went.

Dr. Gronlund. I am sorry. You were to be No. 2 and now you are No. 3. Thank you.

Ms. GRONLUND. That's fine. So do I need to do anything or am I live?

Mr. SHAYS. You are live.

Ms. GRONLUND. I am live. OK. Thank you very much. I appreciate the opportunity to appear here. I am very impressed that you were able to continue to work without lunch.

I have been asked to comment on two issues, the National Missile Defense testing program and the compliance of various proposed NMD systems with the ABM treaty. In light of President Clinton's recent announcement that his administration will not authorize deployment of its planned NMD system, I have focused my comments to be relevant to the decisions the next President might make about this or any other National Missile Defense system.

If the next President does decide to proceed with deployment of an NMD system, it may differ somewhat from the one that is currently under development. For example, the United States could take a totally different approach by developing a boost-phased defense. However, if the United States continues to develop an NMD system designed to intercept missiles in the mid-course of their trajectory, it will necessarily operate in the same basic way as the one the Clinton administration has been developing. Any mid-course system, regardless of whether the interceptors are ground-based or sea-based or air-based, would use infrared homing hit-to-kill interceptors guided by ground-based radars and space-based infrared sensors, as would the system currently under development.

So let me now turn to the issue of the NMD test program. I will focus on several questions. What would the next administration need to know about the effectiveness of the NMD system before it could make a well-informed deployment decision? Based on the tests conducted so far, what do we know? Based on the planned test program, what will we know and when will we know it? And finally, what would a test program look like that was adequate to provide the next administration with the information it needs to make a deployment decision?

What should the United States know about any NMD system before it could make a well-informed deployment decision? As noted in the 1998 report of the Welch panel, the first Welch report, three steps are needed to demonstrate that an NMD technology is viable. So the test program must demonstrate, first, reliable hit-to-kill; second, reliable hit-to-kill at a weapons system level and; third, reliable hit-to-kill against real world targets.

I note that there is a significant difference between demonstrating the ability to do something—which may require only one test, and demonstrating the ability to do so reliably—which requires many tests.

Now the NMD test program, as we heard previously from Dr. Coyle, has demonstrated hit-to-kill but not reliable hit-to-kill nor reliable hit-to-kill at a weapons systems level. However, there is no fundamental reason to doubt that the United States can do so, perhaps by the end of the 19 tests scheduled so far through the next 4 to 5 years.

So I will focus on the third and the most demanding criteria laid out by the Welch panel, demonstrating reliable hit-to-kill against real world targets; namely those that incorporate countermeasures.

In his September 1st announcement that he would not authorize deployment, President Clinton stated that there, quote, remained questions to be resolved about the ability of the system to deal with countermeasures. Unfortunately, this is likely to remain the case unless major changes are made to the planned test program. At a fundamental level, the current test program is not configured to provide the next President with any information about whether the proposed NMD system could reliably intercept real world targets with realistic countermeasures. Although the current NMD program assumes that the countermeasure threat will continue to evolve and that the full system that might be deployed after 2010 will be able to deal with complex countermeasures, all the tests conducted so far and all those scheduled through at least the first term of the next administration will be only of the system against the, quote, defined C–1 threat.

What is the defined C–1 threat? How does it correspond to the real world threat? The detailed definition of the C–1 threat is classified, but there is some public information that allows us to understand something about how it has been defined. The most detailed publicly available official document that discusses countermeasures that would be available to emerging missile states is the September 1999 National Intelligence Estimate. It states that emerging missile states probably would rely on, "readily available technology to develop countermeasures," and that they could do so, quote, by the time they flight test their missiles.

Moreover, the NIE lists several of these technologies that emerging missile states could use. However, in response to questions during his testimony before a Senate Armed Services Committee hearing on June 29th, earlier this summer, Lieutenant General Kadish stated that the defined C–1 threat does not include many of the countermeasure technologies identified in the NIE as being readily available to emerging missile states.

Thus, the targets the NMD system would be tested against exclude the very countermeasures that the U.S. intelligence community has stated would be available by the time the missile threat exists.

Another fundamental limitation of the testing program is that the defense has known in advance what the expected characteristics of the decoy and the warhead would be, and there is no reason to assume that in the real world, the United States would know

what the characteristics of an emerging missile state warhead would be.

So unless the definition of the C–1 threat is changed, the test program continued by the next administration will tell us nothing about the ability of the proposed NMD system to intercept real world targets.

So what would an adequate test program look like? The report, the Rumsfeld Commission report, called attention to two important issues relevant to countermeasure threat and analysis. First, the failure to detect direct evidence does not mean that no such development is occurring.

Second, given the possibility of emerging missile states hiding their development programs, a threat analysis must assess what weapons or what countermeasures a country is capable of developing. This has been dubbed THINK-INT, or think intelligence.

I was on a panel of 11 independent physicists and engineers that applied this THINK-INT methodology to understanding what countermeasures would be available to a country able to develop and deploy a long-range ballistic missile. Our premise was that missile and countermeasure capabilities would be consistent with each other.

The panel produced a very detailed report, which I have here, which was published in April of this year by the Union of Concerned Scientists and the MIT Security Studies program. In our analysis, we assumed that the NMD system had all of the sensors and interceptors planned for the full system that would be deployed by 2010 or later. This is the system the Pentagon says will be effective against missile attacks using complex countermeasures.

We, in the report, surveyed the types of countermeasures that would be available to an emerging missile state and then go into considerable detail on three of those. First, are biological weapons deployed on submunitions? The second, are nuclear weapons deployed with anti-simulation balloon decoys? And the third, are nuclear weapons covered with liquid nitrogen-cooled shroud?

There is more detail about this in my prepared testimony and I will skip over that here, but say that we found that each of these three countermeasures would defeat the fully deployed NMD system.

Now, none of the technical analysis in our report has been publicly disputed, and I believe in his testimony today, Lieutenant General Kadish acknowledges that.

The main criticism levied at our report is that we underestimated how difficult it would be for emerging missile states to actually build and deploy the countermeasures we describe.

We believe that this criticism is incorrect because a country capable of building both an intercontinental range ballistic missile and either a nuclear warhead or biological warhead to arm such a missile would clearly be able to build simple countermeasures. But there is a time-honored way to answer questions like this, which is: do the experiment. As we recommend in the countermeasures report, the United States should establish an independent countermeasures red team whose job it would be to develop, build and test countermeasures using technology available to emerging missile states. Because a red team would try to build countermeasures,

this type of intelligence gathering has been referred to as TRY-INT. And I believe it was Dr. Graham who initially dubbed it TRY-INT.

Then the planned NMD system should be tested against the countermeasures the red team determines would be available to potential attackers. So regardless of what NMD system the next administration pursues, it is essential that independent THINK-INT and TRY-INT programs be established to analyze and build countermeasures to the planned NMD.

Once these programs determined which countermeasures were feasible, the United States must then assess how effective they would be against the planned NMD system through analysis and flight testing. And it should only decide to deploy a system once it has met all three of the Welch panel's criteria. In particular, and I will end with this, no NMD system should be deployed until it is demonstrated that it can reliably intercept real world targets using countermeasures.

Thank you.

Mr. SHAYS. Thank you very much.

[The prepared statement of Ms. Gronlund follows:]

Statement of

Dr. Lisbeth Gronlund

Senior Staff Scientist, Union of Concerned Scientists
and
Research Fellow, Security Studies Program,
Massachusetts Institute of Technology (MIT)

at a Hearing on
National Missile Defense: Test Failures and Technology Development

before the

US House of Representatives
Committee on Government Reform
Subcommittee on National Security, Veterans Affairs,
and International Relations

8 September 2000

Biography of Dr. Lisbeth Gronlund

Since 1992, Lisbeth Gronlund has been a senior staff scientist at the Union of Concerned Scientists and a research fellow in the Massachusetts Institute of Technology (MIT) Security Studies Program. Previously, she was an SSRC-MacArthur Foundation Fellow in International Peace and Security at the Center for International Security Studies at the University of Maryland (1990-92) and a postdoctoral fellow at the MIT Defense and Arms Control Studies Program (1988-90). Dr. Gronlund holds a Ph.D. in physics from Cornell University.

Her recent research has focused on technical issues related to ballistic missile defenses. She has written widely on issues related to ballistic missile proliferation, ballistic missile defenses, international fissile material controls, and nuclear arms control issues. Along with ten other physicists and engineers, she is a co-author of the April 2000 study *"Countermeasures: A Technical Analysis of the Operational Effectiveness of the Planned US National Missile Defense System."*

She currently serves as a member of the Panel on Public Affairs of the American Physical Society (APS), which is the professional association of 42,000 physicists; on the board of directors of the Educational Foundation for Nuclear Science, which publishes the *Bulletin of the Atomic Scientists*; and as an associate editor of *Science and Global Security.*

Statement of Dr. Lisbeth Gronlund
before the
Subcommittee on National Security, Veterans Affairs, and International Relations
of the Committee on Government Reform of the US House of Representatives
8 September 2000

Mr. Chairman, distinguished members, I appreciate the opportunity to appear before the Committee today.

I have been asked to comment on two issues: the National Missile Defense (NMD) testing program and the compliance of various proposed NMD systems with the Anti-Ballistic Missile (ABM) Treaty. In light of President Clinton's September 1 announcement that his administration will not authorize deployment of its planned NMD system, I have focused my comments to be relevant to the decisions the next President might make about this—or any other—national missile defense system.

If the next President does decide to proceed with deployment of an NMD system, that system may differ somewhat from the one currently under development. The United States could take a totally different approach by developing a boost-phase defense, designed to intercept attacking missiles during their boost phase. However, if the United States continues to develop an NMD system designed to intercept missiles in the mid-course of their trajectory, it will necessarily operate in the same basic way as the one the Clinton administration has been developing. Any mid-course system, regardless of whether the interceptors are ground-based or sea-based, would use infrared-homing, hit-to-kill interceptors guided by ground-based radars and space-based infrared sensors, as would the system currently under development. Thus, for specificity, I will focus on the mid-course NMD system currently under development.[1]

The NMD Test Program

Let me now turn to the issue of the NMD test program.

I will focus on several questions: What would the next administration need to know about the effectiveness of the NMD system before it could make a well-informed deployment decision? Based on the tests conducted so far, what do we currently know about the proposed NMD system? Based on the planned test program, what will we know and when will we know it? How does this compare to the potential deployment schedule and deployment decisions? And finally, what would a test program look like that was adequate to provide the United States with the information it needs to make a deployment decision?

[1] This system would be deployed in at least two phases. The initial phase would deploy an X-band missile defense radar at Shemya in the western Aleutians, upgrade five existing early-warning radars to serve as missile defense radars, and deploy first 20 and subsequently 100 interceptors in central Alaska. This system was initially intended to be operational by 2005, although 2007 now seems a more realistic date. The full NMD system would add a second interceptor site, bring the total number of interceptors to 200-250, deploy up to eight additional X-band radars, and add the SBIRS-Low space-based missile tracking system. The full system would be operational sometime after 2010.

First, what should the United States know about the NMD system before it can make a well-informed deployment decision? As noted in the February 1998 *Report of the Panel on Reducing Risk in Ballistic Missile Defense Flight Test Programs* (more commonly known as the Welch Panel, after its chair General Larry Welch), three steps are needed to demonstrate that an NMD technology is viable. The test program must demonstrate:

(1) reliable hit-to-kill
(2) reliable hit-to-kill at a weapon system level, and
(3) reliable hit-to-kill against real world targets.

Note that there is a significant difference between demonstrating the ability to do something, which may require only one test, and demonstrating the ability to do so reliably, which requires many tests. The number of tests required to demonstrate reliable performance depends on both the system reliability required by the user and on the confidence with which the user wants to know that reliability.

Demonstrate reliable hit-to-kill

As the Welch panel noted in its 1998 report, the United States has demonstrated hit-to-kill against intercontinental-range targets. However, the United States has not yet demonstrated that the NMD system is capable of *reliably* intercepting a ballistic missile warhead. Only one of the first three intercept tests resulted in a successful intercept of the mock warhead. Moreover, in the tests so far, the closing speeds have been a little lower and the intercept geometries more limited than would be expected in a real engagement. Lt. General Kadish and others have noted that this is largely due to constraints needed to assure range safety and to avoid creating space debris. It would be appropriate later on to relax these constraints, and it will probably be necessary to do so to demonstrate reliable hit-to-kill under a range of end game scenarios.

However, there is no reason to doubt that the NMD kill vehicle will be able to intercept a target at faster closing speeds and for different intercept geometries. Indeed, there is little doubt that the United States can develop the technology to reliably intercept a mock warhead on the test range. Assuming that problems of the type that have plagued the test program thus far are solved, reliable hit-to-kill would presumably be demonstrated by the end of development testing. There are sixteen development tests scheduled for the first phase of the system, of which the United States has conducted three to date. In addition, three IOT&E (initial operational test and evaluation) tests are scheduled, for a total of nineteen.

Demonstrate reliable hit-to-kill at the weapon system level

What about the Welch Panel's second step—demonstrating reliable hit-to-kill at a weapons-system level?

The tests conducted so far have not demonstrated that all the system elements can work together, much less work together reliably. For example, the booster that has been used for the tests so far is a surrogate and not a prototype of the planned booster. This is particularly relevant because the actual booster will accelerate at a much greater rate that the current surrogate booster—and will place much more stress on the kill vehicle that it carries. A prototype of the booster was initially

scheduled to be ready for use for the fifth intercept test (IFT-7), in FY01, but the development of the booster itself is behind schedule by about a year.

Nevertheless, there is no fundamental reason to doubt that an NMD kill vehicle can be successfully mated with the prototype booster, once it is developed. Moreover, the planned test program should be adequate to demonstrate reliable hit-to-kill at a weapon system level.

Demonstrating reliable hit-to-kill against real world targets

The third and most demanding criteria laid out by the Welch Panel is demonstrating reliable hit-to-kill against real world targets, namely those that incorporate countermeasures to the US defense. I will focus primarily on this issue, since it is the most controversial and the least understood.

In his September 1 announcement that he would not authorize deployment of a national missile defense, President Clinton correctly stated that there remain "questions to be resolved about the ability of the system to deal with countermeasures."

Unfortunately, this is likely to remain the case unless major changes are made to the test program. At a fundamental level, the current test program is not configured to provide the next President with any information about whether the proposed NMD system could reliably intercept real-world targets with realistic countermeasures.

Although the current NMD program assumes that the countermeasure threat will continue to evolve and that the full system that might be deployed after 2010 will be able to deal with "complex countermeasures," all the tests conducted so far and all those scheduled through at least the first term of the next administration will be only of the system against the "defined C-1 threat." The planned test program will provide no information about the system's ability to address anything other than the "defined C-1 threat." If the next administration continues on the path the current administration has laid out, the deployment decision made by the next President will be based only on information about how the system would address the "defined C-1 threat."

What is the "defined C-1 threat" and how does it correspond to the real-world threat? The detailed definition of the C-1 threat is classified, but there is some public information that allows us to understand something about how the C-1 threat has been defined.

The most detailed, publicly available official document that discusses countermeasures that would be available to emerging missile states is the unclassified summary of the September 1999 *National Intelligence Estimate (NIE) on the Ballistic Missile Threat to the United States through 2015*, which is a consensus document of the US intelligence agencies. This document states that emerging missile states probably would rely on "readily available technology… to develop … countermeasures" and that they could do so "by the time they flight test their missiles." Moreover, it lists several readily available technologies that emerging missile states could use to develop countermeasures.

However, in response to questions from Senator Jack Reed during his testimony before the Senate Armed Services Committee on 29 June 2000, Lt. General Kadish stated that the defined

C-1 threat does *not* include "many" of the countermeasures technologies identified in the 1999 NIE as being readily available to emerging missile states.

Thus, the targets the NMD system will be tested against exclude the very countermeasures that the US intelligence community has stated would be available by the time the missile threat exists.

Unless the definition of this threat is changed, the test program continued by the next administration will tell us nothing about the ability of the proposed NMD system to intercept real world targets.

In fact, the 13 June 2000 *Report of the NMD Independent Review Team* (known as the second Welch Panel, after its chair General Welch) found that the United States has "the technical capability to develop and field the limited [NMD] system to meet the *defined C-1 threat* ..." [emphasis added] but that "more advanced decoy suites are likely to escalate the discrimination challenge."

Moreover, if the test program is to establish that the NMD system can *reliably* intercept real world targets, then many more tests will be needed than are planned through the next several years. High reliability and confidence levels can not be established without many tests. And because the real-world operating environment could vary greatly depending on the types and combinations of countermeasures the attacker uses, demonstrating reliable performance against real-world targets would require conducting tests under many different scenarios.

Countermeasures in the planned test program

Let's take a step back and consider the countermeasures that the tests have included so far, and the countermeasures that are planned for the next 16 intercept tests that are currently scheduled.

In the three intercept tests thus far, the targets have included (in addition to the final booster stage) a conical mock warhead and one large spherical balloon decoy, with a physical appearance, infrared signature, and radar cross-section very different from that of the mock warhead. Equally significant, the defense knew in advance what the expected characteristics of the warhead and the decoy would be. According to a 20 June 2000 DoD news briefing by Dr. Jacques Gansler, Undersecretary of Defense for Acquisition, the kill vehicle in the first intercept test (IFT-3) first found the balloon decoy and "its software said 'that's the wrong target.' And then it shifted to the target that had the *characteristics it was supposed to have had*, in this case purely in terms of the infrared characteristics because that was all that seeker had." [emphasis added]

In other words, the ability of the infrared seeker to pick out the warhead was based on the kill vehicle knowing the infrared signature the warhead was *supposed to have had*. However, neither warheads nor decoys will necessarily have a characteristic infrared signature or, for that matter, any other characteristic physical signature. The attacker can readily manipulate the infrared signature and other physical characteristics of both warheads and decoys. And in the real world, there is no reason to assume that the United States will know in advance what the characteristics would be of a warhead deployed by an emerging missile state. The United States may know the

characteristics of warheads deployed by Russia and China by observing their flight tests, but emerging missile states are not expected to conduct many flight tests of their missiles. Moreover, it is easy to disguise the appearance of a warhead by using "anti-simulation."

Thus, a fundamental limitation of the intercept tests conducted so far is that the defense has known in advance what the warhead characteristics would be.

Moreover, this limitation applies to all of the 19 intercept tests planned before the first phase of the NMD system would be deployed. None of these tests will include warheads that are in any way disguised.

An adequate test program

The planned tests are clearly inadequate to demonstrate hit-to-kill against real world targets, much less reliable hit-to-kill against such targets. What countermeasures should the tests include?

The *Report of the Commission to Assess the Ballistic Missile Threat to the United States* (more commonly known as the Rumsfeld Commission, after its chair Donald Rumsfeld) called attention to two important issues relevant to countermeasure threat analysis. First, the failure of US intelligence to detect direct evidence of weapons development does not necessarily mean such development is *not* occuring. Second, given the possibility of non-observable development activities, a threat analysis must assess what weapons a country is *capable* of developing. Such analysis has been dubbed "THINK-INT" or "think-intelligence" in contrast to more physical types of evidence such as that gathered by satellites or intelligence agents.

I was on a panel of eleven independent physicists and engineers that applied this THINK-INT methodology to understanding what countermeasures would be available to a country able to develop a long-range ballistic missile. Our premise was that missile and countermeasure capabilities would be consistent with each other. The panel, which included scientists with considerable experience on BMD and countermeasures issues, produced the most detailed, publicly available document that discusses countermeasures that could be available to emerging missile states. Its report, *Countermeasures: A Technical Evaluation of the Operation al Effectiveness of the Planned US National Missile Defense System*, was published in April by the Union of Concerned Scientists and the Massachusetts Institute of Technology (MIT) Security Studies Program.[2]

In our analysis we assume that the NMD system has *all* of the sensors and interceptors planned for the full system that would be deployed by 2010 or later. This is the system the Pentagon says will be effective against missile attacks using "complex" countermeasures.

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[2] Andrew M. Sessler (chair of the Study Group), John M.Cornwall, Bob Dietz, Steve Fetter, Sherman Frankel, Richard L. Garwin, Kurt Gottfried, Lisbeth Gronlund, George N. Lewis, Theodore A. Postol, and David C. Wright, *Countermeasures:A Technical Evaluation of the Operational Effectiveness of the Planned US National Defense System*, April 2000 (Union of Concerned Scientists and MIT Security Studies Program, Cambridge MA). Available at www.ucsusa.org/arms.

We assume that the attacker can make a long-range missile and a nuclear or biological weapon to arm it with, and therefore possesses the technology and the scientific and engineering expertise required to do so. This is appropriate because that is the stated rationale for the US NMD system. Specifically, we assume a potential attacker can build: a multi-stage intercontinental-range missile with a payload of 1,000 kilograms; guidance accurate enough to target a large city; either a biological weapon containing anthrax or a nuclear warhead compact and light enough to be carried on the missile; and a reentry vehicle capable of shielding the warhead from reentry heating. An attacker with such capabilities is clearly capable of building a wide range of countermeasures.[3]

The *Countermeasures* report surveys the types of countermeasures that would be available to an emerging missile state, and then goes into considerable detail for three of those countermeasures: (1) biological weapons deployed on submunitions, (2) nuclear weapons deployed with anti-simulation balloon decoys, and (3) nuclear weapons covered with a liquid-nitrogen cooled shroud.

We found that each of these three countermeasures would defeat the fully deployed NMD system by either causing it to fail catastrophically or significantly degrading its effectiveness.

An attacker using biological weapons could divide the agent into 100 or more small warheads, or submunitions, that would be released early in flight after boost phase. Such submunitions would simply overwhelm the planned NMD system.

An attacker using nuclear weapons could use anti-simulation decoys. In this case the decoys are not made to look exactly like a specific warhead, but the warheads are disguised to make them look like decoys. Anti-simulation is a particularly powerful tool against exo-atmospheric hit-to-kill interceptors. Above the atmosphere, there is no air resistance and lightweight objects travel on the same trajectory as heavy objects.

We consider a case in which the attacker releases a nuclear warhead in a aluminized mylar balloon along with dozens of empty balloons. We find an attacker could readily make balloons that had no unique distinguishing physical characteristics that could be observed by the planned sensors. Thus, regardless of how capable and accurate the system sensors are, they would not be able to discriminate the empty balloons from those containing warheads. The defense would need to shoot at all the balloons to prevent the warheads from getting through, and an attacker could deploy enough balloons that the defense simply couldn't shoot at them all.

The third countermeasure is a "cooled shroud," in which the attacker covers its nuclear warheads with a double-walled cone containing liquid nitrogen. The very cold liquid nitrogen would greatly reduce the infrared radiation emitted by the shrouded warhead. Discrimination is not the issue here; the X-band radars could see each shrouded warhead and guide the interceptor close to its intercept point. But the cooled shroud would prevent the kill vehicle from homing on the warhead: the kill vehicle's infrared sensors could not detect the warhead in enough time to

[3] The September 1999 NIE also stated that Russia and China might be willing to sell countermeasures to other countries. However, we did not assume this was the case in our study; we assumed that emerging missile states would have access to only those countermeasures they developed indigenously.

maneuver to hit it. Our report also shows that an attack could be launched on nighttime trajectories to prevent the kill vehicle from using visible light sensors for homing.

None of the technical analysis in our report has been publicly disputed. Instead, our critics have made one of two general arguments: (1) that we have underestimated how difficult it would be for an emerging missile state to develop and deploy the countermeasures we describe, or (2) that the system will eventually be able to respond to such countermeasures with counter-countermeasures that could defeat them.

We believe that the first criticism is clearly incorrect. Any country capable of building both an intercontinental-range ballistic missile and a nuclear warhead compact and light enough to be delivered by such a missile would clearly be able to build the relatively simple countermeasures our report analyzed.

The second criticism raises a valid point, but not one that undermines the conclusions of our report. First, as noted above, we considered the full planned NMD system, with all of its sensors and interceptors. The Pentagon states that this system would work against even "complex" countermeasures, and our report showed that this claim was incorrect.

It may indeed be possible to modify the planned NMD system to respond to the some of the countermeasures we discuss (but not to submunitions, which only a boost-phase system could hope to counter). But the offense has important advantages over the defense in this regard. Even if the United States made hardware changes to the planned NMD system to counter some of the countermeasures we discuss, it would take years to develop, test and deploy the new hardware, giving the attacker both the information and time needed to take additional steps to defeat it.

Because the United States is a relatively open society, and any NMD system must go through a multi-year test program in advance of its deployment, the attacker will know a great deal about what sensors and components the NMD system will incorporate. The attacker will have this information well in advance of US deployment, and can tailor its countermeasures to the specific NMD system.

In contrast, the United States is likely to know very little about the countermeasures an emerging missile state is developing. A potential attacker will understand the importance of not divulging such information. As the Rumsfeld Commission emphasized, emerging missile states are increasingly able to conceal sensitive activities. The countermeasures we described could be deployed with considerable confidence without flight testing, after sufficient testing using ground facilities and, where appropriate, airplanes.

A Countermeasure Red Team

In any event, there is a time-honored way to answer questions like this: do the experiment. As we recommend in the *Countermeasures* Report, the United States should establish an independent countermeasures "Red Team" to develop, build, and test countermeasures using technology available to emerging missile states. Because such a Red Team would *try* to build countermeasures, this type of intelligence gathering has been referred to as "TRY-INT."

There is a partial precedent for such an effort: BMDO oversees a program that develops, builds, and tests countermeasure prototypes to theater missile defenses—the Countermeasures Hands-On Program (CHOP). The program involves young scientists, engineers, and military officers not specifically trained in missile defense or countermeasures, who are only given access to the open literature and commercial off-the-shelf technology. But the CHOP program is oriented toward theater missile defenses and not to developing countermeasures to the NMD system. Moreover, the program staff serve for relatively short periods—a year or less—and therefore do not reflect the kind of in-house expertise an emerging missile state is likely to have. And because its funding, staff, and direction are under the control of BMDO, the program is not independent.

The planned NMD system should then be tested against the countermeasures the Red Team determines would be available to potential attackers. As the American Physical Society, the professional association of 42,000 physicists, noted in its April 2000 statement on NMD Technical Feasibility and Deployment: "The United States should not make a deployment decision ...unless that system is shown -- through analysis and through intercept tests -- to be effective against the types of offensive countermeasures that an attacker could reasonably be expected to deploy with its long-range missiles."[4]

Conclusion

Regardless of what NMD system the next administration pursues, it is essential that independent THINKINT and TRYINT programs be established to analyze and build countermeasures to the planned NMD. Once these programs determined which countermeasures were feasible, the United States must then assess how effective they would be against the planned NMD system through analysis and flight-testing. It is important, too, that there be independent oversight of the testing program. Finally, the next administration should only decide to deploy an NMD system once it has met all three of the Welch Panel's criteria. In particular, no NMD system should be deployed until it has demonstrating that it can reliably intercept real-world targets using countermeasures.

The ABM Treaty and NMD

Let me now turn to the second issue I was asked to address: the compliance of various proposed NMD systems with the ABM Treaty.

I will begin by making some general comments on the relevance and purpose of the ABM Treaty.

The ABM Treaty is intended to provide stability by ensuring that deterrence between the US and Soviet Union, and now Russia, remains strong. While some claim that this purpose is no longer necessary after the end of the Cold War, the fact remains that the US-Russian strategic relationship continues to be based on deterrence, albeit at lower force levels than during much of the Cold War. Both countries still rely primarily on nuclear-armed ballistic missiles to provide deterrence. There is no evidence that either country is interested in moving away from a reliance

[4] The full statement is available at the American Physical Society web site: http://www.aps.org/statements/00.2.html

on nuclear deterrence.

In fact, despite the end of the Cold War, the United States and Russia still maintain nuclear postures in which they deploy large numbers of nuclear weapons on high alert levels so they could be launched in a matter of minutes in response to an incoming attack by the other country. One must assume that the military and political leaders of both countries would be unwilling to maintain such an operational policy that increases the risks of accidental, unauthorized or inadvertent launch unless they believed it necessary for security.

If—and when—the United States and Russia should decide to abandon mutual deterrence, then their concerns about national missile defenses and the ABM Treaty itself would become anachronistic and irrelevant. But until this happens—which appears highly unlikely in the near future—US deployment of an NMD system that Russia believes could undermine its deterrent will almost certainly provoke a reaction that will undermine US security. Moreover, although China is not a party to the ABM Treaty, it bases its security planning on the constraints imposed by the treaty and it would also respond to a US NMD deployment that it found threatening by taking steps to preserve its deterrent. These steps could also be detrimental to US and international security.

The essence of the treaty

The treaty seeks to preserve deterrence in three ways:

- First, and most obviously, it bans the deployment of strategic-capable defenses with nationwide coverage. In fact, with the exception of one limited, regional system for each country, the treaty bans all deployments of strategic missile defenses.

- Second, it guards against a rapid breakout from its limits. The treaty contains provisions intended to provide several years notice of any effort to break out of the treaty, and thereby provide time for the other country to build more offensive missiles or take other steps to counter the defense.

- Third, it contains measures designed to prevent circumvention of its provisions, so that neither country could acquire prohibited defensive capabilities in an indirect or surreptitious way.

Although much of the discussion about the planned NMD system and the required changes to the ABM Treaty have focused on the number and location of the interceptors, the location and number of ABM radars and other sensors is equally—if not more—important.

The treaty prohibits nationwide systems by restricting the deployment of radars. All the components of the permitted "single site" ABM system must be deployed in a relatively small area. This restriction, which applies to the defense radars as well as the interceptors, is quite significant. Because the earth is round and the United States and Russia are large countries, neither country can be completely defended using radars at a single site. Due to the curvature of the earth, a radar will not be able to "see" missiles on many of the possible trajectories that could be used to attack large parts of either country. Since the defense interceptor must be guided to the

vicinity of its target by a radar (or by some other sensor substituting for the radar), the ABM system cannot intercept a warhead that the radar cannot see, regardless of how far the interceptor can fly.

Thus, the requirement that the ABM radars be located at a single site along with the interceptors enforces the requirement that the system defend only an "individual region." Several ABM radars, located in different parts of the country, would be needed to provide nationwide coverage.

The ABM Treaty restrictions on radars are also key to preventing a rapid breakout. Modern phased-array strategic missile defense radars are large and take years to build. Their construction is readily detectable by satellites and the absence of such radar deployments provides high confidence that the other country is at least several years away from breakout.

The treaty reinforces its guarantee that neither country will have the capability for a rapid breakout through its prohibition on the development, testing, and deployment of any ABM components that are sea-based, air-based, or mobile land-based. These deployment modes would permit ABM components to be rapidly relocated to provide nationwide coverage. The treaty also prohibits space-based ABM components, since such components inherently have not only nationwide but global coverage.

Treaty changes needed to permit deployment of the planned NMD system
Some have suggested that the first phase of the planned system could be accommodated if the location of the single site system the United States is permitted to deploy was changed from North Dakota to Alaska. This is far from true. Even the first phase of the NMD system violates the treaty in several fundamental ways. Since it is intended to defend the entire United States, this system would violate the Article I prohibitions on deployment of a nationwide defense and on providing a base for a nationwide defense.

Moreover, even though the initial system would deploy all its interceptors at one site, it is not a single site system of the type permitted by the treaty. The X-band radar would be deployed at Shemya in the Aleutians, more than 1,000 kilometers from the interceptor site in central Alaska. The initial system would also violate the treaty by incorporating the five early-warning radars, which would be upgraded to serve as ABM radars and without which the C-1 system could not provide coverage of the entire country.

Deployment of the full NMD system would involve additional serious violations of the currently existing treaty. In particular, the full system would include the SBIRS-low satellite-based tracking system. These satellites are designed to provide tracking data that is accurate enough for interceptor guidance, and can thus substitute for an ABM radar. Thus, the prohibition on space-based components would be violated. Deployment of SBIRS-low without Russian agreement would also violate Agreed Statement D, which requires discussion of and agreement on any new technologies capable of substituting for ABM components.

What effect would these changes have on the treaty provisions?
As noted above, the current ABM Treaty strengthens deterrence in three basic ways: it prohibits

nationwide defenses, it guards against rapid breakout, and it prevents circumvention. A modified treaty that permitted a limited nationwide defense would, of course, no longer prohibit nationwide defenses, but the treaty changes required to permit the deployment of the NMD system currently under development would also all but eliminate the treaty's ability both to guard against rapid breakout and to prevent circumvention to a larger NMD system.

Breakout Guarantee
If the treaty was changed to permit a limited national missile defense, it would be especially important for the treaty to prevent the possibility of a rapid breakout to a larger defense with more interceptors.

Unfortunately, the multiple X-band radars and the SBIRS-low satellite system that would be deployed as part of the full NMD system would constitute a complete sensor infrastructure and therefore completely eliminate the treaty's ability to control breakout. This sensor network would be able to support a much larger system that deployed many hundreds or even thousands of interceptors. Thus, once the full system was deployed, rapid breakout would always be a possibility.

It is important to note that a rapid breakout potential is <u>not</u> an unavoidable consequence of deploying a limited national missile defense; rather, it depends on the type of technology used. For example, rapid expansion could be precluded by deploying an NMD system that used only dish radars—which cannot track many objects simultaneously—instead of the phased array radars the planned system will use. Indeed, several years ago, the Air Force proposed building a rapidly deployable limited NMD system that would use such dish radars.

Circumvention
The full NMD system, which would deploy both a network of X-band radars and the satellite-based SBIRS-low system, would permit the integration of Navy Theater Wide interceptors into the NMD system. Indeed, a June 1999 Ballistic Missile Defense Organization (BMDO) study—the *Summary of the Report to Congress on Utility of Sea-Based Assets to National Missile Defense*—concluded that the NMD system could be upgraded by integrating the hundreds of interceptors to be deployed as part of the ship-based Navy Theater Wide missile defense system. Thus, the changes required to permit the full system would also facilitate the circumvention of the treaty limits by interceptors that were nominally intended for theater missile targets.

<u>Treaty changes needed to permit deployment of a sea-based mid-course NMD system</u>
The ABM Treaty explicitly prohibits sea-based systems, so some have argued that such a system would be less compliant with the treaty and that this is why the United States settled on a ground-based system. However, this is only true in a trivial sense. More significant is that a sea-based system would still require multiple radars and other sensors to permit tracking and discrimination. Thus, not only would such a system require most of the same treaty modifications as the current proposed system, it would raise the same concerns in Russia.

<u>Treaty changes needed to permit deployment of a boost-phase NMD system</u>
The types of treaty changes required to permit a boost-phase system (that used either interceptors based on ships or land) would depend on the details of the system. However, by looking at the

treaty objectives—of preventing a nationwide defense, rapid treaty breakout and circumvention—we can gain some understanding of the reasons Russia might or might not be opposed to US deployment of a boost-phase NMD, and hence to the treaty changes required to make such deployment legal.

Russia might not oppose a US boost-phase defense that (1) could in principle shoot down long-range missiles launched by emerging missile states, but not by Russia, (2) did not require building numerous radars or other sensor systems, which could permit rapid treaty breakout, and (3) did not permit circumvention.

Is it possible to configure a boost phase system that meets these criteria? Perhaps. Because the boost phase of a missile lasts only a few minutes, boost phase interceptors must be deployed close to the launch point of the missile. Thus, it might be possible to design a boost-phase defense that could in principle shoot down missiles launched from a small country, such as North Korea, but not from within a large country, such as Russia. This would rule out a space-based boost-phase defense, which would be equally capable of shooting down missiles in their boost phase launched from anywhere in the world.

Because a boost-phase defense could be oriented towards specific countries, it would not require a global network of X-band radars and other sensors. However, there are many unanswered questions about both the sensors and the interceptors. For example, Russia might be concerned that it could be possible to circumvent the modified treaty by using the interceptors for mid-course rather than boost-phase intercepts. Another issue that may arise is whether a sea-based boost-phase defense could threaten Russian submarine-launched ballistic missiles.

Conclusion

It is not possible for the United States to legally deploy a national missile defense without amending the ABM Treaty. However, some systems will be less objectionable to Russia than others. In particular, it may be possible to configure a limited boost-phase system that did not threaten Russia's nuclear arsenal, in which case Russia may be agreeable to treaty modifications to permit deployment of such a system.

Mr. SHAYS. Dr. Holmes, thank you.

Mr. HOLMES. Thank you very much, Mr. Chairman. I feel like the last of the Mohicans here.

Mr. SHAYS. Well, there is a little edge to this panel. I think it is maybe lunch or something.

Mr. HOLMES. Well, thank you very much for giving me the opportunity to be here today. I have with me, as mentioned earlier, Baker Spring, who is the Heritage Foundation's senior analyst on missile defense matters, to help answer any of your questions.

I would like to take the opportunity this afternoon, if I could, to provide you with some of my conclusions regarding the implications not only of the July 7 missile defense test, but also how the entire missile defense testing program is going.

My first conclusion is that weak missile defense technology was not the cause of the failed intercept test on July 7th. The primary reason the test interceptor did not destroy its target was because of the problem with a rocket technology that is 20 years old and that was built 10 years ago. It is therefore factually incorrect to conclude that the failure of the July 7 test proves that missile defenses are not technologically feasible. If anything, the results of other tests in the past suggest the opposite.

During the first flight test of the kill vehicle in October of last year, the system found and destroyed its target without the benefit of many of the advanced tracking command, control, and communication technologies now being tested. And over the last year, the Ballistic Missile Defense Organization can claim six successful test intercepts of theater and National Missile Defense technology compared with only three significant failures. I think no fair assessment of the facts could lead anyone to conclude that a 66 percent success rate suggests that missile defenses are not technologically feasible and therefore should not be deployed. As a matter of fact, that is basically the conclusion that Secretary of Defense Cohen has reached.

My second conclusion is that even if the July 7 test were a failure and can be blamed on new missile defense technologies, it would make no difference as far as the decision to deploy is concerned. A decision to deploy a National Missile Defense has already been made. The National Missile Defense Act of 1999 requires the fielding of a national missile defense system as soon as is technologically possible. Signed by President Clinton on July 22, 1999, this act is the law of the land. It is therefore a legal requirement that the Federal Government continue to develop and test a variety of systems to find the most effective and near-term alternative. The Congress and the President have spoken. We must now find out how best to proceed, not whether to proceed.

My third conclusion is that removing testing restraints will reduce technical risk in the program. The administration's National Missile Defense testing program is focused exclusively on the option of deploying interceptors at a fixed land-based site. This rules out other approaches that may prove to be more technologically feasible and more militarily effective. For example, despite the wealth of recommendations that the United States pursue a sea-based option, the administration policy bars even the development and testing, let alone the deployment, of sea-based systems.

The Clinton administration's refusal to test sea-based systems is all the more puzzling because they appear to be so promising. For example, recent press reports indicate that a Pentagon study requested by Congress, but which the Congress has not yet received, states that a sea-based system would add significant capabilities to the land-based interceptors of the sort that was tested on July 7.

Furthermore, the Chief of Naval Operations on February 18th stated in a memorandum to the Secretary of Defense that foreclosing the sea-based option would, "not be in the best long-term interests of our country."

I agree with the CNO that foreclosing the sea-based option would be shortsighted, which raises a question: If testing is required to discern the feasibility of land-based technologies, why is it ruled out to discern the feasibility of sea-based systems?

The answer appears to be in the administration's adherence to the ABM Treaty. The constraints that the ABM Treaty is imposing on the testing program are having serious effects, as Dr. Graham has said, both on the quality and the timetable of the entire missile defense program, as they have had on a number of missile defense programs over the last decades.

For example, the Patriot missiles of Gulf war fame were deliberately downgraded during the 1970's and the 1980's to comply with the ABM Treaty. As a result, the United States had to deploy systems less capable than they could have during Desert Storm.

Like the Patriot, the Navy's Aegis tracking systems and interceptors have been repeatedly downgraded to comply with the ABM treaty. The system was constrained in the 1980's to avoid a violation of the treaty, but the Bush administration later initiated a substantial upgrade to the system that would allow it to track and intercept ballistic missiles. Unfortunately, because of the ABM treaty, the Clinton administration severely cut and delayed this program.

The Clinton administration imposed restrictions on the testing of theater defense systems which prevent external sensors from providing early warning tracking and targeting data about possible launches to the interceptor; likewise, a system of space-based, low altitude sensors, which could have allowed the Navy theater-wide system to provide a limited protection from attacks on American soil, also have been delayed.

And as Chairman Shays mentioned this morning, I can find no other reason than the ABM treaty to understand why the Alaska radar was not being constructed. If there was, in fact, no technological reason, although we did not hear from the panel this morning, I would venture to say that the main reason was because they consider it to be a violation of the ABM treaty, and that was the main reason why they decided not to proceed.

Despite the outcome of the July 7 test, the Pentagon, I think, must move forward quickly with the development and deployment of missile defenses for America. And to that end, Congress and the executive branch should make every effort to field missile defenses as soon as technologically possible, as the law requires. We should be abandoning the policy of trying to revive the defunct ABM treaty and lift all restrictions on testing of missile defense systems. We have been talking all morning about testing. The assumption ap-

parently behind testing is to try to get the best system you can get. The ABM treaty is restricting the way we do that job.

I also recommend that a sea-based element be included in all missile defense deployment plans and that Congress be holding more hearings at the earliest possible time about alternative technical options like the sea-based system that I mentioned before.

Mr. Chairman, the Clinton administration has chosen to impose restraints on the testing of missile defense systems. If missile defense testing continues to be managed in this way, the testing restraints will produce the self-fulfilling prophecy of ineffective systems. By intentionally foregoing promising avenues of development such as the sea-based systems, the administration has chosen a course that will inevitably result in a system that will not be optimally effective. Our goal should be instead to develop and deploy the most effective missile defense system possible.

Thank you.

Mr. SHAYS. Thank you very much.

[The prepared statement of Mr. Holmes follows:]

Testimony of Dr. Kim R. Holmes
Vice President and Director
Kathryn and Shelby Cullom Davis Institute for International Studies
The Heritage Foundation
Before
The House Subcommittee on National Security,
Veterans Affairs, and International Relations

September 8, 2000

Mr. Chairman, thank you for providing me with the opportunity to testify on the subject of national missile defense.

I commend you for focusing the attention of Congress, through this hearing, on the question of testing and how it relates to the process of developing and deploying a national missile defense system for the United States. Few national security issues are more important, and yet few are as misunderstood. The reaction to the failed test on July 7 showed a great deal of confusion about the purposes of missile defense testing. Some believed the failed test proved the technological unfeasibility of missile defenses. Others concluded it proved nothing of the sort. A basic disagreement indeed exists in this country over the purposes of missile defense testing. One side insists that testing is designed mainly to decide whether to proceed with any kind of deployment at all. Another side believes that testing is not intended to decide the issue of deployment, but rather to educate us about which kind of technologies and systems would best implement a deployment decision that already has been made.

This distinction is important because the former argue that the failed July 7 test proves that missile defense is not technologically feasible and therefore should not be deployed anytime soon. The latter argue that the July 7 test proves virtually nothing about the technological feasibility of missile defenses and is, in any event, irrelevant to a decision that was already made with the passage and presidential approval of the National Missile Defense Act in 1999.

I contend that the latter position is more consistent not only with America's strategic interests but U.S. law. This becomes clear if we put the July 7 test in the perspective provided by the implications of the National Missile Defense Act. This Act said "it is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized or deliberate) with funding subject to the annual authorization of appropriations and the annual appropriation of funds for National Missile Defense."

To this end, I would like to provide you with my conclusions regarding the implications not only of the July 7 test but also of how the entire missile defense testing program is being run. Hopefully these conclusions can provide you with guidance on which steps should be taken to ensure that we have the best missile defense system possible at the earliest possible date.

TESTING IN PROPER PERSECTIVE

My first conclusion is that weak missile defense technology was not the cause of the failed intercept test on July 7. The primary reason the test interceptor did not destroy its target on July 7 was because of a problem with the rocket technology that is 20 years old and that was built 10 years ago. Yet this essential fact has been lost in the stream of commentary that followed the test.

The interceptor, which was tested over the South Pacific, had two components: a modified Minuteman booster rocket and a kill vehicle to destroy a dummy warhead launched from Vandenberg Air Force Base in California. After the target missile was launched from California, it released the dummy warhead and a balloon decoy in space as planned to try to fool the interceptor. The balloon decoy, which missile defense opponents often contend can easily foil missile defenses, failed to inflate. The interceptor was launched from the Kwajalein Atoll in the South Pacific 20 minutes later. Preliminary analysis of the test results indicates that the sensors, communications system, battle management system, and radar functioned properly. However, a malfunction in the Minuteman booster prevented the kill vehicle from being separated. According to the Pentagon, the booster rocket started to tumble during flight and did not signal the kill vehicle to separate and begin its intercept routine.

The Minuteman rocket is not new technology. It is in fact the backbone of America's deployed land-based strategic missile forces. However, the kill vehicle used in this test did contain new technology for intercepting warheads in space. Moreover, other elements of the test system—such as sensors to track the target missile in flight, a communications system, a battle management system, and prototype radar—contained new missile defense technology as well.

But as the July 7 test showed, it was the old Minuteman rocket technology that failed, not the new missile defense technologies. In reality, the key element of the missile defense system being tested—the kill vehicle—never had an opportunity to demonstrate its intercept capability. The outcome of the test indicates problems not with basic science, but rather with engineering and quality control of the test systems. Lt. General Ronald Kadish, Director of the Ballistic Missile Defense Organization (BMDO), stated during a press conference after the launch that he considered the booster to be so reliable that it was not even on his list of things that might go wrong during the test.

It is, therefore, factually incorrect to conclude that the failure of the July 7 test proves that missile defenses are not technologically feasible. In fact, it proves absolutely nothing about the new technologies since they never had a chance even to be tested. If anything, the results of other tests in the past suggest the exact opposite. During the first flight test of the kill vehicle last October (IFT-3), the system found and destroyed its target without the benefit of many of the advanced tracking and command, control and communications technologies now being tested. Similarly, a test last week of the joint U.S.-Israeli Tactical High Energy Laser (THEL) theater missile defense system succeeded in shooting down two Katyusha rockets launched

simultaneously. In fact, over the last year, the Ballistic Missile Defense Organization can claim 6 successful test intercepts of theater and national missile defense technology, compared with only 3 significant failures. No fair assessment of the facts could lead anyone to conclude that a 66 percent success rate suggests that missile defenses are not technologically feasible and therefore should not be deployed.

My second conclusion is that even if critics were correct that the July 7 test represents a failure of new missile defense technologies, it would make no difference as far as the decision to deploy is concerned; a decision to deploy a national missile defense has already been made. The National Missile Defense Act of 1999 requires the fielding of a national missile defense system as soon as technologically possible. Signed by President Clinton on July 22, 1999, this Act is the law of the land. It is, therefore, a legal requirement that the federal government continue to develop and test a variety of systems to find the most effective and near-term alternative. There can be no question, then, that we must proceed with a national missile defense system. The Congress and the President have spoken. We must now find out how best to proceed, not whether to proceed.

Deciding first on the requirement for a system and then testing to design it is, after all, the normal way military systems are developed. For example, long before we actually had a sea-based nuclear deterrent, first the Navy and then the President decided that we needed to have one. After this decision was made, the Navy set out to develop and deploy the Polaris submarine and sea-launched ballistic missile. They did so, in fact, on an accelerated development schedule precisely because the requirement was deemed to be so urgent. A special program office was established in 1955 by the Navy to develop these systems with only minimal bureaucratic oversight from the Office of the Secretary of Defense. Nothing was allowed to stand in the way of progress. Management was streamlined, funding was guaranteed and the main driving force for the program was to solve as quickly as possible technological problems to make the systems work.

Surely if the requirement for missile defenses is real, as President Clinton has admitted even in his recent address concerning his decision to delay deployment, then it is a fair question as to why he is not moving more aggressively to meet that requirement. Why is President Clinton not moving the missile defense program as quickly as President Eisenhower moved the Polaris program? Does President Clinton think the missile threat to America from rogue states is not as urgent as his words suggest? Is the requirement real or not? If it is real, then the President should not demand near technological perfection at the outset, particularly as proof of whether we should in fact meet the requirement, but rather move as aggressively as possible to meet the requirement that he has already conceded is real and urgent.

One of the best examples of this approach can be found in a civilian program—i.e., President Kennedy's decision to go to the moon. The political and policy decision to send a man to the moon was made almost a decade ahead of achieving the capability to perform the mission. The development and testing program was to determine how to send a man to the moon and bring him back. The results of specific tests in the program were not used to revisit the original

policy and political decision to send a man to the moon. Likewise, the adverse outcome of a particular test should cause neither the Administration nor Congress to revisit the decision it made last year to field a national missile defense system.

The President's decision to delay the construction of a missile defense system should be seen in this perspective. President Clinton tried to leave the impression that his decision was about whether to proceed at all with deployment. As he said, "we should use this time to ensure that NMD [national missile defense], if deployed, would actually enhance our overall national security." But, again, that decision has already been made. There is no question of whether it will be deployed, but only of what kind of system and when it will be deployed. It is hard to avoid the conclusion that the President, because of his Administration's deep ambivalence about the merits of missile defenses, is intentionally misrepresenting the meaning of his decision. By suggesting that deployment is still an open question—and that test failures are a main reason why—the President is implying that he or some future president has the authority to reverse a decision that has been mandated by an act of Congress that he signed into law. Short of changing that law, neither he nor any other president has such an authority.

My third conclusion is that removing unilateral testing restraints will reduce technical risk. The Clinton Administration's national missile defense testing program is focused exclusively on the option for deploying interceptors at a fixed land-based site. This rules out other approaches that may prove to be more technologically feasible and more militarily effective. For example, despite the wealth of recommendations that the U.S. pursue the sea-based option for missile defenses, the Clinton Administration's policy bars even the development and testing, let alone the deployment, of sea-based systems for national missile defense. Thus, the Clinton Administration is effectively putting all of the nation's missile defense eggs in the single basket of the ground-based missile interceptor program.

A more prudent approach would be to broaden the development options and thereby reduce the risks associated with depending on a single system. The Clinton Administration, however, rules out the testing of sea-based interceptors for national missile defense. The reason: The Clinton Administration believes that the 1972 Anti-Ballistic Missile Treaty with the former Soviet Union bars the testing of sea-based and space-based national missile defense intercept capabilities. Clinton Administration officials also believe that the ABM Treaty prohibits the testing of theater missile defense systems to demonstrate their capabilities for national missile defense.

But there are two problems with this approach to the ABM Treaty. The first is that the Administration's plan for a land-based deployment site itself would violate the ABM Treaty. Notwithstanding the fact that President Clinton has delayed the decision to proceed with construction of the land-based site in Alaska, the fact remains that the Clinton Administration has openly conceded that this site would violate the ABM Treaty and thus require changes in it. If both the land- and sea-based options are contrary to the ABM Treaty, then one wonders why one option—the sea-based one—is ruled out *in principle* while the other one is not. It would make more sense to decide which option makes more military sense and then to decide how best to

handle the arms control implications, since clearly the Clinton Administration believes that the ABM Treaty must be modified in some fashion no matter what we do.

The second problem is that there are serious questions about the legal validity of the ABM Treaty itself. A legal study, conducted by the law firm of Hunton & Williams on behalf of The Heritage Foundation in 1998, concluded that the ABM Treaty is no longer binding on the United States because no individual state or combination of states could fulfill the obligations of the former Soviet Union. Similarly, a study conducted by the Former Deputy Assistant Secretary of Defense, Douglas J. Feith, and George Miron of the law firm Feith and Zell concluded that the ABM Treaty lapsed when the Soviet Union dissolved. Finally, former Director of the Central Intelligence Agency James Woolsey, a man who served as ambassador, delegate or advisor to the U.S.-Soviet arms control negotiations for the last two decades of the Cold War, has observed that,

> According to longstanding principles of international law, when one country has a bilateral treaty with another and is then 'succeeded' by a different state, the bilateral treaty remains in effect only if both states so affirm—the new state and its predecessor's treaty partner. . . . Unless some president submits the 1972 ABM Treaty, with its new parties, to the Senate and obtains its consent to the substantive changes, there is nothing to abrogate.[1]

The Clinton Administration's refusal to test sea-based systems is all the more puzzling because they appear to be so promising. The Heritage Foundation's Commission on Missile Defense, most recently in March of last year, proposed the deployment of a comprehensive global missile defense system that had as its centerpiece a sea-based system. I ask that a copy of the Commission's report be made a part of the record. This system would first deploy missile defense interceptors at sea.

Since that time, support for a sea-based missile defense system has grown among members of the expert community. For example, recent press reports indicate that a Pentagon study Congress requested, but has yet to receive, states that a sea-based system would add significant capabilities to the land-based interceptors of the sort tested on July 7. I ask that a May 27 article from *The Washington Post* be made a part of the record as well. Furthermore, the Chief of Naval Operations, on February 18, sent a memorandum to the Secretary of Defense stating his view that foreclosing the sea-based option "would not be in the best long-term interests of our country." I ask that a copy of this memorandum also be made a part of the record. Finally, two former high-ranking defense officials in the Clinton Administration, John Deutch and John White, have recommended consideration of the sea-based option. Their recommendation came in an article they co-wrote, along with former Secretary of Defense Harold Brown, in the summer edition of the journal *Foreign Policy*. I ask that this article be made a part of the record as well.

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[1] James Woolsey. "What ABM Treaty?" *The Washington Post*, August 15, 2000, p. A23.

I agree with the CNO that foreclosing the sea-based option would not be in the long-range interests of the country. That is why I am puzzled by some missile defense critics who oppose the testing of sea-based technologies while at the same time supporting testing for land-based systems. After all, many critics of missile defense base their opposition to land-based deployment largely on their analysis of the results of testing. They believe that testing is necessary to demonstrate that missile defenses will not work. Some have, in fact, called for more testing of land-based systems, suggesting that we do not yet know enough from test data to proceed with deployment.

But if testing is required to discern the feasibility of land-based technologies, why is it ruled out to discern the feasibility of sea-based systems? If land- and sea-based systems both violate the ABM Treaty, then why is the more promising technology—the sea-based option—being ruled out as a matter of high arms control principle? Would it not make more sense to test all available technologies and systems to find out the best solution to the problem? Surely missile defense opponents do not want to argue that willful ignorance of the feasibility of sea-based technologies is the best way to decide how to proceed.

One cannot help but draw the conclusion that the Clinton Administration (with other outside opponents of missile defense) is formulating policy more by the desire to save the ABM Treaty than to find out the best system to defend Americans from missile attack. For example, largely at the behest of the Russians, the Clinton Administration introduced a wholly novel restriction on the testing of theater missile defense systems. The Administration has barred the testing of theater missile defense interceptors against target theater missiles with speeds exceeding 5 kilometers per second or ranges exceeding 3,500 kilometers.[2] They did this in spite of the fact no such original provision existed in the ABM Treaty; in fact, they had essentially to modify the treaty to expand its coverage over theater systems. And they did it in spite of the fact that North Korea's three-stage Taepo Dong rocket—the driving force behind the decision to deploy—has already demonstrated its capacity to deploy a theater ballistic missile that exceeds these speed and range parameters.

Out of frustration with the counterproductive nature of the Administration's restrictive testing policy, Representative David Vitter introduced last year the Realistic Tests for Realistic Threats National Security Act of 1999 (H.R. 2596). This legislation is crafted to reverse the policy of restricting the testing of theater defense systems. H.R. 2596 would require the Department of Defense to test the Navy's Theater Wide (NTW) system and the Theater High Altitude Area Defense (THAAD) system against target missiles that simulate the Taepo Dong-1 missile. Congress could use the opportunity presented by H.R. 2596 to establish the steps that could lead to an alternative approach to the deployment of a national missile defense system in the near term.

Specifically, the ABM Treaty has inhibited the development of a number of missile defense systems over the last two decades:

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[2] This agreement was reached as part of a package of three accords signed by the Administration on September 26, 1997, in New York.

- The Patriot missiles of Gulf War fame were deliberately downgraded during the 1970s and 1980s in order to remain in compliance with the ABM Treaty. As a result, the United States had to deploy systems less capable than they could have been during Desert Storm.
- The Clinton Administration imposes a restriction on the testing of theater defense systems, which prevents external sensors from providing early warning tracking and targeting data about possible launches to the interceptor. Likewise, a system of space-based low altitude sensors, which would have allowed the Navy Theater Wide (NTW) system to provide limited protection from attacks on American soil, has been delayed.
- Like the Patriot, the Navy's Aegis tracking systems and interceptors have been repeatedly downgraded in order to be compliant with the ABM Treaty. During the 1980s, the system was constrained to avoid a violation of the treaty. However, the Bush Administration later initiated a substantial upgrade to the system that would allow it to track and intercept ballistic missiles. Unfortunately, because of the ABM Treaty, the Clinton Administration severely cut and delayed this program—specifically, the radar has been limited so it can only track targets moving slower than 5 km/s and the interceptor's speed has been reduced from 4.5 km/s to 3 km/s.
- Attention was shifted from more effective and less expensive sea- and space-based systems to more complex and expensive ground-based systems.
- In September 1997, the Clinton Administration vetoed a follow-on to the successful 1994 Clementine mission because it would have demonstrated the maturity of technology that could be used to build space-based interceptors. In the end, President Clinton's adherence to the defunct ABM Treaty resulted in a termination of the space-based interceptor project.

Adherence to a non-existent treaty has prevented the United States from developing the means to counter emerging threats and challenges. Undoubtedly, as rogue states develop more advanced missiles, they will attempt to deploy countermeasures capable of defeating the planned, limited, ground-based system. As a result, the United States must put increased emphasis on the development of space-based platforms that will be able to destroy enemy missiles during their boost-phase, when countermeasures are still contained inside the booster rocket. However, under the current Administration's policy, development of such essential systems is prohibited. The capability to counter enemy countermeasures can be developed. The Clinton Administration has chosen not to do so.

My fourth conclusion is there appears to be management and quality control problems in the current national missile defense program. This conclusion is suggested by the outcome of the July 7 test. As I said before, the failure occurred in the booster rocket, technology that is decades old. This fact inevitably raises the question of whether the results of the national missile defense test in July demonstrate a deeper problem with the way the missile defense program has been managed for the past seven and a half years.

A Pentagon panel headed by former Air Force Chief of Staff, General Larry Welch (ret.), concluded in 1998 that a lack of thorough preflight testing caused inadequacies in basic engineering and management discipline of the missile defense program. The end result has been

a "hurry-up-and-get-a-success-before-they-cancel-the-program" mentality. The tendency has been for engineers and project managers to focus too much on low-risk tests that really do not move the program forward. As Phil Coyle, the Pentagon's top testing official, observes, "A more aggressive testing program will be necessary to achieve an effective capability by 2005 or for even several years thereafter."[3]

STEPS TO IMPROVE THE MISSILE DEFENSE PROGRAM

The threat to the United States posed by the proliferation of ballistic missiles is growing. It will likely accelerate as long as America remains vulnerable to missile attack and hostile countries see an opportunity to use ballistic missiles to intimidate the world's only superpower. Despite the outcome of the July 7 test, the Pentagon must move forward quickly with the development and deployment of missile defenses for America. To that end, Congress and the executive branch should:

- **Make every effort to field missile defenses as soon as technologically possible**. The United States made a decision to deploy a national missile defense system when the President signed the National Missile Defense Act of 1999 into law. Deciding not to deploy such a defense is not an option. The Pentagon must continue to develop and test missile defense technologies with the goal of deploying a defense against small-scale strikes as soon as possible.

- **Abandon the policy of trying to revive the defunct ABM Treaty and lift all unilateral restrictions on the testing of missile defense systems**. The nation cannot afford to conduct missile defense development and testing programs with one hand tied behind its back. If the United States is ever going to field an effective defense against both theater and strategic ballistic missiles—a global missile defense capability—it will have to recognize that the ABM Treaty no longer serves its interests. This recognition should start with lifting the restrictions on testing.

- **Recommend a sea-based element in all missile defense deployment plans.** Now that the President has recommended a delay in the construction of the land-based site in Alaska, the Pentagon should give more serious consideration of the sea-based option. According to news reports, the Pentagon has produced a report for Congress that recommends inclusion of a sea-based element because it is technologically feasible and would enhance a missile defense system's overall effectiveness. It also would reduce the technical risks that undermine ground-based systems.

- **Congress should be holding hearings at the earliest possible time about alternative technical options like the sea-based system.** The Congress should take the President at his word that he wants more time to explore the best options on how to defend the country from missile attack. To that end, sea-based systems must be considered as part of

[3] Eric Schmitt, "Pentagon likely to delay new test for missile shield," *The New York Times*, September 1, 2000.

the mix. The Senate and House Armed Services Committees should hold hearings to consider a sea-based architecture for NMD, what the funding requirements for such a system would be, a possible deployment timetable and a program to remove the impediments imposed by the Clinton Administration's severe testing restraints.

- **Stick to the flight test schedule for the ground-based interceptor program.** The July 7 test was only the third flight test in a schedule of 19 such tests. The Pentagon should continue conducting the scheduled flight tests to refine and perfect missile defense technology as soon as possible. I am very much concerned about reports that the Pentagon is planning to delay tests until next year. The National Missile Defense Act says that deployment should begin "as soon as is technologically possible." This goal cannot be achieved if the schedule is relaxed.

- **Tighten management and improve quality control in the missile defense program.** The failure of the interceptor to destroy the target missile was caused by a failure in the proper staging of the rocket—something the technology has been able to do for 40 years. It indicates that the Administration may not be properly managing or assuring the military's research and development programs. The next Administration must correct the deficiencies in the current program by giving ballistic missile defense the priority and funding it deserves, developing a realistic testing program designed to learn from so called "failures" and successes alike, and reducing the bureaucracy involved in the program's administration. This is the only way to alleviate the defense mindset that has plagued the program for the last seven and a half years, reducing quality control and causing failures in 40-year-old technology.

CONCLUSION

Mr. Chairman, the decision to deploy a national missile defense system was made when Congress enacted the National Missile Defense Act of 1999. The Clinton Administration should be faithfully executing that law by fashioning a missile defense program that will field a system as soon as technologically possible. The results of the July 7 test reveal that at best the missile defense program is not well-managed. Worse, the Clinton Administration is pursuing the nation's missile defense program in a way that fails to take advantage of the full array of technological options that are available to it.

Nowhere is this shortcoming more apparent than in the area of testing. The Clinton Administration has chosen to impose restraints on the testing of missile defense systems. If missile defense testing continues to be managed in this way, testing restraints will produce the self-fulfilling prophecy of ineffective systems. By intentionally eschewing promising avenues of development, such as sea-based systems, the Administration has chosen a course that will inevitably result in a deployment option that will not be optimally effective. How could it be otherwise if effectiveness is not the optimum criteria for testing?

The Administration's strategy may or may not be intentional. After all, Administration officials must be aware of what happened with ABM systems in the early 1970s. They were sacrificed as a bargaining chip in arms control precisely because critics argued that they would not be effective enough to defend the country. If the nation has to choose between an ineffective limited defense against ballistic missiles, or arms control, arms control will always win the debate.

This trap must be avoided at all costs. The American people deserve more than a limited and ineffective missile defense system. And they deserve more than the promises of arms control. Instead, they deserve a missile defense system that is as effective as possible. This means that the Pentagon must test all available options, including sea-based and space-based defenses, plus improvements in theater missile defense systems. Doing anything less would violate not only the law but also the trust of the American people in their government to provide for the common defense.

Pursuant to the requirements of the Truth in Testimony Act, the following describes The Heritage Foundation's sources of income:

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Total Heritage Income: sources of income, excludes new pledges)	$43,597,718 (this is the Accounting figure for all
Total number of donors:	186,947
Percent of Income with Amount	
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Individuals	42.5 percent ($18,539,759)
Foundations	18.3 percent ($7,983,673.73)
Corporations	9.6 percent ($4,175,610)
Investment Income	27.2 percent ($11,844,484)
Publications sales and other	2.4 percent ($1,054,192)

Mr. SHAYS. This ought to be a very interesting panel to hear your answers to the questions, and we will start with Helen Chenoweth-Hage.

Mrs. CHENOWETH-HAGE. You did that right, Mr. Chairman. Thank you very much. It confuses me sometimes, too.

Mr. SHAYS. Thank you. You are very gracious.

Mrs. CHENOWETH-HAGE. Thank you, Mr. Chairman.

I wanted to direct some of my comments or questions to Mr. Korb.

Mr. Korb, you commented on the Patriot missile, anti- missile missile. But wasn't the Patriot anti-missile missile designed originally as an anti-aircraft?

Mr. KORB. That's how it started. As a matter of fact, it was former Vice President Quayle that got the Congress to put money into Patriot give it an anti-missile capability. That plan was not put forward by either the Reagan or Bush administrations, that is correct. Patriot was originally built as an anti-aircraft system.

Mrs. CHENOWETH-HAGE. And a very courageous Army colonel in Huntsville, AL, actually directed the startup of the production lines on his own authority, recently retired but he upgraded the software and deployment system in the Patriot.

You know, it's my understanding, Mr. Korb, that the U.S. aerospace community has repeatedly met more daunting and challenging engineering challenges than that posed by finishing up what we have already started. And it would seem to me that our biggest concerns, as a Congress, should be looking at better management practices. I mean, in your testimony you stated that we need to be involved in at least 7 more years of vigorous research before we can make an informed choice on deployment, but if we could concentrate on some of the management practices and removal of the political constraints, I think that we would be miles ahead.

Mr. Korb, this is the reason I make this statement. We have had a number of successes that we are not talking about, and we muddle around in the ABM treaty and we forget the successes that have been instituted and have actually occurred since 1955 when we first started this.

Now, using pre-SDI technology in 1984, the Army's HOE experiment launched from an island in the Pacific, South Pacific, of a Volkswagen-sized kill vehicle to intercept a Minuteman missile, launch from Vandenberg Air Force base in southern California, that was a success, wasn't it?

Mr. KORB. Are you talking about the homing overlay experiment?

Mrs. CHENOWETH-HAGE. I am talking about the homing overlay experiment.

Mr. KORB. Well, as it turned out, the Congress found out some years later that that test was rigged, this came to light after the Reagan administration left office. In fact, I believe there was a GAO investigation and a congressional.

Mrs. CHENOWETH-HAGE. Well, I——

Mr. KORB. I don't disagree with your point that we could eventually get the technology to work. I think that to the extent that you do concurrent research development, you are increasing the chances that you are going to have what General Welch called a rush to failure.

I would also point out that not every system works. We have had spectacular failures. The division air defense (DIVAD) gun was a system that we tried to rush and it never worked, and in fact, it was because of the testing DIVAD there that Congress passed a law that set up Mr. Coyle's office.

Secretary Cheney had to cancel the A–12 because it just wasn't working.

So it may work, but my point is to the extent that you rush, you increase the chances that it won't.

Another point, this is not just another system. This, if it doesn't work, then you are going to have what Chairman Burton talked about before, that is missiles raining down on the country. Then all the money you have spent will have gone in vain. It is not like flying a plane, where you get to go make a second pass.

Mrs. CHENOWETH-HAGE. Well, you know, because there have been allegations of tests being rigged, I am not convinced that they were. What I am convinced of is this, that we learned a lot from that launch, that whole launch, and in addition to that the Air Force successfully intercepted a dying low altitude satellite with its miniature homing vehicle launched from an F–15, also using pre-SDI technology.

The SDI program instituted a major technology demonstration program that placed priority on dramatically reducing the size and weight of critical compulsion and sensor and data processing and other electronic systems, we have already done that, and to enable an effective hit-to-kill interceptor system. Why are we continuing to drape crepe? Most notable among these demonstration systems was the delta series or what would has become familiar to us as the delta star series, in 1989, which over a 9-month period gathered very important information. That's all been done.

Also in 1989 the Army's E-risk program repeated the HOE experience with a much lighter interceptor kill vehicle, using mid-1980's technology. There have been numerous other experiments that demonstrate the maturity of the basic technology.

So I don't want to see us just mull around in the ABM treaty while other countries are advancing their systems and we are muddled down trying to reinvent the wheel.

The SDI program has produced the technology that was demonstrated in the award winning 1994 Clementine mission, which returned to the moon for the first time in 25 years and provided over a million frames of optical data. That's all in our history of what we have produced. But, unfortunately, President Clinton, in his short-lived veto, line item veto authority, killed the Clementine, an award-winning program that all of aerospace looked at.

So, Mr. Korb, my concern is, as former President John Kennedy was noted as saying regarding the space program, one can always make the perfect the enemy of the good, and this seems to me to be exactly what we are trying to do, by not recognizing the accomplishments but focusing on our test setbacks.

So I thank you for your testimony.

Mr. KORB. Thank you.

Mrs. CHENOWETH-HAGE. I wanted to ask Mr. Spring about the ABM treaty. You know, it seems to me that this treaty has succeeded in its purpose of blocking the development, testing and de-

ployment of an effective defense anti-ballistic missile system, at least for the United States; and that last parenthetical phrase is what concerns us all.

Mr. SPRING. Sure.

Mrs. CHENOWETH-HAGE. This seems to meet the objectives of those who wish to preserve the cold war mutual assured destruction policy that I have referred to earlier, a doctrine which may benefit some but certainly doesn't move us to mutual assured survivability.

I wonder if you would like to comment on that?

Mr. SPRING. Well, certainly the treaty does—and it was designed to, from the outset—impose limitations on development and testing as well as deployment. Those restrictions are found in articles 5 and 6 of the treaty. They affect sea-based, space-based, mobile, ground-based and air-based systems. In my judgment, in terms of development and testing, to put it in the context of, say, for example, the moon mission, we would say that well, we are going to go to the moon, but we have a restriction that we can't use liquid-fueled rockets, or that we can't use advanced computer technology. That, in other words, all of the options that would otherwise be put on the table are now being taken off as a matter of political constraint and diplomatic constraint.

The other restriction in article 6 says we can't take theater missile defense systems and upgrade them to give them a long-range or strategic ballistic missile defense capability. Well, the fact of the matter is that our most advanced technologies, because they have been proceeding in relative terms to the NMD system now in a relatively unconstrained fashion, are among the most advanced; and, therefore, some of the best avenues to providing, in my judgment, the most effective missile defense system that we can obtain as soon as possible, according to law, would be to upgrade our missile defense systems that are now categorized as theater defenses.

Those include most particularly the Navy theater-wide program. So in my judgment, we are proceeding in this program essentially with one hand tied behind our backs, as a result of the diplomatic and political constraints that are imposed on it through what I view to be unilateral observance of ABM restrictions as a matter of policy by the Clinton administration.

It is not, in my judgment, a free and fair exploration of all the technological options that would be available to the defense community.

Mrs. CHENOWETH-HAGE. Thank you, Mr. Spring.

Mr. Chairman, I yield back the balance of my time.

Mr. SHAYS. Thank you very much. Mr. Tierney.

Mr. TIERNEY. Thank you. Dr. Holmes, Mr. Spring, I am a little struck by what I think is a rather extreme argument in your statement that the ABM treaty should no longer be considered binding based on an argument, I guess, that since the Soviet Union dissolved Russia is not bound by the same agreements, and I see that you cited a couple of prominent individuals who share that view but I would like to ask you a question about the implications of that.

Do you believe on that basis that no treaties currently exist between Russia and the United States other than the few that we

might have signed since the break-up of the Soviet Union? So I guess that would mean that no previous arms treaties, no status of force agreements, no trade pacts, none of these continue to exist in your mind?

Mr. HOLMES. Well, many of the treaties that existed with the Soviet Union have been handled on an individual basis, and so has, actually, the ABM treaty. There was a multilaterization treaty, a successor agreement that was signed with four countries, Ukraine, Belarus, Khazakhstan and Russia, that the Clinton administration signed and must be sent up to the Senate for its advice and consent before it becomes the law of the land. So even the administration believes that something must be done to have a legally binding treaty. Otherwise, they would not have negotiated that agreement.

So, therefore, to answer that question you have to handle each one of these agreements separately. The ABM treaty has been handled separately. It is now a successor agreement that has to be sent up to the Senate. If the Senate approves that and ratifies it, then it will be binding. If it doesn't——

Mr. TIERNEY. What about the status of forces agreement and trade pacts, do you think they are all out the window?

Mr. SPRING. Let me answer that question. The finding that we had done for us by the law firm of Hunton and Williams was that the ABM treaty is null and void by reason of impossibility of performance. That is, there was no state in existence today that could have fulfilled the obligations the treaty imposed on the Soviet Union, primarily for reasons of geographic scope.

The ABM treaty imposed restrictions with regard to the territory of the Soviet Union which Russia does not control. As a result of the impossibility of performance on obligations that are unique to the ABM treaty, the treaty is null and void by force of international law.

That does not speak to the obligations of the United States relative to other treaty obligations with the Soviet Union and the succession issues that would surround them.

Mr. TIERNEY. Thanks.

Mr. HOLMES. Could I add one thing to that, if I may?

Mr. TIERNEY. Sure. Sure.

Mr. HOLMES. This is also the view, by the way, not only of the chairman of the Senate Foreign Relations Committee, but also the Senate Majority Leader, who have, in many communications with the White House, made the same point that we have made here; primarily, that the successor agreement must be sent up to the Senate for ratification before it becomes the law of the land.

Mr. TIERNEY. Terrific.

Dr. Gronlund, let me ask you about the latest intercept flight test, the IFT–5. The Department of Defense provided a briefing and gave us some slides, and one of them listed all the mission objectives that were supposedly accomplished by that IFT–5 test. When you look at it—well, first you know what countermeasures were included in that target sweep?

Ms. GRONLUND. There was one large spherical balloon decoy.

Mr. TIERNEY. What happened to the deployment of that particular countermeasure?

Ms. GRONLUND. It didn't inflate. It didn't deploy properly.

Mr. TIERNEY. My problem is anyway, that would be an unsuccessful interceptor, wouldn't you think so?

Ms. GRONLUND. Well, they never got to the point of testing the intercept because the killr vehicle did not release from the booster properly.

Mr. TIERNEY. Can you explain to me then how the Department of Defense indicates that for discrimination, the full objective of their plan was met? How would they get to that conclusion given that scenario?

Ms. GRONLUND. No, I don't know that, actually. I don't.

Mr. TIERNEY. All right. Let me discuss with you a little bit, you mentioned three different countermeasures that you thought were—that you actually went into in further depth in your report.

Ms. GRONLUND. Yes.

Mr. TIERNEY. One of them was submunitions.

Ms. GRONLUND. Yes.

Mr. TIERNEY. As I understand it, you are not only talking about submunitions with nuclear warheads, you are talking about submunitions with biological or chemical warheads?

Ms. GRONLUND. Particularly biological warheads.

Mr. TIERNEY. The premise being that any country like North Korea, Iran or Iraq, if they were to have the capacity to send up an anti-ballistic missile, they probably also have the capacity to use submunitions on those?

Ms. GRONLUND. Right. A country that had an ICBM and had a biological weapon would also be able to simply separate that agent into 100 or more bomblets. This was something that I believe the Rumsfeld Commission first noted would be an option for an emerging missile state, and people have raised various concerns about reentry heating, about disposal, and those are the things that we looked into in great detail in our report.

Mr. TIERNEY. And your report indicated that submunitions——

Ms. GRONLUND. That if the country could already have a biological weapon that it could deliver by long-range missile, it could just as readily put them on submunitions.

Mr. TIERNEY. Now, if you had as few as five missiles.

Ms. GRONLUND. Yes.

Mr. TIERNEY. Could you put 100 submunitions on each one?

Ms. GRONLUND. Yes.

Mr. TIERNEY. You'd have 500 submunitions of biological agent coming over, disbursing—in fact, that probably would be preferable if you were a rogue country and you really wanted to disburse that agent. It'd be better to have 100 different places of release than it would be just one, right?

Ms. GRONLUND. It probably would, yes.

Mr. TIERNEY. So if you had 500 coming over, even after we go to C–3 on this stage, what are the total number of interceptors that the system currently envisions?

Ms. GRONLUND. Which is 250 interceptors. Even if they were perfectly effective, fewer than half of the bomblets would be destroyed.

Mr. TIERNEY. So we should probably be real honest with the American people and tell them that in terms of biological weapons at least——

Ms. GRONLUND. Yes.

Mr. TIERNEY [continuing]. This system doesn't cut it.

Ms. GRONLUND. Right, right.

Mr. TIERNEY. And I would guess you might even make the argument that if I were a rogue nation, I would be encouraged to go that path as opposed to nuclear, since I knew you might be trying to provide some sort of a nuclear deterrent.

Ms. GRONLUND. That is a possibility. I mean, the other reason biological agents might be more attractive than nuclear weapons to an emerging missile state is that it's hard to get the fissile material that you need to make a nuclear weapon. And, for example, North Korea reportedly has enough material to make one or two nuclear weapons, but there's no, de facto limit to how many biological weapons it could make.

Mr. TIERNEY. Can you talk to us for a bit about the difference between effectiveness and competence?

Ms. GRONLUND. Oh, boy. OK. Let's say that you want to have a system that is 95 percent effective but you also need to know with some amount of certainty what the effectiveness is. For example, if I gave you a coin, I said this coin is weighted and I want you to tell me what the weighting is, and I let you flip it once and it lands on heads, would you then say I am 100 percent certain that this coin is weighted so it will always come up heads? No.

OK. So there's both a certain confidence level of what the effectiveness is, or if you're looking at the coin example, how the coin is weighted, and the only way you can become highly confident of what the weighting of the coin actually is is by flipping it a lot of times. Or the analogy with missile defense testing, the only way you can know with high confidence how effective the system would be is to test it a lot of times.

Mr. TIERNEY. Now, if we had—and I won't go into all of those of when we talked earlier—but a fairly significant number of relatively simple countermeasures that were available now to rogue nations, it wouldn't be enough to test against each one of those countermeasures individually. Wouldn't we have to test about them in different combinations?

Ms. GRONLUND. Ideally, to have confidence the system would work against an attack using countermeasures, you would want to consider a lot of different possibilities, a lot of different real world conditions, yes.

Mr. TIERNEY. Mr. Korb, maybe if I just ask you to answer this: If we didn't have great confidence in the system, what good does it do us?

Mr. KORB. Could you speak a little louder?

Mr. TIERNEY. Sure. If we don't have a high level of confidence in the effectiveness of this type of national missile defense system, would it still be an important element, or what sort of an element would it be in our entire defense?

Mr. KORB. Well, it obviously would be much more important than any other system because the purpose of this is to detect an attack by a rogue nation using a weapon of mass destruction, and if it doesn't work, all of the money the Nation spent on NMD is wasted. It is not just another weapons system. We have lots of weapons systems. If an airplane goes in and it misses its target, you can come back again and hit it, but you get one shot at this, and if you

miss, then in fact you've wasted all your money. So that's why you have to have a higher degree of confidence that it will be effective.

Mr. TIERNEY. So, therefore, the more importance of testing——

Mr. KORB. It's much more important to test it more, say, than the B–1 bomber. The B–1 bomber was rushed into production; it hasn't worked well yet, but it didn't mean as much as NMD, because we then came with the B–2 we had other ways to deliver bombs on target.

Mr. TIERNEY. One of the supposed purposes for this system is to avoid accidental launchings or to at least protect against accidental launchings from Russia or some other country. They already have sophisticated countermeasures, don't they?

Mr. KORB. The Soviets have not only countermeasures, they have missiles with multiple warheads on them. Remember, that's why they first developed the multiple warheads was to be decoys. And then somebody said, gee, why do you want to just have decoys, let's make them real. And so in effect it spreads apart and you then have to—several of them even if you hit 1, the other 3, 4 or 10 get through.

Mr. TIERNEY. So it's not really effective against a biological submunitions scenario and it has limited effect against an accidental launch from Russians with multiple warheads——

Mr. KORB. If it's a multiple warhead, that's correct.

Mr. TIERNEY. Thank you. Thank you, Mr. Chairman.

Mr. SHAYS. First, I would like to ask if any of you would like to comment to any question that wasn't asked of you by Helen or John. Yes.

Mr. HOLMES. I'd like to comment on this idea that the missile defense system has to be perfect or near perfect before it can justify actually building it. First of all, I know of no weapons system that demands perfection before you actually begin deployment. But the idea that somehow we would have more or less permanently, after we made a decision to deploy, a national missile defense system that would forever be static or stays the way it is—it will not improve over time—seems to me to underestimate not only what we have learned from the history of the development of weapons systems, but also the technological capacity of this country. Because the fact of the matter is, it's hard for me to imagine if we made—if we actually deploy a missile defense system, that it will be a 100 percent failure. It might have failure at the margins. Perhaps sometimes it would catch some missile; maybe it won't catch all of them. But it would at least catch some of them. And so, therefore, there would be some effect on the saving of lives of Americans even if it is only partially successful. So the idea that it has to be 100 percent successful before we even make the decision to deploy seems to me to be a false assumption.

Mr. SPRING. Maybe if I could just say something quickly with regard to biological threat, and that is that, first, the argument that is put forward with regard to the biological threat in my judgment is a perfect argument for why we need a boost-phase capability which we are currently prohibited from even testing and developing, let alone deploying.

The second is that, at least with regard to biological attack by missile or any other means, there's at least some reasonable op-

tions for civil defense, and I certainly advocate that we move forward with regard to those capabilities for homeland defense. But with a nuclear weapon, I think that the options for that are limited indeed. So I think that you have some options with regard to biological attack that you wouldn't have in the case of nuclear attack.

Mr. KORB. Let me make one comment on something that was said earlier about the National Missile Defense Act of 1999. I think an important point in the legislative history of that act is Senator Levin's amendment to it which talks about the fact, not just technologically feasible, but of the arms control implications of a deployment. I think you cannot just say just because it's technologically feasible, that's the end of the situation. As I read the legislative history and the Levin amendment, I think that also is a factor in the decision.

Mr. SPRING. Let me comment on that.

Mr. KORB. Wait, we're going to be here forever. We all get one shot here because I've got——

Ms. GRONLUND. And I haven't gotten mine yet.

Mr. SHAYS. I thought I was in charge.

Ms. GRONLUND. I'd like to comment on the notion of the need for a 100 percent perfection. There is a difference—this is the question Mr. Tierney asked me—between the effectiveness and the confidence level. At a fundamental level, aside from how effective the system would actually be, the United States will not know how effective it will be, which will make it very difficult to plan for using it.

Now one of the things that Secretary of Defense Cohen says—in fact, he says the real reason we need this system is to preserve U.S. freedom of action so the United States can continue to use its conventional forces around the world without fear of threat of being hit by a ballistic missile. And he says if we have a national missile defense we don't need to worry about that; but in fact, if we have a national missile defense, the President and the policy planners will not know how effective it would be.

So if we're now postulating that we're going to go around the world preserving our freedom of action to intervene and yet we don't know how effective our NMD system is, that could put us in a situation we're actually encouraging attacks that otherwise wouldn't have happened, and we still don't know how effective the system is. And, feelings aside, you know, whether or not people feel that the system would be somewhat effective is irrelevant. It hasn't been proven. We have no basis—we have no basis for knowing what the effectiveness is.

Mr. SHAYS. Let me—you know, I don't know why I need to say this, but for anyone in my staff to suggest when a hearing ends is more difficult than developing a national missile defense system, and all of you have come before committees before. So I don't know how many Members attend a hearing, and they get the right to ask questions. Mr. Spring, I want to just hear what your comment is.

Mr. SPRING. On the——

Mr. SHAYS. What did you want to say?

Mr. SPRING. I was going to say with regard to the National Missile Defense Act, what was very clear in my judgment from that legislative record is that there are dual goals of deploying the na-

tional missile defense system, or requirement in that case, and the goal of offensive reductions. Those also mentioned in the act are not dependent on each other. In other words, it is not a case that the search for offensive reductions is indeed a requisite for the deployment of a national missile defense system under the act.

Mr. SHAYS. Let me just ask——

Mr. KORB. I disagree respectfully on that, and I think the legislative history will support my position. I didn't comment on some of the things they said. If we're going to keep this hearing going, I think we ought to adjourn for lunch and come back. I thought you told us each to mention one thing we wish we were asked, but I have strong disagreements——

Mr. SHAYS. I'd love to hear them and we'll get out of here at five of—I'll hit the gavel—but I'd like to hear them. The whole purpose of this is to have some issue of where the battle is. And so do you want to—let's hear where you disagree.

Mr. KORB. I am not saying this has to be a perfect system but it has to be better than your average weapons system. In fact many weapons systems never do work. There is a history of weapons systems, even after the lot of money, you not, being able to function properly. And I think we have to recognize that as we go into this debate.

Mr. SHAYS. You have 435 Members of Congress, 100 Senators, and we have been somewhat over the lot on this issue, but I have always believed in my heart of hearts that someday we will want a missile defense system. I didn't want nuclear weapons in space, but I didn't mind that we had sensors there, and I basically have come to believe that we need to have a limited national defense system. I'd just love to know in very short terms whether you, Doctor, would feel we need that or we shouldn't even consider it.

Ms. GRONLUND. I think that it is something the United States should continue R&D on, but I don't think it helps the cause to deploy something that can't do the job.

Mr. SHAYS. Fair enough. But you are willing to say that we should continue to see if we can develop a system?

Ms. GRONLUND. Sure.

Mr. KORB. I think we ought to continue research and development until we have a reasonable prospect that it will do what it's supposed to do. But like any other weapons system, you have to do a cost-effectiveness analysis in terms of what it will cost, what you will get, and what you will give up to get it.

Mr. SHAYS. Dr. Holmes.

Mr. HOLMES. Well, yes, I think it's a strategic requirement. It's the law of the land. I think that the disagreements and problems of the Russians can be worked out. We were very near doing that in the early 1990's in the Bush administration. And I think that from what I have seen from talking to technical experts, that you can have a reasonable assurance that over time you will have an effective system.

Mr. SHAYS. Now, is it true that ABM, some of you have suggested this, prevent us from developing a system—Dr. Gronlund, maybe you would respond—that gives us all the options for developing a system?

Ms. GRONLUND. Well, I'm not quite sure what you mean, but one charge that has been made is that the United States is prevented from developing a sea-based system by the ABM Treaty and that this would be much more effective. In fact, it would have the very same limitations that the land-based system would have. So I don't think the ABM Treaty is standing in the way—I mean, there are problems well before that in terms of developing an effective system.

Mr. SHAYS. Let me just hear Dr. Korb.

Mr. KORB. I agree that at some point the ABM Treaty will prevent you from doing what you want, but I don't think we're there yet.

Mr. SHAYS. But doing what you want in terms of deployment or doing what you want in terms of even developing the maximum and best system?

Mr. KORB. Well, I agree with, what Dr. Gronlund who said that we are not there yet; that in other words, I see no evidence that the program that has been started really since the mid-1980's has ever gotten to the point where you'd have to say, well, gee, if there wasn't an ABM Treaty, then I could start now, today, to go ahead and move to the—into the next step.

Mr. SHAYS. Maybe, Mr. Spring, I should have—you're the one who introduced it, in your concept of liquid fuel versus——

Mr. SPRING. Yes, exactly. My concern more generally—and I'll come back to the sea-based system—is that if what we do is at the outset say that we're going to limit ourselves to R&D, and in fact limit ourselves to only a narrow scope of R&D, you will never be in the position to get to saying at the level of assurance that my colleagues on the panel want to obtain the level of confidence for deployment.

Mr. SHAYS. But let me just specifically—is there any type of testing that we are prevented to be able to do because of the ABM Treaty?

Mr. SPRING. Absolutely, and let me just use a specific example. We cannot, under the administration's policy as it interprets the ABM Treaty and applies it today, test a sea-based ballistic missile for ascent-phase intercept capability against a ballistic missile that flies faster than 5 kilometers per second.

Mr. SHAYS. And that's a significant example. Any others?

Mr. SPRING. The same thing would obtain to range; 3,500 kilometers, against a target ballistic missile with a range in excess of 3,500 kilometers.

Mr. TIERNEY. I want Dr. Gronlund to respond to that.

Ms. GRONLUND. But we're not at the point where that is an issue. We don't have a sea-based system that is capable of intercepting long-range missiles; and if we did, it would have the same technical issues associated with it as the ground-based system. The basing mode is irrelevant if it's a mid-course hit-to-kill interceptor. Where it's launched from is irrelevant to whether it will work and whether it can deal with countermeasures.

Mr. SHAYS. If we could just divide up the next 10 minutes, and then we'll call it quits.

Mr. TIERNEY. Fine. Thanks. I actually have less than that. I think early on when Mr. Allen was making his remarks, he was

pretty salient when he said that if we had a system that actually could work to a high degree of effectiveness that we had confidence in and that wasn't going to end up with less security for this country in terms of our relations with other countries and the effect that it would have overall, that we all should look at trying to implement it. And the fact is we're not anywhere near that yet. We're not anywhere near that in terms of the technical capability of this program. I think the evidence has shown that very clearly today, and I think there's still some larger questions as to how we relate to our former adversaries, now friends hopefully, as well as our allies, in all the other considerations and the further considerations of whether or not this is the best priority for us to be attending to, when in fact there are any number of other dangers, not the least of which are biological weapons and chemical weapons and other ways of delivery that we ought to be considering.

So all of those things said, I think the President's decision was right where it should have been, that it was much too premature to deploy. And I think that the plan of the national missile defense at the current time does not allow for the degree of testing that would warrant us to feel real confident that this is the direction we want to go in.

We should have a plan that has a lot more testing, that would give us a lot more confidence in the effectiveness of this particular system before we move forward. And then it should have a system or a regime where those tests are analyzed by a relatively independent agency, by an absolutely independent agency. And if it is going to be Mr. Coyle's group—and I think he's done a marvelous job on a lot of things that he's done—that people ought to have to listen to him.

The legislation that we have now setting up his branch merely gives him advisory capacity. Although he was right on the money with the status, the current status of our situation and the fact that we shouldn't deploy, the Department of Defense was fully ready to ignore his advice on this particular occasion. I don't think that's a healthy thing for us.

So I think the witnesses today have done us a considerable service, both panels. I want to thank this panel very much for taking your time and extending later into the afternoon than certainly you anticipated, but I think it's been extremely helpful, and want to thank you.

Mr. SHAYS. I did want to ask another question before I said where I come down. So thank you for interrupting. I am not clear as to why I should care what Europe feels about ABM, when this was an agreement negotiated with the Russians, and in my judgment is somewhat outdated. And, Mr. Korb, you can respond to that and I'll throw it out to the others.

Mr. KORB. Well, you've got one practical reason. If you want an effective system and one that's under development, you're going to need consent of Denmark and England to put the—enhance the radars in their country. That's one.

I think, No. 2, you do have a whole set of relationships with Europe that go into lots of areas, not the least of which is the future of NATO. And if in fact you create a situation where there's a

break between the United States and Europe in terms of the way that they approach problems, this will undermine us.

Mr. SHAYS. But they didn't negotiate the ABM Treaty with us.

Mr. KORB. No, I understand, I understand, and I am not arguing that you have to give them a veto. But your question is, should we be concerned? I think you need to be concerned with how they feel because we have a whole web of relationships with them that could be affected.

Now, in the final analysis, I don't think anybody would argue that the United States should let other nations have a veto over its security. Nobody is arguing that. But what you're talking about here is you're not at a stage where you want to force that issue and the consequences, given what's happened with the technology. Even Dr. Kissinger, who supports that in the piece he wrote in the Washington Post, said, you know, before you go ahead with, you know, abrogating the ABM Treaty and causing all these things, you better decide what system you have and, you know, that you're ready to go ahead with it.

Mr. SHAYS. Thank you.

Dr. Gronlund, and then I'll come to you. Dr. Gronlund, comment about that question I asked in regards to paying attention to the Europeans. I think you——

Ms. GRONLUND. Yes, I guess—I think U.S. security is more than just the sum of the weapons systems that we deploy, and in part it relies on our alliance relationship and our relationship to countries that aren't our allies yet; in particular, Russia and China. So what we are trying to do, I hope, is to maximize our security overall, and it may well be that going forward with something that has marginal security benefits in terms of being able to defend against emerging missile states and upsets our allies in Europe and upsets Russia and China would be a net negative. So I think that's a valid question. That really is the big picture that we all should be looking at.

Mr. SHAYS. Dr. Holmes.

Mr. HOLMES. I certainly wouldn't advocate ignoring our allies in Europe, but I think one of the reasons why they are so hesitant—it's not the only reason—but one of reasons why is they sense the administration is not fully committed to the program, and it's therefore sensing that they're not getting any leadership from the United States; say, for example the kind of leadership that you got from Ronald Reagan during the Euromissile crisis when there was also a tremendous debate about the deployment of SS–20 missiles in Europe. That kind of leadership shows the allies will come along when the United States leads. The United States is not leading on this issue. They sense weakness, they sense uncertainty, so therefore they're hesitating and holding back.

The President said last week, when he announced his decision to delay deployment, that no nation has a veto over deployment. If you look at the speech the way that came, he had spoken for almost 6 or 7 minutes about why because of China, because of Russia, because of NATO allies, etc., he was making the decision because of their objections, he was not going to proceed; and then he proceeds to say that no nation has a veto. Is that a theoretical pos-

sibility or is in fact that always going to be the case because of the uncertainty that Russia and China have?

Mr. SHAYS. Thank you. My observation is simply to say that our national missile defense system is, in fact, the law of the land. I'm not convinced, frankly, and I'm happy to have you comment, but I'm not convinced that the administration was an eager participant, and so it leaves me a little uneasy. I would have thought that we would have had an opportunity to force the question with our allies with the ability to move forward with the missile defense detection in Alaska and that we still would have left open tremendous options. But if I were our allies, I wouldn't be convinced that we're supporting this program, even though it is in fact the law of the land. But I recognize that it makes no sense to deploy it until we know, one, it works, and two, that we can actually afford it. Just a last comment from you or anyone else?

Mr. TIERNEY. Just before we leave the impression that—the law of the land is as it was stated a couple of times here—Mr. Korb I think certainly hit on this—the law of the land is that we'll go forward if there's an effective national missile defense system that is technologically feasible and ready to be deployed, and keeping mindful of our relationships with our allies and the nonproliferation regime and things that we've been working on. So that all has to be taken together. I think the administration was fully aware of all of those different factors, and this system clearly wasn't ready to go to deployment when those things were considered and that's why the decision was properly made.

Mr. SHAYS. With that, you get to go to your meeting that was 2 hours ago, and we will adjourn this hearing. Thank you all for participating. This hearing is adjourned.

[Whereupon, at 1:55 p.m., the subcommittee was adjourned.]

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