Countermeasures to the Proposed US National Missile Defense System

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that could deploy a long-range missile very likely render the planned NMD system ineffective, they will also undercut the confidence the United States would be able to gain from its test program.

The United States needs to have confidence in the NMD system to 'preserve US freedom of action' in the world—to permit the United States to intervene with its conventional forces without fear of reprisal on US cities.

An easy way to understand the difference between these two concepts is to consider a coin that was weighted so the odds of heads and tails was not necessarily 50%. What are the odds of getting heads? The odds are not known a priori. The only way to determine the odds is through testing—in this case, through repeated coin flips. The degree of confidence the coin flipper has in the odds is reflected in the degree of confidence the coin flipper has in the value of the constant P in the probability equation

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) with some relatively straightforward changes, but the fundamental deficiency would not be eliminated.

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 National Academy of Sciences, and the Union of Concerned Scientists have all noted, the United States has been taking an unusual, even unique approach to test its NMD system. The planned NMD system will have considerable confidence without flight testing, after sufficient testing using ground facilities and, where appropriate, airplanes.

As we recommend in the Countermeasures Report, the United States should begin by conducting a capability demonstration, which would subject the planned NMD system to a small number of countermeasures to demonstrate the system's capability and help close the questions of confidence. 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) submunitions, which are warheads contained in a missile; (2) decoys, which can be either passive or active; and (3) nuclear warheads.

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 begin by developing a countermeasure demonstration phase in which US military planners and scientists with considerable experience on ballistic missile defense and countermeasures issues, produced a detailed report—Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Proposed United States National Missile Defense System. The first publicly available discussion of countermeasures that might be available to emerging missile states was the September 1999 National Intelligence Estimate on the Ballistic Missile Threat to the United States, which is a component report of the US intelligence agencies. This document noted that such states could use "readily available" technology to develop countermeasures and could do so "by the time they flight test their missiles."

We studied the next step we considered in the test types of countermeasures that would be available and assessed how effective the planned US NMD system would be against such countermeasures. Such a detailed analysis is possible because the United States is now so close to potential deployment that it has selected the specific interceptor and sensor technologies that the NMD system would use.

One of the reasons the NMD system has all of the sensors and interceptors planned for the full system that would be deployed by 2010 or later is this is the system the Pentagon says will be effective against emerging missile states using "complex" countermeasures. We made generous assumptions about the capability of the defense; we assume that the individual components work perfectly, that the planned NMD system has all the sensors and interceptors that will be deployed, and that the missile states will be unable to develop countermeasures. However, if we assume that the missile states can develop countermeasures, the planned NMD system is quite vulnerable.

Sen. Joe Lieberman (D-CT) said that he would not authorize deployment of the national missile defense (NMD) system under development by the United States. However, the issue of NMD will remain on the agenda for the next administration. If the next President does not decide to proceed with deployment of an NMD system, the 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 we accept the US NMD system as NMD is currently on track to be deployed, then the system will have a set of sensors and interceptors that is not yet under development. The structure of this paper reflects the progress of the US NMD program as of November 1998

The planned NMD system will have considerable confidence without flight testing, after sufficient testing using ground facilities and, where appropriate, airplanes. The upper atmosphere, there is no air resistance and lightweight objects travel on the ground as if by heavy object. In the case we consider, we assume the attacker puts its nuclear warhead inside a balloon of alumina碌ned, and releases it along with dozens of empty balloons. Each of the balloons contains a different shape from the others.

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Confidence The issue of "effectiveness" (i.e., how well would the system work?) is different from, but related to, the issue of "confidence" (i.e., with what certainty would US military planners and politicians know how effective the system would be?)

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The Upper Atmosphere

The United States is likely to know very little about the emerging emerging missile state is developing. A potential attacker would understand the importance of not divulging such information. As the Russian Federation emphasized, emerging missile states are increasingly able to conceal sensitive activities. The countermeasures we considered are well suited for testing in ground facilities or from aircraft and would not require flight testing on a missile.