Statement by
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Before the
Senate Armed Services Committee
Thursday, June 29, 2000

Mr. Chairman, Members of the Committee. I am delighted to have the opportunity to testify on the US National Missile Defense program.

Today, I would like to outline for you what we are doing in the program, why we are doing it, and how we are progressing. I also will address the independent assessment that General Welch has just completed. Then I want to amplify my comments on the acquisition approach we are taking and the testing program, and close with some thoughts on the “attacks” the program recently has received.

The impetus behind our program comes from the threat assessment by the Intelligence Community and the bipartisan Rumsfeld Commission. The Director of Central Intelligence testified before Congress earlier this year that, “Over the next 15 years, our cities will face ballistic missile threats from a variety of actors . . . .” He specifically pointed to North Korea’s ability to test its Taepo Dong II missile this year, a missile that “may be capable of delivering a nuclear payload to the United States.” Given this capability, the threat of an attack on the United States territory will become increasingly likely during the next few years, a potential for which we must be prepared.

We expect these initial capabilities to include only relatively simple countermeasures. These emerging capabilities and timelines have been significant factors in how we have gone about developing the NMD system and why we picked the approach that we did.

<u>System Description</u>

Let me begin by explaining why we picked the midcourse phase of a ballistic missile’s trajectory to execute the intercept. There has been a lot of discussion, including by a number of very distinguished persons, about the potential benefits of a boost-phase system or even a terminal-phase one; but most of the focus has been on the boost phase.

Chart 1 helps illustrate some of the points associated with intercept options.

In the boost phase, there are many ways we can approach the problem. We can do it from land, as the Russians have suggested -- in other words, a Russian-based (joint U.S./Russian) boost-phase intercept system -- or we can do it using either a surface or subsurface sea-based system. In both cases, the ship-based interceptors would have to be launched from a point very close to the booster launch point, i.e., in waters where ships are highly vulnerable; the response would have to be very rapid (the timing for this approach is obviously critical). The first signal we would get would be from a satellite indicating a launch; as soon as it recognizes that there had in fact been a launch.

Of course, an immediate intercept response to this signal assumes that we are very clear it is a hostile ICBM launch. We do not necessarily want to be shooting down a satellite launcher or a test shot. Clearly, there are some very important command-and-control issues associated with this system and its development. If the launch is validated as hostile, then we could try to intercept with a high-performance interceptor -- which we do not now have -- to get out quickly and shoot down the missile in its boost phase.

Another alternative is a space-based system. Here there is a choice of either a space-based laser system or a space-based interceptor. Of course, were we to use a kinetic energy interceptor from space, it would have to be an extremely high-performance interceptor to reach the missile in its boost phase, or we would have to accept the reality that the intercept would take place during the missile’s mid-course phase. As to a space-based laser, as you know, we have the Space-Based Laser (SBL) technology under development. The launch of the first integrated flight experiment for this system is scheduled for the 2012 time period. Development and deployment would stretch considerably beyond that.

So besides the obvious point that each of these systems probably would violate the ABM Treaty, we also have rather lengthy development times associated with them. None of these approaches could produce a system in the 2005 time period.

A terminal-phase system would provide defense at the other end of a ballistic missile’s trajectory. This approach has some very distinct advantages in terms of being able to sort out decoys. The effect of the earth's atmosphere on the warhead and penetration aids can significantly assist our discrimination capability.

The disadvantage associated with this approach is that we would have to have a very large number of interceptors at many locations because this is a “point defense” system. Defending all 50 states and major metropolitan areas in them with a terminal system would require an extensive number of deployments -- a very expensive and probably very contentious concept (since many, less populated areas would remain unprotected). Also, because intercepts would take place virtually overhead, there are some obvious disadvantages regarding nuclear, biological, and chemical warhead fallout.

Each phase has its advantages and disadvantages, including the mid-course phase that we selected.

The big advantage of the mid-course, from a defensive point of view, is that we have relatively more time to react than during the other two phases. We have more time to make decisions, to sort the decoy from the warhead, and to ensure human-in-the-loop control. This extra time also allows us the ability to shoot, and then verify the success of that shot, and then shoot again if necessary, a so-called "shoot-look-shoot" capability. Additionally, multiple shots (simultaneously and/or sequentially) at the target give a higher probability of being able to hit it. And if we were unable to discriminate between, for example, a very sophisticated decoy and a warhead, we would shoot them both down. Multiple shots and a shoot-look-shoot capability can provide for a more robust defense. The longer time period of the mid-course phase allows that.

The downside of the mid-course phase, of course, as so many critics remind us, is that it is quite easy to generate decoys in this phase (since it takes place outside the atmosphere). This poses a major discrimination challenge, one with which we are quite familiar. I will come back to this issue.

Importantly, given the progress we already have made in the development of technologies for the planned NMD system, if we are to develop a system in the shortest possible time period against a relatively simple offensive system, a midcourse defensive system is the way to go. This is the approach we have chosen. It is an approach that does not rule out later adding either boost or terminal phase complements to the system, should the threat evolution require it and future technology allow it. If the President decides to deploy, we can have an initial capability by 2005. The remainder of my discussion describes the system we could deploy, pending that decision.

Chart 2 shows the basic system elements of the selected NMD system. It begins with the space-based warning system, the system that picks up the fact that a booster has been launched and provides some initial trajectory information. The Defense Support Program (DSP) satellite system is already in place. The DSP has been there for many years to detect launches, and we are planning to replace this constellation with more capable SBIRS-High satellites. Six planned Space-Based InfraRed System satellites will be inserted into geosynchronous and highly elliptical orbits and will have greater sensitivity and an improved ability to project trajectories.

Once we have the detection, track, and initial impact projection data from the space-based sensors, the information is passed on, through the command and control system, to the Early Warning Radars (EWRs). These are also in place today at a variety of places around the globe. These UHF radars will be upgraded to enhance their current ability to track the targets, providing better information to help us determine where the targets are headed and provide better information for the intercept.

This information is then passed to the X-Band Radars -- high frequency, short wavelength radars -- that can do an excellent job of discrimination. Using these radars, we can begin to sort out the decoys and other objects from the real warhead or warheads. This is the kind of radar planned for deployment on Shemya, an island at the end of the Aleutian Islands (more about this later).

Assuming we knew the missile track and that it was heading toward the United States, we would launch the ground-based interceptors. This interceptor will have two main elements -- the booster and the exoatmospheric kill vehicle. We are now using in our tests a booster that is a surrogate for the final operational booster. The operational booster will be built from a combination of three modified off-the-shelf commercial boosters. We have run into some unexpected technical problems in the modifications, which have had an impact on the schedule, and we are working to resolve these. In the meantime, we will continue to conduct our tests with the surrogate.

Finally, we have the interceptor kill vehicle itself. The EKV is the front end of the National Missile Defense (NMD) Ground Based Interceptor (GBI) missile. It is launched with a three-stage booster. In all integrated flight tests to date, we have used a surrogate booster. Later flight tests will use the operational booster. The booster propels the EKV toward an approximate intercept location so that the EKV can perform terminal maneuvers to impact the target. Once the EKV separates from the booster, it acquires, tracks, and discriminates its target, ultimately maneuvering for a hit-to-kill collision. The EKV weighs about 130 pounds and measures about 51 inches long. It uses a multiple-waveband seeker to acquire, track, and discriminate its target. This seeker consists of infrared and visible light focal plane arrays and a cryogenic cooling system attached to a telescope, supported by processing hardware and software. Onboard guidance and navigation equipment calculates homing maneuvers, and divert propulsion and attitude control system motors make the needed lateral and pointing movements to zero in on a target and destroy it.

Before launch, the EKV receives key information from the Battle Management, Command, Control, and Communications (BMC3) element as to the incoming threat and the predicted position and time of the intercept. The GBI's Command Launch Equipment uses that information to construct a firing solution and launch the interceptor. After launch, the EKV uses an onboard communications system to receive further targeting information from the BMC3 element's In-Flight Interceptor Communications System, or IFICS. This information may include a more precise estimate of the threat's position and speed, as well as additional discrimination data based on radar measurements. The NMD EKV was designed by Raytheon. It has been used in integrated flight tests 2 (sensor fly-by only), 3 (intercept), and 4 (near hit).

The key to ensuring that this entire system works together is the battle management system that integrates all the elements, including the multiple sensors, which enhances the system's overall discrimination capability.

Lastly, I should point out that we will later be adding a new Space-Based InfraRed System in low earth orbit, the so-called SBIRS-Low, to provide even more effective launch detection and discrimination against later, more sophisticated threats.

Chart 3 provides an illustration of how the NMD system works, the concept of operation showing how the pieces of this complex system fit together. It starts with the detection of the launch of the threat missile by the satellite system. This information is transferred to the large early warning radar that helps predict the envelope within which the target is expected to travel. We can then commit the interceptor, based upon the projected trajectory, since this is basically a ballistic trajectory. The X-Band Radar refines that track and does a significant amount of discrimination of decoys from the target reentry vehicle, and passes that information to the interceptor. This radar can also provide data through the battle management system to the interceptor in mid-course for course correction and seeker pointing after the interceptor has been launched. This in-flight communications ability will be included for the first time in our next flight test on July 7th.

Then the kill vehicle itself, on its own, does the final sorting among the decoys and the target, diverts toward the right target, and does a hit-to-kill, direct intercept. The kinetic energy from this high-speed collision (with closing velocities of approximately 15,000 miles per hour) will literally pulverize the target. In relative terms, these reaction timelines for NMD program operators are very short. In some cases, however, the time allotted to us in the mid-course phase of flight could allow us to get off a second shot against the same target, thereby increasing the probability of an intercept.

Program Schedule

Chart 4 addresses the NMD schedule. One of the key aspects of this program is our intent to upgrade and evolve this system over time. This is an important point. It was our original intent, and it continues to be our intent.

We start off with a single-site system with 20 missiles, a single X-Band Radar, multiple EWRs that already are available but will be upgraded, and then the SBIRS-High, which are planned to replace the DSP satellites. This configuration of the system we refer to as the initial "C-1", or Capability 1, system.

As the threat grows in number, the X-Band Radar software can be upgraded and 80 missiles added. We refer to this later system, which we would deploy by 2007, as the "Expanded C-1" system. The SBIRS-Low satellite sensor system would be added later for additional detection and discrimination capability as the threat evolves.

Obviously, with the small size of the system we have here, it is not even remotely a threat to the large quantities of the Russian missile systems. It is clearly intended for the small quantities of missiles that we might expect from the countries of concern.

The important point here is that subsequent enhancements include significant hardware and software upgrades and the addition of a substantial additional discrimination capability. Basic improvements are funded.

Flight Tests

Chart 5 shows the initial system flight tests. There have been four such flights to date. The first two flights were not intended as intercept flights. They were intended to gather data on the EKV's ability to discriminate. There were two such "fly-by" tests, using two different candidate kill vehicles, each built by a different contractor team. This was during a competitive phase, and there were two systems at that time -- a Boeing/TRW system and a Raytheon system. Both candidate vehicles were flown. The first test was called 1-A since, on the originally planned flight (#1), although the target missile was launched and flew, the interceptor was incorrectly programmed and did not fly. So we wasted that target, but later reused the interceptor for flight test 1-A.

Both these flights were successful in that they allowed us to make a fair comparison of their relative capabilities. What is particularly important, though, is that they also gathered an enormous amount of data on targets that are even more sophisticated than the ones the so-called “Expanded-C1” system, the 100-interceptor system we could deploy by 2007, is designed to defeat.

When we went to the intercept phase of our flight test program, starting with the third flight, we simplified the target cluster, because our objectives were very different. We wanted to see if the interceptor could operate through to intercept, and to see if the whole system could work together. Some people have said, "You dumbed it down," and I will address this point later. Let me just say now that that was not what we were doing at all. What we were doing on the first two flights was trying to make flight comparisons and to gather a lot of data for later use. When we started the intercepts on flight #3, we wanted to be able to verify our capability against the expected threat.

On this third flight test, IFT-3, the target complex consisted of the warhead bus, a balloon decoy, and a re-entry vehicle. What was interesting about this particular flight, which resulted in a successful intercept, is that the kill vehicle looked first at the decoy, then assessed it as not being the right object, searched for the real target, found it, diverted toward it, and slammed into it, destroying it. In other words, the test demonstrated a basic discrimination ability and an intercept ability. The test was successful.

IFT-4, the fourth flight-test, integrated more of the NMD system elements. This integration showed the transfer of data from radars to command-and-control, and from command-and-control to the booster launch. Everything went well until we got to the last five and a half seconds of the flight. At that point, the infrared seekers on the missile failed to cool down, the target was not picked up properly, and no intercept occurred. A post-flight analysis indicated the cause of the failure was an obstruction in the cooling system. We have taken corrective actions to address the material handling and flight preparation processes and made adjustments to the hardware to ensure that this problem does not reoccur. This failure did not require a major redesign of the EKV.

While we demonstrated integration of the system, we did not demonstrate final intercept. This we will try again with our July 7th test flight, IFT-5. In this test, we will add the one system link not utilized on IFT-4, namely the in-flight communications system to send guidance and final seeker pointing information on the target to the interceptor while in-flight.

<u>Overall NMD Decision and Deployment Schedule</u>

Chart 6 lays out the schedule. To put the planned tests and the decision process into perspective, let me first go through that internal DoD acquisition decision process and relate it to the flight tests.

There are basically four major acquisition decisions to be made.

The first of these, the so-called “Deployment Readiness Review,” (which Dr. Gansler chairs, and which has all of the senior military and civilian relevant leadership as participants) is scheduled this year. It will assess the technological state of the program and provide a recommendation to the Secretary of Defense. The Secretary will then make a recommendation to the President.

To meet a 2005 Initial Operational Capability, we would have some other critical, early decisions to make: site selection, authorization for site preparation for the Shemya X-Band radar, commencement of design work for that site, and begin construction of the radar site infrastructure. There are a few early long-lead parts that we might want to order at this point. None of this work will be contracted for until a Presidential decision is made to proceed.

The second key point in the acquisition decision process is next year, when, again to make the 2005 schedule, we would have to start the actual building of the radars and associated communications systems at his point we would also want to authorize some selected long-lead parts for the interceptors. These become the second-tier of long-lead time system elements.

The third major acquisition decision is the point at which we would actually commit to buying the interceptors. In terms of the typical program, this is when we say, "We are going to build our weapons." This is a decision that would get made in 2003.

The final decision, the determination that the system is ready, is the easiest one to make. That is the one in which we say, "We have 20 interceptors. This system has been shown to be effective. We’re ready to go." It is the prior three that are the major acquisition decision points in the development process.

So, first, we decide whether to commit to construction of the radar construction site at Shemya (the X- Band Radar). Second, we decide whether to commit to the other radar upgrades and the communication systems and the building of the X-band radar. Third, we decide whether to commit to the actual interceptor builds. Finally, we get to the IOC.

There are a series of flight tests that are planned all the way through this development program. First, we had the two initial fly-bys to characterize seeker performance against multiple objects. Then we tested the ability of the kill vehicle, which resulted in a successful hit. The fourth flight test demonstrated the integration of the system, but did not result in a successful final intercept. Now we have our fifth test coming up July 7th. Together, these tests will give us a measure of the system’s technological feasibility for this summer’s DRR.

We have planned a series of additional flights. Flight test #6 is scheduled for later this year. Flight test #8 is critical because it is the first test of the next-generation interceptor booster, the booster planned for production. This decision would be made by the Defense Acquisition Board (DAB) on what recommendation to provide to the Secretary of Defense at that time.

The third milestone point is when we would make the decision to commit to the interceptors. At this point we want to be using the production interceptor. Functionally, the final production interceptor is the same as for the ones we have used in this early round of flight-testing. But when we move from engineering to production, there are many necessary quality and process changes. So, it is important that the production kill vehicle be the final proven design. And this third milestone is scheduled to determine that. Again, this decision would be made in the DAB as to what to recommend to the Secretary.

Throughout the testing process, not only are we testing equipment that becomes progressively more mature, we are presenting new challenges to the system so that each test increases in complexity and sophistication. They also include increasing the sophistication of decoys and penetration aids to ensure the system can handle the threat we project for that time.

There is also a series of test flights (not shown on this schedule) that are not intercept-flights, but which, nonetheless, are crucial. These involve putting up additional target decoys to check out the radars and much of the rest of the system. These are "risk-reduction" flights. There is a whole series of these flights, and they have been going on and will continue. In one test we had 22 different objects in space to test the radar's discrimination capabilities. These tests improve our ability to discriminate and test out various elements of the system. .

<u>Independent Reviews of the Program</u>

Next, let me highlight the independent reviews of this program that have taken place. Secretary Cohen recently asked retired General Larry Welch and his team of noted scientists and experts from a wide spectrum of viewpoints to conduct a third review of the program--and he will discuss this with the Committee later this morning. I might note that some of these earlier reports were quite critical of the way we were going about the NMD program.

In his earlier reports, General Welch's team highlighted three basic criticisms. One of them, the so-called "rush to failure" criticism, was the judgment that we were being too schedule-driven as opposed to event-driven in the development of the system. In response, we modified the overall program. You may remember that we had a "three-plus-three" program aimed at fielding a system as early as 2003. As a result of that report, we modified our schedule by extending the IOC two years, to provide for possible deployment by 2005 rather than the original 2003. It gave us more time.

Additionally, we made a major philosophical change, namely to be event-driven rather than schedule-driven. Our major milestone decisions are now scheduled to occur after the major events identified on Chart 6. The events are driving the decisions to commit to further action, not the schedule.

The second point made by General Welch's team in their earlier reports was that we were trying too hard to do too much too soon. He recommended that we adopt a more evolutionary approach. We should start out with simpler decoys and evolve the system over time. That is exactly what we are now doing.

And third, in his earlier reports, General Welch believed that we did not have as many tests scheduled as we should have had. We have since added a significant amount of testing and testing resources to lower the risk in the program.

Chart 7 shows the four very important and unanimous findings and recommendations from the independent review team. The first one is that the technical capability is available to develop and field the limited system to meet the defined C-1 threat. This is a relatively limited threat, but the technical capability to meet it is available.

Second, the team finds that the NMD program is still on a high-risk schedule. We agree, and this is something we have been saying for a number of years now. Importantly, the report concludes that there is "no technical reason to change the schedule at present." So we are continuing with the schedule that we have now, based on both his assessment and our own, that we have the ability to meet the 2005 date, if things go according to plan.

Third, General Welch's team said that there are inherent restrictions in our flight testing that will be very limiting for the program. That's true. For example, we don't want objects falling onto fisherman in the South Pacific, so we have range safety limitations. We also have limitations on debris in space, and we have limitations on impact area. Our intent is to try to come up with some ways in which we can overcome these limitations.

The team's last point dealt with discrimination. It concluded that while "design discrimination capabilities are adequate to meet the defined C-1 threat … more advanced decoy suites are likely to escalate the discrimination challenge." Clearly our capability has to evolve with the system and the threat. What was really encouraging about his findings is the fact that he and his team believed we have the inherent capability in our design, should we choose to add the additional sophistication, to be able to handle those sophisticated decoys.

In their most recent report, the Welch team attempts to provide a quantitative illustration of the program's schedule risk. In it, Welch team members highlight the risks associated with the three major decision points mentioned earlier. These are, first, risks associated with the flight that we have coming up, and the decision scheduled in the fall. Then there is the risk regarding the flight with the new booster. Finally, there are the risks associated with the demonstration of the production kill vehicle and the decision on its production release. These are the gating items in the schedule, and these are the events we will use to drive the decision points. General Welch labeled these three major decisions, first, a “feasibility assessment,” second, a “decision to purchase,” and third, a “decision to deploy.”

Why Shemya Construction Site Is The Long-Lead Item

Chart 8 provides a perspective of Shemya Island. It is not a place that one would normally choose for a vacation. It is a very small island, way down at the end of the Aleutian chain. By looking at the size of the airport runway, you can get some idea of the scale.

Shemya is a terrible place in terms of weather. It happens to be a perfect place in terms of geography, because from this vantage point, we can see everything coming up towards the United States from the direction of North Korea. We will need to put a power plant and a radar on the island, and preparing the site for these represents a significant challenge in meeting the schedule for NMD system deployment by 2005. In fact, it is the longest lead item.

Chart 9 gives an idea of average of days per month with wind conditions under 30 miles per hour in Shemya. Shemya’s normal weather conditions are not those under which we would like to land a barge loaded with heavy or sensitive equipment. The wind can reach above 100 miles an hour on some days. There are only a limited number of days throughout the year, and not even many during the more favorable summer months, in which the winds average less than 30 miles an hour. There are even far fewer days with winds less than the 10 miles an hour, needed for some delicate crane operations. So Shemya is not an attractive place in terms of high seas, of bringing in equipment on barges, and of construction. Any building has to be done in the summer, and even then the weather may not be very accommodating.

Chart 10 looks at why, if we are to make the 2005 date, we must start site construction in the summer of 2001. For construction preparations to begin, we need to let a contract, probably in this calendar year. That means we need to get a request for a proposal (RFP) out very shortly, in order to have the contract award and be in a position to begin construction. Contract award for the radar construction, of course, will depend on the President's decision regarding deployment. (In making this decision, the President will consider four criteria: status of the threat, the maturity of the technology, affordability, and overall national security, including arms control.) Let me reiterate: the construction -- digging the ground, pouring the concrete, putting up the base for the radar -- is the long-lead item in deploying this system for the year 2005. Between then and now, of course, we have another 17 integrated flight tests, so there are a lot of parallel actions we must undertake to move this system forward.

Our System Acquisition Approach—And Some Misconceptions

Now let me turn to some other issues, specifically our general acquisition approach, which will shed further light on our programmatic decisions.

Two major stresses on this program have emerged. The first stems from the pace at which the threat has grown, and which in turn has placed a premium on developing such a complex system in a much shorter time frame than might otherwise be the case. The second concerns the technical challenges of mid-course discrimination and hit-to-kill, which we are resolving through modeling, simulation, and both ground and missile testing.

The nearness of the 2005 deadline will not allow business as usual. Certainly the way we must acquire some of our systems in order to meet more rapidly evolving threats is markedly different from the way we did it during most of the Cold War.

The development of the Atlas ICBM in the late 1950s under the leadership of Air Force General Bernie Schriever was accomplished under a similar urgency. He pioneered some of the concurrency in development we use today, an approach that entails risks, yet can yield great payoffs in the long run. The difference between then and now is that some of those acquisition techniques and procedures are now being used for simultaneously acquiring many interrelated systems—essentially, a "system of systems," not just one crash program.

In many respects the Ballistic Missile Defense program, because of its importance, complexity, and unique joint requirements, is paving new ground in the weapons' acquisition world. The standard -- or traditional -- approach to weapon-system acquisition is risk-averse, and does not allow us to develop new concepts and systems rapidly. As you know, we in Defense have not been able to keep pace with rapid developments in the commercial sector. This inadequacy in our approach to acquisition is magnified when the threat drives the urgency for development. Nonetheless, the program, in spite of the schedule urgency, <u>must</u> be event-driven, (not held to calendar dates even if performance has not yet been satisfactorily demonstrated). This is our approach.

The second major stress on the NMD program involves coping with technological complexity. The hit-to-kill approach we are following allows little room for error -- not more than a few inches at very high speeds. There is a premium on accuracy, but that accuracy is meaningless unless the right object is identified correctly (discriminated) and struck. It also puts a premium on our testing program and on our modeling and simulation capability because we cannot do live testing for every eventuality or reality that we might expect to encounter. A single fully integrated intercept flight test, for example, with far-flung equipment ranging across and above the globe, can cost upwards of $100 million and require several months of preparation.

I mentioned earlier that we have been accused of dumbing down our tests and even falsifying results. The charges betray a misunderstanding of the NMD testing program, its objectives and its approach. Any well conceived test program -- and the NMD testing regime has survived a number of exhaustive reviews over the past several years, not just by General Welch -- involves a series of events, each building on the success or failure of prior events. Yet each test, whether it is a ground test or a flight test, is designed to be sufficiently unique in and of itself so as to isolate variables. Too much attempted in a single test event will not allow program managers to identify problems, causes, and solutions. Yet, if there is too little attempted, the testers waste valuable resources and unrecoverable time.

When we progressed from the first two (non-intercept) flight tests, involving 11 objects each, to the next two intercept flights, involving three objects each, we were not making the targets simpler in order to gain a shallow success. We were examining very different and discrete capabilities of the elements being tested. The target information gathered, especially on the first two (non-intercept) tests, is being used to enhance the development of both the hardware and the software of this very complex system. Future intercept tests will build on this data, so that by the time these intercept tests are completed—along with other non-intercept "risk reduction" target flights--we will have a comprehensive picture of the capabilities of the NMD system to cope with the threat projected for that time. Some seem to expect that the first tests will demonstrate the full capability of the mature system, and they criticize us for not immediately testing to the ultimate capability we project.

Real world constraints -- not only range safety limitations I described earlier, but resources as well -- preclude us from doing all the ground- and flight-testing we would like, and this means we must do as much modeling and simulation as we can, both for system elements and the whole integrated system. We also know that what works on the test range may not work in a real-world crisis, and we try to second guess those differences using as broad a range of data and experience as we can.

Is it a perfect system? No, but it beats little or no testing at all, which is the problem generally faced by those states that are being given credit by some of our critics for developing unsophisticated countermeasures that are believed by them to be capable of overcoming our planned system.

The ability of the planned system to "work," i.e., handle the countermeasures threats has been questioned rather extensively in the open press. I do not share the assessment that what we are attempting to accomplish with our system is in any way impossible. Neither did General Welch and his team of experts with access to far more data than the critics. Difficult and challenging, yes. Impossible or infeasible, no. Those who charge that the system cannot be technologically feasible simply do not have all the information they need to make such a conclusion. They are not taking into account the inherent capability of the NMD design to adapt to the evolving threat. I believe the tests planned over the course of the next five years will continue to build our confidence in our ability to discriminate, to identify target warheads in spite of anticipated countermeasures, and to destroy any incoming warheads using advanced hit-to-kill technology.

I would like to close by addressing charges that the NMD tests are "rigged," and that we are "falsifying data" and "lying" about the success of the technology that we need to make the system work. I testify here before you today that I would not tolerate, nor would those above me or below me in the Defense Department tolerate, such activity. Ethical or competency problems in any part of my organization would be detrimental to the Department as a whole, and, more fundamentally, betray the trust the American people have placed in us. Many people have worked diligently on this program and remain dedicated to developing this country's first operational national missile defense system.

The very scrutiny that the NMD program has received, still receives, and will continue to receive, may be its surest and most effective defense against allegations of incompetence and for falsifying data. 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 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.

Chart 11 shows a flow chart to depict the NMD analysis process. Data integrity from NMD Integrated Flight Tests is assured through the use of configuration-controlled data from a variety of independent sources and organizations, which is then assimilated into an Integrated Data Package by an independent contractor outside the influence of the NMD Lead System Integrator. Once developed, all analysts, including the Lead System Integrator, or LSI, use the Integrated Data Package as the benchmark of truth.

The IFT-5 Data Management Plan identifies in excess of 200 data products that are obtained from national test ranges, including Kwajalein Missile Range, Vandenberg Air Force Base, Kauia Test Facility, and the Joint National Test Facility using multiple sensors (optical, infrared, photonic hit indicator, telemetric, and radar). Data is collected by more than twenty-five providers representing multiple agencies, many providing data independently of the NMD contract and test objectives. These raw data products, under configuration control, are delivered to members of a government team who serve as couriers to transport the data to the data manager for subsequent distribution. Data products then are distributed to over 50 organizations for analysis, a procedure that provides a broad range of independent perspectives. At all levels of data collection and processing, data is controlled and archived.

Data analysis is performed by the LSI and by multiple diverse government organizations, for the Operational Test Agencies and the NMD Joint Program Office. Within the LSI, element-level subcontractors and subject matter experts perform critical analysis using different perspectives, tools and resources. Analysis results are presented by various organizations at a series of comprehensive Post-Test Analysis Briefings.

We also must not ignore the fact that many of the discrimination technologies and techniques the system relies on cannot be discussed in an open forum. There are legitimate national security concerns about divulging information on our discrimination capabilities. Some material has been made public, but there is a great deal more that has not been divulged, and properly so. We withhold this information not to "cover up" what we have been doing, but to prevent access to information by potential adversaries concerning the design specifications of our counter-countermeasures systems. Consistent with the national security of this country, we will continue to be forthright and open with respect to this important defense program.

Public opinion in these matters is of utmost importance, which is one of the reasons we must make every effort to correct the record and defend the integrity of the NMD program. Over the coming months and years, I believe program results can speak for themselves in responding to the criticism that the NMD system cannot operate as designed against the projected countermeasure threat that a state of concern might pose. We believe the established testing program will continue to affirm our assessments thus far. In the meantime, it is vitally important to continue the public discussion and try to resolve any legitimate disagreements.

Mr. Chairman, I again thank you and the Committee for this opportunity to discuss our National Missile Defense system, and look forward to your questions.