DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2006

WEDNESDAY, MAY 11, 2005

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Cochran, and Inouye.

DEPARTMENT OF DEFENSE

MISSILE DEFENSE PROGRAM

STATEMENTS OF:

GENERAL JAMES E. CARTWRIGHT, UNITED STATES MARINE CORPS, COMMANDER, UNITED STATES STRATEGIC COMMAND

LIEUTENANT GENERAL HENRY A. OBERING, III, UNITED STATES AIR FORCE, DIRECTOR, MISSILE DEFENSE AGENCY

OPENING STATEMENT OF SENATOR TED STEVENS

Senator STEVENS. The subcommittee is pleased to welcome General James Cartwright, Commander of the United States (U.S.) Strategic Command (STRATCOM), and Lieutenant General Henry Obering, Director of the Missile Defense Agency (MDA). General Obering, this is your first opportunity I believe to testify before us as Director of the Missile Defense Agency. We welcome you. Given your service at MDA and in other roles, your having been a Director for almost 1 year now, we are happy to see you on board and to welcome you to our subcommittee. We thank you both for coming today.

Ballistic missile defense (BMD) is one of the most challenging missions in the Department of Defense. This subcommittee has consistently provided support for missile defense programs. It is fair to say that this administration has been more active in fielding missile defense to meet the current and growing threat than any previous administration. Even as its support for missile defense remains strong, the administration is also contending with the global war on terror. With all the competing priorities, resources are extremely limited and funding for missile defense may have reached its high water mark in fiscal year 2005. However, we must move to ensure that our diminishing missile defense resources are well focused on the right priorities.

General Cartwright, General Obering, we look forward to hearing about the missile defense capabilities and receiving an update on how the overall program is proceeding. We are going to make each of your statements a part of the record.

I am delighted to turn it over now to our vice chairman for his remarks.

STATEMENT OF SENATOR DANIEL K. INOUYE

Senator INOUYE. Mr. Chairman, I am also pleased to join you in welcoming General Obering and General Cartwright.

These are challenging times and very interesting times for missile defense. The program has seen both setbacks and achievements this past year. For example, last September the President was all set to announce the deployment of a missile defense system, but problems persisted in testing the system, and that announcement had to be delayed. More recently, we have seen two tests where the target was launched, but the interceptor never left the silo.

I understand you are currently considering whether to withdraw from the high altitude airship program due to cost and schedule overruns. Nevertheless, we recognize that missile defense is technologically challenging. Despite these setbacks, it is important to note the many successes that have occurred over the past year.

The Aegis ballistic missile defense program had another successful intercept last February. This brings you to five out of six successes for its testing. In addition, one of the Aegis destroyers, equipped with the capability to search and track missiles, is now positioned in the Sea of Japan.

Mr. Chairman, I would like to have the remainder of my statement made part of the record, if I may.

Senator STEVENS. Yes, Senator, it will be.

[The statement follows:]

PREPARED STATEMENT OF SENATOR DANIEL K. INOUYE

Today I am pleased to join our chairman in welcoming to the committee Lieutenant General Obering, Director of the Missile Defense Agency, and General Cartwright, Commander of U.S. Strategic Command.

Gentlemen, you have stepped into your respective positions at a very interesting and challenging time for missile defense. The missile defense program has seen both set backs and achievements this past year.

Last September, the President was set to announce the deployment of a limited national missile defense system. However, problems persist with testing the system, and the announcement has been delayed.

More recently, we have seen two tests where the target was launched successfully, but the interceptor never left the silo because of problems with ground equipment.

I understand you are currently considering whether to withdraw from the high altitude airship program due to cost and schedule overruns.

Finally, the missile defense program was cut back by $1 billion in the fiscal year 2006 budget request as part of the overall pressure to reduce the Defense Department budget.

Nevertheless, we recognize that missile defense is technologically challenging, and despite these setbacks, it is important to note the many successes that also occurred over the past year.

The aegis ballistic missile defense program had another successful intercept test last February, bringing it to five out of six successes in its testing. In addition, one of the aegis destroyer equipped with the capability to search and track missiles is now positioned in the sea of Japan.

The airborne laser program met two successful milestones—the first light of the laser beam and flight of the aircraft. This happened after many skeptics believed the program was headed toward failure.

Finally, eight long-range interceptors are in the ground and checked-out in Fort Greely, Alaska and Vandenberg Air Force Base in California.

The fact of the matter is that ballistic missiles are proliferating. They are a threat to our homeland and to those of our allies and friends around the world. Building an affordable and workable missile defense system is important for our national security for now and for the foreseeable future.

Gentlemen, this committee understands the importance of a strong missile defense. We will continue to support your programs, but we will keep an ever watchful eye on the risks and costs of your missile defense programs.

I look forward to hearing from you both on the fiscal year 2006 budget request and the priorities and challenges of the missile defense program.

Senator STEVENS. I call on the chairman of the full committee, Senator Cochran.

STATEMENT OF SENATOR THAD COCHRAN

Senator COCHRAN. Mr. Chairman, thank you very much. I join you in welcoming our witnesses today at this important hearing. I think it is important for us to remain engaged with those who are involved in developing and deploying comprehensive capability of defending against missile attacks.

We have legislated the authority to deploy a national missile defense system, and Senator Inouye and Senator Stevens and I cosponsored legislation several years ago that was adopted by the Congress and signed by the President calling for the deployment of that capability. I think you have demonstrated that it is feasible, that we do have the capabilities of making this goal come true and become a reality. For all of that, we congratulate you and look forward to your testimony about this and other capabilities you are working on to protect troops in the field and other assets and resources that we have that are a matter of supreme national interest. Thank you for your service.

Senator STEVENS. Thank you very much.

General Cartwright, we would be happy to have your statement.

SUMMARY STATEMENT OF GENERAL CARTWRIGHT

General CARTWRIGHT. Thank you, Mr. Chairman and Senator Inouye. I would like to take just a few minutes and make a few remarks. My presence here is to bring you up to date on some of the operational issues as the system starts to transition to the operational side.

I just want to walk back. In 2004, our goal was to provide a rudimentary system against a limited threat. That threat was defined as two to five missiles coming from North Korea. What we were able to put together at the early part of the year and at the end of 2004 was what I would describe as a thin line system. In other words, we had a command and control system that reached to the critical points. We had sensors that were on a single thread but were end to end, and we had a weapons system that was at that time at one base.

We put that system together. It was available. If there were an emergency, we could use it, but being a thin line system, it really was a system that was not set up to do both operations and research and development (R&D) simultaneously. So we have been

moving back and forth on a scheduled basis between operations and R&D with a focus mainly on R&D in 2005.

Our focus in 2005 was to build the system and start to put some depth and redundancy into the system to bring the assurance levels up and to bring the operational realism and start to train our soldiers to operate the system. Behind me is Lieutenant General Larry Dodgen who is my commander for missile defense. He has the responsibility of training the individuals to operate the system on a day-to-day basis.

In the early part of the year, we asked and worked with Secretary Rumsfeld to set up what we called a shakedown period, which in Navy terms was to take the system and put operators on the system and start to understand the strengths and weaknesses, start to understand the concept of operation that you would employ on a day-to-day basis, things as simple as four people sitting at consoles working the system, what if the display shuts off, what if the coms do not work, starting the build the procedures which also builds in the confidence for the soldier to be able to operate the system. These were critical things to start to understand, get the operators involved.

It also helped us shape and define what operationally realistic meant, what we needed to work with General Obering on, to make sure that the system matched up with the expectations of the soldiers, as we learned to operate the system. That has gone on since the beginning of the year. We have moved back and forth and scheduled activities. I think we are on our ninth iteration where we turn the system over to the operators, let them work on it for an extended period of time. That has given us a lot of insights and a lot of help in defining how we are going to use this system.

Another question that I routinely get is why do we need a defensive system. We are putting this investment in. I go back really to my marine routes on this. If you talk to Captain Cartwright or Private First Class (PFC) Cartwright about having a balanced offensive capability with a balanced defensive capability, I would not send a marine into the streets of Fallujah without armor. It makes a difference in how the enemy treats you and it makes a difference in how you behave in a threat environment. Having a balanced offense and defense in the sophisticated threats that we deal in today, we can have snipers and terrorists on the street who hide among civilians, take their first shot, thinking they are going to get the advantage by getting that first shot off with no regret factor because nobody will shoot back at them and you are worried about ducking. Having a defense makes all the difference in the world in the calculus of the mind of the adversary and the mind of our soldiers, sailors, airmen, and marines.

When we look at the threat that we are facing today, having only a strategy of mutual assured destruction, or offense only, is just not going to be robust enough for the diverse threat that we face today. We have to change the calculus in the mind of the enemy so that that first shot, they do not believe that they are going to escape with that with no regret. Number two, they have got to question whether they are going to be successful or not, and number three, they have got to believe that we will get them if they take that first

shot. It is just absolutely essential. So having a balanced offense and defense in the world we deal in today is absolutely essential.

The shakedown for us has provided our soldiers with the mind set and the confidence to operate the system. 2005, hopefully for us, brings additional weapons, additional sensors so that we have the backups and the redundancies and we are not relying on a single string. It brings a more robust command and control system, and we will start to get to the point where we also bring into the equation, as the administration has laid out, our first priority of defending the Nation, our second priority of defending our forward deployed forces. And with the Aegis systems that Senator Inouye alluded to, we start to get the capability to bring systems to bear that can defend our deployed forces wherever they are in the world. And to me that is essential. We have got to extend that umbrella out and have it available for our deployed forces and then our allies and friends in addition.

PREPARED STATEMENT

So I stand ready for your questions. I hope that gives you a context in which STRATCOM has come into this equation.

[The statement follows:]

PREPARED STATEMENT OF GENERAL JAMES E. CARTWRIGHT

Mr. Chairman and Members of the Subcommittee: This is my first opportunity to appear before you as Commander of the United States Strategic Command. Thank you for the time you've given me to discuss the missions assigned to us as we continue to prosecute the Global War on Terror and take on the challenge of combating weapons of mass destruction.

My prepared remarks cover USSTRATCOM's role in the challenging 21st Century environment and plans for addressing those challenges with capabilities to serve our nation's needs in war and in peace.

THE 21ST CENTURY GLOBAL ENVIRONMENT

Global interdependence—economic, political, and social—combined with near instantaneous global connectivity, is a trademark of the new century. It also heightens the importance of strong links between U.S. strategic objectives and regional operations. U.S. strategic objectives have profound influence on individuals, regions, nations, and non-state actors and networks. The tight linkage between U.S. strategic objectives and the conduct of regional operations is evident in our operations in Afghanistan and Iraq, and more recently in Asia in the aftermath of the tsunami. In Afghanistan, the strategic objective to combat global terrorism guided, as well as constrained, our regional decisions. The regional operations in Iraq are clearly influencing cultural, economic, and security considerations around the globe.

Our adversaries are using asymmetric approaches; exploiting social, political, and economic vulnerabilities to avoid confronting superior U.S. forces head on. We continue to see increases in the speed and deceptive scale of proliferation of potential weapons of mass destruction, including delivery and concealment capabilities. We see adversaries who would use improvised explosive devices (IEDs) and suicide bombs against their own people and infrastructure, as well as against deployed multinational forces. These adversaries have easy access to the same global technology base we do, and can exploit the same communication and information resources as the American public. They have proven they are an intelligent and adaptable enemy.

All operations, while regional in execution, have global consequence and therefore require a global perspective. Regional combatant commanders, who are responsible and accountable for conducting combat and peacekeeping operations in their areas of responsibility (AORs), have long depended upon support provided from outside their AORs. Much of that support, which in the past was provided on an ad hoc basis, has now been codified in the Unified Command Plan as a USSTRATCOM global responsibility. We are positioning USSTRATCOM to advance a distinctly global and strategic perspective on current and emerging capabilities necessary to

deter threats to our way of life, particularly those threats involving weapons of mass destruction. USSTRATCOM will enable combatant commander's regional operations through realization of a comprehensive set of global mission capabilities, soundly integrated to achieve more effective and efficient execution.

We look upon this responsibility as both an exciting challenge and a solemn obligation to the regional combatant commanders, the American men and women who serve in their AORs and to the American people.

GLOBAL ENABLERS

21st Century operations are fundamentally different from those of the last century. Combat operations are being conducted in rapidly changing circumstances, shifting from humanitarian operations to intense firefights within a few hundred yards of each other with little or no warning. This dynamic nature is matched by a varying composition of assisting partners. We must be ready to conduct integrated, distributed operations using global and regional military forces. In many situations, these forces will be augmented by other U.S. Government personnel, coalition and commercial partners, and possibly, non-governmental organizations. To plan and effectively execute these types of distributed, agile and integrated operations, the regional combatant commands increasingly rely on multiple capabilities the global commands must support or provide.

The Unified Command Plan expands USSTRATCOM responsibilities through the assignment of global mission areas that span levels of authority, cross regional boundaries and intersect with various national and international agencies. USSTRATCOM's missions are:

—Global deterrence;
—Global support from space-based operations;
—Global intelligence, surveillance, and reconnaissance;
—Global strike;
—Global information and network operations;
—Global command and control;
—Global integrated missile defense coordination; and
—Globally combating weapons of mass destruction.

Achieving the full potential of these missions is contingent upon identifying the right capabilities mix and sustaining our global reach through space. However, without the context of advanced situational awareness, and the power of collaboration, even the best tools may be insufficient to deter and defeat a determined adversary. We are placing an emphasis on the following global enablers:

The New Triad.—USSTRATCOM supports The New Triad concept; a strategic way ahead in pursuit of a more diverse set of offensive and defensive warfighting capabilities. We are active participants in all three legs of The New Triad: offensive nuclear and non-nuclear strike (including non-kinetic), passive and active defenses, and a defense infrastructure capable of building and sustaining all offensive and defensive elements, including the critical support areas of command and control and intelligence.

Coupled with improved collaboration and shared global awareness, The New Triad concept will enable more precisely tailored global strike operations. With a full spectrum of nuclear, conventional and non-kinetic options available, regional combatant commanders will be enabled to achieve specific local effects against high value targets in the context of the strategic objective.

While we are confident in our ability to support effective global strike operations today, we must continue to evolve that capability to meet the demands of an uncertain tomorrow. For example, I intend to conduct experiments to better understand the value of weapon accuracy within a range of stressing environments. If modeling and testing confirm the value of such capability, this may lead to new thoughts on the balance between nuclear and conventional strike alternatives.

The new responsibilities assigned to USSTRATCOM have required the command to broaden its Cold War focus from deterring nuclear or large-scale conventional aggression to becoming a major contributor to the much broader defense strategy. Nuclear weapons; however, continue to be important, particularly for assuring allies and friends of U.S. security commitments, dissuading arms competition, deterring hostile leaders who are willing to accept great risk and cost, and for holding at risk those targets that cannot be addressed by other means. As steward of the nation's strategic nuclear deterrent, we have two specific areas of focus—rationalizing our nuclear forces, and providing for a relevant nuclear stockpile in the context of The New Triad. At the same time we will continue to evaluate and provide a range of options, both nuclear and non-nuclear, relevant to the threat and military operations.

The New Triad concept presents an opportunity to reduce our reliance on nuclear weapons through the evaluation of alternative weapons, defensive capabilities and associated risk. It is our intent to have the upcoming Quadrennial Defense Review address nuclear issues, and the associated infrastructure, to determine transformation requirements for our nuclear capabilities in the 21st Century. We will look at rationalizing our nuclear forces as an element of the overall force structure and the proper tailoring of nuclear effects as part of the broad spectrum of national power. These assessments will be important to future operational planning as well as future budget plans.

Space.—The importance of the space mission to our national security cannot be overstated. The U.S. economy, our quality of life, and our nation's defense are all linked to our freedom of action in space. For example, satellites are at the heart of routine financial activities such as simple automatic teller machine operations or complicated international currency and stock market transactions. The telecommunication industry is heavily vested in space. Commercial airliners, container ships, trains, trucks, police, fire departments and ambulances have also become highly dependent upon space-based global positioning systems to enhance their ability to safely deliver people, goods and services. The fact is, our dependency on space increases every day—a fact not lost on our adversaries. This growing national dependence on space-based and space-enabled capabilities establishes a true imperative to protect our space assets and our ability to operate freely in, and from, space.

We currently enjoy an asymmetric advantage in space, but our adversaries are gaining on us. Our space support infrastructure is aging and, in some instances, on the verge of becoming obsolete. We will continue to face additional challenges as other nations exploit new technologies and capabilities in attempts to bridge the gap between them and us.

The space environment itself is also rapidly changing. For example, the number of objects in-orbit increases every month, while the size of those objects decreases. This is challenging our space surveillance technology, developed in the latter half of the 20th Century, because it was not designed to detect or track the current magnitude of new, smaller objects, including micro-satellites. This increases the chances of collisions, which threatens our manned spaceflight program; opens the door for unwarned action against U.S. satellites by adversaries; and limits our ability to protect our space assets.

We must do a better job of leveraging the capabilities of our space assets—in DOD, national and commercial systems. We must also maintain the ability to protect our own space assets and capabilities, both actively and passively, while denying our adversaries the military use of space—at the time and place of our choosing.

In order to bring these elements of space control together, our near-term plan is to work with the various space programs to identify potential gaps and make sure existing information and applications are available and provided to authorized users on a global network. This plan will serve as the basis for a concept of operations to exploit information from our space assets, providing space situational awareness to the regional combatant commands.

Distributed Operations.—For distributed, integrated operations, dominant situational awareness is an imperative—globally, regionally, and locally. It must exist across the full breadth and depth of operations, from planning and combat through post-conflict reconstruction, and ultimately, peacetime.

For our forces to effectively employ collaborative capabilities and capitalize upon situational awareness, we must enable them to create pictures of the battlespace tailored to their specific needs—what we refer to as User Defined Operating Pictures. It is USSTRATCOM's job to provide the global capabilities to enhance situational awareness, facilitate collaborative planning, and provide a basic User Defined Operating Picture capability for all of the combatant commands.

Many of the capabilities required for agile, distributed operations will be facilitated by space and enabled by a global information environment with ubiquitous, assured access to information, when and where any combatant commander needs it. To achieve this vision, the old mantra to provide information on a "need to know" basis, must be replaced by a "need to share." Critical information that the warfighter didn't know existed, and the owner of the information didn't know was important, must be made available within a global information environment easily accessible to commanders at all levels.

Interdependent Capabilities.—Our action plan for global command and control focuses on ensuring the all-source information needed for effective operations is available to all theaters. For the global Intelligence, Surveillance, Reconnaissance (ISR) mission, that also means developing integrated and persistent systems capable of supporting precision targeting. USSTRATCOM has the lead for coordinating global

ISR capabilities and will be working closely with the regional combatant commanders, Joint Forces Command and the services to develop the associated strategy.

The Department's net-centric global information services, currently in development, are essential to our global missions. These services will connect global and regional applications and improve both horizontal and vertical information integration.

We are developing a prioritized plan for transitioning away from stove-piped legacy systems to capabilities that support broader information and applications access. Included in this plan are actions focused on leveraging existing legacy applications and data by making them more broadly accessible. Each user will be allowed the flexibility to select from any available data source, anywhere on the network, those objects most useful to them at any particular time. Additionally, any new data source will be available the moment it comes onto the network, rather than requiring a modification to existing systems, as is the case today. USSTRATCOM is an advocate for net-centricity. Our focus is on:

—Capability to enable our "internet-like" environment and access to information;
—Realization of a high-bandwidth, ubiquitous communications backbone to deliver information with high assurance and low latency; and
—Robust information assurance required to defend our networks and our information.

Creating a collaborative structure is more than just designing and disseminating tools—it is also about changing human behavior. Our objective is a global, persistent, 24/7 collaborative environment—comprising people, systems, and tools. Our future structure must support real time command and control at both the global and local levels as well as enable dynamic, adaptive planning and execution in which USSTRATCOM, the regional combatant commanders, and other geographically dispersed commanders can plan and execute operations together. Our collaborative environment must also provide the capability to "connect all the dots"—enemy dots, friendly dots, neutral dots, contextual dots—all the dots that matter—as they appear, rather than wait for a post-event analysis when all of the different data stores can be opened. With improved collaboration and shared awareness, we can more effectively conduct operations using the full spectrum of capabilities to achieve desired, focused effects against high value targets.

In that regard, we are actively assessing the currently available collaborative environment and processes and investigating potential pilot programs to encourage organizational information sharing to build trust in shared information. Fundamental to this issue is the establishment of data tagging standards and associated information assurance policies.

With regard to sharing information, we are in some respects navigating uncharted waters. While the value of sharing information with allies, coalition partners and other Federal departments and agencies is well understood, sharing information with industry or other private sources presents proprietary, intellectual property and privacy concerns which are not well understood. Such information has the potential to be of great value to USSTRATCOM and the regional combatant commanders in accomplishing our missions. We will be attentive to the actions currently being taken throughout the Federal government in response to Executive Order 13356, "Strengthening the Sharing of Terrorism Information To Protect Americans," which may provide us valuable insight and guidance in this sensitive area.

BUILDING AN ASYMMETRIC ADVANTAGE

In addition to our role as steward of the nation's nuclear forces and guardian of global deterrence, USSTRATCOM now has the responsibility for working across regional boundaries to address threats in a global perspective. To achieve the asymmetric advantage we desire requires us to build the interdependent, collaborative, operational environment we've envisioned. It is our responsibility to provide global services and global context to the regional combatant commands and their deployed forces so we are collectively a more effective force—for warfighting, peace and all possible combinations of both.

New Command Structure.—As the latest step in maturing our approach to fulfilling USSTRATCOM's global mission responsibilities we are implementing a new command structure. This structure is critical to the asymmetric advantage we seek, leveraging essential competencies of associated components and key supporting agencies through an distributed, collaborative environment.

Rather than creating additional organizational layers, we are bringing existing commands and agencies under our global mission umbrella through the establishment of Joint Functional Component Commands. These interdependent Joint Functional Component Commands will have responsibility for the day to day planning

and execution of our primary mission areas: space and global strike, intelligence surveillance and reconnaissance, network warfare, integrated missile defense and combating weapons of mass destruction.

USSTRATCOM headquarters retains responsibility for nuclear command and control. Additionally, headquarters will provide strategic level integrated and synchronized planning to ensure full-spectrum mission accomplishment. USSTRATCOM will also advocate for the capabilities necessary to accomplish these missions.

This construct will allow us to leverage key, in-place expertise from across the Department of Defense and make it readily available to all regional combatant commanders. Our vision is for the combatant commanders to view any Joint Functional Component Command as a means by which to access all of the capabilities resident in the USSTRATCOM global mission set. Anytime a Combatant Commander queries one of our component commands, they will establish strategic visibility across our entire structure through our collaborative environment. The fully integrated response USSTRATCOM provides should offer the Combatant Commander greater situational awareness and more options than originally thought available. Specific Joint Functional Component Command responsibilities include:

—*Space and Global Strike.*—The Commander STRATAF (8th Air Force) will serve as the Joint Functional Component Commander for Space and Global Strike. This component will integrate all elements of military power to conduct, plan, and present global strike effects and also direct the deliberate planning and execution of assigned space operation missions. For plans not aligned with a specific mission set, the Joint Functional Component Command for Space and Global Strike is tasked to work in close coordination with USSTRATCOM headquarters as the lead component responsible for the integration and coordination of capabilities provided by all other Joint Functional Component Commands.

—*Intelligence Surveillance and Reconnaissance.*—The Director, Defense Intelligence Agency will be dual-hatted to lead the Intelligence, Surveillance, and Reconnaissance Joint Functional Component Command. This component is responsible for coordinating global intelligence collection to address DOD worldwide operations and national intelligence requirements. It will serve as the epicenter for planning, execution and assessment of the military's global Intelligence, Surveillance, and Reconnaissance operations; a key enabler to achieving global situational awareness.

—*Network Warfare.*—The Director, National Security Agency will also be dual-hatted to lead the Network Warfare Joint Functional Component Command. This component will facilitate cooperative engagement with other national entities in computer network defense and offensive information warfare as part of our global information operations.

Our coordinated approach to information operations involves two other important supporting commands. The Director, Defense Information Systems Agency also heads the Joint Task Force for Global Network Operations. This organization is responsible for operating and defending our worldwide information networks, a function closely aligned with the efforts of the Joint Functional Component Command for Network Warfare. Additionally, the Commander, Joint Information Operations Center coordinates the non-network related pillars of information operations: psychological operations, electronic warfare, operations security and military deception. Both the Joint Task Force for Global Network Operations and the Commander, Joint Information Operations Center will be full members of the USSTRATCOM distributed, collaborative environment.

—*Integrated Missile Defense.*—The Commander, Army Space and Missile Defense Command will head the Integrated Missile Defense Joint Functional Component Command. This component will be responsible for ensuring we meet USSTRATCOM's Unified Command Plan responsibilities for planning, integrating, and coordinating global missile defense operations and support. It will conduct the day-to-day operations of assigned forces; coordinating activities with associated combatant commands, other STRATCOM Joint Functional Components and the efforts of the Missile Defense Agency. The Joint Functional Component Command for Integrated Missile Defense is a key element of the "defenses" leg of The New Triad concept.

—*Combating Weapons of Mass Destruction.*—The Secretary of Defense recently assigned USSTRATCOM responsibility for integrating and synchronizing DOD's efforts for combating weapons of mass destruction. As this initiative is in its very formative stages, we have yet to formalize any specific componency structure. However, we anticipate establishing a formal relationship with the Defense Threat Reduction Agency as an initial starting point.

This new componency structure is in its infancy and will take several months to fully realize. There are detailed issues to work through, including the proper distribution of subject matter expertise and an assessment of expanding relationships with other U.S. Government departments.

A final element of our evolving organizational structure involves developing relationships with the private sector to build upon efforts under the Partnership to Defeat Terrorism. This important partnership with the private sector supports many of our national objectives and crosses into relatively uncharted territory.

—*Partnership to Defeat Terrorism.*—The United States has achieved success in the Global War on Terrorism by attacking terrorist infrastructure, resources and sanctuaries. Nevertheless, our adversaries continue to plan and conduct operations driven by their assessment of our vulnerabilities. The main vulnerability requiring our constant vigilance is the nation's economy, and one need look no further than the economic aftershock attributed to the 9/11 terrorist attacks to affirm this assertion. The risk is accentuated given the global underpinnings of our economic structure. Even a small-scale terrorist attack against a lower tier provider in a distant land can have wide-ranging and pervasive economic implications.

Given the evolving understanding of terrorist's use of global processes, the Partnership to Defeat Terrorism was created to intercede on behalf of combatant commanders, among others, and positively affect outcomes through connections with the private sector. Since November 2001, the Partnership to Defeat Terrorism has successfully combined private sector global processes with other elements of national power to help fight global terrorism as part of USSTRATCOM's global mission responsibilities. This fruitful relationship with the private sector has proven effective on a number of occasions and has garnered the support of influential leaders both within and outside government.

Yet, the Partnership to Defeat Terrorism is somewhat of an ad hoc process based on trusted relationships. As such, the value of the program is directly related to the availability of the participants. USSTRATCOM was recently contacted by a group of people from various non-military sectors, advocating the creation of a working group to formalize this ad hoc program to begin planning a more permanent approach for the long-term.

On a strategic level, the value of such an effort is the open realization that all elements of national power, which have not traditionally operated in a synchronized and coordinated role in National Security, understand the urgent need for their involvement.

Full realization of the benefits inherent in the distributed, interdependent organizational structure described above requires an effective collaborative operation. A true collaborative environment provides us the asymmetric advantage necessary to deter and defeat the agile adversaries we face in the 21st Century environment. In the future, these skills will take on even greater importance as we broaden our partner base within the U.S. government, with coalition partners, commercial partners, academia and others, including non-government organizations.

ACHIEVING THE STRATEGIC IMPERATIVE

Agile, responsive distributed operations, enabled by meaningful information exchange, shared objectives and shared situational awareness, are key to the successful performance of USSTRATCOM's global missions. We have assessed the capability gaps in our global mission areas and have developed action plans, working with our partner commands, to improve our collective ability to carry out operations at all levels.

USSTRATCOM's strategy is focused on:

—Stewardship of the strategic nuclear stockpile;

—Defending against asymmetric approaches used by our adversaries, including weapons of mass destruction;

—Responding effectively in a rapidly changing combat operations environment;

—Achieving prompt, predictable precision operations;

—Coordinating with U.S. and private sector partners in a collaborative environment;

Implementing this strategy relies on new and enhanced capabilities, including:

—Dominant situational awareness,

—A ubiquitous, assured, global information environment,

—Dynamic, persistent, trustworthy collaborative planning,

—User Defined Operating Pictures, using distributed, globally available information, and

—A culture that embraces "need to share" rather than "need to know."

We are not there yet. Working with our partner commands, we have developed plans to improve our global capabilities. We need your continued support to deliver the capabilities needed to combat the threats of the 21st Century. We need your support for:

—Pursuit of high capacity, internet-like capability to extend the Global Information Grid to deployed/mobile users worldwide;

—Adoption of data tagging standards and information assurance policies to increase government-wide trusted information sharing;

—Technology experiments to enhance our understanding of the value of accuracy and stressing environments for current and future weapons.

USSTRATCOM recognizes what has to be done to be a global command in support of the warfighter. We are aggressively moving out on actions to ensure USSTRATCOM fulfills our full set of global responsibilities, supporting our national security needs in peace and in war.

Thank you for your continued support.

Senator STEVENS. Thank you.

General Obering, I was pleased to visit Fort Greely last month and delighted to have you here today.

STATEMENT OF LIEUTENANT GENERAL HENRY A. OBERING, III

General OBERING. Thank you very much. Good morning, Mr. Chairman, Senator Inouye, Senator Cochran. It is a privilege to be here this morning. As you said, we have had many accomplishments and a few disappointments since my predecessor last addressed this subcommittee, but overall the missile defense program remains on track.

Threats from weapons of mass destruction and ballistic missiles continue to present grave security concerns. Now, to deal with these, we are developing and incrementally fielding a joint, integrated, and layered ballistic missile defense system to defend the United States, our deployed forces, our allies, and our friends against all ranges of ballistic missiles. We have put the foundation of this system in place today.

We are requesting $7.8 billion in fiscal year 2006, or roughly $1 billion less than our fiscal year 2005 request. This funding balances continued testing and system improvement with the fielding and sustainment of the long-range ground-based midcourse defense components, our short- to intermediate-range defense involving the Aegis ships with their interceptors, and the supporting radars, command, control, battle management, and communication capabilities.

Now, the successful prototype interceptor test that we conducted in 2001 and 2002 gave us the confidence to proceed with the development and fielding of the system that relies primarily on the hit-to-kill technologies. While our testing has continued to build our confidence in the system, long-range interceptor aborts in our last recent test have been very disappointing. These aborts were due to a minor software problem in the first test and a ground support arm that failed to retract in the second. While these failures do not threaten the basic viability of the system, I have taken strong action to address them, which I have outlined in my written statement.

We remain confident in the system's basic design, its hit-to-kill effectiveness, and its inherent operational capability. Nevertheless, neither you, the American public, nor our enemies will believe in our ground-based Intercontinental Ballistic Missile (ICBM) defense

until we demonstrate its effectiveness by successfully conducting additional operationally realistic flight tests.

In planning our future test program, the Director of Operational Test and Evaluation and I have jointly approved an integrated master test plan effective through 2007. The plan includes combined developmental and operational testing with criteria for operational realism incorporated. Our pace in executing this flight test program for the long-range system will depend, however, on the recommendations of a mission readiness task force which I chartered and those recommendations are due in the coming weeks.

We are on track with our initial fielding of the ground-based and sea-based block 2004 interceptors, sensors, and the command, control, battle management, and communications components. Working closely with our warfighter partners, we have certified missile defense crews and put in place logistic support infrastructure and operational support centers. We have been in a shakedown period, as General Cartwright said, since last October to get us to the point where we could use this developmental system more routinely in an operational mode.

Over the next decade, we will move toward greater sensor and interceptor robustness and mobility while adding a boost-phase defense layer. We will continue development, testing, fielding, and support for the ground-based midcourse defense and the Aegis ballistic missile defense elements. We are also upgrading additional early warning radars and developing two new sensors, a very powerful sea-based X-band radar and a transportable X-band radar for forward basing. The terminal high altitude area defense program will resume flight testing this year and will continue into fiscal year 2006. In 2007, we plan to improve our sensor capabilities and coverage with the deployment of another forward-based X-band radar and the launch of two space tracking and surveillance system test bed satellites.

At the moment, we are preserving decision flexibility with respect to our boost-phase defense programs. The airborne laser has recently enjoyed success, achieving first light and first flight milestones, but many challenges remain and we still need an alternative. The kinetic energy interceptor provides that alternative, and I have restructured that program to focus on the successful demonstration of a high acceleration booster flight in 2008. If successful, it could also provide us an alternative mobile approach for our next generation boosters.

Finally, we have been working closely with a number of our allied and friendly governments to make missile defense a key element of our security relationships. We have signed framework agreements with Japan, the United Kingdom, and Australia, and are pursuing closer collaboration with Russia.

PREPARED STATEMENT

In closing, Mr. Chairman, I want to thank this subcommittee for its continued tremendous support. I also want to thank the thousands of dedicated and talented Americans working on the missile defense program. I believe that we are on the right track to deliver the unprecedented capabilities that we will need to close off a major avenue of vulnerability for this Nation.

Thank you, and I look forward to your questions.
[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL HENRY A. OBERING, III

Good morning, Mr. Chairman, Members of the Committee. It is an honor to be here today to present the Department of Defense's fiscal year 2006 Missile Defense Program and budget. The Missile Defense Agency mission remains one of developing and incrementally fielding a joint, integrated, and multilayered Ballistic Missile Defense system to defend the United States, our deployed forces, and our allies and friends against ballistic missiles of all ranges by engaging them in the boost, midcourse, and terminal phases of flight.

Our program, reflected in the fiscal year 2006 budget submission, is structured to balance the early fielding elements of this system with its continued steady improvement through an evolutionary development and test approach. The budget also balances our capabilities across an evolving threat spectrum that includes rogue nations with increasing ballistic missile expertise.

We are requesting $7.8 billion to support our program of work in fiscal year 2006, which is approximately $1 billion less than the fiscal year 2005 request. About $1.4 billion covers the continued fielding and sustainment of our block increments of long-range ground-based midcourse defense components; our short- to intermediate-range defense involving Aegis ships with their interceptors; as well as all of the supporting radars, command, control, battle management and communication capabilities. About $6.4 billion will be invested in the development foundation for continued testing and evolution of the system.

To provide the context for our budget submission, I would like to review what we have accomplished over the past year. And while I believe the Missile Defense Program is on the right track to deliver multilayered, integrated capabilities to counter current and emerging ballistic missile threats, I am planning to make some program adjustments in light of our two recent flight test failures.

I also will explain the rationale behind our testing and fielding activities and address the next steps in our evolutionary ballistic missile defense program.

THE EVOLVING SECURITY ENVIRONMENT

The threat we face from proliferating and evolving ballistic missile systems and associated technologies and expertise continues unabated. There were nearly 100 foreign ballistic missile launches around the world in 2004. This is nearly double the number conducted in 2003 and slightly greater than the number of launches in 2002. More than 60 launches last year involved short-range ballistic missiles, over ten involved medium-range missiles, and nearly twenty involved land- and sea-based long-range ballistic missiles.

Operations Desert Storm (1991) and Iraqi Freedom (2003) demonstrated that missile defenses must be integrated into our regional military responses if we are to provide adequate protection of coalition forces, friendly population centers, and military assets. We must expect that troops deployed to regional hotspots will continue to encounter increasingly sophisticated ballistic missile threats.

Nuclear-capable North Korea and nuclear-emergent Iran have shown serious interest in longer-range missiles. They underscore the severity of the proliferation problem. Our current and near-term missile defense fielding activities are a direct response to these dangers. There are also other ballistic missile threats to the homeland that we must address in the years ahead, including the possibility of an offshore launch.

We have had recent experience with tragic hostage situations involving individuals, and we have witnessed how the enemy has attempted to use hostages to coerce or blackmail us. Imagine now an entire city held hostage by a state or a terrorist organization. This is a grim prospect, and we must make every effort to prevent it from occurring. Any missile carrying a nuclear or biological payload could inflict catastrophic damage. I believe the ability to protect against threats of coercion and actively defend our forces, friends and allies, and homeland against ballistic missiles will play an increasingly critical role in our national security strategy.

Missile Defense Approach—Layered Defense

We believe that highly integrated layered defenses will improve the chances of engaging and destroying a ballistic missile and its payload. This approach to missile defense also makes deployment of countermeasures much more difficult. If the adversary has a successful countermeasure deployment or tactic in the boost phase, for example, he may play right into the defense we have set up in midcourse. Layered defenses provide defense in depth and create an environment intended to frus-

trate an attacker. The elements of this system play to one another's strengths while covering one another's weaknesses.

With the initial fielding last year of the Ground-based Midcourse Defense and Aegis surveillance and track capabilities of this integrated system, we are establishing a limited defensive capability for the United States against a long-range North Korean missile threat. At the same time, we are building up our inventory of mobile interceptors to protect coalition forces, allies and friends against shorter-range threats. With the cooperation of our allies and friends, we plan to evolve this defensive capability to improve defenses against all ranges of threats in all phases of flight and expand it over time with additional interceptors, sensors, and defensive layers.

Since we cannot be certain which specific ballistic missile threats we will face in the future, or from where those threats will originate, our long-term strategy is to strengthen and maximize the flexibility of our missile defense capabilities. As we proceed with this program into the next decade, we will move towards a missile defense force structure that features greater sensor and interceptor mobility. In line with our multilayer approach, we will expand terminal defense protection and place increasing emphasis on boost phase defenses, which today are still early in development.

Initial Fielding of Block 2004

Since my predecessor last appeared before this committee, we have made tremendous progress and have had a number of accomplishments. We also came up short of our expectations in a few areas.

We stated last year that, by the end of 2004, we would begin fielding the initial elements of our integrated ballistic missile defense system. We have met nearly all of our objectives. We have installed six ground-based interceptors in silos at Fort Greely, Alaska and two at Vandenberg Air Force Base in California. We completed the upgrade of the Cobra Dane radar in Alaska and the modification of seven Aegis ships for long-range surveillance and tracking support. These elements have been fully connected to the fire control system and are supported by an extensive command, control, battle management and communications infrastructure. In addition, we have put in place the required logistics support infrastructure and support centers.

Since October 2004, we have been in a "shakedown" or check-out period similar to that used as part of the commissioning of a U.S. Navy ship before it enters the operational fleet. We work closely with U.S. Strategic Command and the Combatant Commanders to certify missile defense crews at all echelons to ensure that they can operate the ballistic missile defense system if called upon to do so. We have exercised the command, fire control, battle management and communication capabilities critical to the operation of the system. The Aegis ships have been periodically put on station in the Sea of Japan to provide long-range surveillance and tracking data to our battle management system. We have fully integrated the Cobra Dane radar into the system, and it is ready for operational use even as it continues to play an active role in our test program by providing data on targets of opportunity. Finally, we have executed a series of exercises with the system that involves temporarily putting the system in a launch-ready state. This has enabled us to learn a great deal about the system's operability. It also allows us to demonstrate our ability to transition from development to operational support and back. This is very important since we will continue to improve the capabilities of the system over time, even as we remain ready to take advantage of its inherent defensive capability should the need arise.

Completing Block 2004

Today we remain basically on track with interceptor fielding for the Test Bed. We have recovered from the 2003 propellant accident, which last year affected the long-range ground-based interceptors as well as the Aegis Standard Missile-3 (SM–3) and Terminal High Altitude Area Defense, or THAAD, booster production. We should have ten more interceptors emplaced in Alaska by December of this year. In October, we received the first Standard Missile-3 for deployment aboard an Aegis ship. To date, we have five of these interceptors with a total of eight scheduled to be delivered by the end of the year. By then, we will also have outfitted two Aegis cruisers with this engagement capability. So, in addition to providing surveillance and tracking support to the integrated ballistic missile defense system, Aegis will soon provide a flexible sea-mobile capability to defeat short- to medium-range ballistic missiles in their midcourse phase.

Our sensor program is also on track. The Beale radar in California is receiving final software upgrades this spring and will be fully integrated into the system. We

are now testing a transportable X-band radar, which can be forward-deployed this year to enhance our surveillance and tracking capabilities. Our most powerful sensor capability, the Sea-Based X-band Radar (SBX) will be traversing the Atlantic and Pacific Oceans this year, on its way to Adak, Alaska, where it will be ported. This radar is so capable that, if it were sitting in Chesapeake Bay, it could detect a baseball-sized object in space over San Francisco. This sea-mobile midcourse radar will allow us to increase the complexity of our tests by enabling different intercept geometries. And when we deploy it in the Pacific Ocean, it also will have an inherent operational capability against threats from Asia. Finally, the RAF Fylingdales early warning radar in the United Kingdom will be fully integrated for missile defense purposes by early 2006 and will provide the initial sensor coverage needed against Middle East threats.

BMD elements will remain part of the system Test Bed even after we field them for initial capability. However, the Missile Defense Agency does not operate the BMD system. Our job is to provide a militarily useful capability to the warfighter. Because the BMD system is integrated and involves different Services, the MDA will continue to manage system configuration to ensure adequate integration of new components and elements and the continued smooth operation of the system.

For these reasons, Congress mandated the Agency to maintain configuration control over PAC–3 and the Medium Extended Air Defense System (MEADS) following their transfer to the Army. Regarding the transition of the system elements, we use several models. Each transition, to include time and method of transfer, will be unique. In some cases, it may not be appropriate to transfer a BMD system element to a Service. The Sea-Based X-band Radar, for example, will likely remain a Missile Defense Agency Test Bed asset and be made available for operational use as appropriate. In other words, the Services and the Missile Defense Agency will have shared responsibilities and will continue to work with the Secretary of Defense, the Services, and the Component Commanders to arrange appropriate element transfer on a case by case basis.

Building Confidence through Spiral Testing

The development and fielding of Block 2004 was initiated based on the confidence we built in our test program between 2000 and 2002. We successfully conducted four out of five intercept tests using prototypes of the ground-based interceptors we have in place today against long-range ballistic missile targets. In addition, in 2002 and 2003, we successfully conducted three intercept tests against shorter-range targets using an earlier version of the sea-based Aegis SM–3 interceptors we are deploying today. These tests demonstrated the basic viability and effectiveness of a system that relies primarily on hit-to-kill technologies to defeat in-flight missiles. In fact, we had learned as much as we could with the prototypes and decided it was time to restructure the program to accelerate the testing of the initial operational configurations of the system elements.

In 2003 and 2004, we had three successful flight tests of the operational long-range booster now emplaced in the silos in Alaska and California. The booster performed exactly as predicted by our models and simulations. In addition, between 2002 and 2004, we successfully executed 58 flight tests, 67 ground tests, simulations, and exercises, all of which have continued to bolster our confidence in the basic ballistic missile defense capabilities. In the past year, however, we had several concerns with quality control and, as a result, executed only two long-range flight tests since last spring.

The interceptor launch aborts in Integrated Flight Test (IFT)–13C last December and IFT–14 this past February were disappointments, but they were not, by any measure, serious setbacks. The anomaly that occurred in IFT–13C, in fact, is a very rare occurrence. As the interceptor prepares to launch, its on-board computer does a health and status check of various components. In that built-in test, interceptor operations were automatically terminated because an overly stringent parameter measuring the communications rate between the flight computer and its guidance components was not met. The launch control system actually worked as it was designed when it shut the interceptor down. A simple software update to relax that parameter corrected the problem. The fix was verified during subsequent ground tests and the next launch attempt. We did enjoy some success in the test. We successfully tracked the target and fed that information into the fire control system, a process that allowed us to successfully build a weapons task plan that we then loaded and, which was accepted, into the interceptor's computer.

In February we used the same interceptor to attempt another flight test. Again, the target successfully launched. The interceptor successfully powered up and worked through built-in test procedures and was fully prepared to launch. Again, the system successfully tracked the target and fed the information to the fire control

system, which generated a weapons task plan accepted by the interceptor's computer. This time, however, a piece of ground support equipment did not properly clear, and the launch control system did not issue a launch enable command.

Mr. Chairman, I can assure you that while these test aborts were major disappointments, they were not major technical setbacks. We maintain our confidence in the system's basic design, its hit-to-kill effectiveness, and its inherent operational capability. Because of our recent test launch aborts, I chartered an independent team to review our test processes, procedures and management. They reported their findings to me last month. They indicated that we had successfully demonstrated the hit-to-kill technology and achieved a major national accomplishment in fielding initial defensive capabilities. The team described the rapid development and initial deployment of the system as comparable to other major military efforts, such as the initial deployment of the Minuteman and Polaris ballistic missiles.

With the basic functionality demonstrated, the independent review team believed that we should now enter a "Performance and Reliability Verification Phase," in which mission assurance becomes the number one objective. They noted that our system reliability is based on multiple intercept attempts per engagement, whereas our system testing focuses on the performance of a single interceptor. They also observed that our flight testing has a strategic significance well beyond that normally associated with military systems' development.

The team recommended specific improvements in five areas. First, increase rigor in the flight test certification process, to include the addition of a concurrent and accountable independent assessment of test readiness. Second, strengthen system engineering by tightening contractor configuration management, enforcing process and workmanship standards, and ensuring proper specification flow down. Third, add ground test units and expand ground qualification testing. Fourth, hold prime contractor functional organizations (such as engineering, quality and mission assurance experts) accountable for supporting the program. And finally, ensure program executability by stabilizing baselines and establishing event-driven schedules.

I also named the current Aegis BMD program director, Rear Admiral Kate Paige, as the Agency's Director of Mission Readiness with full authority to implement the corrections needed to ensure return to a successful flight test program. We have pursued a comprehensive and integrated approach to missile defense testing under the current program and are gradually making our tests more complex. Prior to the establishment of the Mission Readiness Task Force, we had planned a very aggressive test program for the next two years. That test plan involved flying the ground-based interceptor to gain confidence in our corrections and conducting two more long-range interceptor tests this calendar year. These flight tests included: an engagement sequence using an operationally configured Aegis ship to provide tracking information to a long-range interceptor and an engagement sequence using an interceptor launched from an operational site, Vandenberg; tracking information provided by an operational radar at Beale; and a target launched out of the Kodiak Launch Complex in Alaska. We also planned to fly targets across the face of the Cobra Dane radar in the Aleutians and Beale in California. However, all follow-on GMD flight tests are on hold pending the implementation of the Independent Review Team recommendations and a return to flight recommendation by the Mission Readiness Task Force.

Missile defense testing has evolved, and will continue to evolve, based on results. We are not in a traditional development, test, and production mode where we test a system, then produce hundreds of units without further testing. We will always be testing and improving this system, using a spiral testing approach that cycles results into our spiral development activities. That is the very nature of spiral development. This approach also means fielding test assets in operational configurations. This dramatically reduces time from development to operations, which is critical in a mission area where this nation has been defenseless. Nevertheless, neither you, the American public nor our enemies will believe in our ground-based ICBM defense until we demonstrate its effectiveness by successfully conducting additional operationally realistic flight tests.

In fiscal year 2006, we are adding new test objectives and using more complex scenarios. Also, war fighter participation will grow. We plan to execute four flight tests using the long-range interceptor under a variety of flight conditions and, for the first time, use tracking data from the sea-based X-band radar.

In terms of our sea-based midcourse defense element, this past February, we successfully used a U.S. Navy Aegis cruiser to engage a short-range target ballistic missile. This test marked the first use of an operationally configured Aegis SM–3 interceptor. In the last three Aegis ballistic missile defense intercept flight tests, we incrementally ratcheted up the degree of realism and reduced testing limitations to the point where we did not notify the operational ship's crew of the target launch

time and they were forced to react to a dynamic situation. This year, we will conduct two more tests using Aegis as the primary engagement platform. In fiscal year 2006, Aegis ballistic missile defense will use upgraded software and an advanced version of the SM–3 interceptor to engage a variety of short- and medium-range targets, including targets with separating warheads. We also plan to work with Japan to test the engagement performance of the SM–3 nosecone developed in the United States/Japan Cooperative Research project.

Four Missile Defense Integration Exercises involving warfighter personnel will test hardware and software in the integrated system configuration to demonstrate system interoperability. War games also are an integral part of concept of operations development and validation. Four integrated missile defense wargames in fiscal year 2006 will collect data to support characterization, verification, and assessment of the ballistic missile defense system with respect to operator-in-the-loop planning and the exchange of information in the system required for successful development and system operation.

In addition to having laid out a very ambitious test plan, we are working hand-in-hand with the warfighter community and the independent testing community. We have more than one hundred people from the test community embedded in our program activities, and they are active in all phases of test planning, execution, and post-test analysis. We meet with them at the senior level on a weekly basis, and they help us develop and approve our test plans. All data from testing is available to all parties through a Joint Analysis Team and are used to conduct independent assessments of the system.

The Missile Defense Agency and Director, Operational Test & Evaluation have completed and jointly approved an Integrated Master Test Plan, effective through 2007. The plan includes tests that combine developmental and operational testing to reduce costs and increase testing efficiency. Within our range safety constraints, we are committed to increasing the operational aspects as I stated earlier. This accumulated knowledge helps inform the assessment of operational readiness.

Building the Next Increment—Block 2006

In building the Ballistic Missile Defense program of work within the top line budget reductions I mentioned earlier, we followed several guiding principles. To keep ahead of the rogue nation threats, we recognized the need to continue holding to our fielding commitments to the President for Blocks 2004 and 2006, including investment in the necessary logistics support. We also knew that we must prepare for asymmetric (e.g., the threat from off-shore launches) and emerging threat possibilities as well in our fielding and development plans.

In executing our program we are following a strategy to retain alternative development paths until capability is proven—a knowledge-based funding approach. This is a key concept in how we are executing our development program. We have structured the program to make decisions as to what we will and will not fund based upon the proven success of each program element. The approach involves tradeoffs to address sufficiency of defensive layers—boost, midcourse, terminal; diversity of basing modes—land, sea, air and space; and considerations of technical, schedule and cost performance.

The funding request for fiscal year 2006 will develop and field the next increment of missile defense capability to improve protection of the United States from the Middle East, expand coverage to allies and friends, improve our capability against short-range threats, and increase the resistance of the integrated system to countermeasures. We are beginning to lay in more mobile, flexible interceptors and associated sensors to meet threats posed from unanticipated launch locations, including threats launched off our coasts.

For midcourse capability against the long-range threat, the Ground-based Midcourse Defense (GMD) element budget request is about $2.3 billion for fiscal year 2006 to cover continued development, ground and flight testing, fielding and support. This request includes up to ten additional ground-based interceptors, their silos and associated support equipment and facilities as well as the long-lead items for the next increment. It also continues the upgrade of the Thule radar station in Greenland.

To address the short- to intermediate-range threat, we are requesting approximately $1.9 billion to continue development and testing of our sea-based midcourse capability, or Aegis BMD, and our land-based THAAD element. We will continue purchases of the SM–3 interceptor and the upgrading of Aegis ships to perform the BMD mission. By the end of 2007 we should have taken delivery of up to 28 SM–3 interceptors for use on three Aegis cruisers and eight Aegis destroyers. This engagement capability will improve our ability to defend our deployed troops and our

friends and allies. Six additional destroyers, for a total of 17 Aegis ships, will be capable of performing the surveillance and track mission.

THAAD flight testing begins this year with controlled flight tests as well as radar and seeker characterization tests and will continue into fiscal year 2006, when we will conduct the first high endo-atmospheric intercept test. We are working toward fielding the first THAAD unit in the 2008–2009 timeframe with a second unit available in 2011.

We will continue to roll out sensors that we will net together to detect and track threat targets and improve discrimination of the target suite in different phases of flight. In 2007, we will deploy a second forward-based X-band radar. We are working towards a 2007 launch of two Space Tracking and Surveillance System (STSS) test bed satellites. These test bed satellites will demonstrate closing the fire control loop and the value of STSS tracking data. We are requesting approximately $521 million in fiscal year 2006 to execute this STSS and BMDS Radar work.

All of these system elements must be built on a solid command, control, battle management and communications foundation that spans thousands of miles, multiple time zones, hundreds of kilometers in space and several Combatant Commands. This foundation allows us to mix and match sensors, weapons and command centers to dramatically expand our detection and engagement capabilities over that achieved by the system's elements operating individually. In fact, without this foundation we cannot execute our basic mission. That is why the Command, Control, Battle Management and Communications program is so vital to the success of our integrated capability.

Building a single integrated system of layered defenses has forced us to transition our thinking to become more system-centric. We established the Missile Defense National Team to solve the demanding technical problems involved in this unprecedented undertaking. No single contractor or government office has all the expertise needed to design and engineer an integrated and properly configured BMD system. The National Team brings together the best, most experienced people from the military and civilian government work forces, industry, and the federal laboratories to work aggressively and collaboratively on one of the nation's top priorities. However, integrating the existing elements of the Ballistic Missile Defense System proved to be very challenging. Today, we have streamlined the team's activities and realigned their priorities to focus on providing the detailed systems engineering needed for a truly integrated capability. The team has now gained traction and is leading the way to building the system this nation will need for the future.

Moving Toward the Future—Block 2008 and Beyond

There is no silver bullet in missile defense, and strategic uncertainty could surprise us tomorrow with a more capable adversary. So it is important to continue our aggressive parallel paths approach as we build this integrated, multilayered defensive system. There are several important development efforts funded in this budget.

We are preserving decision flexibility with respect to our boost phase programs until we understand what engagement capabilities they can offer. We have requested approximately $680 million for these activities in fiscal year 2006.

In fiscal year 2006 we are beginning the integration of the high-power laser component of the Airborne Laser (ABL) into the first ABL weapon system test bed and will initiate ground-testing. Following that we will integrate the high-power laser into the aircraft and conduct a campaign of flight tests, including lethal shoot-down of a series of targets. We still have many technical challenges with the Airborne Laser, but with the recent achievements of first light and first flight of the aircraft with its beam control/fire control system, I am pleased with where we are today. We have proven again that we can generate the power and photons necessary to have an effective directed energy capability. An operational Airborne Laser could provide a valuable boost phase defense capability against missiles of all ranges. The revolutionary potential of this technology is so significant, that it is worth both the investment and our patience.

We undertook the Kinetic Energy Interceptor boost-phase effort in response to a 2002 Defense Science Board Summer Study recommendation to develop a terrestrial-based boost phase interceptor as an alternative to the high-risk Airborne Laser development effort. We will not know for two or three years, however, whether either of these programs will be technically viable. With the recent successes we have had with ABL, we are now able to fine-tune our boost-phase development work to better align it with our longer-term missile defense strategy of building a layered defense capability that has greater flexibility and mobility.

We have established the Airborne Laser as the primary boost phase defense element. We are reducing our fiscal year 2006 funding request for the KEI effort and

have restructured that activity, building in a one-year delay, in order to focus near-term efforts on demonstrating key capabilities and reduce development risks. We restructured the Kinetic Energy Interceptor activity as risk mitigation for the Airborne Laser and focused it on development of a land-based mobile, high-acceleration booster. It has always been our view that the KEI booster, which is envisioned as a flexible and high-performance booster capable of defending large areas, could be used as part of an affordable, competitive next-generation replacement for our midcourse or even terminal interceptors. Decisions on sea-based capability and international participation in this effort have been deferred until the basic KEI technologies have been demonstrated. The restructured Kinetic Energy Interceptor activity will emphasize critical technology demonstrations and development of a mobile, flexible, land-based ascent and midcourse engagement capability around 2011, with a potential sea-based capability by 2013. A successful KEI mobile missile defense capability also could improve protection of our allies and friends.

We are requesting $82 million in fiscal year 2006 to continue development of the Multiple Kill Vehicle (MKV). MKV is a generational upgrade to ground-based midcourse interceptors to increase their effectiveness in the presence of countermeasures. We look forward to the first intercept attempt using MKV sometime in 2008.

Our flexible management structure allows us to adjust development activities based on demonstrated test results, improve decision cycle times, and make the most prudent use of the taxpayer's money. Using a knowledge-based funding approach in our decision making, we will conduct periodic continuation reviews of major development activities against cost, schedule, and performance expectations. We have flexibility in our funding to support key knowledge-based decision paths, which means that we can reward successful demonstrations with reinvestment and redirect funds away from efforts that have not met our expectations. We have assigned a series of milestones to each of the major program activities. The milestones will provide one measure for decision-making and help determine whether a program stays on its course or is accelerated, slowed, or terminated. This approach gives us options within our trade space and helps us determine where we should place our resources, based on demonstrated progress. The alternative is to terminate important development activities without sufficient technical data to make smart decisions. We believe that this approach also acts as a disincentive to our contractors and program offices to over-promise on what they can deliver.

International Participation

Interest in missile defense among foreign governments and industry has continued to rise. We have been working closely with a number of allies to forge international partnerships that will make missile defense a key element of our security relationships around the world.

The Government of Japan is proceeding with the acquisition of a multilayered BMD system, basing its initial capability on upgrades of its Aegis destroyers and acquisition of the Aegis SM–3 missile. We have worked closely with Japan since 1999 to design and develop advanced components for the SM–3 missile. This project will culminate in flight tests in 2005 and 2006. In addition, Japan and other allied nations are upgrading their Patriot fire units with PAC–3 missiles and improved ground support equipment. This past December we signed a BMD framework Memorandum of Understanding (MOU) with Japan to expand our cooperative missile defense activities.

We have signed three agreements over the past two years with the United Kingdom, a BMD framework MOU and two annexes. In addition to the Fylingdales radar development and integration activities this year, we also agreed to continue cooperation in technical areas of mutual interest.

This past summer we signed a BMD framework MOU with our Australian partners. This agreement will expand cooperative development work on sensors and build on our long-standing defense relationship with Australia. We also are negotiating a Research, Development, Test and Evaluation annex to the MOU to enable collaborative work on specific projects, including: high frequency over-the-horizon radar, track fusion and filtering, distributed aperture radar experiments, and modeling and simulation.

We have worked through negotiations with Denmark and the Greenland Home Rule Government to upgrade the radar at Thule, which will play an important role in the system by giving us an early track on hostile missiles. We also have been in sensor discussions with several allies located in or near regions where the threat of ballistic missile use is high.

Our North Atlantic Treaty Organization (NATO) partners have initiated a feasibility study for protection of NATO territory and population against ballistic missile

attacks, which builds upon ongoing work to define and develop a NATO capability for protection of deployed forces.

We are continuing work with Israel to implement the Arrow System Improvement Program and enhance its missile defense capability to defeat the longer-range ballistic missile threats emerging in the Middle East. We also have established a capability in the United States to co-produce components of the Arrow interceptor missile, which will help Israel meet its defense requirements more quickly and maintain the U.S. industrial work share.

We are intent on continuing U.S.-Russian collaboration and are now working on the development of software that will be used to support the ongoing U.S.-Russian Theater Missile Defense exercise program. A proposal for target missiles and radar cooperation is being discussed within the U.S.-Russian Federation Missile Defense Working Group.

We have other international interoperability and technical cooperation projects underway as well and are working to establish formal agreements with other governments.

CLOSING

Mr. Chairman, I want to thank this committee for its continued support of the Missile Defense Program. As we work through the challenges in the coming months, we will conduct several important tests and assessments of the system's progress. We will continue our close collaboration with the independent testers and the warfighters to ensure that the capabilities we field are effective, reliable, and militarily useful. There certainly are risks involved in the development and fielding activities. However, I believe we have adequately structured the program to manage and reduce those risks using a knowledge-based approach that requires each program element to prove that it is worthy of being fielded.

I believe we are on the right track to deliver multilayered, integrated capabilities to counter current and emerging ballistic missile threats. For the first time in its history, the United States today has a limited capability to defend our people against long-range ballistic missile attack. I believe that future generations will find these years to be the turning point in our effort to field an unprecedented and decisive military capability, one that closes off a major avenue of threat to our country.

Thank you and I look forward to your questions.

Senator STEVENS. Well, thank you very much.

General Cartwright, the defense budget is coming down, and I remember the time I made and I think Senator Inouye made the trip up there too. We made several trips to Alaska to accompany those who were making the scientific assessment of where these ground-based interceptors should be located. It may appear to some people that that decision was made because of my chairmanship. I do not think so. I was with the scientists when they said this is the place. As a matter of fact, they went to a place I would not have gone. It was at Fort Greely, which had already been closed. That community had been through a trauma of one base closure. It did not want to see a buildup and then a let down again. But I do believe that the decision has been made and we agreed with it.

NEAR-TERM PRIORITIES

I think we now find ourselves in the position, however, with the budget coming down. I have to ask, are we clearly focused on near-term priorities? It seems to me as you would want to balance the budget under these circumstances, that we probably should be looking more to the near-term deployment priorities. General Obering, I would assume that would be the Navy's Aegis system and the ground-based midcourse system. Would you comment on that first, General Cartwright, and then General Obering. Should we try to maintain that balance, let all of these programs go forward, but with emphasis on the near-term priorities?

General CARTWRIGHT. Senator, I think you categorized it correctly in that the lay down of the system was done based on the science involved in intercepting the logical threat zones coming toward the United States, but also with a mind toward the future of a global system and putting it in the right place to make sure that we could advantage ourselves for the entire United States and to the extent of the ground-based system, that we could protect our deployed forces and allies, that it was in its best position. We have evolved it that way, setting priorities to cover the largest area as quickly as possible.

In the balance between the fixed system that defends the United States in principal and the system that we have started to field and work on that deals with our deployed forces, those mobile capabilities like Aegis, we have adjusted the balance. We have looked at that balance and we are certainly trying to make sure that our investment pattern addresses both the defense of the United States and the defense of our forward-deployed forces in a way that makes sense and can match the technologies available to build those systems.

NEAR-TERM PRIORITIES—TECHNOLOGY

I will turn it over to General Obering to talk to the technology side of it.

General OBERING. Yes, sir. Senator, you are correct. I was not there at the time, but I do know that there were many factors that went into the decision to locate the interceptors at Fort Greely, not the least of which was soil composition and the makeup there and how it supported the silo construction, and also its ability to reach and to protect the United States from that type of great circle approach.

Your question about priorities. Sir, we are clearly focused on continuing to field the ground-based midcourse interceptors, and we have that in our budget to continue to do that and to continue to get those missiles into the ground there. We are also focused on, as you said, the Aegis with its mobile capability, not against an ICBM but against the shorter-range missiles, and its flexibility that it brings in the mobility.

While we are continuing to focus on that, we cannot give up the future, though. We have to continue that balance between near term and the longer term because building those defenses do take time and building these capabilities. So a lot of the decisions that we are making today will have consequences 5, 6, 10 years out that we have to pay attention to because the evolving threat environment, as we proceed in the future, and the uncertainty of that forced us to have to be able to do that. So we are trying desperately to reach that balance between the near-term priorities and the longer-term priorities that are involved in our development program.

Senator STEVENS. General Cartwright, your comment about the defense and offense I think is the most lucid explanation of why we have to have a ground-based system in terms of being able to do our utmost to catch that first one and to teach the person that launched it a very serious lesson. That is something that I think misses most people.

We in Alaska have looked at this as being there to deal with places like North Korea where they are so unpredictable that no one knows what they will do. They really do not have the massive capability of a Soviet Union, but they have got the capability, we believe, to launch a missile or missiles at us with warheads that would be very dangerous to our survival.

BALANCED FUNDING—AEGIS, LASER, GLOBAL MISSILE DEFENSE (GMD)

Now, are you satisfied with the way this funding is set forth in this budget in terms of balance? I am trying to get back again to the balance between the Aegis system, the laser system, and the ground-based system. Has this been worked out to your satisfaction?

General CARTWRIGHT. Senator, I think it has. The good news here is that in the shakedown, we have been given a voice in that discussion so that the warfighter is at the table and has an opportunity to make a contribution about that balance. Clearly that balance is very important to us. I believe that we are on the right path, that we are testing to the right criteria to keep it operationally realistic, allowing the testing to influence our decisions on what we buy and at what pace, and keeping the warfighter in mind, and working the balance between all of those three is critical. Like I say, the good news here is for STRATCOM we are at the table, we are a part of that dialogue, we are allowed to make input, and now we are getting to a point where that input has got the judgment of people sitting at the console working the system on a day-to-day basis and making contribution.

INFRASTRUCTURE CUTS

Senator STEVENS. Well, General Obering, I am informed that in the preparation of this program, there were $80 million from the GMD program allocated to another portion of the system. Where did that go?

General OBERING. Sir, if you are referring to part of our infrastructure cuts, potentially is what you may be referring to. If I could for a second, I could put this in context.

As you heard in my opening remarks, we had a $1 billion reduction overall in our program between 2005 and 2006. Even given that, the ground-based midcourse defense is $300 million more in 2006 than in the President's budget 2005 request for 2006 in the balance, and it is almost $3 billion across the future years defense program (FYDP) for the ground-based midcourse defense than it was in the 2005 President's budget.

Part of that budget reduction, though, was to try to get more efficient. General Kadish, my predecessor, did a great job in laying the technical foundation for the integration of these programs so that we can begin to integrate Aegis and the ground-based midcourse and terminal high altitude area defense (THAAD) and others. What we have not addressed, though, was the programmatic integration across the board such that we could begin to combine some of our overhead, if you want to call it that, our infrastructure, and getting more efficient in how we manage the programs. We had set a target of about $300 million a year, beginning in 2006, to try to reduce our overhead by those amounts.

The ground-based midcourse portion of that is around $60 million to $80 million, in that region. Again, that is a better than fair share in terms of its portion of our budget overall. But we have taken that across the board, and we certainly hit much of our headquarters staff the hardest in this regard.

GLOBAL MISSILE DEFENSE SHORTFALL

Senator STEVENS. I am indebted to Ms. Ashworth for her research into this. But she tells me that there was a $431 million shortfall in the President's 2006 budget as far as the ground missile defense system. So with the cooperation of the chairman, we added $50 million to that supplemental that just passed to try and catch up on that. I am sure you are familiar with that. Is that shortfall still a realistic number?

General OBERING. Yes. I think if you are referring to the cost variance at the end of the current contract, yes, sir. It has actually been estimated between roughly that and as much as $600 million or more. That is the total cost variance at the completion of the contract which is at the end of 2007, which represents less than a 5 percent variance in the overall, which is about a $12 billion contract value. We have paid down about $400 million of that, and so your help there has been tremendous in that regard.

Senator STEVENS. Thank you very much.

Mr. Chairman, do you have a time problem?

Senator COCHRAN. No.

Senator STEVENS. Senator Inouye.

AEGIS PROGRAM AND FUNDING CUT

Senator INOUYE. Mr. Chairman, if I may follow up. The Aegis ballistic missile defense program has been very successful, five out of six intercepts, but as a result of the fiscal year 2006 reduction of $1 billion, about $95 million will be cut out of this test program and it might have an impact upon whether we have the signal processor, which I have been advised that it would be at least a year. Why are we setting aside such a successful program where the outcome is almost predictable and spending it on other riskier programs?

General OBERING. Yes, sir. First of all, the program has been very successful in the testing that we have done to date. Now, one of the things we have not done yet is fly against a separating target, and that is something that we do need to do because that represents the lion's share of the threats that we may be facing around the world.

The reason that we have not done that is because, if you recall, the one failure that we did have in the test program had to do with the divert attitude control system malfunction as we got into the higher pulses that we would need for a separating warhead. We have not completely fixed that yet in the program. We are still going through the ground testing for a new design to validate that we do have a fix. We think we have identified the root cause of that and we are taking steps to address that, but that is why we do not have a more robust profile either in the testing or in our production profile because we have not jumped all those technical hurdles yet, but we are in the process of doing that.

The reductions that were taken in Aegis—the program director, Admiral Paige, saw some ways that she could combine some of the testing that we are doing with our Japan cooperative program, also combine some of our software deliveries into more efficient drops, and we were able to achieve those savings as part of that overall reduction.

But it is a very successful program. We still have some things that we need to address there, though, before we can go full bore in that program.

AEGIS SIGNAL PROCESSOR

Senator INOUYE. Would it improve the program if you got your signal processor?

General OBERING. Yes, sir, it would. It would allow us, again, to be able to address more complex threats, and it is very definitely a benefit to the Aegis program. There are other steps we can take by combining other sensors to achieve the same effect, but it certainly helps the Aegis program tremendously.

Senator INOUYE. Then it would have some merit for the committee to look into that matter.

General OBERING. Sir, we would always enjoy your support. Yes, sir.

Senator INOUYE. I would appreciate it if you could give us an unclassified version of a memo on the signal processor and the capabilities of it and how it would improve your Aegis program.

General OBERING. Yes, sir.

SPACE-BASED MISSILE DEFENSE TEST BED

Senator INOUYE. The other question I have is on the space-based missile defense test bed beginning in 2008. Now, we have been told that this has a potentially large price tag, technological challenges, and tons of people objecting to it. I suppose we are going to spend a lot of money and it might require setting aside some of the less riskier programs to carry out the space program. Why move forward on another controversial, costly, and technologically riskier program when your other programs have not reached fruition yet?

General OBERING. Well, sir, what you are seeing reflected in our program is a very small effort, actually an experimentation program, a test bed that we start, relatively speaking, overall very small in the budget. The reason for that is, as I mentioned earlier, we are trying to deal with the world as it may exist in 10 years. In order to be able to address that, we believe that there are some prudent experimentation steps that we should take because, to be very honest with you, sir, in spite of what a lot of people will articulate, I am not at all certain that we have tackled all the technical issues associated with space-basing of interceptors. There are some questions that I think we need to answer in terms of the on-orbit storage, so to speak, of interceptors. There is a number of issues with respect to command and control, with being able to sense the rising targets and being able to distinguish those. There are a lot of technical challenges that we need to address. I think that while it is important to have the debate on the philosophical advantage and strategy of having space-based interceptors, it

would be prudent to lay in a technical experimentation program to see if we could even do that.

BATTLE MANAGEMENT COMMAND AND CONTROL

Senator INOUYE. General Cartwright, we have been advised that at each stage of the missile defense mission, you will have combatant commanders in charge of identification, track, discrimination, and defending against incoming missiles. How are you going to coordinate all of this, especially when the time window is not that big?

General CARTWRIGHT. That is one of the key challenges in the system when you try to field a global system for which the decision windows to decide whether or not you have a threat coming at the United States or at our forces. Where did that threat come from, where is it going to, what should I use or what should the system use to engage it are all decisions that have to be made in a very timely fashion and really brings to the forefront the technical challenge of a global system.

The way we have set it up today is that Strategic Command provides to the regional commanders the capability. So for Northern Command and Pacific Command right now, we are providing them with all of the command and control capabilities necessary to analyze the threat when it is detected, align the sensors so that they can determine where that threat is going, characterize that threat, and then align the weapons and use the weapons if appropriate. In the case of Pacific Command, that capability resides in Hawaii at the commander's headquarters there. In the case of Northern Command, that capability resides in Colorado Springs with the headquarters there. We have built that system. This year sees the system being installed in Hawaii. In the first year, in 2004, we had the system installed at Northern Command and at STRATCOM with situation awareness systems deployed here in Washington to the Joint Staff and to the National Command Authority.

That is what we are working through in the shakedown period, understanding the concept of operations and how we will deal with a threat that we are watching nine time zones away and trying to manage both the sensors, the command and control, and the weapons. What we have seen to date is that it is in fact working, but we cross several lines of authority between, say, Pacific Command and Northern Command and STRATCOM, and in the time zones and where the sensors are located versus where the weapons are located, et cetera. It is a complex system. Like I said, in the shakedown, we have gotten to a point now where the soldiers are getting good confidence that the system, in fact, can perform, that the commanders can get sufficient information to make credible decisions about threats that may be presented in the system.

EXECUTIVE DECISIONMAKING COMMAND AND CONTROL

Senator INOUYE. In this decisionmaking process, I presume the President and the Secretary of Defense are involved?

General CARTWRIGHT. Yes, sir. But as you can imagine, this is a stressing scenario because the timelines associated with those decisions for the stressing threats, which really are the threats to

Alaska and Hawaii, the timelines are much shorter than if you are traveling a greater distance, say, to the continental United States.

Senator INOUYE. What would be the decision window for launching an interceptor at an incoming ballistic missile, if you can give it to us in open session? What is the time?

General CARTWRIGHT. I think we can do this in open session. The system is designed so that we can have a characterization of the threat in the first 3 to 4 minutes and that we have a decision window, depending on where the threat missile is moving, probably in the next 3 to 5 minutes in the short scenarios like Hawaii and Alaska and expands out as you go further. But you are eating up decision time. And so we are working through with the Secretary, with General Obering a set of tabletop exercises to walk us through and understand where the regret factors are, if you do not make a decision on time, when does that happen, when are the key windows and the vulnerabilities in the decision window that would allow us to commit a weapon against a threat in a timely fashion and have a secondary opportunity if at all possible.

As we work those through, then we are also working through is it phone calls that we make, do we use the command and control system and the displays to inform that National Command Authority, how are we going to bring them together? As you can imagine, getting the President, the Secretary, the regional combatant commander into a conversation and a conference in a 3-to 4-minute timeframe is going to be challenging. So what are the rules that we lay down? That is what the shakedown has been about. We are working very hard with the Secretary to lay down those rules and understand the risks associated with those very quick and timely decisions that are going to have to be made, particularly for Alaska and Hawaii when we deal with the North Korean threat.

Senator INOUYE. In the Alaska and Hawaii situation, your decision window for life and death decisions would be less than 7 minutes?

General CARTWRIGHT. It would be right in that area, right about 7 minutes.

Senator INOUYE. Thank you, sir.

Senator STEVENS. Senator Cochran.

Senator COCHRAN. Mr. Chairman, thank you.

GROUND-BASED SYSTEM TESTING PROGRAM

The testing program for the ground-based system has had some recent difficulties after a series of successful intercepts have proven the capabilities are there in the system. What are your plans for future tests? Do you have the resources in this budget request that will enable you to carry those out?

General OBERING. Yes, sir. I will take that. The aborts that we had in our last two tests were caused—in the December timeframe, we had a software timing issue. As we got in and discovered the root cause, we determined that, first of all, it was a rare occurrence, and we have actually flown with that condition three times before with the booster. And it was correctable with a fix to one line of software code and one parameter in that software code.

The failure that we had to launch in February was due to a ground support arm that failed to retract. We now know what the

root cause of that was. We actually had done some work in the bottom of the silo to modify that because that silo was configured for a "BV" configuration booster, an earlier configuration that is no longer in the program, and the workmanship allowed some leakage and some moisture to gather in the bottom of the silo which caused corrosion around the shims in that arm on the hinge and basically bound up the hinge to be able to move away. And then we had the wrong size crush block. It kind of dampens the retraction of the arm so it does not bounce into the interceptor when it is launching. That was the wrong size and the wrong stiffness. So we had workmanship issues, we had quality control issues that we had to go back and address.

INDEPENDENT REVIEW TEAM AND TESTING

I got very angry about that because those are basic blocking and tackling that you have to do as part of any development program. That is why I chartered the independent review team that gave me their findings several weeks ago, and this mission readiness task force that is taking those recommendations along with their Aegis expertise from that program and putting that into a road back, a way ahead to a successful test program.

Some of the recommendations coming out of the independent team is that we need to do more ground qualification testing as part of our overall flight test program. We need to have a more rigorous flight certification, kind of a concurrent but independent assessment of our readiness to fly. And we are factoring that all into our test program.

The basic content of our tests will not change in terms of what we are planning to do over the next 2 years in terms of getting more realistic testing. We are going to launch targets out of Kodiak, Alaska like we did the last two tests, very successfully, by the way. Tremendous help and team support up there. It actually demonstrated that we could take the target information and inject that into our operational fire control system and get the interceptor to accept that, the flight computer and be ready to launch.

But we are going to do that in the next several years. We are going to take an operationally configured interceptor and fly it out of Vandenberg, which is an operational site. We are going to fly it across the face of the Beale radar, which is an operational radar with operational crews. So we are going to get more and more realism in our test profile.

Certainly the resources that we have—we believe that what we have programmed will allow us to do that, but that still depends somewhat on the recommendations that I will be getting from this mission readiness task force in the next several weeks.

General CARTWRIGHT. Could I just chime in just for one second?

Senator COCHRAN. Sure.

General CARTWRIGHT. Particularly on this last part that we talked about here of actually using the interceptors, launching them from operational sites, using operational crews, using operational sensors. These are the things that we on the STRATCOM side of the equation really wanted to see brought into the test program, and in 2005 and forward, General Obering has made a great effort to be able to bring that in because we think that is impor-

tant. It gives the soldier confidence that the system will work. It gives us confidence that the netting together of the system works. To me that is critical on the operational side. So I just want to kind of get that in and chime in on that, the support for that. To me that is very important.

OPERATIONAL AND TECHNICAL READINESS

Senator COCHRAN. Is the testing program far enough down the track now for you to be willing to use the interceptors that are in the ground in case of a crisis in trying to defeat a missile attack against the United States?

General OBERING. Sir, I will speak technically to that and General Cartwright can speak from an operational perspective. I believe the answer to that is yes. I believe that we have enough confidence that we will have a pretty good chance of that succeeding.

Now, I would like to fly the kill vehicle in its operational configuration. We have not done that. We flew prototypes of the kill vehicle in our successful intercepts in the past. About 67 percent the same hardware, 60 percent the same software, as we flew in our previous test, but we did a redesign for manufacturability and for more robustness in that kill vehicle. We have not flown that configuration, which I would like to do, and that is part of our coming test program to get into the air and get the data that we need from that testing to give you a full confidence answer.

General CARTWRIGHT. And I would chime in that from an operational standpoint for the system that we have today, one, we are confident that the crews are trained and can use the system and that the command and control system will, in fact, work for us; two, that the sensors and the weapons are netted in such a fashion that they will, in fact, provide us a great opportunity to intercept any kind of incoming threat. As it gets more redundancy, the system becomes more resilient, we understand better how to employ it, we will get better, but in an emergency, we are in fact in a position. We are confident that we can operate the system and employ it.

INTERNATIONAL COOPERATION

Senator COCHRAN. One of the things that occurs to me is that we are going to be depending on other nations to cooperate and support our efforts to have a successful, comprehensive, layered missile defense capability, radar sites in the United Kingdom, and elsewhere. Even cooperation in the development of the Arrow program is also contributing to our own improved knowledge and expertise in this area.

Are you pleased with the cooperation, generally speaking, internationally that we are receiving, or do we have problems that need to be addressed in diplomatic ways or any ways that we can provide funding in this budget cycle that would be helpful to you?

General OBERING. Sir, I will take the programmatic aspects of that. As I mentioned, we have signed agreements with Japan, with the United Kingdom, and with Australia now on broad memorandums of understanding to cover joint cooperative research and development, as well as procurement and cooperation.

To give you an example of the level of cooperation and interest, we co-host a conference every year, a multinational conference. Last year it was in Germany. We had over 850 delegates from more than 20 countries attend that conference. We were able to conduct bilateral discussions with many of the nations there, looking at what they are interested in and what they bring to the table. So I do see a rising tide of interest in missile defense. And I see concrete actions like the Japanese have taken and the investments that they have made in their budget for missile defense because they view the threat, I believe, similar to the way that we do, and the cooperation that we have received in the United Kingdom with the placement and the upgrade of the Flyingdales radar that is placed in that nation. So I think it is a very bright outlook, sir.

AIRBORNE LASER PROGRAM

Senator COCHRAN. Mr. Chairman, I have just one more question I will ask and then others, if it is okay, I will just submit for the record.

The airborne laser program is one that has potential for use as part of a comprehensive and layered program of missile defense. What is your impression so far? Do you have enough knowledge from tests that have been undertaken to lead you to a conclusion about the utility and the potential success of an airborne laser (ABL) program?

General OBERING. Well, sir, we achieved two major milestones in that program over this last year. The first light in the laser was extremely significant because we had a lot of critics in the past believe that that could never be done, which is the simultaneous ignition of those laser modules to get the power that we need to make this a very viable weapons system. We achieved that. We were able to achieve first flight of the heavily modified, in fact, the most heavily modified 747 in history.

We are continuing with the lasing test today as we speak, and we are continuing with the flight test where we begin to unstow the ball in the front of the aircraft. That should be coming in the next several weeks. So we are gaining confidence. We have tackled all of the major technical questions with respect to the operation of the system.

But there is still a long way to go between that and saying that we would have a viable operational capability. That is where we are today. As we go beyond these first major steps, tear down the laser, reassemble it on the aircraft, and then fly the joint weapons system, as I said, in the 2007–2008 timeframe, that is when we will have the real confidence to move forward. We are setting up a series of decision milestones then that we can provide to the Department, to the administration based on knowledge-based results from those tests.

Senator COCHRAN. Thank you, Mr. Chairman.

Senator STEVENS. Thank you, Mr. Chairman. Glad to have you here.

OPERATOR EDUCATION REQUIREMENTS

Pardon my cold here a little bit, General.

I had a briefing at one place we will not talk about, but sitting was this young operator. He demonstrated how he would shift from one incoming missile to another one. I said, you know, that is pretty fast. He says, it is nothing like Nintendo, Senator. I want to ask a little bit about the educational requirements now. Are you running into problems with regard to educational requirements for the people who will man the system?

General CARTWRIGHT. I can ask General Dodgen back here who has the lead in the training side of this, but as I have, like you, gone out and sat and talked with these young soldiers as they work the consoles, it is not like Nintendo, but their minds tend to pick up the displays and all of the information and process it in ways that leaves me in awe, to tell you the truth. They are very good at it. They grew up understanding how to look at a screen and take in large amounts of information and process it and consistently come out with the right answers.

When we started into the training program, as you always do, whether it is an aircraft or a radar site, what do you display that cognitively will get the right information when you go into sensor overload in your brain, when people have a sense of urgency, when people are yelling in the back of the room? What gets into your head and do you make the right decisions? Part of our shakedown has been taking each operator up to a point of stress where they are at overload and then seeing what decisions do they make, what information do they actually use in those times of stress, and is it presented to them in a way that they will retain it. We are pretty confident that we have got the displays about right and the cognitive reaction to those displays, that they make the right decisions time and time again. We have multiple people on those consoles to ensure that we are making those decisions right.

But my sense is we have, in fact, got a good cadre of people, that the training regimen is replicatable and can be exported to a broader group of people. As you know, we are using Guard and Reserve people to do this, soldiers, and they are doing a great job with it. My sense is we do have the right people, the right skills, and that they can retain them and we can teach them on a sustaining basis.

Senator STEVENS. Going on from that, Senator Inouye and I were in the Persian Gulf War the night a young man on Joint Surveillance and Target Attack Radar Systems (J–STARS), which was deployed during the test phase, as a matter of fact, noticed that the headlights were going the wrong way. They were going north not south. It was his immediate perception of that that changed the course of that war.

AIRBORNE LASER APPLICATIONS

This is now getting to the point where this airborne laser system comes into play here too. Do you believe that that has applications beyond missile defense?

General CARTWRIGHT. Sir, as we understand both what the art of the possible would be in an energy-based system that moves at the speed of light and the range at which we could apply it, we are starting to look at the feasibility of other applications for that kind of technology, whether it be airborne, ground-based, mobile. We are looking at a wide variety of opportunities that could be presented

by having that kind of technology and starting to explore them. But we are still very early in the R&D phase. So these are feasibility studies. These are things that we are using, say, our universities, our military universities, to start to think about, how could you use this kind of a weapon in more than just the missile defense role.

Senator STEVENS. My last question. Many people have said to me the real problem here is how to hit a bullet with a bullet from 1,000 miles away. Does the airborne laser change that equation?

General CARTWRIGHT. My sense is it gives you more decision time because the weapon actually moves at the speed of light. So the first chance to strike the bullet, so to speak, to the last chance, you have more opportunity, more decision time, more chance for a second shot if the first one did not make it. We are trying to understand how precise do we have to be with this type of weapon. How much makes a difference? Is it millimeters? Is it bigger than that? We do not have those answers yet. But at the end of the day, the hope is that, one, you have more opportunities, larger decision time, more opportunities to make the right decision, and if you miss, for whatever reason, a malfunction or an aiming problem or something else, the opportunity to have subsequent shots is increased.

Senator STEVENS. Is it possible to separate that beam as it goes out so there is more than one opportunity to strike the incoming missile?

General OBERING. Sir, the aircraft has the ability to hit more than one missile. I cannot go into much more detail than that, but it does have the ability to do so.

Senator STEVENS. Well, you are in a very exciting area. As an old silo jockey, I envy you. Thank you very much.

Senator Inouye.

TERMINAL HIGH ALTITUDE AREA DEFENSE TESTING

Senator INOUYE. Testing for THAAD has been continually slipping. Can you tell us in this hearing what the causes are and what your new schedule is going to be?

General OBERING. Yes, sir, I can. As you may recall, in August 2003, there was series of explosions at a motor supplier in California, in San Jose. It was the Chemical Systems Division of Pratt and Whitney. Now, unfortunately, that supplier handled all of THAAD's motors, and in the recovery from that, requalifying another supplier and moving out of that facility had an impact on the program and began to delay its return to flight test.

Also, the THAAD program, as I think you may be aware of, Senator, was plagued with quality control problems in its past in the 1999–2000 timeframe and the redesign that it went through, which I think is going to be very successful, and the manufacturability improvements that have been made have taken time. It is the reason it has not been back in flight.

It is now finished with almost all of its ground qualification testing. The flight test missile is in assembly as we speak in Troy, Alabama and will be shipped out for flight testing. We anticipate that to be by the end of June to return to flight, and then we look forward to an intercept attempt, after a series of guided flights. By the end of this calendar is what our plan is.

I believe that what I have seen—in fact, to be very frank with you, after I saw the quality control problems that we experienced on the ground-based midcourse system, I sent an audit team out to the contractor facilities for that program. I also sent an audit team to take a look at the THAAD program before flight to see if we had any problems, and I got a pretty glowing report coming back from there. So I am confident that we will be able to meet our objectives with that program, but as you said, the primary cause of that slippage was the recovery from that unfortunate explosion.

Senator INOUYE. So you think you are on track now.

General OBERING. I think so, yes, sir.

MISSILE DEFENSE AGENCY $1 BILLION CUT AND PROGRAMS AFFECTED

Senator INOUYE. Now, the Missile Defense Agency has been told to take out $1 billion. What programs do you believe will be impacted the most, if you can tell us?

General OBERING. Sir, we tried to, as I said, in the past balance this across our portfolio in terms of how much risk we were taking in the development programs and how much we were able to meet our fielding and our support commitments that we have made. The kinetic energy interceptor (KEI) program is where we have taken the largest amount of risk with this. That was in part due to two reasons.

One is because the inception of that program was as an alternative to the airborne laser, a risk reduction program for the airborne laser. That was at the recommendation of the Defense Science Board in 2002. We had laid in a fairly robust acquisition program for the kinetic energy interceptor. That included land-based and sea-based aspects to that. I felt that we were getting out in front of our headlights a little bit too much, so to speak, much like we had done on airborne laser. We did the same thing. We were spending money 2 years ago on airborne laser, worrying a lot about the operational support of that program before we had ever even generated first light out of the laser. We felt like that that had to be refocused, and that is what General Kadish and I did last year and we were successful in doing that.

We did much the same thing on KEI. What is going to make this program work is a very high acceleration booster, much, much, much faster in acceleration than the ground-based interceptor that we have today or Aegis or any of the others. So they had to demonstrate to me the ability to do that before we make them a full-blown acquisition program, number one.

Number two, if they are able to do that, it provides us some options for the Department on midcourse and even terminal phases because of that performance. It begins to expand our envelope, so to speak, that we can use. Even if we are backfilling missiles and silos in Fort Greely with this missile, it gives us that kind of capability.

So that is where we took the lion's share of the money in terms of that cut. That is also why you see that we did not terminate anything because I felt that we needed to balance our portfolio out.

Senator INOUYE. In cutting out $1 billion, do you believe you had to cut out some real flesh, muscle?

General OBERING. Well, what I would say that we did, sir, is we just accepted more risk in certain areas. We tried to and we did adhere, for the most part, to our fielding commitments, which is really the muscle and the flesh that you are referring to.

Senator INOUYE. Well, I thank you very much. We will do our very best, sir.

General OBERING. Thank you.

Senator INOUYE. Thank you, Mr. Chairman.

Senator STEVENS. Thank you very much.

Senator Cochran, do you have any further questions?

Senator COCHRAN. No.

OUT-YEAR FUNDING

Senator STEVENS. We thank you again. I really want you to know that I worry a little bit about the out-year funding with what is happening right now. I do hope that you will keep in touch with us as we go through this work on this subcommittee to see if we can find some way to alleviate some of that strain in the out-years by a proper allocation of the money now. I do not think we can get any more money. He has the problem now.

I do think we should make certain that the money in the near term is directed toward really being able to get a robust system in the near term. I can tell you that when I am home, everyone reads the papers about what is happening in North Korea. It is a very solid worry for those of us, I think in Hawaii probably to a lesser extent, but the offshore States do worry about that potential they have already. We believe they have it already. I cannot get into too much of that here today. But we want to work with you in every way possible to assure the near-term completion of the test phase, if we can. So call on us if there is anything we can do.

ADDITIONAL COMMITTEE QUESTIONS

We look forward to trying to have the subcommittee take a look at the ground-based laser again this year. We did that 3 years ago and I think we ought to play catch-up.

We do thank you, General Cartwright, General Obering.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO GENERAL JAMES E. CARTWRIGHT

QUESTION SUBMITTED BY SENATOR TED STEVENS

GROUND-BASED MID-COURSE PROGRAM

Question. What additional military capabilities would you like to see within the Ground-Based Mid-Course Program? Would you use these Ground Based Interceptors if a missile were launched at the United States? In your opinion, how many interceptors does the United States need?

Answer. Today, we have a thin line Ground Based Mid-Course Defense System. Our focus for additional capabilities in the near-term is to increase the redundancy of the sensors and command and control components so we are not reliant on a single string.

Although the system is still rudimentary, I am confident that our crews are well trained and that the network of sensors, weapons, and command and control is configured to optimize success. In an emergency, we could employ Ground Based Interceptors against a missile launched at the United States. The number of interceptors

needed is an issue under constant study and will continue to evolve as the threats develop and ballistic missile technology continues to proliferate.

QUESTION SUBMITTED BY SENATOR PETE V. DOMENICI

CONVENTIONAL CAPABILITIES ROBUST NUCLEAR EARTH PENETRATOR

Question. General Cartwright, it is my understanding that as part of the expanded responsibilities of Strategic Command, your organization is directly involved in discussions concerning Robust Nuclear Earth Penetrator (RNEP).

As you know, the program was not funded for fiscal year 2005, but the budget for next year requests $8.5 million to continue the study. I am interested in your views about the conventional capability of RNEP.

Would the RNEP sled-test data inform us also as to the safety and reliability of a conventional penetrator capability? Please discuss your views as to why this is important.

Answer. The Robust Nuclear Earth Penetrator (RNEP) study was initiated to determine the technical feasibility of a guided, 5,000-pound class nuclear earth penetrator capable of surviving penetration into the hard surface geologies that lie above most strategic hard and deeply buried targets. Data from the RNEP sled test supports nuclear or conventional weapons.

Modeling and simulation developed in the study predict the transfer of loads to internal hardware components. The sled test will provide critical empirical data to validate these models and simulations for both conventional as well as nuclear weapons.

QUESTION SUBMITTED BY SENATOR RICHARD C. SHELBY

JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE

Question. General Cartwright, I understand that U.S. STRATCOM has been assigned new missions over the past few years. As a result of these new missions, one of which is missile defense, you are presently taking steps to stand up Joint Functional Component Commands (known as JFCCs) for each of the new missions. Since today's hearing is focused on missile defense, I would like to focus on the JFCC for Integrated Missile Defense. I certainly understand that as a Combatant Commander, a primary focus must be placed on enhancing and fielding systems such as Patriot and the Ground-Based Midcourse Defense System. However, I am sure that you would agree that emphasis must be placed on developing the next generation of missile defense systems. Please share with the committee the process and agreements you have with the Missile Defense Agency regarding how technology development for future systems are prioritized and funded.

Answer. It is important the Combatant Commanders have an input into the development of future capability. We have addressed this process from two aspects to ensure we are capable of effectively advocating for future needs. First, the Warfighter Involvement Process was developed in concert with the Geographic Combatant Commanders' staffs and Missile Defense Agency (MDA) to provide the forum and framework to integrate Ballistic Missile Defense System users into the capability development and acquisition processes at MDA. Second, my Joint Functional Component Command for Integrated Missile Defense has recently concluded an agreement with MDA that defines their respective roles and responsibilities for advocacy, of advanced concept and technology demonstrations. It is through close working relationships such as these that we will ensure science and technology programs are prioritized and funded to meet our needs in the 10 to 15-year timeframe. I am confident we can work effectively with MDA to successfully field the next generation of missile defense systems.

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL HENRY A. OBERING, III

QUESTIONS SUBMITTED BY SENATOR TED STEVENS

Question. The Administration is fielding the Navy's Aegis Missile Defense System and the Ground-Based Midcourse System. Do these remain your near-term deployment priorities? Does your budget reflect those priorities and your commitment for enhanced testing?

Answer. Yes, our near-term priority continues to be fielding these elements of the Ballistic Missile Defense System (BMDS). In 2004 we began fielding the initial elements of the Block 2004 BMDS. In 2005 we improved this capability by adding more Ground-Based Interceptors and the first Standard Missile-3 (SM–3) missiles. In fiscal year 2006 our objective is to complete the development, fielding and verification of Block 2004 and begin fielding the next increment of missile defense capability, Block 2006. This Block will add 10 Ground-Based Interceptors at Fort Greely as well as an Upgraded Early Warning Radar in Thule, Greenland and another Forward Based X-Band Radar. We also plan to deliver additional SM–3 missiles, and continue upgrading Aegis cruisers and destroyers.

All of this work involves continued development and deployment of near-term BMDS assets and this priority is reflected in our fiscal year 2006 budget request. Our budget includes about $400 million in fiscal year 2006 to complete the initial Block 2004 fielding and about $4.9 billion for the development and fielding of Block 2006.

Our commitment to enhanced testing is also a priority that is reflected in our fiscal year 2006 budget request. Resources for test and evaluation are included in our Test & Targets Program Element as well as the Program Elements for individual BMDS elements. Total funding for test and evaluation activities is about $2.78 billion in fiscal year 2006 or about 35 percent of our budget request.

Let me note that the recent interceptor launch aborts in IFT–13C and IFT–14 in the Ground-Based Missile Defense (GMD) program have reinforced my commitment to our testing program. I have chartered an Independent Review Team (IRT) to review our test processes, procedures and management and they have reported back to me with a series of specific recommendations. In addition, I have appointed Rear Admiral Kate Paige as Director for Mission Readiness. She is leading a Mission Readiness Task Force and has full authority to implement the corrections needed to ensure a successful flight test program.

Question. It is very important that we do everything possible to get the most capability we can out of our missile defense systems, such as the Ground Based Interceptor (GBI), that we have already invested in so heavily. What are your plans for spiral development of the GBI, and how much funding do you have in the fiscal year 2006 budget and throughout the out-years for upgrading the capabilities of the GBI? Is this sufficient?

Answer. The Ground Based Interceptor spiral development strategy from fiscal year 2006 through fiscal year 2011 capitalizes on concurrent efforts to field additional interceptors while incorporating performance upgrades, as well as reliability, maintainability and producibility improvements. As we deploy and operate the Limited Defensive Operations capability, these development upgrades ensure that system limitations in operational performance, availability, or sustainability will be addressed. Additionally, the development program will ensure the interoperability of the Ground Based Interceptor with the other evolving elements of the Ballistic Missile Defense System and ensure that the technical capability of the Ground Based Interceptor will continue to improve and mature to meet the developing threat.

Development upgrades to be tested and fielded in fiscal year 2006 and fiscal year 2007 include Orbital and Lockheed Martin booster software builds; an Exoatmospheric Kill Vehicle processor upgrade; Exoatmospheric Kill Vehicle software algorithm enhancements; booster-aided navigation using booster Global Positioning System to improve interceptor accuracy; sensor manufacturing improvements and sensor enhancement for longer acquisition range; and configuration changes necessary to address improved shelf life/reliability. Development upgrades planned for fiscal year 2008 through fiscal year 2011 will focus on the expansion of the number and capability of Ballistic Missile Defense System Ground Based Interceptor Engagement Sequence Groups, Warfighter enhancement options, and improved reliability, availability, and maintainability. Development program activities are being closely coordinated with sustainment activities to ensure maximum feedback from the fielded architecture into the development effort.

Ground Based Interceptor component development is funded within the Ground Based Interceptor portion (which also funds flight and ground test interceptors, modeling and simulation development, common silo and common Command Launch Equipment development, launch complex ground/system testing, verification/validation and accreditation activities) of the Ground-Based Midcourse Defense development and test project. I attached a copy for the record of a table that provides the budgeted and planned amounts for Ground Based Interceptor component development from fiscal year 2005 through fiscal year 2011. I believe these amounts are sufficient.

BUDGETED AND PLANNED AMOUNTS FOR GROUND-BASED MIDCOURSE DEFENSE PROGRAM AND GROUND BASED INTERCEPTOR COMPONENT DEVELOPMENT FROM FISCAL YEAR 2005 THROUGH FISCAL YEAR 2011

[In thousands of dollars]

	Fiscal Year—						
	2005	2006	2007	2008	2009	2010	2011
Total GMD Budget	3,318,623	2,298,031	2,701,940	2,473,388	2,064,754	1,895,820	1,562,709
Total Development and Test	2,019,600	1,392,609	1,503,841	1,065,476	1,029,220	1,153,500	1,229,709
GBI (Includes Test GBI Assets)	621,577	359,900	515,300	413,325	399,400	383,500	388,225
GBI Component Development	200,800	182,100	198,400	171,300	145,400	132,700	135,600

Question. Have you discovered anything that would indicate that the GMD Technology does not work or do we still have the confidence in the interceptors that have been fielded at Fort Greely and Vandenberg Air Force Base? How do you plan to get GMD testing back on track? What will it cost to implement the recommendations of the Graham Panel?

Answer. In light of the two recent tests in which interceptors failed to launch, I chartered the Independent Review Team in February to examine the failures in recent integrated flight tests of the Ground-Based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS). Dr. William Graham, Dr. William Ballhaus, and Major General (United States Army, Retired) Willie Nance (assisted by Dr. Widhopf and Mr. Tosney of Aerospace Corporation) were directed to: review analysis of the failures associated with Integrated Flight Tests 10, 13C, and 14; understand the causes of Ground-based Midcourse Defense failures; determine any impact of these failures and other problems with the Ground-Based Interceptors and ground support equipment located at Fort Greely, Alaska and Vandenberg Air Force Base, California; review the pre-flight preparation and test execution process and provide recommendations as appropriate; and review in detail all actions required for a successful launch.

The Independent Review Team completed its investigation and provided its outbrief to the Missile Defense Agency on March 31, 2005. The team determined that the inherent system design was sound and had been demonstrated to be effective in previous tests. The team also determined that in order to achieve a fully operational missile defense system, Ground-based Midcourse Defense needs to enter a new phase, one that emphasizes performance and reliability verification. Key recommendations include: establishing a more rigorous flight readiness certification process; strengthening systems engineering; performing additional ground-based qualification testing as a requirement for flight testing; holding contractor functional organizations accountable for supporting prime contract management; and assuring that the Ground-based Midcourse Defense program is executable.

I concur with their findings and recommendations. To focus on these and several other initiatives to improve our mission assurance and quality control processes throughout the Ballistic Missile Defense System, I chartered Rear Admiral Kate Paige as Director of Mission Readiness, with responsibility for overarching mission readiness. She leads a small, highly experienced Mission Readiness Task Force chartered in part to develop a plan for the next few flight tests, including objectives and schedules. This flight test plan is part of a larger plan, which addresses processes and procedures to enhance the verification of operational readiness of the Ground-based Midcourse Defense weapons system. The Independent Review Team report will be one of the many of inputs she uses to chart the way ahead. The Mission Readiness Task force recommendations will be available in June and will include cost and schedules for a new Ground-Based Midcourse Defense program plan. I will act upon these recommendations in the most effective manner possible.

Question. I'm pleased that Airborne Laser (ABL) has made so much progress the last year, although much work remains to be done. Do these accomplishments give you confidence that the program can continue to overcome its remaining challenges?

Answer. Yes. The two recent milestones were the culmination of a series of significant risk reduction activities including risk reduction demonstrations and component/subsystem demonstrations. The first laser light in the Systems Integration Lab was completed on November 10, 2004. The first aircraft flight with the combined Battle Management, Command, Control, Communications, Computers, and Intelligence and Beam Control/Fire Control systems was completed on December 3, 2004. The remaining program activities, with key knowledge points identified annually

will continue to build our confidence in overcoming the remaining challenges on the program.

QUESTION SUBMITTED BY SENATOR THAD COCHRAN

Question. I have been informed that Admiral Mullen, the President's nominee to be the next Chief of Naval Operations, views missile defense as a core Navy mission. As you noted in your testimony, the Navy has already deployed an Aegis cruiser with a midcourse defense capability, in addition to the Aegis system's surveillance and tracking capabilities. The Kinetic Energy Interceptor program offers the opportunity to expand on these mobile capabilities, and expand the layered system by providing a system that would engage its target during the boost phase. Could you update us on the progress of the Kinetic Energy Interceptor program?

Answer. The Kinetic Energy Interceptor program is on track to demonstrate key boost/ascent phase intercept capabilities this year as incremental steps towards a 2008 decision as to if and how to proceed further. We have in the field today a mobile Kinetic Energy Interceptor Battle Management, Command Control and Communications prototype that is demonstrating, with real-time and playback data, our ability to generate rapid and accurate fire control solutions with overhead sensor data. Next year we plan to upgrade this operational prototype to integrate and fuse Ballistic Missile Defense System Forward Based X-band radar data with the overhead sensors. This Kinetic Energy Interceptor fire control capability investment will pay dividends for the entire Ballistic Missile Defense System by improving our ability to track, type, and predict threat trajectories in the early phases of flight.

Our interceptor development team recently completed a wind tunnel test series and the composite case winding and cure of our second stage booster motor. We are on schedule for a late August/early September 2005 static firing of a tactically-representative (same burn time and size as the objective design) second stage with a trapped-ball thrust vector control system. A tactically-representative first stage static firing with a flex-seal thrust vector control system is planned for January 2006. The interceptor team will complete an additional eight static fires (four with each stage) prior to executing the full-scale booster flight test in fiscal year 2008.

The Kinetic Energy Interceptor specification requires a common interceptor design for land and sea basing operations. Sea-basing offers unique battlespace access, taking maximum advantage of KEI's mobility and its resulting ability to intercept missiles in their boost and ascent phases. We are working with the Navy to assess alternative platforms for this mission, including cruisers, destroyers and submarines. We expect to make a joint decision on a Kinetic Energy Interceptor platform strategy in late fiscal year 2006, but the acquisition of a sea-based Kinetic Energy Interceptor capability will not start until after our overall program plans are settled in fiscal year 2008.

We believe that, for modest increases in funding, we can extend KEI's boost/ascent capability to provide a flexible, mobile midcourse layer to the Ballistic Missile Defense Systems as a complement to fixed site Ground-based Midcourse and sea-based Aegis Ballistic Missile Defense. As a result, in fiscal year 2006 we are initiating requirements definition, concept design and performance assessment of the Kinetic Energy Interceptor capability in a mobile midcourse defense role (e.g., asymmetric defense of the United States and Allies).

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

VALUE OF TEST RANGES TO MISSILE DEFENSE AGENCY

Question. White Sands is perhaps the most unique installation in all of DOD and, when combined with Fort Bliss (most of which resides in New Mexico) and Holloman Air Force Base, it gives the Department a highly valuable venue for combining operations and testing.

Can you describe the value MDA places on its access to an installation like White Sands with its enormous geographic size and restricted airspace?

Answer. MDA seeks to achieve realistic testing environments and maintain safety to the maximum practical extent. The large land area, accompanying restricted airspace and mobile instrumentation at White Sands Missile Range provides an excellent location for the conduct of short range tactical ballistic missile intercept tests. In the 1990's, we developed the Fort Wingate Launch Complex as a remote target launch facility to effectively increase the range of the tactical ballistic missile intercept tests. Since that time, we have maintained the land lease and evacuation rights to the western and northern expansion areas to expand capability and enhance safe-

ty. We plan to retain the majority of this capability for upcoming Terminal High Altitude Area Defense testing in fiscal year 2006.

Question. Does this access provide the type of realistic testing environment needed to collect accurate data for your systems?

Answer. For short range tactical ballistic missile target profiles, White Sands Missile Range's size, restricted air space, and array of fixed and mobile instrumentation make it an excellent environment for testing. Target launch facilities that MDA added at Fort Wingate allow flight profiles of up to 370 kilometers into the range. As test envelopes continue to expand, the capability of White Sands Missile Range is being exceeded. That requires us to look toward other test range options. White Sands Missile Range cannot accommodate the trajectory and debris hazard patterns from higher energy medium-range, intermediate-range and intercontinental ballistic missile targets and interceptors within its boundaries. These scenarios require larger and more remote ranges that provide the kind of test scenarios and safety that we need.

Question. How will White Sands contribute to the success of the Ballistic Missile Defense System in the future?

Answer. There will continue to be opportunities to conduct Ballistic Missile Defense System tests at White Sands Missile Range. In addition to short range tactical ballistic missile tests, the Airborne Laser program, whose mission is to intercept targets in the boost phase, plans to conduct some initial tests at White Sands Missile Range.

White Sands Missile Range is involved in the development and deployment of mobile instrumentation and sensors and provides knowledgeable test support personnel to support Ballistic Missile Defense System testing as members of the Pacific Range Support Team. For example, White Sands Missile Range mobile instrumentation and approximately 45 White Sands Missile Range test personnel were recently deployed to Kodiak, Alaska in support of Ballistic Missile Defense System test operations and MDA plans on continuing to use this type of support in the future.

TERMINAL HIGH ALTITUDE AREA DEFENSE TEST SCHEDULE

Question. It is my understanding that the Terminal High Altitude Area Defense (THAAD) missile will return to flight testing at White Sands Missile Range this year, and that funding provides for additional tests next year.

What is the THAAD testing schedule for this year and next? What will be the nature of those tests?

Answer. *CY 2005 Flight Testing*.—THAAD Flight Test (FT)-01, planned in summer 2005, is a high-endoatmospheric Control Test Flight at White Sands Missile Range (WSMR). This mission will consist of a THAAD missile flight without a target to assess missile dynamic flight characteristics and vehicle controls in the high-endoatmospheric environment.

THAAD FT–02, planned in late fiscal year 2005, is the first integrated system test including all THAAD components (Missile, Launcher, Radar and C2BMC). This flight test will be conducted at WSMR and will include a virtual target (injected into the radar) in lieu of an actual target, and will exercise all functions except the seeker endgame.

THAAD FT–03, planned in early fiscal year 2006, is a Seeker Characterization flight with a target in the air, to characterize the behavior of the seeker. Although intended as a "fly by" against a live target, it could result in an intercept. This test will be conducted at WSMR against a HERA unitary target at a high-endoatmospheric altitude.

CY 2006 Flight Testing.—THAAD FT–04, planned in second quarter fiscal year 2006, is an intercept attempt against an exoatmospheric HERA separating target to be conducted at WSMR.

THAAD FT–05, planned in third quarter fiscal year 2006, is a low endoatmospheric Control Test Flight at WSMR of a THAAD missile flight without a target to assess missile dynamic flight characteristics and vehicle controls in the low-endoenvironment.

THAAD FTT–06–1, planned in fourth quarter fiscal year 2006, is the first THAAD flight test at Pacific Missile Range Facility (PMRF). This is an integrated element test of a high endoatmospheric intercept attempt against a foreign target. It is the first THAAD system test against a threat representative target.

THAAD FTT–06–2, planned in first quarter fiscal year 2007, is an intercept flight test mission at PMRF against a mid endoatmospheric foreign target.

THAAD FTT–06–3, planned in first quarter fiscal year 2007, is an intercept flight test mission at PMRF against an exoatmospheric unitary target.

Question. Since prior THAAD testing ended in 1999, how has MDA incorporated those testing results into today's system to make the missile more producible and more reliable?

Answer. Since we completed testing in the previous phase of the program, we have implemented several initiatives that place increased emphasis and attention on quality, producibility, and reliability. Also, there was a comprehensive independent review conducted late in the previous phase of the program and those findings have been incorporated into this phase of development. These initiatives include an aggressive parts, materials, and processes program; reliability growth program; comprehensive closed-loop corrective action system; design simplification; enhanced Environmental Stress Screening (ESS); verification of critical missile functions (100 percent) prior to each flight; enhanced built-in test capability; and increased focus on foreign object elimination during assembly.

We have also made improvements in the area of producibility, such as a more modular missile design, use of flex cables, reduction/elimination of blind mates (or connections hidden behind another object), improved production test equipment, and use of automated test software. Additionally, we have made changes to improve reliability, such as review and approval of all parts and materials during the design phase, more robust ESS, extensive qualification of hardware beyond expected flight environments, and margin testing of assemblies.

ARROW MISSILE TESTING AT WHITE SANDS MISSILE RANGE

Question. I am told that White Sands Missile Range can support realistic testing of this shorter range Arrow missile.

In your opinion, should the United States be supportive of this new Arrow program?

Answer. The current Arrow system, supported by Patriot, has been developed and refined to defend Israel against medium-range and most short-range ballistic missiles, including SCUD missiles. In fact, flight testing in Israel and in the United States has shown the Arrow Weapon System to be effective against the short range threat. Furthermore, our joint U.S.-Israeli Arrow System Improvement Program continues to assess and improve the capability of the Arrow Weapon System to meet the evolving threat in the region.

The proliferation of very short range ballistic missiles and large-caliber rockets is of great concern to both Israel and the United States. At present, the Israeli Patriot system has the capability to intercept some of these threats, albeit at a relatively high cost. In the United States, the Missile Defense Agency and the military services are developing other systems that will add to this capability in the future.

We recognize that developing an effective yet low cost interceptor to defend against short range threats will be a significant challenge. Recently, Israel began evaluating the feasibility of two concepts for low-cost interceptor systems proposed by Israeli industry.

Question. If so, do you agree that White Sands is the proper venue for hosting Arrow tests?

Answer. It appears upon first examination that White Sands Missile Range is a suitable test range to conduct short range ballistic missile defense system testing; however, a final determination is contingent upon the results of the ongoing feasibility study.

QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

Question. General Obering, I am sure you would agree that the Joint Project Office for Ground-Based Midcourse Defense has been an essential organization for the development and integration of our system at Fort Greely, AK. As the Ground Based Midcourse Defense System continues to evolve and mature, what future role do you see for the JPO GMD?

Answer. The Ground-Based Midcourse Defense Joint Program Office has done, and continues to do, a remarkable job in developing, testing and fielding our initial defenses against intercontinental ballistic missiles. In the process, the Joint Program Office has developed an infrastructure and reservoir of experience and talent that we will continue to use for missile defense. As we move toward delivery of a truly integrated Ballistic Missile Defense System, we need to transform the Agency from one comprised of individual programs to one comprised of components that we can ultimately integrate into a layered ballistic missile defense system. Additionally, we are undertaking infrastructure reductions because of decreases in our topline budget over the next several years. To effectively deal with these, we are conducting an Agency-wide reengineering effort, which we expect to finish by the end of this

summer. I will at that time inform the Committee of what, if any, effect there will be on the Joint Program Office. However, I can assure the Committee that the expertise in the Ground-Based Midcourse Defense Joint Program Office will not be lost.

Question. Specifically, do you see their mission and responsibilities downsizing over the next year?

Answer. I believe that the pace of work for the Ground-Based Midcourse Defense Joint Program Office will continue to be high during fiscal year 2006. There will be an intense workload associated with the testing of the system as well as the production of additional interceptors. I do see, however, that there will be some changes in the Joint Program Office mission and responsibilities because of our reengineering and the Ground-Based Midcourse Defense program's progress. For example, I see some diminished need for the site activation activity in the Joint Program Office. During fiscal year 2006 Vandenberg Air Force Base and Fort Greely sites will mature and we are delaying a decision on a third site until fiscal year 2008. Importantly, we will leverage the site activation expertise within Ground-Based Midcourse Defense Joint Program Office in order to significantly improve Agency-wide efforts for site activation. Finally, there will be some consolidating of our functional activities such as contracting, security and testing in Huntsville to gain efficiencies and take broader advantage of the expertise we have developed in the Agency. I do not know how this will affect the Joint Program Office's mission and responsibilities. Once we complete the reengineering later this summer, I will inform the Committee if there is any downsizing in the Joint Program Office's mission and responsibilities.

Question. Let me follow up on the KEI program. General Obering, are there plans in place to stand up a project office for this important initiative?

Answer. We have had a project office in place since we signed the development contract with Northrop Grumman in December 2003. I expect we will be moving that project office to Redstone Arsenal as part of our reengineering effort.

Question. If so, can you share with the Committee some of the time line details?

Answer. We will be moving the program office responsibility to Redstone Arsenal over time beginning in 2006.

Question. I am concerned about the lack of emphasis within MDA on technology development. Technology development funding for sensor improvement, better software, faster communications systems, improved propulsion systems, lighter and stronger structures, better thermal control, enhanced signature discrimination, decoy concepts and detection techniques are all vital areas of interest. Does MDA have an adequate technology development budget to support spiral development of all of your systems?

Answer. We believe the fiscal year 2006 President's Budget strikes the right balance between fielding initial capabilities and developing future technologies. The Technology Program Element supports emerging technologies, including sensors, propulsion systems, radars, and discrimination. It also supports the need to address future threats or countermeasures, including technology work on enhanced discrimination, laser detection, and radar improvement efforts. Overall for fiscal year 2006, we remain focused on the specific technology efforts that are necessary to field capabilities for the Ballistic Missile Defense System.

Question. Do you have critical technology development requirements this budget isn't sufficient to support?

Answer. No. Our critical requirements are funded and the fiscal year 2006 BMD Technology Program Element funding meets near-term and far-term requirements for the Ballistic Missile Defense System. However, as we focused on technology needed to support the block upgrade plan for capability improvements, we made the decision to discontinue the Discriminating Sensor Technology, a breadboard Laser Radar [LADAR] for Kill Vehicles, after Advanced Measurements Optical Range testing for this project concludes. Additionally, we reduced by 40 percent the number of Laser Technology projects that integrate into Airborne Laser and laser radar sensor programs. We also delayed prototype demonstration efforts originally planned for the High Altitude Airship program due to funding reductions and programmatic issues.

QUESTIONS SUBMITTED BY SENATOR KAY BAILEY HUTCHISON

Question. General Obering, several years ago the Defense Department terminated the Sea-Based Area Theater Ballistic Missile Defense program and since that time I believe your agency has been focusing on developing and deploying a Sea Based Mid-course capability in your Aegis/SM–3 program. It would appear that in situa-

tions where our forces are projected from the sea into combat operations ashore, you have a serious defensive gap that could place our forces in a situation where they could suffer undue casualties from tactical ballistic missile attacks without an assured lethal terminal capability. Is your agency developing a plan and budget to fill that sea-based terminal gap?

Answer. The Navy and Missile Defense Agency are working together to identify options to provide a sea-based terminal ballistic missile defense capability. A joint working group was formally assembled in January to review recent analyses related to sea-based contributions to ballistic missile defense in the terminal phase. The objective of this assessment is to propose options that leverage existing Navy and MDA development programs in order to provide a mobile sea-based terminal BMD capability within the integrated layered ballistic missile defense system. The working group is scheduled to report its findings this summer, allowing us to make an informed decision in partnership with Navy leadership on an appropriate way ahead to address this need.

Question. I am concerned, General Obering, that with the exception of the PAC–3 program, which is a land-based system, that there are no funds in the budget to finance a Sea Based Terminal Ballistic Missile Defense capability that will give us the same hit-to-kill lethality that your agency produced in PAC–3 and SM–3 in either this year's budget or in future-year budgets. Are you concerned about this Sea-Based Terminal gap and if so, what can we do to help you address it?

Answer. Navy and MDA staffs are working closely to identify options leveraging existing Navy and MDA development efforts that can address this capability gap. We need to look at this issue in the context of the integrated layered system approach MDA is using to develop ballistic missile defenses. We have a joint working group that has been working this issue over the past several months and will report out this summer. We will work closely with Navy leadership to determine a way forward when we are better equipped to make an informed decision.

Question. General, would you mind furnishing for the record what the sea-based terminal plan ahead is and the associated budget needed to finance it before we mark up the President's Budget Request?

Answer. The President's fiscal year 2006 Budget Request represents the best mix of funding for development and fielding of the Ballistic Missile Defense System. The Navy and MDA staffs are working closely to lay out potential options for leveraging existing programs to provide a sea-based terminal defense capability in future blocks. We anticipate being able to make an informed decision on funding requirements in fiscal year 2007 and beyond after the joint Navy-MDA working group completes their assessment and reports out later this summer.

Questions Submitted by Senator Dianne Feinstein

COST

Question. President Bush has requested $9 billion for missile defense for fiscal year 2006. The United States has spent $92 million on missile defense since 1983 and the Administration anticipates spending an additional $58 billion over the next six years. Some experts put the overall price tag at well over $150 million. Given the number of national defense priorities we face—providing for non-proliferation activities, deterrence, homeland security—how do you justify spending so much on missile defense?

Answer. I understand that from 1984 until now the total investment in ballistic missile defense made by MDA and its predecessor organizations has been about $94 billion. To put that in perspective, this is a little more than 1 percent of the total Defense budget. Today, the United States has an initial capability to destroy missiles heading towards the United States where before we had none. The Block 2004 BMDS now in place cost about $11.5 billion over the period fiscal year 2002-fiscal year 2006. The GAO Report 02–700R estimated damage costs for the terrorist attacks of September 11, 2001 alone at $83 billion. The consequences of an attack by even a single WMD-tipped ballistic missile could cost far more.

PERFORMANCE AND TESTING

Question. The missile defense system experienced two test failures in December, 2004 and February, 2005. The system was not declared operational at the end of 2004 as had been planned by the Administration. What criteria will you use to determine whether or not the system will be declared operational? When do you believe this will occur? Will you move forward with declaring the system operational if future tests fail?

Answer. The initial Ballistic Missile Defense System elements planned by the Administration were deployed and operationally available at the end of 2004. Those elements could be placed into an operational status quickly should the situation dictate, and have been exercised to a launch ready status routinely during an on-going series of readiness demonstrations. However, the operational availability of the system must be balanced against the continuing need for testing and the integration of new features which provide expanded capability. But, if the nation needs it, we have an emergency capability.

The Secretary of Defense will make the decision to declare the missile defense system operational based on several criteria, including but not limited to performance demonstrated during tests. He will make that declaration when his confidence in system performance reaches a level against the predicted threat he is comfortable with. Conversely, he will also make that declaration when the risk from that threat increases to the point he is uncomfortable without the protection the system provides, limited as it is today.

When this occurs is difficult to say. Highly visible, successful flight tests build confidence in the system, but so do the less visible testing of individual components, modeling and simulations which are on-going and continuous, and held in conjunction with the war fighters. The war fighter's assessment of the system's utility, and their willingness to accept it in its current state, also builds my confidence.

Whether or not a subsequent flight test failure would preclude declaring the system operational would depend on the root cause of the test failure. A failure that identifies an unanticipated problem that requires a system-wide reconfiguration could, depending upon risk, preclude an operational declaration. A failure due to an individual component which can be identified and corrected quickly may not.

Question. You have said that the system could be "turned on" at any time, if an emergency arose. Do you have any plans to test the system as it would operate in that situation?

Answer. Yes, the Missile Defense Agency—working closely with the Warfighter and testing community—conducts a wide variety of exercises and tests of the Ballistic Missile Defense System. For instance, there is a continuing exercise program that uses the operational system for Ballistic Missile Defense System Capability Readiness Exercises. These events are carried out to allow the Warfighters and technicians to practice and improve tactics, procedures, processes and checklists for such things as bringing the Ballistic Missile Defense System from one readiness condition to another. These activities have already successfully demonstrated our ability to transition the system from a developmental configuration to a defense capable configuration. The exercises have also demonstrated the ability of our Combatant Commanders to operate the system in the defense capable configuration.

To characterize the performance of the currently available system, we have been conducting and will continue a flight and ground test program. The test program will increase the realism of our tests in a measured fashion, commensurate with risk and with the constraints of flight test range safety, and the needs for engineering data collection and evaluation. Although the Ground-Based Midcourse Defense element recently conducted two flight tests where the interceptor did not launch, there were significant segments of the test that operated successfully, providing excellent insight into technical and operational performance of those aspects of the system. For example, the target warhead configuration and motion was realistic and threat representative. The only sensor data allowed into the fire control processing was representative of the current operational system. The system demonstrated the ability to acquire, to track, classify, do real time engagement planning, generate sensor, communication, and weapon task plans, and to bring the interceptor to within two seconds of launch.

I have asked Admiral Paige and her Mission Readiness Task Force to propose a plan for the next few flight tests, including objectives and schedules. This flight test plan is part of a larger plan, which addresses processes and procedures to enhance the verification of operational readiness of the GMD weapons system. Defining flight test objectives and schedules will be a logical part of this ongoing process. Over time, we intend to fold in more and more data from operational sensors and incorporate additional operational sensors (Aegis Ballistic Missile Defense Long Range Surveillance and Tracking Destroyers, Upgraded Early Warning Radar at Beale Air Force Base, Forward Based X-Band Radar Transportable, the Sea-Based X-Band Radar, and others). We plan to begin launching operational missiles (configured for test in terms of range safety and data telemetry) from operational silos at Vandenberg Air Force Base, California. As the Missile Defense Agency further develops the GMD test plan, program and procedures, we will continue to work closely with the Operational Test agencies and the Warfighter to craft test objectives and scenarios that further increase operational realism. The Warfighter is already an active par-

ticipant in all aspects of the ground and flight test program and such participation has increased our confidence in the operation of the system.

Question. In other words, will you test the system as it is currently being available, so we can get some sense of its capability right now? That would mean testing the system with:

—No prior information on the enemy target, its launch time, intended target, trajectory, or target cluster;
—No GPS or C-band beacon on the target reentry vehicle;
—No SBIRS-High or STSS or simulated information from such sources;
—With only early warning radars, e.g. Aegis, Beale;
—With no floating X-band radar until it is actually operational;
—With only DSP for satellite coverage.

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Question. When do you plan to test against: a. a tumbling warhead? b. against more than one target warhead? c. without prior knowledge of the target, its trajectory, or the target cluster? d. at night? e. without a GPS or C-band beacon on the target warhead?

Answer. The Missile Defense Agency, working closely with the Director of Operational Test & Evaluation, has developed the BMDS test bed that significantly improves the test infrastructure by providing operational assets to participate in more operationally realistic, end-to-end ground tests and flight test scenarios. The Missile Defense Agency and the Director of Operational Test & Evaluation are working with the Operational Test Agency team to increase operational realism through the test planning process, consistent with the maturity of the Ballistic Missile Defense System test bed. The test bed enables the Department of Defense to develop operational concepts, techniques, and procedures, while allowing the Operational Test & Evaluation office to exploit and characterize its inherent defensive capability. "Oper-

ational Testing" is a term typically used for traditional tests that are conducted on mature developmental systems by an operational test agent. Because of the scope and complexity of BMDS, as well as the urgency of the mission, DOT&E, their operational test agents, the BMDS operational military commands and MDA have teamed to conduct tests that meet all our objectives as we incrementally increase system capability through the spiral Block process. The term "operationally realistic" is used for these combined tests to identify those processes, procedures and scenarios that are the same as or closely replicate those that will be used in real world operations.

All operationally oriented testing of complex systems is necessarily constrained by such real world issues as the need for range safety and to equip the missile with instrumentation to collect data. In a system as geographically dispersed as GMD, the issue of test geometries vs. operational assets and test launch facilities is an added constraint which we are mitigating with the ability to launch targets from Kodiak, Alaska, among other initiatives.

We will continue to work closely with the Operational Test agencies and the Warfighters to craft test objectives and scenarios; in particular, Warfighters have already begun participating directly in ground and flight testing in an operationally realistic manner. As the system maturity increases and is demonstrated in test, we will further increase the operational realism of the tests, in a measured fashion to help us evaluate the system's technical and operational capabilities.

Question. Why is there no operational testing planned for the ground-based midcourse system deployed in Alaska and California, but only "more operationally realistic tests?"

Answer. The Missile Defense Agency, working closely with the Director of Operational Test & Evaluation, has developed the BMDS test bed that significantly improves the test infrastructure by providing operational assets to participate in more operationally realistic, end-to-end ground tests and flight test scenarios. The Missile Defense Agency and the Director of Operational Test & Evaluation are working with the Operational Test Agency team to increase operational realism through the test planning process, consistent with the maturity of the Ballistic Missile Defense System test bed. The test bed enables the Department of Defense to develop operational concepts, techniques, and procedures, while allowing the Operational Test & Evaluation office to exploit and characterize its inherent defensive capability. "Operational Testing" is a term typically used for traditional tests that are conducted on mature developmental systems by an operational test agent. Because of the scope and complexity of BMDS, as well as the urgency of the mission, DOT&E, their operational test agents, the BMDS operational military commands and MDA have teamed to conduct tests that meet all our objectives as we incrementally increase system capability through the spiral Block process. The term "operationally realistic" is used for these combined tests to identify those processes, procedures and scenarios that are the same as or closely replicate those that will be used in real world operations.

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We will continue to work closely with the Operational Test agencies and the Warfighters to craft test objectives and scenarios; in particular, Warfighters have already begun participating directly in ground and flight testing in an operationally realistic manner. As the system maturity increases and is demonstrated in test, we will further increase the operational realism of the tests, in a measured fashion to help us evaluate the system's technical and operational capabilities.

Question. Isn't it useful to test a system under operationally realistic conditions, i.e., operational testing, to determine the true effectiveness of the system?

Answer. Yes. Testing the BMDS in scenarios that closely approximate all the conditions and environments of actual operational missions provides the fullest demonstration of system effectiveness. The BMDS test program will progressively increase scenario realism, as the system matures, to the extent possible within the constraints of flight safety and geographical limitations of the test ranges. BMDS tests include both developmental and operational test objectives and requirements. In general, the BMDS test program will increase operational realism with each successive test as outlined in the Joint MDA and DOT&E document "Ballistic Missile Defense System Response to Section 234 Increasing Operational Realism" dated April 4, 2005.

Question. If the missiles deployed in Alaska and California are "better than nothing" and the United States is wary of a North Korean ballistic missile threat, why isn't the system turned on 24/7?

Answer. The fielded Ballistic Missile Defense System Test Bed supports the continued development and testing of new and evolving Ballistic Missile Defense System technologies. We have an emergency capability now, and we are making progress towards being able to operate on a 24/7 basis. The system has not been turned on 24/7 because, since October 2004, we have been in a "shakedown" or check-out period similar to that used as part of the commissioning of a U.S. Navy ship before it enters the operational fleet. We work closely with U.S. Strategic Command and the Combatant Commanders to certify missile defense crews at all echelons to ensure that they can operate the ballistic missile defense system if called upon to do so. We have exercised the command, fire control, battle management and communication capabilities critical to the operation of the system. The Aegis ships have been periodically put on station in the Sea of Japan to provide long-range surveillance and tracking data to our battle management system. We have fully integrated the Cobra Dane radar into the system, and it is ready for operational use even as it continues to play an active role in our test program by providing data on targets of opportunity. Finally, we have executed a series of exercises with the system that involves temporarily putting the system in a launch-ready state. This has enabled us to learn a great deal about the system's operability. It also allows us to demonstrate our ability to transition from developmental testing to operational support and back. This enables us to continue to improve the capabilities of the system over time, even as we remain ready to use its inherent defensive capability should the need arise.

INTERCEPTORS

Question. Can you explain to me why we should continue to purchase additional ground-based interceptors, specifically why we should initial funding for #31–40, when we have not had a single successful test with this model?

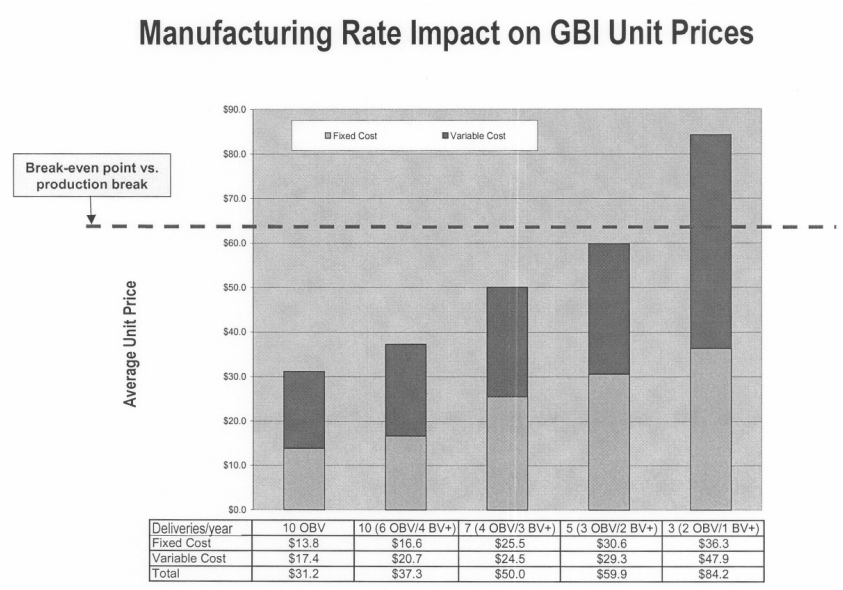
Answer. North Korea's Taepo Dong-2 intercontinental ballistic missile could deliver a nuclear warhead to parts of the United States in a two-stage variant and all of the North America in a three-stage variant. This missile may be ready for testing. The Defense Intelligence Agency has assessed that Iran will have the technical capability to develop an ICBM by 2015, though it is not clear that they have decided to field such a missile. Additionally, according to the Warfighters, one of the primary system limitations is that there are too few interceptors. Finally, all of our testing indicates that the interceptor design is sound. Our recent failures have not been related to the interceptor design, and though disappointing, I do not think these failures warrant a costly break in our plan for continued development and testing of the interceptor. We have already stretched out the delivery of the Ground Based Interceptor 21–30 buy to the greatest extent possible without causing a break in manufacturing. If deficiencies are discovered in future flight or ground testing, we have time to accommodate them.

Question. You have testified previously [before the SASC, April 7] that it would cost $260 million to $300 million to reconstitute the ground-based interceptor booster production should it be shut down. Can you please break down those costs in detail—how much would be fines we would pay, how much would be restarting the line?

Answer. The primary driver for the cost of a break in the manufacturing line is the length of time the line is not operational. The longer the shut down period, the greater the increased costs for reconstituting the 2nd and 3rd tier vendor base and for mitigating the effects of loss of quality control processes and subcontractor/supplier obsolescence. If there is a three-month break, the estimated cost to restart the manufacturing line is $237 million. If there is a six-month break, the estimated cost is $262 million. If there is a one-year break, the estimated cost is $300 million. The major cost drivers for a six-month break are: loss of learning ($72 million), restoration/recertification of the manufacturing line(s) ($105 million), loss of sole source 2nd and 3rd tier vendors ($45 million), and subcontractor/supplier parts obsolescence ($40 million).

The Missile Defense Agency views the break even point for the ground based interceptor manufacturing lines as less than five interceptors per year. Below five per year, the unit costs of the manufactured interceptors increase to a point where it is more cost effective to allow the manufacturing line break. However, the current Agency budget provides for no less than eight interceptors per year. This profile does not provide for optimum unit cost efficiency but it does provide an acceptable

unit cost and precludes any break in the manufacturing line. I have provided a copy of the Manufacturing Rate Impact on GBI Unit Prices chart for the record.



Deliveries/year	10 OBV	10 (6 OBV/4 BV+)	7 (4 OBV/3 BV+)	5 (3 OBV/2 BV+)	3 (2 OBV/1 BV+)
Fixed Cost	$13.8	$16.6	$25.5	$30.6	$36.3
Variable Cost	$17.4	$20.7	$24.5	$29.3	$47.9
Total	$31.2	$37.3	$50.0	$59.9	$84.2

Question. You have said that the kill vehicle has 62 percent of the same software and 67 percent of the same hardware as the version flight tested years ago. That means that over one-third of the system is different, yet we are planning to buy ten more of these kill vehicles and the boosters that go with them, despite the fact that we don't have a single successful test with this booster or kill vehicle. Why does that make sense?

Answer. The overall functionality of the kill vehicle has not changed since the earliest flight tests demonstrated the soundness of the basic design. The changes have focused on producibility, parts obsolescence, reliability, and algorithm improvements. These changes have been verified by extensive ground-based hardware- and processor-in-the-loop testing. Buying more kill vehicles is not a high risk proposition.

Question. Are any missile defense tests planned from the silos in which interceptor missiles are currently installed?

Answer. Although, we may at some future date conduct Ground-based Missile Defense flight testing out of Fort Greely, Alaska where interceptors are currently installed, plans for such flight test from the silos in Fort Greely are being held in abeyance pending required environmental and safety approval processes. The Ground-based Missile Defense system also currently has four operationally configured silos at Vandenberg Air Force Base. Two of these Vandenberg AFB silos, do not currently have interceptors installed, and we intend to use these silos for missile defense flight testing.

I have asked Admiral Paige and her Mission Readiness Task Force to propose a plan for the next few flight tests, including objectives and schedules. This flight test plan is part of a larger plan, which addresses processes and procedures to enhance the verification of operational readiness of the GMD weapons system. Defining flight test objectives and schedules will be a logical part of this ongoing process. Admiral Paige and the Mission Readiness Task Force will recommend a path forward for the GMD program.

COUNTERMEASURE AND COUNTERMEASURE TESTING

Question. You recently said that the ground-based system has been tested against balloon countermeasures. However, those tests involved balloons that were significantly different in size than the warhead, and therefore had significantly different infrared signatures. In essence, you demonstrated that your sensors and interceptor can differentiate between large, medium and small. While this is a significant ac-

complishment, it's also something that dogs and one-year old babies can do. But it is nothing like situation the defense would face in the real world, where the balloons and the warhead would be made to look alike. How would the system differentiate in that scenario?

Answer. [Deleted].

Question. If North Korea launched a missile at us today, and the target suite included a dozen or more objects designed to have infrared signatures identical to the warhead, how could the kill vehicle decide which was the real target?

Answer. The Ground-Based Midcourse Defense Exoatmospheric Kill Vehicle decides between the warhead and other objects by using multiple infrared and visible sensors, each capable of measuring multiple features. These features are based upon fundamental physical characteristics of the object. Non-warhead objects generally do not have signatures identical to the warhead for all the measured features. Flight testing has demonstrated the ability of the EKV to discriminate between the real target and other objects with similar infrared signatures. In addition, it is important to point out that the kill vehicle also relies on other GMD system elements for input. For instance, data from ground-based radars are relayed to the Exoatmospheric Kill Vehicle and are also used to decide which object is the warhead. The radar data represents an independent set of target features, making it more difficult for all warhead target features to be replicated by the other objects. The combination of infrared and visible sensors, and radar data enable the GMD system to discriminate between warheads and countermeasures and debris.

Question. What is the status of the Red, Blue, and White teams created to increase the robustness of the countermeasures element of the missile defense testing program? Are they still functioning? How do they interface with the Missile Defense Agency?

Answer. The Missile Defense Agency Countermeasures/Counter-Countermeasures Program's Red, Black, Blue, and White Teams are active and functioning. The Red, Black, Blue, and White Teams assess technical risks, identify mitigation approaches, and support development of engineering changes to the baseline Ballistic Missile Defense System to improve performance against adversary capabilities, focusing primarily on addressing countermeasures. The teams are managed and funded under the Missile Defense Agency Deputy for Systems Engineering and Integration, and their products are integrated across all aspects of the Ballistic Missile Defense System, to include testing.

Question. A group of 22 scientists recently said that the current system "will be unable to counter a missile attack that includes even unsophisticated countermeasures." Do you agree with that assessment?

Answer. No, based upon a large body of ground and flight test data I disagree with that assessment.. The ability of the Ballistic Missile Defense System to respond to countermeasures has always been a critical objective of the MDA ground and flight test program. The Ground-Based Midcourse Defense element, for example, executed in fiscal year 2004 and fiscal year 2005 a series of high-fidelity hardware-in-the-loop ground test campaigns employing operational hardware and software; these tests included various so-called unsophisticated countermeasures. The hardware-in-the-loop test campaigns were preceded by a detailed series of ground test events using high fidelity digital simulations of the Ballistic Missile Defense System. These digital simulations included various countermeasures but with a significantly larger number of countermeasure variations. These tests have indicated that the Ballistic Missile Defense System has a significant initial capability to operate against some countermeasure types.

In parallel with the ground test venues, there has been flight testing of the Ground-Based Midcourse Defense. Using a prototype Ground-Based Interceptor, GMD was successfully tested against increasingly threat-representative separating reentry vehicles accompanied by various debris and countermeasure objects with four hit-to-kill successes out of five tests.

Research, development and testing of new discrimination approaches also continues. The development effort includes dedicated countermeasure flight tests as well as dedicated counter-countermeasure ground and flight test demonstrations. Comprehensive countermeasure data have been acquired during these developmental flight tests for all the countermeasures listed above; flight data on other more advanced countermeasures have also been obtained. These data are currently being used in the development and testing of additional counter-countermeasures capabilities to be implemented in Block 2004 Ballistic Missile Defense System and beyond.

Question. Vice Admiral Lowell Jacoby, the Director of the Defense Intelligence Agency, recently suggested that North Korea may have developed a small nuclear warhead cable of being delivered onto U.S. territory. Do you agree with that assess-

ment? If the North Koreans don't have the capacity today, how soon could they develop it?

Answer. As Mr. Di Rita pointed out in the press conference on April 29th, there is no new assessment on North Korea. Just to reiterate the official assessment of the Taepo Dong-2, I'd like to quote from Vice Admiral Jacoby's February 16th statement to the Senate Select Committee on Intelligence, "North Korea continues to invest in ballistic missiles to defend itself against attack, achieve diplomatic advantage and provide hard currency through foreign sales. Its Taepo Dong-2 intercontinental ballistic missile may be ready for testing. This missile could deliver a nuclear warhead to parts of the United States in a two stage variant and target all of North America with a three stage variant."

EFFECTIVENESS

Question. In March of 2003, Edward "Pete" Aldridge, who was then the Under Secretary of Defense for Acquisition, Technology and Logistics, testified before the Senate Armed Services Committee that the ground-based interceptor system would be 90 percent effective. Can you explain how he arrived at that figure and what data it is based on? Do you agree with his assessment?

Answer. Yes, I agree with his assessment. The effectiveness figure you cited is known as Probability of Engagement Success. The equation relating the probability of engagement success includes the number of shots and the probability of kill of the interceptors. It also includes all non-kill contributions such as availability, detection, tracking and planning which are correlated with each shot against a single missile.

[Deleted].

Question. David Duma, the Acting Director of the Pentagon's Operational Test and Evaluation Office, recently testified that "I don't think that you can say the system is operationally ready today." What is your view of his assessment?

Answer. David Duma made two principal points in his testimony. I concur with both. First, he stated that "integrated ground testing results to date indicate the testbed has the potential to defend against a limited attack under certain conditions," but "difficulties in the flight test program have delayed the confirmation of intercept capability using the testbed." He also stated that the "maturity of the testbed will not yet support realistic operational end-to-end testing." Both points are valid, and we at the Missile Defense Agency are working hard to address them in the remaining months of 2005.

The recent test aborts we experienced were major disappointments, but they were not major technical setbacks. We recognize the importance of demonstrating the effectiveness of our system, and realize that confidence in its capabilities will be limited until we can demonstrate a successful intercept during an operationally realistic test. We currently plan to conduct an end-to-end test with operational assets this calendar year, and expect to execute three to four more during 2006. In planning our future test program, I work closely with Mr. Duma, and we have jointly approved an integrated master test plan through 2007 that combines developmental and operational testing to reduce costs and increase test efficiency.

The maturity of the testbed will also increase significantly when the Sea-based X-band radar arrives in the North Pacific later this year. While COBRA DANE and Aegis radars can provide initial defensive capability, this new radar is an essential element to provide mid-course discrimination and track updates.

Until we complete operationally realistic testing, we will not have complete confidence that the system is operationally ready. We do, however, currently have deployed an increasingly robust system that provides an emergency capability.

Question. The Missile Defense Agency has not been able to conduct a successful test even of the highly scripted series currently underway since October 2002? How can the system have any credibility?

Answer. The Ground-based Midcourse Defense System has proven Hit-to-Kill technology works, and that far-flung sensors, command & control components and interceptors can work together to kill a threat target. It has done this not only through 5 successful flight tests, but also through significant integrated ground testing of the software/hardware-in-the-loop, providing confidence that the system will perform as designed.

The Agency was not successful on recent flight tests, two of which failed to launch the interceptor. However, we have root caused the problems, implemented corrective actions, and brought in two separate teams of experts to independently assess these and other processes across the program. The Independent Review Team (IRT), led by Dr. Bill Graham, reviewed the flight failures, and recommended process changes to address flaws that they identified. The Director, MDA then established the Mis-

sion Readiness Task Force, including elements of GMD and Boeing, under the command of RAdm Kate Paige to implement changes as necessary to assure a GMD system that is ready and able whenever called upon by an operational commander, or a test director, based on recommendations from the IRT, GMD & Boeing initiatives, and her own Task Force.

The successful testing that has been accomplished to date does not excuse the recent flight failures, but it does put the condition of the system in perspective and provide confidence that we do indeed have a thin line of defense available to us today.

Examples of the successful testing accomplished over the last one-two years follow:

Four software/hardware-in-the-loop Integrated Ground Tests, and four System Integration and Check-Out Tests using the actual deployed system. Integrated Ground Tests use a software and hardware-in-the-loop configuration in the laboratory to test the system against an array of threat scenarios. Approximately 80 percent of the laboratory ground test configuration is the real Ground-based Midcourse Defense Software/Hardware and the remaining 20 percent is simulated. The simulated portions of the test configurations are accredited to represent the threat, environments, and those portions of the system such as interceptor fly out, that are not possible in a laboratory. A comprehensive set of System Integration and Check Out tests on the deployed system certify that the Ground-based Midcourse Defense interfaces are fully operational in a fielded environment.

Ground-based Midcourse Defense conducted a successful flight test of the operational configuration of the booster vehicle in January 2004.

During IFT–13C and IFT–14, the two recent flight tests where the interceptor failed to launch, we were able to test the command and control components and their ability to accurately generate sensor, communications and weapons task plans necessary to automatically initiate the interceptor launch process.

IFT–13C and IFT–14, as well as the Integrated Ground Tests and System Integration and Check Out Tests, exercised the warfighting procedures, with soldiers under operational command operating the warfighting consoles and operational test agencies observing and evaluating.

Question. The United States has been vigorously pursuing a national missile defense for many years. Do you believe that our program has served as a deterrent on the nuclear weapons aspirations of either the Iranians or the North Koreans?

Answer. I have not seen any evidence that would indicate that either North Korea or Iran has been deterred in their nuclear weapons aspirations by our program. I am certain, however, that the serious commitment the United States has demonstrated to developing and fielding effective missile defenses has greatly complicated the ability of North Korea and Iran to threaten the United States with nuclear weapon delivery systems.

SUBCOMMITTEE RECESS

Senator STEVENS. Our subcommittee will now stand in recess until next Tuesday, May 17, when we receive testimony from public witnesses concerning the President's budget request. That will be an almost all-day hearing.

Thank you very much.

[Whereupon, at 10:59 a.m., Wednesday, May 11, the subcommittee was recessed, to reconvene at 2:30 p.m., Tuesday, May 17.]