

**Unclassified Statement of**

**Lieutenant General Henry A. Obering III, USAF**

**Director, Missile Defense Agency**

*Before the*

**House Oversight and Government Reform Committee**

**National Security and Foreign Affairs Subcommittee**

*Regarding*

**Oversight of Missile Defense (Part 3)**

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United States House of Representatives*

**Lieutenant General Henry A. Obering III, USAF**  
**Director, Missile Defense Agency**  
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**April 30, 2008**

Good morning, Chairman Tierney, Ranking Member Shays, distinguished Members of the Committee. Thank you for this opportunity to discuss the important contributions of the missile defense program to the security of our country. As Director of the Missile Defense Agency (MDA), I have the privilege of leading an outstanding group of thousands of men and women who work hard every day to develop, test and field an integrated, layered ballistic missile defense system to defend the United States, deployed forces, and allies and friends against ballistic missiles of all ranges in all phases of their flight.

The Ballistic Missile Defense System (BMDS), which began limited defensive operations in 2004, is becoming more integrated, robust, and global every day. The system already includes fielded assets operated by Air Force, Army, and Navy personnel under the integrated control of Combatant Commanders. We also have fielded transportable and sea-mobile defenses to protect deployed forces, allies, and friends against short- to medium-range ballistic missiles. Tying these assets together is a near-global command, control, battle management and communications capability.

Recent flight tests confirm technological progress and operational effectiveness for short-, medium-, and long-range defensive capabilities. 2007 was a particularly noteworthy year in our missile defense test program. The Missile Defense Agency and

the military services executed a successful long-range ground-based intercept using the Ground-based Midcourse Defense element, six sea-based intercepts of separating and unitary targets (one of those tests used a Japanese destroyer), and three THAAD intercepts of unitary targets.

Our record of international cooperation reflects the growing confidence in missile defense technologies among our allies and friends. With respect to the European Site Initiative, we have completed missile defense negotiations with the Czech Republic, and we are making progress towards reaching an agreement with Poland. Assuming we satisfy congressional requirements to proceed, and assuming the legislative bodies in Poland and the Czech Republic ratify the agreements, the Missile Defense Agency intends to begin site construction for up to ten long-range interceptors and a fixed-site radar in Europe to defend allies and deployed forces in Europe and expand homeland defense against limited Iranian long-range threats. We have undertaken substantive cooperative efforts with several European, Middle Eastern, and Asian nations, and we continue to engage Russian officials and technical experts to discuss threat perceptions and missile defense cooperation.

## **THE BALLISTIC MISSILE THREAT – WHY WE NEED MISSILE DEFENSE**

Let me review why missile defense is so critically needed.

Our National Intelligence Estimates continue to warn that in coming years we will face threats from short-, medium-, and long-range ballistic missiles from a variety of

actors. There were over 120 foreign ballistic missile launches in 2007, significantly exceeding what we observed in previous years. This comes on the heels of a very active 2006, during which time North Korea and Iran demonstrated an ability to orchestrate multiple and simultaneous missile launches involving different ranges.

North Korea's ballistic missile development and export activities remain especially troubling. Currently, North Korea has hundreds of deployable short- and medium-range ballistic missiles. It is developing a new intermediate-range ballistic missile and a new short-range, solid-propellant ballistic missile, which it test-launched in June 2007. Pyongyang continues to press forward with the development of a nuclear-capable intercontinental ballistic missile (ICBM). While the firing of the Taepo Dong 2 in July 2006, launched together with six shorter-range ballistic missiles, failed shortly after launch, North Korean engineers probably learned enough to make modifications, not only to its long-range ballistic missiles, but also to its shorter-range systems. North Korea's advances in missile system development, particularly its development of new, solid fuel intermediate-range and short-range ballistic missiles, could allow it to deploy a more accurate, mobile, and responsive force. North Korea's nuclear weapons program makes these advances even more troubling to our allies and the commanders of our forces in that region.<sup>1</sup>

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<sup>1</sup> Oral Statement by the Director of the Defense Intelligence Agency, Lieutenant General Michael D. Maples to the Senate Select Committee on Intelligence Annual Threat Assessment Hearing, 5 Feb 2008, <http://www.dia.mil/publicaffairs/Testimonies/Statement29.pdf>; Current and Projected National Security Threats to the United States, Lieutenant General Michael D. Maples, U.S. Army Director, Defense Intelligence Agency, Statement for the Record, Senate Armed Services Committee, 27 February 2007, <http://www.dia.mil/publicaffairs/Testimonies/statement28.html>.

Iran has the largest force of ballistic missiles in the Middle East (several hundred short- and medium-range ballistic missiles), and its highly publicized missile exercise training has enabled Iranian ballistic missile forces to hone wartime skills and tactics. In addition to its uranium enrichment activity, Iran continues to pursue newer and longer-range missile systems and advanced warhead designs. Iran is developing an extended-range version of the Shahab-3 that could strike our allies and friends in the Middle East and Southeastern Europe as well as our deployed forces. It is also developing a new Ashura medium-range ballistic missile capable of reaching Israel and U.S. bases in Eastern Europe.<sup>2</sup> Iranian public statements also indicate that its solid-propellant technology is maturing. With its significantly faster launch sequence, a new solid-propellant missile would be an improvement over the liquid-fuel Shahab-3.<sup>3</sup>

Iran has reportedly bought a new intermediate-range ballistic missile (IRBM) under development by North Korea,<sup>4</sup> underscoring the urgent need to work with our allies in the North Atlantic Treaty Organization (NATO) to field and integrate long-range missile defenses in Europe. Iran's development of a space launch vehicle using technologies and designs from its ballistic missiles is equally troubling. The Defense Intelligence Agency estimates that Iran could have an ICBM capable of reaching the United States by 2015.<sup>5</sup>

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<sup>2</sup> Statement of Lieutenant General Michael D. Maples, 5 February 2008.

<sup>3</sup> Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January to 31 December 2005, Central Intelligence Agency, <http://dni.gov/reports/CDA%2011-14-2006.pdf>.

<sup>4</sup> Statement of Lieutenant General Michael D. Maples, 5 February 2008.

<sup>5</sup> Current and Projected National Security Threats to the United States Vice Admiral Lowell E. Jacoby, U.S. Navy Director, Defense Intelligence Agency Statement For the Record Senate Armed Services Committee, 17 March 2005, <http://www.dia.mil/publicaffairs/Testimonies/statement17.html>

Syria is working to improve its ballistic missile capabilities and production infrastructure. Today Syria is capable of striking targets in Israel and Turkey, our southern NATO partner, using rockets and ballistic missiles. Syria can produce longer-range Scud-variant missiles using considerable foreign assistance from countries such as North Korea and Iran.<sup>6</sup>

Our critics have downplayed the risks posed by ballistic missiles, and I disagree with some of their assessments. Some missile defense critics maintain the risk to national security of a weapon of mass destruction being smuggled into the United States by ship, truck or aircraft is far greater than the risks posed by ballistic missiles, and that smuggling is the only realistic option available to a terrorist group like al Qaeda. It is assumed that because a weapon is smuggled, it is untraceable and therefore this way of attack would offer anonymity.

Smuggling is not the only form of attack that can be accomplished anonymously. It may be possible, for example, for a terrorist group to acquire a ballistic missile that may be launched off the deck of a freighter against a coastal target. Yet the fact remains that ballistic missiles actually were used in two recent conflicts without concern for anonymity. Ballistic missiles have been used over the past two decades to further military ends, coerce political leaders, and provide regional prestige to governments. Iran, for example, has threatened to wipe Israel off the map, and it has boasted that it has the military capabilities, that is, the ballistic missiles, to accomplish that. Iran has also

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<sup>6</sup> Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January to 31 December 2005, Central Intelligence Agency.

threatened to retaliate, if provoked, by firing its ballistic missiles in mass across the Middle East, striking Arab states and Israel. The missile parades in countries like Iran and North Korea serve as ominous reminders to other states.

During Operation Iraqi Freedom, several conventionally armed ballistic missiles actually were launched against coalition forces and were engaged successfully by U.S. missile defenses deployed to the region. Ballistic missiles were the weapon of choice. In fact, one can make the case that some countries are replacing their national air forces with ballistic missiles.

We do know that potential adversaries of the United States are working very hard, spending a significant portion of their limited national resources, to acquire ballistic missiles and weapons of mass destruction. Clearly, our armed forces must be prepared to counter all threats to the nation and our interests abroad. The possibility of a threat posed by weapons of mass destruction smuggled into our country is clear enough, but so too is the threat posed by ballistic missiles armed with nuclear, biological, chemical, or high-explosive munitions.

Critics of missile defense also assume activities associated with ballistic missile and nuclear weapon development and operation would be readily detected by the intelligence services of the United States and its allies and friends and any threat dealt with promptly. We should not assume that we have a precise or full understanding of ballistic missile activities around the world. We have been surprised in the past. Most notably, we were surprised by North Korea's launch of a No Dong ballistic missile in 1993 and a long-range Taepo Dong ballistic missile in 1998. The nuclear weapon tests

conducted by India and Pakistan in 1998 and the detonation of nuclear material by North Korea in 2006 also caught the intelligence community by surprise.

Some of our critics have noted that only five countries currently have a capability to develop, test, and field ICBMs with nuclear warheads. While I accept the conclusion that the technical, organization, and management challenges associated with deploying ICBMs are daunting, the ability of another country to overcome such challenges, especially in the current proliferation environment, and to acquire a long-range attack capability is well within the bounds of the possible. I would note that the proliferation of foreign ballistic missiles and nuclear expertise, technology, and systems have drawn down many of the barriers to long-range ballistic missile development present during the Cold War. Today we are witnesses to long-range missile development in countries that are hostile to the United States, most notably North Korea and Iran.

Other countries now are able to develop ballistic missile systems on shortened timelines compared to what was possible during the Cold War. Much of the investment by governments interested in ballistic missiles is spent to increase the size, range, and accuracy of their ballistic missile forces. Many of these technologies and systems are now available on the global market. We have evidence of whole missile systems being transferred from one country to another. Importantly, some of the countries acquiring ballistic missile forces today also support terrorist groups. Iran is known to have assisted Hezbollah forces in the Middle East by supplying rockets carrying conventional munitions, which terrorist forces used to target Israeli cities in 2006. Already this year Palestinian militants have fired imported rockets into Israeli border towns.

So why would potential adversaries of the United States invest a significant share of their resources to develop ballistic missiles if, as our critics claim, it is easier to smuggle a weapon across our borders? The answer is that ballistic missiles offer significant military and political utility. Ballistic missiles provide a capability to swiftly strike populations and military targets hundreds or even thousands of miles away. These weapons offer a way to counter asymmetrically the conventionally superior armed forces of the United States. Ballistic missiles may be used to intimidate, coerce, or deter a larger power such as the United States and achieve a political or military end without firing a shot. For all these reasons, the acquisition of ballistic missiles remains a high defense priority in many countries.

We have had experience with tragic hostage situations involving individuals, and we have witnessed how enemy forces, to include non-state actors, have attempted to use hostages to coerce or blackmail us or our allies, oftentimes without fear of reprisal. Indeed, with the attacks of September 11, 2001, we have direct experience dealing with non-state actors, terrorist forces who strike without warning and without fear of consequences. Imagine an entire city held hostage by a state or a terrorist organization with ballistic missiles. Our nation was vulnerable to this threat prior to 2004. We must continue to make every effort to prevent that possibility from occurring again.

While it is true that we do not face the same ballistic missile threat we faced during the Cold War, when the Soviet Union targeted and placed on alert thousands of warheads against us, we need to be cautious about minimizing the consequences of even a single nuclear-tipped ballistic missile that reaches its target. It only takes one ballistic

missile carrying a nuclear or biological payload to inflict catastrophic damage on a city. While we would be able to retaliate militarily for a nuclear attack against one of our cities and punish the attackers, the unthinkable loss of life and trillions of dollars in economic losses would have already been inflicted. Simply stated, would it not be better to save lives by stopping such an attack in the first place rather than to inflict punishment on the enemy after the fact? With missile defense, we gain another option on the spectrum of possible diplomatic and military responses to a threat or an attack, an option other than deterrence or retaliation. I believe the ability to protect against threats of coercion and actively defend our forces, friends and allies, and homeland against ballistic missiles is essential to our national safety, today and in the future.

#### **MISSILE DEFENSE PROGRAM BENEFITS TO THE NATION**

Throughout the 1990s we made tremendous technological advances in computer processing, sensor and propulsion technologies, and light-weighting of materials, a reality that was reflected in national policy-making at the time. The 1990s were also a time rogue states were expanding the size and sophistication of their ballistic missiles arsenals. The bi-partisan Congress recognized the threat to our nation and the critical importance of fielding effective missile defenses when it passed the National Missile Defense Act of 1999, which the President signed into law in 1999. It became U.S. policy to deploy missile defenses “as soon as technologically possible” to defend the United States against limited ballistic missile attacks.

By 2001 the Bush Administration concluded that non-nuclear ballistic missile defense using hit-to-kill technologies had proven itself to be technologically possible and directed the deployment of a limited ballistic missile defense capability. Not only had most of the well-publicized flight tests been successful, but we also gained confidence in the feasibility of a missile defense capability through sophisticated computer simulations and ground tests. So in January 2002, the Secretary of Defense directed the Missile Defense Agency to restructure the missile defense program to deal with the urgency, enormity and complexity of developing, testing and building a missile defense system. This required the adoption of an evolutionary acquisition strategy to be executed by a single agency, a strategy that relies on continual assessments of the threat, available technology, and what can be built and fielded to provide a militarily useful capability in an urgent manner.

Having capitalized on our steady progress since the 1980s, we delivered to the Combatant Commanders in 2004 an initial missile defense capability to defeat the near-term long-range missile threat. Supported by an extensive command, control, battle management and communications (C2BMC) infrastructure, we connected additional system elements to the fire control system and put in place trained system operators, the logistics support infrastructure and support centers required for limited operations.

To date, we have made significant, unprecedented strides to deliver a capability where none existed before, one of the most complex defensive systems ever envisioned. And we did so while sustaining an aggressive development program that continues to feed new technologies into the system.

The missile defense investments of four Administrations and eleven Congresses in all aspects of missile defense, or roughly \$115 billion through the FY 2008 budget, are paying off. With the initial deployment of a limited missile defense capability, the era of absolute vulnerability of our country to a long-range missile attack came to a close. This is important, because I believe a capability against even a single reentry vehicle has significant military utility. The modest long-, medium-, and short-range defensive capabilities we have today can help reduce the more immediate threats to our security and enhance our ability to defend our interests abroad.

I would like to review briefly our current fielding plan and explain the capabilities we have available today and expect to field in the near future. We have nearly completed deployments to defend the United States against a North Korean long-range missile and are well along in delivering missile defense force structure that contributes to the defense of our deployed forces, allies and friends. Subsequent deliveries will build on these long- and short-range defenses to improve protection of the U.S. homeland and provide increased protection for our forces and regional allies. We also are working closely with NATO and our European partners to provide our allies protection against ballistic missiles launched out of the Middle East.

This past year we saw an unprecedented pace of fielding of an integrated missile defense capability. In 2007 we emplaced 10 ground-based interceptors, for a total of 24 long-range interceptors in missile fields at Fort Greely, Alaska and Vandenberg Air Force Base, California. In 2008 we plan to increase interceptor inventories up to a total of 30 at the two sites. By 2011, we plan to expand our inventory of long-range interceptors up to 44 in the United States.

By the end of 2008, we will have 18 Aegis BMD ships that contribute to long-range defense by passing early detection, cueing, and tracking data across communications lines into BMD system communication and battle manager nodes located at Fort Greely and in Colorado Springs.

The transportable forward-based X-band radar at Shariki Air Base, Japan provides precise early detection and tracking to increase the probability we will destroy any lethal target launched by North Korea. In 2007 the Sea-Based X-band radar (SBX) completed crew training and testing off the coast of Hawaii and transited to the North Pacific to conduct a cold weather shakedown off Adak, Alaska, where it will be home-ported in 2009, and it is available to the warfighter for emergency operations during 2008. The SBX participated in system flight tests this past year, including the September 28 long-range intercept test and the December 17 engagement of a medium-range separating target at sea by our ally, Japan. This year the radar will again participate in a long-range intercept test.

Since 2002 we have expanded and improved terminal and midcourse defenses to defeat short- and medium-range threats from land and sea, protecting the forces we deploy abroad and our allies and friends. We began fielding SM-3 interceptors in 2004. We will have 38 in inventory by the end of 2008. By year's end, each of the 18 Aegis BMD ships-- 15 destroyers and 3 cruisers-- will have engagement capabilities. We also are upgrading the Aegis BMD weapon system, and the Navy is upgrading the SM-2 Block IV missile, the goal being to deploy up to 100 interceptors to provide a near-term sea-based terminal engagement capability on 18 Aegis BMD ships beginning in 2009.

We are working closely with the Army to develop and begin fielding in 2009 two Terminal High Altitude Area Defense fire units, with full delivery of the first two fire

units by 2010 and 2011 and delivery of the fire units 3 and 4 in 2013. THAAD is uniquely designed to intercept targets both inside and outside the Earth's atmosphere. Consisting of 48 interceptors and the associated radars and C2BMC, THAAD will provide transportable terminal protection from short- to medium-range ballistic missiles for our troops and our allies.

We are also upgrading key radars needed for protection of the United States- the upgraded early warning radars at Beale Air Force Base in California, Fylingdales in the United Kingdom, and Thule in Greenland. This past year we completed operational testing of the radars at Beale and Fylingdales and made them available to the warfighter for emergency situations. Together with the early warning radars in the United Kingdom, the Thule radar, which we will begin to integrate into the system in 2009, will ensure coverage of the United States against threats from the Middle East.

By devaluing Iran's longer-range missile force, European missile defenses could help dissuade the Iranian government from further investing in ballistic missiles and deter it from using those weapons in a conflict. We believe the long-range defense assets we are planning to deploy to Central Europe offer the most effective capability to defeat this threat. The sensors, interceptors, and C2BMC infrastructure planned for deployment in Europe are needed to improve protection of the United States and, for the first time, extend coverage to all European NATO allies vulnerable to long-range ballistic missile attack from Iran. This work focuses on upgrade and deployment of the test bed midcourse X-band radar, currently located at the Kwajalein test site, to the Czech Republic and the

establishment of an interceptor field in Poland, pending agreements with both governments.

Several countries in southern Europe do not face threats from projected Iranian long-range missiles. Yet these same countries are vulnerable to the shorter-range ballistic missiles currently fielded by Iran and Syria. Mobile intercept systems such as Aegis BMD, THAAD, and Patriot can be augmented by other sensors, like the European Midcourse Radar, and can engage slower short- to medium-range ballistic missile systems. Together with other NATO missile defense assets, these missile defense forces could protect European countries vulnerable to short- and medium-range ballistic missiles when integrated into the NATO command and control structure.

What has the nation received for its investment in missile defense? We have successfully leveraged advanced technologies developed over the past twenty-five years and engineered a one-of-a-kind system of integrated layered defenses to provide our nation's cities, our sons and daughters deployed to regions of conflict, and friendly nations protection against limited missile attack. Much of that investment remains untapped, of course, such as the considerable work done on space defenses. It is important to note that only a portion of this investment in missile defense could be said to have been allocated to the development and fielding of long-range, or "strategic," defenses – roughly \$64 billion through FY 2008. This \$64 billion figure not only includes work conducted on Ground-based Midcourse Defense and National Missile Defense, it also includes the legacy work on these ground-based defenses and more future-oriented capabilities represented by space-based interceptors and sensors. We are

not able to leverage much of the space-related work today because of the termination of missile defense space programs back in the 1990s. About \$48 billion was spent through FY 2008 developing and fielding defenses against shorter-range missiles to protect our troops and our allies. Of course, the successes we have with our long- and short-range, or regional and strategic, defenses have applicability across the spectrum of missile defense capabilities, and we can apply lessons learned in each functional area across the system.

Today our armed forces have available a real capability that our nation's leaders can use to achieve a military victory, stabilize a crisis, and minimize dangers to the American people. In fact, we already have real-world examples that help shed light on how useful a missile defense capability is to the United States today.

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. Indeed, Patriot Advanced Capability (PAC)-3 proved to be exceptionally effective during Operation Iraqi Freedom, when PAC-3 and PAC-2 GEM systems destroyed all threatening short-range ballistic missiles. At least one of the ballistic missiles destroyed had been on a course to strike a command base in Qatar. Thanks to our missile defenses, it did not reach its target.

When the North Koreans conducted their launches in the summer of 2006, for the first time in the history of the United States we had the capability to defend our nation's

cities against a long-range missile had it been necessary. Working closely with U.S. Strategic Command, we successfully took the system out of the development mode and handed it over to the warfighter for operation.

Alert activities included activation of the Ground-based Midcourse Defense and the deployment of a missile defense capability to the Sea of Japan. We had Aegis long-range surveillance and track ships stationed east and west of Japan and a forward-based X-band radar at Shariki Air Base, Japan during the missile firings. Had there been a successful long-range launch, data collected from these sensors would have helped identify whether it was a ballistic missile or a space launch vehicle and would have provided tracking data to the system. The situational awareness displays were operational and being monitored at the various commands. Given these events from the summer of 2006 and our ability to bring the system on line and prepare it for emergency use, I am very confident that the system would have operated as designed had the Taepo Dong-2 threatened the United States. Because we had a defense option, our leaders did not have to choose proposed alternative responses, one of which was to preemptively destroy the missile launch site, to minimize the threat to the country.

Finally, in February 2008 the Department of Defense called on our country's missile defenses to destroy a large tank of toxic fuel onboard an out-of-control U.S. satellite about to reenter the Earth's atmosphere. The uncertainty of when and where the satellite would reenter, and the near certainty that the fuel tank would survive reentry and possibly break up on Earth, drove the urgency of this mission. Using an extensively modified SM-3 interceptor and a modified Aegis Weapon System onboard the USS Lake Erie, the Navy

successfully destroyed the tank. The Department undertook this operation, carefully choosing an intercept altitude that would not add to the debris currently in orbit, to protect against the possible risk to life that a natural reentry of the satellite could have posed. After engagement, the toxic hydrazine dissipated in space, and, by now, most of the debris from the satellite body has burned up in the Earth's atmosphere.

This was a very successful joint mission involving the Navy, U.S. Strategic Command, the Missile Defense Agency, the National Aeronautics and Space Administration, the National Reconnaissance Office, and other national security offices. Missile Defense Agency engineers worked closely with the Navy to modify the interceptor and the Aegis weapon system for this one-time engagement. This was a case where the missile defense system was unexpectedly pushed into service and performed exceptionally well. While this stands as an example of what the nation received for its investment in missile defense, I want to be clear that it does not represent an operational anti-satellite capability. The time and level of technical expertise it took to plan and orchestrate this mission, the split-second fragility of the once-per-day shot opportunities, and the relatively low altitude of the satellite's decaying orbit did not approach the responsive and robust capability that would be needed to attack enemy space assets in wartime.

There is one real-world example where missile defense did not play a role that provides an important lesson – the September 11, 2001 terrorist attacks on our country. According to the Government Accountability Office, the direct cost of the September 11, 2001 attacks to New York City was \$83 billion – and that was an attack that did not

involve a weapon of mass destruction.<sup>7</sup> As I indicated earlier, a ballistic missile attack against even just one of our cities, especially if that attack involved nuclear or biological weapons, would likely kill thousands, if not tens of thousands, of Americans and cause several trillion dollars in damages.<sup>8</sup> I think we need to keep these prospects in mind as we examine the investments we have made in missile defense over the past twenty-five years.

## **MISSILE DEFENSE TESTING**

When the President charged the Missile Defense Agency with fielding an initial system in 2004, we had to take some risks and pursued technology development even as we were fielding capabilities. The system we fielded relied significantly on legacy technologies, to include the long-range interceptors, which we retrofitted to make them a critical part of the initial, limited integrated system. We were able to put in place a capability, a backbone of sensors, weapons, C2BMC, where none existed before 2004. At this point, we could begin to test and improve the system incrementally.

We were able to deploy beginning in 2004 because of the confidence we achieved through our testing program between 2000 and 2002, especially testing involving the long-range interceptor prototype. In 2002 and 2003, we successfully conducted four of five intercept tests against shorter-range targets using a prototype version of the sea-based Aegis SM-3 interceptors we are deploying today. These tests demonstrated the basic

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<sup>7</sup> Government Accountability Office Briefing, May 29, 2002, <http://www.gao.gov/new.items/d02700r.pdf>; William C. Thompson, Jr. (New York City Comptroller), "One Year Later: The Fiscal Impact of 9/11 on New York City," September 4, 2002.

<sup>8</sup> See Pacific Northwest National Laboratory, "Thinking about the Unthinkable: Economic Consequences of Nuclear Attack," January 27, 2006, PNNL-SA-46083, [http://environment.pnl.gov/accomp/prodline/prodline\\_detail.asp?id=540](http://environment.pnl.gov/accomp/prodline/prodline_detail.asp?id=540)

viability and effectiveness of a system that relies primarily on hit-to-kill technologies to defeat in-flight missiles. We had learned as much as we could with the long-range interceptor prototypes and decided it was time to restructure the Ground-based Midcourse Defense program to accelerate the testing of the initial operational configurations of the system elements. The successful testing we have had to date tells me this was the right decision.

Now that we have a basic system in place, we no longer have to take significant risk. Our capability-based acquisition model actually follows a “fly-before-you-buy” construct. We have in place a disciplined process to deliver early, partial, and full capabilities, with significant developmental and operational testing events throughout. We do not follow the Defense Department’s traditional requirements process, laid out in the Joint Capabilities Integration and Development System (JCIDS), but do follow the acquisition principles in DoD Directive 5000.1. However, MDA does not follow the Milestone review process in DOD Instruction 5000.2. Given the complexity of the missile defense mission and the urgency to respond to the threat, in 2002 the Secretary directed MDA to try a different approach, and this new approach has been effective in delivering missile defense capability to the warfighter in a timely and disciplined manner.

We have consistently pursued a comprehensive and integrated approach to missile defense testing and are gradually making our tests more complex. Missile defense testing has evolved, and will continue to evolve, based on results. We have a system available for operational use today, a system evaluated by U.S. Strategic Command to have military utility, because of the capability-based acquisition approach we have followed

since 2002. This approach leverages collaboration with the warfighting community throughout development and testing to the point where we transition or transfer capabilities to the operators.

Testing under operationally realistic conditions is an important part of maturing the system. We have been fielding test assets in operational configurations in order to conduct increasingly complex and end-to-end tests of the system. Comprehensive ground tests of the elements and components precede each flight test. Our flight tests increasingly introduce operational realism, limited by environmental and safety concerns. Each system test builds on knowledge gained from previous tests and adds increasingly challenging objectives.

The Director, Operational Test and Evaluation (DOT&E), the Operational Test Agencies (OTA), and the warfighting community are very active in all phases of test planning, execution, and post-test analysis, to include development of an Integrated Master Test Plan. The plan documents the combined developmental and operational test approach that focuses on increasing operational realism. DOT&E and OTA participate independently in our Combined Test Force planning, test, and data analysis activities to integrate operational test and warfighter requirements into a system-wide test program, which enables independent operational assessments. The Agency also uses the warfighter's input to develop test objectives that evaluate new concepts of operations and exercise the warfighter's tactics, techniques, and procedures. Using criteria established by the warfighter and the Agency's system engineers, all ground and flight tests provide

data that we and the operational test community use to anchor our models and simulations and verify system functionality and operational effectiveness.

Last year alone we successfully intercepted targets in 10 of 10 attempts. Since 2001 we have successfully demonstrated 34 of 42 hit-to-kill intercepts. None of the failures we experienced in the missile defense program was a result of problems with underlying missile defense technologies. All flight-test failures occurred in components or software, which we fixed. Three of the eight failures occurred during tests of the PAC-3, which has already been combat-proven in Operation Iraqi Freedom.

In 2007 the Missile Defense Agency conducted 25 major tests and successfully met our objectives in 18 of 20 flight tests. In doing so, we used the test ranges available to us today to maximum capacity. Our flight test program for Ground-Based Midcourse Defense, Aegis BMD, and Terminal High Altitude Area Defense confirmed technological progress for short-, medium-, and long-range defensive capabilities.

After a legacy target failure in May 2007, we successfully completed Ground-based Midcourse Defense Flight Test-03a on September 28, 2007. In this test, an operationally configured ground-based interceptor launched from Vandenberg Air Force Base engaged a threat-representative intermediate-range target fired from Kodiak Island, Alaska using sensor information from the operational upgraded early warning radar at Beale Air Force Base in California. Trained crews manning fire control consoles reacted within a specified window under limited-notice launch conditions. This test leveraged fielded hardware and fire control software as well as operational communications, tracking, and reporting paths. The Exo-atmospheric Kill Vehicle successfully collided

with the target near the predicted point of impact, destroying it. According to the Director, Operational Test & Evaluation, FTG-03a “incorporated operational realism consistent with the maturity of the fielded system” and “demonstrated an end-to-end test of the system.”

The growth in our confidence in this system’s effectiveness is directly tied to our rigorous test program and our ability to practice with the system in operationally realistic ways. By having a system, even a limited system, in place that we can make operational in times of crisis, we compel our adversaries to ask themselves a very important question: do we gamble that the American missile defense system will not work?

We have been asked why we have not conducted more tests of the long-range defenses to date. The answer is that we have found it very difficult to do more than one or two a year. One of the reasons these flight tests are so expensive, upwards of \$100 million a test or more, is that we employ several data collection assets. We want to make sure we capture every piece of information about the test that we possibly can. The result is that we collect so much data with each test that it takes months just to sift through it, catalogue it, and analyze it properly. It is important we understand the data from a flight test before we move on to the next test of a similar system element. Each test is intended to shed new light on the system technologies and integration. We do not want to conduct a test just to conduct a test, a reality that brings us to one or two long-range tests a year.

Our integrated ground tests, which involve the operational long-range defense elements and employ the actual operational hardware, have been enormously successful. We test the system end-to-end by simulating engagements. These ground tests,