

# PHASED ADAPTIVE APPROACH

Administration's new missile defense strategy is discussed with Senate Armed Services Committee.

2009 has been a year of change for the U.S. missile defense program. With the recent developments to the strategy of defense and protection of our European allies, *Military Space & Missile Forum*, the publication on record for military defense, wanted to share with our readers the September 24, 2009 Senate Armed Services' committee testimony of Lieutenant General Patrick J. O'Reilly, director, Missile Defense Agency; Under Secretary of Defense for Policy Michèle A. Flournoy; and Vice Chairman of the Joint Chiefs of Staff General James E. Cartwright. The topic was European Missile Defense and they addressed not only the new operational philosophy and strategy but the technical components as well.



# *New Approach to Missile Defense*

**IN LATE SEPTEMBER UNDER SECRETARY OF DEFENSE FOR POLICY MICHÈLE A. FLOURNOY AND VICE CHAIRMAN OF THE JOINT CHIEFS OF STAFF GENERAL JAMES E. CARTWRIGHT TESTIFIED BEFORE THE SENATE ARMED SERVICES COMMITTEE ON THE TOPIC OF EUROPEAN MISSILE DEFENSE.**

Thank you, Chairman Levin, Senator McCain, and members of the committee. We appreciate the opportunity to discuss the administration's new approach to missile defense in Europe, and to set the record straight that the Obama administration is committed to deploying timely, cost-effective, and responsive missile defenses to protect the United States, our deployed forces, as well as our allies and friends against ballistic missiles of all ranges.

We are confident that our new approach represents a dramatic improvement over the program of record. Under the old plan, we were not going to be able to deploy a European missile defense system capable of protecting against Iranian missiles until at least 2017. Under our new plan, we'll be able to protect vulnerable parts of Europe and the tens of thousands of U.S. troops stationed there by the end of 2011. And we'll also be creating a far more flexible missile defense system, one that can be adapted to provide better protection against emerging threats.

Before going into details, I would like to place this decision about European missile defense in context. As you know, we are in the midst of several major defense reviews, one of which is a congressionally mandated review of our approach to ballistic missile defense. DoD is leading that review, with active participation from the intelligence community and a number of other agencies. That review is comprehensive and ongoing; it examines our strategic and operational approach to missile defense not just in Europe but around the world.

The review is moving forward based on four key principles:

- We must ensure that U.S. missile defenses are responsive to the threats we face today and are likely to face in the future, that the technologies we use are proven and effective, and that our defenses are cost effective;

- We must maintain and improve defenses for the U.S. and our allies against potential missile attacks from countries such as Iran and North Korea;
- We must renew our emphasis on protecting U.S. deployed forces and their dependents in theater, as well as U.S. allies and friends against regional threats; and
- We must continue to make missile defense an important feature of our international cooperation efforts.

The results of the Ballistic Missile Defense Review are not due back to Congress until January, but as we began our in-depth analysis, it became clear very early that circumstances had changed fundamentally with regard to missile defense in Europe, so that we would need to make some significant adjustments to the previous administration's plan.

In early 2007, the previous administration decided to seek deployment of ground-based interceptors in Poland, a European mid-course radar (EMR) in the Czech Republic, and an AN/TPY-2 radar elsewhere in the region. The decision to move forward with that particular configuration was made nearly three years ago, and had been considered for several years prior to that, based on the threat information and the technologies available at that time.

Circumstances have changed significantly since early 2007. First, we now have a rather different intelligence picture than we had three years ago, particularly with regard to Iranian capabilities. And second, we have made major strides in missile defense technologies and capabilities in just the last few years. We are now in a position to put an effective missile defense system in place far more rapidly than we were a few years ago, one that will be far more flexible, adaptable, and capable.

The intelligence community now assesses that the threat from Iran's short- and medium-range ballistic missiles is developing more

rapidly than previously projected, while the threat of potential Iranian intercontinental ballistic missile (ICBM) capabilities has been slower to develop than previously estimated. In the near term, the greatest missile threats from Iran will be to U.S. allies and partners, as well as to U.S. deployed personnel—military and civilian—and their accompanying families in the Middle East and in Europe.

Iran already possesses hundreds of ballistic missiles capable of reaching neighbors in the Middle East, Turkey and the Caucasus, and is actively developing and testing missiles that can reach further into Europe. Our intelligence assessments indicate that the continued production and deployment of these more capable medium-range missiles has become one of Iran's highest missile priorities.

In the near- to mid-term, this means that the primary threat posed by Iranian missiles will be to U.S. allies, our 80,000 deployed forces in Europe, our civilian personnel and their families. And needless to say, this concern is all the more urgent in light of Iran's continued uranium enrichment program. Iran continues to defy international obligations, and there continues to be reason to fear that Iran is seeking a nuclear weapons option.

We hope that won't come to pass. But obviously it increases the urgency of developing a truly effective missile defense system in Europe for the protection of NATO territory and populations and the U.S. homeland.

As the Secretary of Defense has noted, we understand that the intelligence projections can be wrong, which makes it all the more important for us to have a flexible and adaptable missile defense system that can evolve with the threat. So we remain very concerned about Iran's potential to develop ICBMs, and part of our new approach in the later phases is to provide a more effective addition to our already existing ground-based interceptors based in Fort Greely and Vandenberg Air Force Base, which we will address in detail in a minute.

Let us turn now to the opportunities for improved capabilities.

Technological developments over the past several years have led to new capabilities, demonstrated in multiple tests. Improved interceptor capabilities now offer us more flexible and capable missile defense architecture, and we have also significantly improved our sensor technologies. That means we now have a variety of better options to detect and track enemy missiles and guide the interceptor in-flight to enable a successful engagement. As a result, we now have new and proven missile defense options that were not previously available.

The previous plan, approved in early 2007, relied on two large, fixed missile-defense sites, with 10 ground-based interceptors in Poland and the EMR in the Czech Republic.

It was designed to identify and destroy up to about five to 10 long-range missiles, and as noted, the radar and interceptors called for under the old plan would not have been in place until at least 2017.

Our new approach, which the president adopted on the unanimous recommendation of the secretary of defense and the Joint Chiefs of Staff, will rely on a distributed network of sensors and SM-3 interceptors. The SM-3 IA is a proven capability with eight successful tests since 2007, and it is more than capable of dealing with current threats from even multiple short- and medium-range missiles. It and future variants also have many advantages over a ground-based interceptor (GBI). The SM-3 is much smaller, weighing only about 1 ton compared to the GBI's 25 tons. Because it is smaller and fits inside a vertical launch canister, it can be fired from Aegis capable ships. Starting with the SM-3 Block IB, it will also be able to be fired from land.

The capability of having a missile defense system that can integrate interceptor sites located both at sea and on land offers us geographic flexibility that was unavailable under the previous plan. Furthermore, the resulting distributed network is more survivable in the case of an attack than the single large radar and single missile field of the previous plan. The SM-3 IA and IB, at around \$10 million per interceptor, are also much cheaper than a GBI, which costs around \$70 million per interceptor. This means that we can deploy scores of SM-3 interceptors, again enhancing our defensive capabilities. Since

Iran already possesses hundreds of short- and medium-range ballistic missiles, this is critical.

The SM-3 will be upgraded over time. Each upgrade will provide more capability for countering Iranian threats, meaning each upgrade will be able to defend an increasingly larger area.

Our planned European missile defense architecture includes both sea- and land-based missile defense systems, encompassing both interceptors and a range of sensors. As our capabilities and technologies continue to improve, the architecture will evolve and become ever more capable.

Now to describe our phased adaptive approach. Phase 1 is essentially under way; the SM-3 Block IA is already deployed in the fleet. In the first phase of our plan, we can provide SM-3 Block IA capable warships when necessary for the protection of parts of southern Europe. To enhance protection in Phase 1, we will need a forward based sensor, probably a TPY-2 radar.

By including the forward based sensor, we are retaining one of the most significant contributions to the defense of the United States from the previously proposed architecture. The forward based sensor contributes to the defense of the United States by providing early and precise track data to our GBIs in Alaska and California. We expect that full Phase I missile defense capability will be possible in 2011.

In Phase 2, to be completed by 2015, we intend to use a more advanced version of the SM-3 interceptor, the SM-3 Block IB, which is already under development. We will deploy this at sea and on land. By adding the land-based sites, we will significantly increase coverage of NATO against ballistic missiles from Iran without having to increase the number of Aegis BMD ships—a much more cost effective approach.

In Phase 3, we will introduce a new, more capable version of the SM-3, the Block IIA. This interceptor is currently under development. The SM-3 Block IIA will provide full coverage of NATO against short, medium, and intermediate range ballistic missiles. We expect to deploy the SM-3 Block IIA by 2018.

In the final phase, Phase 4, we expect to field an even more-improved SM-3 missile that has anti-ICBM capabilities. This ascent-phase intercept capability will further augment the defense of the U.S. homeland from potential Iranian ICBM threats. This phase is planned for 2020.

It is important to note that the SM-3 based defense against any Iranian ICBMs will be additive to the GBI-based defense we already have deployed in the United States, at Fort Greely and Vandenberg AFB. As noted previously, these U.S.-based defenses will be made more effective by the forward-basing of a TPY-2 radar—which we plan by 2011.

We currently have the ability to defend the United States, including the East Coast, against any Iranian ICBM, and with the TPY-2 deployment planned in Phase 1 and continued improvement of the GBIs, this defense will grow even stronger in the next several years.

While we expect the SM-3 based approach to ICBM defense to work, we also will continue to improve our existing GBI-based system here in the United States and conduct tests of the 2-stage GBI in the near term.

The SM-3's ascent-phased intercept capability in Phase 4 would mean that, unlike the previous administration's GBI-based system, Iranian missiles would have to defeat not one, but two very different kinds of missile defenses.

Over time, we plan on one land-based site in southern Europe and one somewhere in northern Europe. Given the flexibility of the architecture, there are a number of options for land-based sites that would provide the same capability, including in Poland. The mix of sea-and land-based systems makes our new approach far more capable and adaptable; we can move sensors and interceptors from region to region as needed.

This approach allows us to scale up our defenses, if necessary, by deploying additional SM-3 interceptors much faster and at lower costs than adding the much heavier ground based interceptors, and their associated silos. In times of crisis, the system can "flex" by surging Aegis capable ships to the area for more protection and to serve as a visible deterrent. This approach also allows us to deal with a wider range of potential missile tactics, such as salvo launches. The previous GBI architecture could intercept about five to 10 missiles at most; the new plan's distributed network will be able to cope far more effectively should an adversary fire many missiles simultaneously.

Similarly, replacing the fixed radar site with a mix of sensors that are airborne, seaborne and ground-based will allow us to gather much more accurate data, and will offer better early warning and tracking options combined with a stronger networking capacity.

Finally, because it relies on a distributed network of sensors and interceptors, the new approach is more survivable—less vulnerable to destruction or disruption—than the previous plan, which relied on a single large radar and a single interceptor field.

It should be crystal clear that those who say we are "scrapping" missile defense in Europe are, as Secretary Gates has said, "either misinformed or misrepresenting the reality of what we are doing." In fact, we are replacing the previous plan with a phased approach that delivers more effective and more robust capability sooner.

To sum up: the phased adaptive approach offers many advantages over the previous plan for European missile defense. We will now be able to defend the most vulnerable parts of Europe six to seven years earlier than the previous plan. Our new approach will be also able to cover all NATO territory and populations, rather than leaving some allies exposed to short- and medium-range threats. And we will move toward a new additive approach to defending the United States against any future Iranian ICBM—while continuing to enhance our existing GBI-based defenses. Overall, our new approach allows us to better respond to existing threats now—and to better prepare for future threats as they emerge.

Those who assert that the new plan doesn't uphold U.S. security commitments to friends and allies, particularly Poland and the Czech Republic, are far off the mark. This is a better defense for Europe as well as for the United States. All of our missile defense efforts will be complementary of and interoperable with those being developed by NATO, and the new architecture we are creating provides many opportunities for alliance-building and burden-sharing between the United States and our NATO partners.

NATO Secretary General Rasmussen has hailed our decision as "a positive step"; Polish Prime Minister Donald Tusk said it offers a real "chance to strengthen Europe's security."

We remain firmly committed to strong bilateral relationships with both Poland and the Czech Republic and have already begun discussions with both nations about their potential roles in the new missile defense architecture. In the coming weeks, we will have numerous strategic discussions with the Poles on missile defense and our security arrangements. It is prudent that we continue to seek Polish ratification of the missile defense basing agreement and supplemental Status of Forces Agreement.

We are also in discussions with the Czech Republic to ensure that they continue to play a leadership role on missile defense within the alliance. We have several joint projects already under way with our Czech partners, and are discussing several more.

Last week, in addition to visiting Warsaw and Prague to discuss the phased adaptive approach, Under Secretary Flournoy briefed the North Atlantic Council on our new approach and emphasized that we will pursue missile defense in a NATO context. The response was very positive, as evidenced by the NATO Secretary General's comments last week that "it is my clear impression that the American plan on missile defense will involve NATO ... to a higher degree in the future. ... This is a positive step in the direction of an inclusive and transparent process, which I also think is in the interest of ... the NATO alliance."

This phased adaptive approach better meets our security needs, and our security commitments to our European allies and partners. Russia's positive response to date is a useful collateral benefit, though we are not sure whether and how it will affect their perspective on missile defenses. We welcome Russian interest in our new approach as well as potential cooperation in sharing data from their radars. But Russian reactions notwithstanding, we will continue to do whatever it takes to ensure our security and that of our European partners and allies.

In closing, it is important to note that the strategic thinking behind our new approach to European missile defense will also be valuable as we continue to address missile defense issues in other regions.

Because the type of system we are planning in Europe can be easily adapted to different geographic constraints, it can be applied in various regions around the globe, if necessary.

In fact, a scaled-down version of this approach is already being used for the defense of Japan against North Korean missile threats, and for the defense of Israel against an Iranian missile attack. Because the assets of this system are either mobile or transportable, the new approach provides future flexibility to reposition interceptors and sensors if the geopolitical environment changes. And because the systems will be upgraded over time, the new approach provides a natural evolution to match the threat.

As the president said, "our new missile defense architecture in Europe will provide a stronger, smarter and swifter defense of American forces and America's allies. It is more comprehensive than our previous program. It deploys capabilities that are proven and cost-effective. And it sustains and builds upon our commitment to protect the U.S. homeland against long-range ballistic missile threats. And it ensures and enhances the protection of all of our NATO allies."

Thank you for your time. We will continue to work with you as we move forward on the Ballistic Missile Defense Review. ★

# *A New Proposal to Counter a Growing Ballistic Missile Threat*



**LIEUTENANT GENERAL PATRICK J. O'REILLY, DIRECTOR, MISSILE DEFENSE AGENCY,** RECENTLY TESTIFIED BEFORE THE SENATE ARMED SERVICES COMMITTEE ON EUROPEAN MISSILE DEFENSE AND THE TECHNICAL AND PROGRAMMATIC DETAILS OF THE PRESIDENT'S DECISION TO USE A PHASED ADAPTIVE APPROACH TO ENHANCE MISSILE DEFENSE PROTECTION FOR THE UNITED STATES AND EUROPE.

Good morning, Mr. Chairman, Senator McCain, and distinguished members of the committee. I appreciate the opportunity to testify before you today on the technical and programmatic details of the president's decision to use a phased adaptive approach to enhance missile defense protection for the United States and Europe—for our friends, allies, our forward deployed forces, civilian personnel, and their families there.

This new proposal would provide a more powerful missile defense capability for NATO, enhance U.S. homeland defense, and would be applicable in other theaters around the world to counter a growing ballistic missile threat, and would be more adaptable to respond to threat uncertainties and developments. With the phased adaptive approach, we are not scrapping or diminishing missile defense—rather we are strengthening it and delivering more capability sooner.

In 2006 the Defense Department proposed a long-range missile defense of Europe that consisted of four components: a command and control system; 10 ground based interceptors [GBIs] in Poland; an X-band discrimination radar in the Czech Republic; and an X-band precision tracking radar forward based in Southeastern Europe.

Assuming a shot doctrine of two interceptors against each threat missile, the 2006 proposed missile defense architecture provided an upper-tier missile defense to intercept five intermediate range ballistic missiles [IRBMs] aimed at Europe, or it could intercept five intercontinental ballistic missiles [ICBMs] aimed at the continental United States from the Middle East.

The most important component of the 2006 proposed architecture to the defense of the U.S. homeland was the forward based X-band radar in Southeastern Europe, which was to provide early and precise tracks of threat missiles from the Middle East, increasing the accuracy of the fire control instructions to our GBIs based at Fort Greely, Alaska, and Vandenberg Air Force Base, Calif. We remain concerned about a future Iranian ICBM threat; therefore, we are retaining the forward-based X-band radar of the 2006 proposed European missile defense architecture in our new phased

adaptive approach proposal. We will also continue to improve our domestic GBI-based system and conduct research and development for the two-stage GBI in the near term.

Under the phased adaptive approach, we propose defending Europe in phases starting with the area most vulnerable to today's Iranian missile threat: southern Europe. Phase 1 would consist of Aegis ships with Standard Missile [SM]-3 Block IA missiles deployed in the Mediterranean Sea and a forward-based sensor in southern Europe. This will provide protection across much of the southern tier of Europe against Iranian medium-range ballistic missiles.

We propose by 2015 the deployment of the SM-3 Block IB missile, which will have a greater capacity to use a network of sensors and greater ability to discriminate threat objects. Once this technology is proven in our test program these interceptors would be deployed at land- and sea-based locations and extend protection against medium-range ballistic missiles launched from the Middle East.

By 2018, the deployment of the SM-3 Block IIA missile, an interceptor with greater range currently being developed, could defend all of Europe from land- and sea-based locations. By 2020, our goal is to leverage the lightweight kill vehicle technology developed in the now terminated multiple kill vehicle program to develop a higher velocity SM-3 Block IIB missile that would destroy ballistic missiles early in flight, during the ascent phase, from many hundreds of kilometers from the threat launch location. This missile would still fit on today's Aegis launch system. With that capability, two land-based SM-3 Block IIB sites could protect all of Europe. The timelines I have presented allow for missile defense technologies to be tested and proven prior to deployment decisions.

A significant limitation of the previous European architecture was that the GBIs were used in both ICBM and IRBM defense roles. Although we have only tested the GBIs against IRBMs [ranges less than 5,000 kilometers], it is currently our only interceptor designed against ICBMs. The earliest operational

date of the 2006 proposed architecture is 2017 and more likely 2018 considering the host nation approvals that would have been required to construct the facilities. When deployed in 2017 the European based GBIs could be consumed by an attack of 5 IRBMs aimed at NATO countries, leaving no two-stage GBIs to contribute to U.S. ICBM defense.

Therefore, the previously proposed European defense architecture is insufficient to counter large raid sizes. Under the phased, adaptive approach, the SM-3 Block IIB would be able to accommodate a large IRBM and ICBM missile threat and diversify the technology that we are using to counter Iranian ICBMs, providing a layered defense.

We have made significant advances in missile defense technologies that enable the Phased Adaptive Approach. First, the interceptors we are developing are smaller, faster and have greater on-board discrimination capability. The sea-based Aegis BMD SM-3 interceptor would provide a very capable weapon for this particular mission due to its high acceleration, burn out velocity, proven track record [for the SM-3 IA], and our ability to rapidly increase the number of interceptors at any launch site.

Since we began testing the operationally configured SM-3 Block IA missile in June 2006, we successfully intercepted the target in 8 out of the 9 times we have launched the interceptor. We are also taking a deliberate approach to the development and testing of the next generation kill vehicle for the SM-3 interceptor, the SM-3 IB, which has a more advanced seeker and a fire control system that uses external sensors as well as its ship's radar. We have already demonstrated the higher risk components of the new kill vehicle: the solid propellant divert and attitude control system, new seeker, and fire control system with good results. The first test of the SM-3 IB is scheduled for the winter of 2011.

The area of greatest opportunity for increased missile defense capability involves our achievements in developing faster and more accurate command control, battle management, and communication capabilities, which combines data from a network of many

different sensors—especially sensors that track missiles in the early phases of their flight—rather than using single large radars in a region. Key to our successful intercept of the ailing satellite in February 2008 was our ability to combine data from sensors around the world and provide a highly accurate track of the satellite to an Aegis ballistic missile defense ship and launch the modified SM-3 IA prior to the ship’s radar seeing the satellite.

We have had many other demonstrations of these capabilities to date, to include the most recent intercept test of the Ground-Based Midcourse Defense system last December, when we combined the tracks of satellites, early warning radars, Sea Based X-band radar and forward-based radars on land and at sea to provide the GBIs with a very accurate track.

Additionally, we have also demonstrated the capability of unmanned aerial vehicles as highly accurate forward-based missile defense sensors in the Navy’s Stellar Dagers series of intercept tests last spring. Tomorrow we are scheduled to launch a pair of demonstration Space Tracking and Surveillance System [STSS] satellites that will detect and track ballistic missiles over their entire flight. Over the next few years we will conduct several tests using the tracking capabilities of these STSS demonstration satellites, including the launching of an interceptor from an Aegis ship, to intercept ballistic missile targets.

Finally, at our External Sensors Laboratory at Shriever Air Force Base, Colo., we continue to develop new algorithms and combine new sensor data to achieve even more accurate tracks than any individual sensor could produce.

A more advanced variant of the SM-3 has been under development with our Japanese partners since fiscal year 2006. This interceptor will have the range to defend all of NATO from only a few small sites. SM-3s are also more affordable than GBIs—you can buy four to seven production variants of the SM-3s, IA or IB, for the cost of one GBI. But the key

attribute is that we can launch SM-3s from sea or sites on land, which gives us great flexibility in locating the interceptor launch point between the origin of the threat launch and the area we are trying to protect—a key enabler to intercepting threat missiles early in flight.

One advantage of land-based SM-3s over the previous GBI missile field proposal is that they can be relocated if the direction of the threat changes rather than waiting the more than five years needed to construct a new GBI missile field.



The STSS demonstration satellites (being launched into orbit (above)) “will detect and track ballistic missiles over their entire flight.” [Photo courtesy of Northrop Grumman]

I would note that the new phased adaptive approach offers greater opportunities for our close allies, including Poland and the Czech Republic, to collaborate on the missile defense architecture—by hosting sites or providing funding or capabilities that could be linked to provide a network of missile defenses. Likewise, the radars at Armavir and Gabala could augment the proposed sensor network, and that type of collaboration could perhaps be a catalyst for Russia to join countries participating in our cooperative development of missile defense technologies.

An additional advantage of the phased adaptive approach is that efforts over

the next several years to develop, test, and procure the sensor, command and control, and interceptor upgrades for deployment of this architecture have application in the United States and theaters other than Europe. As an example, if the land-based SM-3 is tested in Hawaii, it would also provide continuous protection of those islands.

We are committed to fully funding this program as we prepare for the next budget submission to Congress. However, it is important that we have relief from rescissions and the flexibility to spend the unused FY09 RDT&E and some MILCON dollars associated with the previous European site proposal. With relief from some of the constraints placed on our FY09 budget and support for redirection of some FY10 funds, we believe we can start work on components of this new architecture within our FY10 budget request.

I would note that both House and Senate authorizing committees very presciently included provisions in this year’s National Defense Authorization bill that permit the Department to use FY09 and FY10 funding for an alternative architecture once the Secretary of Defense certifies that this architecture is expected to be consistent with the direction from the North Atlantic Council, operationally effective and cost-effective, and interoperable with other missile defense components. I believe the president’s new plan meets these criteria and would strongly reinforce NATO’s overall approach to missile defense.

My assessment is that executing this approach is challenging, but no more challenging than the development of other missile defense technologies. It is more adaptable, survivable, affordable and responsive than the previous proposal, while enhancing the defense of the U.S. homeland and our European allies. There will be setbacks, but the engineering is executable and development risks are manageable.

I look forward to discussing the specifics of the phased adaptive approach with members and staff in this and other forums. ★