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# OVERSIGHT OF BALLISTIC MISSILE DEFENSE (PART I): THREATS, REALITIES, AND TRADEOFFS

## HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY AND FOREIGN AFFAIRS

OF THE

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

MARCH 5, 2008

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# OVERSIGHT OF BALLISTIC MISSILE DEFENSE (PART I): THREATS, REALITIES, AND TRADE-OFFS

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**WEDNESDAY, MARCH 5, 2008**

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON NATIONAL SECURITY AND FOREIGN AFFAIRS,
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
*Washington, DC.*

The subcommittee met, pursuant to notice, at 10 a.m. in room 2154, Rayburn House Office Building, Hon. John Tierney (chairman of the subcommittee) presiding.

Present: Representatives Tierney, Lynch, Yarmuth, Van Hollen, Welch, Shays, Burton, and Foxx.

Staff present: Dave Turk, staff director; Andrew Su and Andy Wright, professional staff members; Davis Hake, clerk; Dan Hamilton, fellow; Christopher Bright and Todd Greenwood, minority professional staff members; Nick Palarino, minority senior investigator and policy advisor; Brian McNicoll, minority communications director; Benjamin Chance, minority clerk; and Mark Lavin, minority Army fellow.

Mr. TIERNEY. A quorum being present, the Subcommittee on National Security and Foreign Affairs hearing entitled, "Oversight of Ballistic Missile Defense (Part 1): Threats, Realities, and Tradeoffs," will come to order.

I ask unanimous consent that only the chairman and ranking member of the subcommittee be allowed to make opening statements. Without objection, so ordered.

I ask unanimous consent that the hearing record be kept open for 5 business days so that all members of the subcommittee be allowed to submit a written statement for the record. Without objection, so ordered.

Mr. BURTON. Mr. Chairman.

Mr. TIERNEY. Yes, Mr. Burton.

Mr. BURTON. I know that you are limiting the opening statements, but I am going to have to leave and I would like to say one or two words before I leave.

Mr. TIERNEY. You are the ranking member right now, so you are going to be home free with that.

Mr. BURTON. OK. And if Mr. Shays gets here——

Mr. TIERNEY. We will always make an allowance for Mr. Shays, as well.

Mr. BURTON. Thanks so much.

Mr. TIERNEY. Thank you.

Good morning and welcome to all of you.

In a few short weeks—to be specific, on March 23rd—our country will mark the 25th anniversary of President Ronald Reagan's announcement to the Nation of his plan to shield our country from Soviet nuclear missiles. A lot has happened over those 25 years. Gone are the days when thousands of missiles from the Soviet Union were immediate threats. Current efforts, instead, focus on Iran and North Korea.

In 2002, President Bush withdrew our country from the Anti-Ballistic Missile Treaty and the Missile Defense Agency was created and exempted from normal acquisition, testing, and reporting requirements.

This subcommittee wanted to take this opportunity to step back a bit to ask what we have achieved over the last 25 years and over $120 billion in investment. That is a conservative estimate by the Congressional Research Service. The Congressional Budget Office estimates that missile defense spending could double by 2013 to about $19 billion per year. More importantly, we want to find out where we should be going in the future.

Specifically, the National Security and Foreign Affairs Subcommittee begins today a robust and concerted investigation into the rationale for missile defense; its cost, benefits, and technical obstacles; and the accountability, transparency, and testing regime of the Missile Defense Agency.

We thought it vital to begin this investigation with a thorough examination of the potential threat our country faces from ballistic missiles and how that threat compares to other homeland security and weapons of mass destruction vulnerabilities. That will be primarily our focus here today, just that: what is the threat? And how does it compare to other homeland security and WMD vulnerabilities?

After all, threat assessments, both with respect to ballistic missile threats, specifically, and comparing this threat across sectors, should be the logical foundation from which sound policy and resource judgments are made.

Unfortunately, what we largely have to date is instead a series of intelligence estimates from the 1990's that factually have been tossed around like political footballs. What we seek to do with this first oversight hearing on missile defense is to have as robust and open a dialog as possible about the threats we face with top experts who have devoted decades of their lives to exploring these issues, and we are doing so drawing on information already in the public sphere.

I think it is vital that, as much as possible, we have these debates and discussions in public so that the American people can get the most accurate picture possible about what our Government is up to, especially when you are talking about a program costing in excess of $10 billion a year.

In the spirit of the robust debate to follow today, I want to throw out a few thoughts to get the ball rolling.

First, what advice do our panelists have for navigating through the various intelligence estimates on intercontinental ballistic missile threats? I think we have to understand as we go through this

hearing, too, that is what we are talking about: intercontinental ballistic missiles. We are not talking about theater defense systems, we are not talking about short range or medium range; we are focusing on that intercontinental ballistic missile threat and what has occurred in the real world since these earlier estimates took place.

Do we need an updated national intelligence estimate? If so, how can we achieve one that is free of political pressure and interference?

Second, when we are talking about a threat assessment, how important is it to differentiate between short- and medium-range missiles versus intercontinental missiles?

Third, I note with great interest a point that has been repeatedly stressed by our intelligence community over the years. In 2000, for example, Robert Walpole, who was then the CIA's point person on the issue, testified in Congress as follows: "In fact, we project that in the coming years, U.S. territory is probably more likely to be attacked with weapons of mass destruction from non-missile delivery means—most likely from non-state entities—than by missiles, primarily because non-missile delivery means are less costly and more reliable and accurate. They can also be used without attribution."

A National Intelligence Council report in 2000 entitled, "Global Trends 2015," reiterated this point: "Other means to deliver weapons of mass destruction against the United States will emerge, some cheaper and more reliable and accurate than early-generation ICBMs. The likelihood of an attack by these means is greater than that of a weapons of mass destruction attack with an intercontinental ballistic missile."

My question for our panel today is, if other methods to strike the United States are cheaper, more reliable, more accurate, and provide anonymity instead of ensuring a completely devastating counter-strike by our country, is it likely that our highest-priority threat against which we must protect ourselves will come from a country that wanted to cause us harm by focusing their limited resources and expertise on the very difficult process of building, testing, and deploying an intercontinental ballistic missile with a miniaturized weapon of mass destruction as a payload?

Fourth, what are the opportunity costs of spending roughly $10 billion a year on missile defense when this amount of funding represents a third of the total budget for the Department of Homeland Security and is roughly equal to the total appropriation for the Department of State? To break it down further, we are annually spending billions more on missile defense than the entire budget for the Federal Emergency Management Agency, 20 more times than for public diplomacy, and 30 more times than for the Peace Corps.

I have no doubt that the members of this subcommittee and the American people will benefit from the opportunity to learn today from our witnesses and your decades of collective military, arms control, and national security experience. I want to thank all of you for being with us today. We look forward to your testimony.

[The prepared statement of Hon. John F. Tierney follows:]

**Opening Statement of Chairman John F. Tierney**
**at the**
**Subcommittee on National Security and Foreign Affairs hearing entitled,**
**"Oversight of Missile Defense (Part 1): Threats, Realities, and Tradeoffs."**

**March 5, 2008**

Good morning, and welcome to you all.

In a few short weeks – March 23rd to be exact – our country will mark the 25th anniversary of President Ronald Reagan announcing to the nation his plan to shield our country from Soviet nuclear missiles.

A lot has happened over those 25 years. Gone are the days when thousands of missiles from the Soviet Union were the immediate threat; current efforts, instead, focus on Iran and North Korea.

In 2002, President Bush withdrew our country from the Anti-Ballistic Missile Treaty and the Missile Defense Agency was created and exempted from normal acquisition, testing and reporting requirements.

This Subcommittee wanted to take this opportunity to take a step back, to ask what have we achieved over these past 25 years and over $120 billion in investment – as conservatively estimated by the Congressional Research Service – and, more importantly, where we should be going in the future.

Specifically, the National Security and Foreign Affairs Subcommittee begins today a robust and concerted investigation into the rationale for missile defense; its costs, benefits and technical obstacles; and the accountability, transparency and testing regime of the Missile Defense Agency.

We thought it vital to begin this investigation with a thorough examination of the potential threat our country faces from ballistic missiles and how that threat compares to other homeland security and weapons of mass destruction vulnerabilities.

After all, a threat assessment – both with respect to ballistic missile threats specifically and comparing this threat across sectors – should be the logical foundation from which sound policy and resource judgments are made.

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What we seek to do with this first oversight hearing on missile defense is to have as robust and open a dialogue as possible about the threats we face with top experts who have devoted decades of their lives exploring these issues.

And we are doing so drawing on information already in the public sphere. I think it's vital that, as much as possible, we have these debates and discussions in public so that the American people can get the most accurate picture possible about what our government is up to, especially when you're a talking about a program costing $10 billion a year.

And in the spirit of the robust debate to follow today, I wanted to throw out a few thoughts to get the ball rolling.

First, what advice do our panelists have for navigating through the various intelligence estimates on intercontinental ballistic missiles threats, and what has occurred in the real world since those earlier estimates? Do we need an updated National Intelligence Estimate, and how can we achieve one that is free of political pressure or interference?

Second, when talking about a threat assessment, how important is it to differentiate between short- or medium-range missiles versus intercontinental missiles?

Third, I note with great interest a point that has been repeatedly stressed by our intelligence community over the years. In 2000, for example, Robert Walpole, then the CIA's point person on these issues, testified in Congress, and I quote:

In fact, we project that in the coming years, U.S. territory is probably more likely to be attacked with weapons of mass destruction from non-missile delivery means (most likely from non-state entities) than by missiles, primarily because non-missile delivery means are less costly and more reliable and accurate. They can also be used without attribution.

A National Intelligence Council report in 2000 entitled "Global Trends 2015" reiterated this point:

Other means to deliver WMD against the United States will emerge, some cheaper and more reliable and accurate than early-generation ICBMs. The likelihood of an attack by these means is greater than that of a WMD attack with an ICBM.

My question for our panel today is if other methods to strike the United States are A) cheaper; B) more reliable; C) more accurate; and D) provide anonymity instead of ensuring a completely devastating counterstrike by our country, is it likely that our highest priority threat against which we must protect ourselves will come from a country that wanted to cause us harm by focusing their limited resources and expertise on the very difficult process of building, testing, and deploying an intercontinental ballistic missile with a miniaturized weapon of mass destruction as its payload?

Fourth, what are the opportunity costs of spending roughly $10 billion a year on missile defense when this amount of funding represents a third of the total budget for the Department of Homeland Security and is roughly equal to the total appropriation for the Department of State? To break it down further, we are annually spending billions more on missile defense than the entire budget for FEMA, 20 times more than for public diplomacy, and 30 times more than for the Peace Corps.

I have no doubt that the Members of this Subcommittee and the American people will benefit from the opportunity to learn today from our witnesses and your decades of collective military, arms control, and national security experience.

I thank our witnesses for being with us today, and I look forward to your testimony.

I now yield to the Ranking Member of the Subcommittee, Congressman Chris Shays.

Mr. TIERNEY. I now yield to Mr. Burton, recognized for 5 minutes.

Mr. BURTON. I want to take 5 minutes. I appreciate your giving me a little bit of time.

In 1983, right after I was elected to the Congress, I was on the floor of the U.S. House and a fellow named Tom Downey from New York and a fellow from Tennessee named Al Gore were discussing this very issue in 1983. I debated them for about an hour, and that was the first time the term was used, Star Wars, first time. Tom Downey I think is the one that coined that phrase, and Al Gore jumped all over it. Ever since then, we have been denigrating, if you will, or saying that a missile defense system like this simply was not going to be effective and it was going to be too costly.

The fact of the matter is, one of the reason the Soviet Union fell apart and is no longer a major threat is because we did start developing a missile defense system and the Soviet Union simply could not keep up. They just kept spending their money to such a degree that they finally just had to dissolve the whole system over there.

I believe, especially after what we just saw recently with the point-to-point hitting of the incoming satellite that was falling out of orbit, that the technology is there to do a good job in defending against an intercontinental ballistic missile and maybe even a shorter-length missile.

The problem that I have about destroying or doing away with a missile system like we have, missile defense system like we have, is that I don't know what China is going to do. We just found out they are going to increase their military board by a dramatic amount, and they have already stolen a ton of our technology, including the ability to launch satellites and to launch missiles intercontinentally, should they decide to do that. Russia still has that ability. North Korea has been testing missiles that would go beyond the Sea of Japan, and maybe even intercontinentally. Iran is trying to develop everything they can, including nuclear weapons, as well as, I believe, a delivery system that could even hit the United States, as well as western Europe.

So I think that, even though this is a costly undertaking, this is something that we should continue to move on. Nobody knows how the United States may be attacked. Nobody ever thought we would be attacked by two airplanes flying into the World Trade Center or the Pentagon, but it happened. I think that we should do whatever is necessary to make sure that this Nation is protected from any kind of an attack, interior, inside the country, or outside. I think that is why this system that we are developing still needs to be pursued.

We may find ways to economize. I have no problem with that, Mr. Tierney. But I think it is something that we should continue to work on. We have been working on it since I got here in 1983, and I think it has a lot of merit, and for that reason I will listen with great interest to our witnesses, but I certainly hope we won't derail this system.

Mr. TIERNEY. I thank you, Mr. Burton.

Mr. Burton, I think we shared this with Members in our brief. This first hearing is just to give us an idea of the threats and sort of prioritize where they are and how our resources are going. We

will have a subsequent hearing on the technological aspects of it, and, along the line of that, something about the spiral development and block scheduling and whether or not we really have the accountability that we need as an oversight committee to determine. It has been going since 1983, and $120 billion.

There is some question, I think, that we should be looking at whether we are deploying before we adequately test, or whatever, even if you have a system. That argument goes, have one, but how do you go about it and how do you have the accountability? And then the last one, we will have the Defense Agency, itself, to make its presentation so that we get all angles on this thing.

Mr. Welch, do you have any comments? In fairness, we expanded the openings a little bit.

Mr. WELCH. No, I don't.

Mr. TIERNEY. Thank you.

Mr. Shays, you are recognized.

Mr. SHAYS. Thank you, Mr. Chairman, for scheduling this hearing today. Missile defense is a vitally important topic. Protecting our homeland is a daunting task. We live every day with the knowledge there are terrorists who seek to harm us and countries that wish to harm us. We acknowledge that individuals in a rogue nation may elect to strike us 1 day. Evil people and rogue regimes are constantly considering new ways to threaten the United States. We must remain vigilant. Each day we must safeguard our infrastructure and, more importantly, protect our citizens.

Sadly, ours is a world where hostility and brutal, undemocratic regimes like Iran and North Korea have or seek nuclear weapons. They also want to develop long-range ballistic missiles. Together, these elements pose a dire challenge to our Nation. We cannot help but be concerned about this threat. Of course, decisions made about how best to protect our States must be weighed against the various defense options available to us.

In fiscal year 2008, Congress appropriated nearly $10 billion for missile defense. This enormous sum clearly deserves oversight, but we must remember, as well, the financial and emotional cost of a successful missile strike on our territory would cost far more than $10 billion. It is against this alternative that we must examine the missile defense program.

Nine years ago, President Clinton decried "the growing danger that rogue nations may develop and field long-range missiles capable of delivering weapons of mass destruction against the United States and our allies." Just 2 weeks ago, the Deputy Director of National Intelligence told the Armed Services Committee, "Iran continues to deploy ballistic missiles inherently capable of delivering nuclear weapons." He also said Iran "sought to develop longer-range missiles." The Deputy Director told members North Korea possessed nuclear weapons and "has already sold ballistic missiles to several Middle East countries and to Iran." And he observed that one type of North Korean missile "probably was the potential capability to deliver a nuclear-weapon-sized payload to the continental United States." This is a threat we cannot be blind to.

Today I wrestle with whether or not our priorities are correct. Should we be putting money into a ballistic missile shield or should

we divert some or all of the funds into other forms of protection for our homeland?

There is one final point I would like to make concerning the development of a national missile defense. Before September 11th the Hart Rudman Commission argued we needed a Department of Homeland Security with all its accompanying powers. If the Department of Homeland Security had been operational before September 11, 2001, it is very likely the terrorists who flew commercial airplanes into the World Trade Center would have been caught. This, of course, would have saved thousands of lives and trillions of dollars, so I can't help but wonder if advocates of a strong missile defense, like the members of the Hart Rudman Commission, are people we should be listening to. It seems to me the answer is yes.

Thank you, Mr. Chairman.

[The prepared statement of Hon. Christopher Shays follows:]

HENRY A. WAXMAN, CALIFORNIA
CHAIRMAN

TOM DAVIS, VIRGINIA
RANKING MINORITY MEMBER

ONE HUNDRED TENTH CONGRESS

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**Representative Christopher Shays**
**Opening Statement**
**"Oversight of Ballistic Missile Defense: Threats, Realities, and Tradeoffs"**
**March 5, 2008**

Thank you, Mr. Chairman, for scheduling this hearing today. Missile defense is a vitally important topic.

Protecting our homeland is a daunting task. We live every day with the knowledge there are terrorists who seek to harm us and countries that wish us harm.

We acknowledge that individuals in a rogue nation may elect to strike us one day. Evil people and rogue regimes are constantly considering new ways to threaten the United States. We must remain vigilant. Each day, we must safeguard our infrastructure and, more importantly, protect our citizens.

Sadly, ours is a world where hostile and brutal undemocratic regimes like Iran and North Korea have or seek nuclear weapons. They also want to develop long-range ballistic missiles.

Together, these elements pose a dire challenge to our nation. We cannot help but be concerned about this threat.

Of course, decisions made about how to best protect our states must be weighed against the various defense options available to us.

In Fiscal Year 2008, Congress appropriated nearly $10 billion for missile defense. This enormous sum clearly deserves oversight.

But, we must remember as well, the financial and emotional cost of a successful missile strike on our territory would cost far more than $10 billion.

It is against this alternative that we must examine the missile defense program.

Nine years ago, President Clinton decried "the growing danger that rogue nations may develop and field long-range missiles capable of delivering weapons of mass destruction against the United States and our allies."

Just two weeks ago, the Deputy Director of National Intelligence told the Armed Services Committee, "Iran continues to deploy ballistic missiles inherently capable of delivering nuclear weapons." He also said Iran sought "to develop longer-range missiles."

The Deputy DNI told Members North Korea possessed nuclear weapons and "has already sold ballistic missiles to several Middle Eastern countries and to Iran." And, he observed that one type of North Korean missile "probably has the potential capability to deliver a nuclear-weapon sized payload to the continental United States."

This is a threat we cannot be blind to.

Today I wrestle with whether or not our priorities are correct. Should we be putting money into a ballistic missile shield or should we divert some or all of the funds into other forms of protection for our homeland?

There is one final point I would like to make concerning the development of national missile defenses. Before September 11, the Hart-Rudman Commission argued we needed a Department of Homeland Security with all its accompanying powers.

If the Department of Homeland Security had been operational before September 11, 2001, it's very likely the terrorists who flew commercial airplanes into the World Trade Center would have been caught. This, of course, would have saved thousands of lives and trillions of dollars.

So, I can't help but wonder if advocates of a strong missile defense, like the members of the Hart-Rudman Commission, are people we should be listening to.

It seems to me the answer is yes.

Mr. TIERNEY. Thank you, Mr. Shays.

The subcommittee will now receive testimony from the witnesses before us today. I would like to take the opportunity to introduce them generally. They all have much, much steeper credentials than I am going to have the time to record here.

Our first witness is Joseph Cirincione. This hearing marks the first day Mr. Cirincione actually takes office as president of the Ploughshares Fund. Congratulations. He was most recently vice president for National Security and International Policy at the Center for American Progress. He is the author of a recent book, *Bomb Scare: the History and Future of Nuclear Weapons.* He teaches at Georgetown University and was some years ago a staffer on the predecessor to this committee, as well as on the House Armed Services Committee.

Welcome, Mr. Cirincione.

Baker Spring is the F.M. Kirby research fellow in national security policy at the Heritage Foundation. Mr. Spring began studying missile defense issues while researching the SALT II Treaty as an intern in the 1970's. He later served on the staffs of Senators Paula Harkins and David Kearns. He has also developed tabletop exercises for nuclear war games.

Steven A. Hildreth has been a specialist in missile defense and nonproliferation at the Congressional Research Service since 1985. He is a graduate of the National War College, has published several books on security assistance and advanced weapons in developing countries. He has written numerous reports for Congress, primarily dealing with missile defense and missile proliferation. Mr. Hildreth led the Congressional Research Service's efforts in support of the Joint Congressional Committee Investigating the Attacks of 9/11.

Dr. Stephen E. Flynn is the Jean J. Kilpatrick fellow for national security studies at the Council on Foreign Relations in New York. He is a retired U.S. Coast Guard Commander. He is the author of the recent book, *The Edge of Disaster: Rebuilding a Resilient Nation,* and the national best seller, *America the Vulnerable.* At the Council on Foreign Relations, Dr. Flynn directs an ongoing private sector working group on homeland security. He was also the director and principal author for the report, "America: Still Unprepared, Still in Danger," for the task force co-chaired by former Senators Gary Hart and Warren Rudman.

The subcommittee wants to thank all of you for being with us today, for your many years of experience and first-hand knowledge on the topics that we will be discussing. I am sure you are going to provide us with excellent starting points and perspective for this series of hearings.

We swear in all of our witnesses that testify before this subcommittee, so I would like to ask you to please stand and raise your right hands. If there is any other person that might be assisting you in your testimony, please ask them to stand, as well.

[Witnesses sworn.]

Mr. TIERNEY. The record will please reflect that all witnesses answered in the affirmative.

Gentlemen, your full written statements will be entered on the record. We have had the opportunity to read them. I can't imagine

that too many of them would fit within the 5-minute provision that we have here, but they were very valuable in the information they provided, so I know that those Members that are here have probably already read them or will read them.

We will give you 5 minutes. Most of you have testified before us. The green light gets you started, yellow light lets you know there is a minute or so to go, the red light means it is over. We have a practice in this subcommittee of not shutting people off mid-sentence. We would love to hear you conclude your thought, but be mindful of the other people testifying and their need for time, as well as the opportunity Members want to have questions. We would like you to stay as close to the 5-minutes as you possibly can.

Mr. Cirincione, will you please start us off with your testimony?

**STATEMENT OF JOSEPH CIRINCIONE, PRESIDENT OF THE PLOUGHSHARES FUND; BAKER SPRING, F.M. KIRBY RESEARCH FELLOW IN NATIONAL SECURITY POLICY, THE HERITAGE FOUNDATION; STEVEN A. HILDRETH, SPECIALIST IN NATIONAL DEFENSE FOREIGN AFFAIRS, DEFENSE, AND TRADE DIVISION, CONGRESSIONAL RESEARCH SERVICE; AND STEPHEN E. FLYNN, SENIOR FELLOW FOR NATIONAL SECURITY STUDIES, COUNCIL ON FOREIGN RELATIONS**

**STATEMENT OF JOSEPH CIRINCIONE**

Mr. CIRINCIONE. Thank you, Mr. Chairman. It is a pleasure to be here. I have much in common with the members of this committee. I grew up in Connecticut, I was educated at Boston College, and I vacation in Vermont.

Mr. TIERNEY. Been to Indiana lately?

Mr. CIRINCIONE. I haven't been to Indiana. Sorry.

More importantly, I served on the predecessor to this committee, the Government Operations Committee, as the deputy staff director for then the National Security Subcommittee. We did investigations into the ballistic missile threat at that time. We had Steve Hildreth give what I thought was some of the best testimony Congress ever got during those years. I was also on the House Armed Services Committee. My very fist assignment when I joined in 1984 was oversight over the strategic defense initiative.

At that time we were not worried about a prototype Iranian missile that might or might not be deployed. We were worried about 5,000 Soviet warheads on SS–18 and SS–19 missiles screaming over the pole, hitting the United States, destroying not just our country but most life on this planet.

I have known ballistic missile threats. I have researched ballistic missile threats. Mr. Chairman, this is not a serious ballistic missile threat that we face today. Don't get me wrong: we do have threats, we do have challenges, but they pale in comparison to the challenges we confronted 15 or 20 years ago when President Reagan began what is still the initiative to find an effective defense against these ballistic missiles. I believe the best way to summarize it is the way I do in the first page of my testimony: the ballistic missile threat today is limited and changing relatively slowly. There is

every reason to believe that it can be addressed through measured military preparedness and aggressive diplomacy.

The most serious threat the United States and our allies face are the short-range missiles confronting us in various theaters of operation, not the long-range missiles that are the focus of the bulk of the anti-ballistic missile budget.

I want to talk about the ballistic missile budget, which is why we are here today.

[Slide.]

Mr. CIRINCIONE. The ballistic missile budget request this year is four times the size of what President Reagan was requesting when he was trying to find an effective counter-measure to those 5,000 SS–18s and 18 missiles. The $12.3 billion sets a record for anti-ballistic missile funding, and it would expend over $60 billion over the next 5 years.

A great deal of that money is devoted to the still hypothetical Iranian missile. The budget request over the next 5 years is some $10 billion be devoted to countermeasures to the medium-range Shahab III ballistic missile.

I believe that, in order for Congress to judge whether these sums are necessary, they need a comprehensive assessment of the ballistic missile threat. Congress has never, never gotten this kind of assessment.

Here is what I mean. When you look at where we were 20 years ago or 10 years ago, what immediately strikes you is that the world we face today has a decreasing number of ballistic missiles. There are fewer ballistic missiles in the world today than there were 10 years ago or 20 years ago. There are fewer hostile missiles potentially threatening the United States. There are fewer countries with ballistic missiles potentially threatening the United States. But there are more countries that have started medium-range ballistic missile programs, but they are poor and less technologically advanced than the countries that had long-range ballistic missile programs some 20 years ago.

Let me just give you a few facts to back up those bars on the chart. No. 1, there are currently far fewer intercontinental ballistic missiles and long-range submarine-launched ballistic missiles than there were during the cold war. The total number of long-range ballistic missiles potentially threatening the United States has decreased by 71 percent over the last 20 years. By anybody's standard, that is a decreasing long-range ballistic missile threat.

The total number of medium- and intermediate-range ballistic missiles has decreased by 80 percent. We are now primarily worried about approximately 70 Chinese missiles that could hit regional targets. Some could hit the United States. About 20 of those could hit the United States. About 90 North Korean NoDongs—again, these are medium-range missiles that would threaten South Korea or Japan or U.S. forces in the area—and a small number of Iranian Shahab III missiles that could hit neighboring countries.

Even with those existing threats, it is an 80 percent reduction in the kinds of threats we faced 20 years ago. Five new countries—India, Pakistan, China, North Korea, and Iran—have developed limited medium-range ballistic missile capabilities since the late

1980's, yet there were still fewer medium-range missiles than there are today.

The vast majority of nations with ballistic missiles have only short-range ballistic missiles with ranges under 1,000 kilometers, basically SCUDs. This is often ignored when officials or experts cite the 30 countries with ballistic missile capability. That is true. There are approximately 28 countries with ballistic missiles, but of these 17 have only SCUD-B missiles or similar. Most of these countries are friends or allies of the United States.

So when you look at the ballistic missile threat, it really comes down to a handful of countries that are potentially hostile to the United States.

The next chart gives you my overall assessment of this threat. This is the kind of assessment that I believe Congress deserves before it can make a judgment on the budget. It shouldn't be satisfied with assessments that cherry-pick one or two threats and then pretend that is the kind of comprehensive assessment we demand. Overall, a decrease in long-range ballistic missiles, a decrease in intermediate-range ballistic missiles, some increase in medium-range missiles, primarily from these new programs I mentioned, a declining inventory of short-range ballistic missiles, fewer hostile countries with ballistic missile programs, and the potential damage from ballistic missile attack, while very serious, is orders of magnitude below that what it was 20 years ago.

The assessment I have presented to you I am sure has errors in it, some mistakes in a few of the numbers, but I believe that it is the kind of assessment that Congress should demand the administration present to support a budget request of this magnitude.

Thank you.

[The prepared statement of Mr. Cirincione follows:]

# The Declining Ballistic Missile Threat

**Testimony of**
**Joseph Cirincione**
**President, Ploughshares Fund**

**United States House of Representatives**
**Committee on Oversight and Government Reform**
**Subcommittee on National Security and Foreign Affairs**

**March 5, 2008**

Chairman Tierney and Members of the Committee, thank you for the opportunity to testify before you today on this critical issue.

The administration this year has submitted to Congress a request for over $12.3 billion for anti-missile weapons programs, the largest for any weapon in the defense budget. This is an historic high for anti-ballistic missile systems and triple what the United States spent on such systems in 2000.

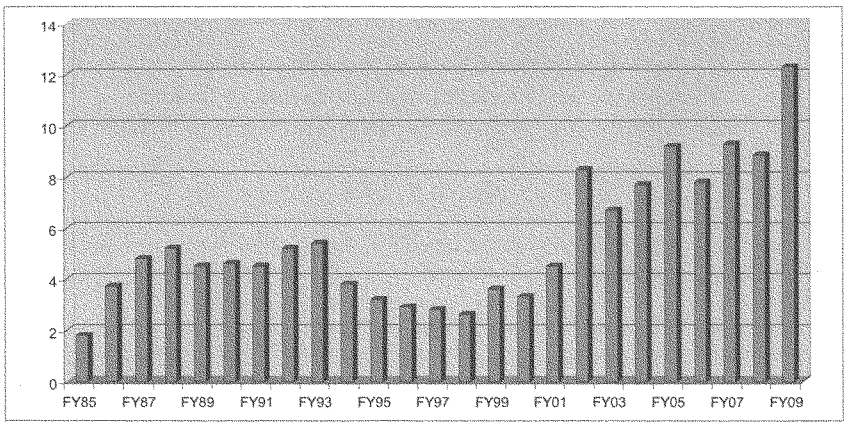
Before the Congress approves expenditures of this magnitude it deserves and should demand a comprehensive assessment of the current and projected ballistic missile threat confronting the United States and our allies. The current budget request does not contain such an assessment, nor have previous submissions in recent years provided this tool essential to any military budget. Instead the request is supported by the claim that "the threat can never be predicted with certainty," and therefore the administration is pursuing a "capabilities-based strategy." [1] This means that the administration will produce weapons independent of a concrete threat and deploy them irrespective of the weapon's operational performance.

Such an approach, based on exaggerated threat estimates and optimistic expectations, wastes valuable defense resources needed for other pressing military needs. Central to the budget justification is the claim that the United States faces a growing threat from ballistic missiles. Yet, by most measures, the threat has steadily declined over the past 20 years. There are far fewer missiles in the world today than there were 20 years ago, fewer states with missile programs, and fewer hostile missiles aimed at the United States. Countries still pursuing long-range missile programs are fewer in number and less technically advanced than 20 years ago.

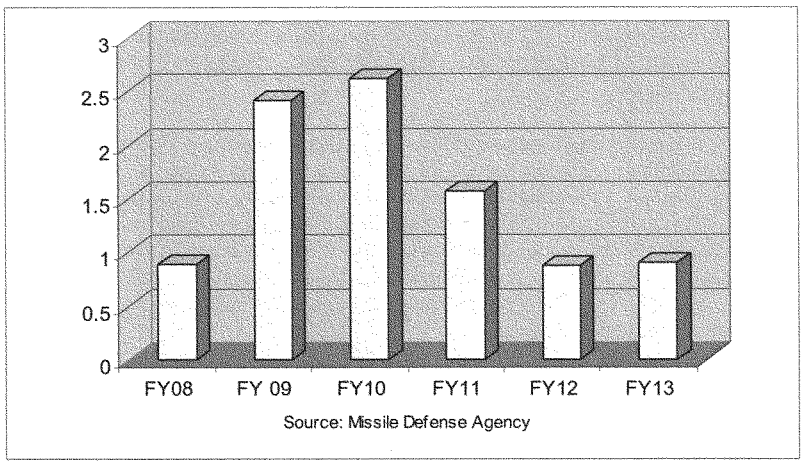
In short, the ballistic missile threat today is limited and changing relatively slowly. There is every reason to believe that it can be addressed through diplomacy and measured military preparedness. The most serious threats are the short-range missiles confronting our armed forces and some allies, not the long-range missiles that are the focus of the bulk of the anti-ballistic missile budget.

My testimony is an attempt to provide the kind of detailed threat analysis Congress requires. It is imperfect and likely contains small errors, but I believe my findings are a more accurate assessment of the ballistic missile threat than has heretofore been provided Congress by this administration.

**Graph 1. Presidential Budget Request for Missile Defense FY85-FY09 (in billions of dollars)[2]**




**Graph 2. Budget Requests to Counter Iranian Missile Programs FY08-FY13 (in billions of dollars)[3]**



**Summary of Today's Ballistic Missile Threat**

Slightly over two dozen countries have ballistic missiles today--but almost all these nations are friends of the United States, and almost all have only short-range missiles that threaten only their neighbors. China is the only potentially hostile nation that has a long-range missile that can reach central Europe or the United States from its territory.[4]

Here are the facts:

- There are currently far fewer intercontinental ballistic missiles and long-range submarine-launched ballistic missiles than there were during the Cold War. In 1987, the Soviet Union deployed 2,380 long-range missiles in its combined ICBM and SLBM arsenals with 9,847 warheads.[5] The United States deployed 1,640 long-range missiles with 8,331 warheads.[6] As of 2007, Russia has only 669 long-range missiles carrying 2,467 warheads,[7] and America has only 836 long-range missiles carrying 3,066 warheads.[8]

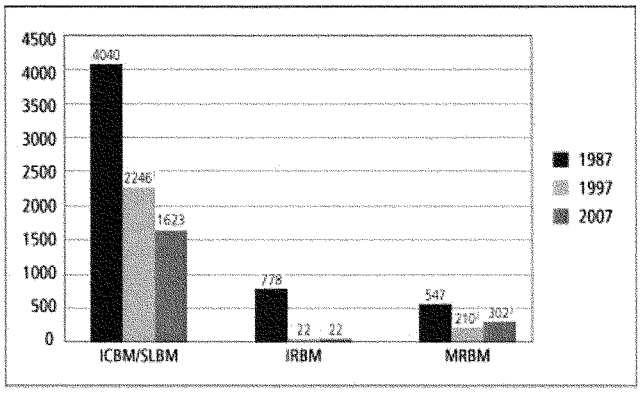
- The total number of long-range missiles potentially threatening the United States has declined from 2,400 fielded by the Soviet Union and China in 1987 to only 689 fielded by Russia and China today. This is a 71 percent decrease in the number of ICBMs that threaten U.S. territory.

- The ballistic missile threat to American forces and interests in Europe and Asia has gone from 915 medium- and intermediate-range Chinese and Soviet missiles in 1987 to about 70 Chinese missiles, about 90 North Korean *No Dongs*, and a small number of Iranian *Shahab III* missiles now.[9] This totals about 180 missiles that could threaten U.S. forces or allies, representing an 80 percent decrease in threatening systems. This threat could grow in the future if these three nations increase their missile production and deployment.

- Five new countries—India, Pakistan, China, North Korea, and Iran—have developed limited medium-range ballistic missile capabilities since the late 1980's. Yet there are still fewer medium-range missiles today than 20 years ago.

- The vast majority of nations with ballistic missiles have only short-range ballistic missiles with ranges under 1,000 km—a fact ignored in the oft-cited, ominous statements that "30 countries have ballistic missiles."[10] Of these nations (actually 28), 17 only have Scud-B or similar missiles with approximate ranges of 300 km or less. Many of these missiles are quite old, have not been well maintained, and are consequently declining in military utility.

**Graph 3. Long and Medium Range Ballistic Missiles 1987-2007[11]**




[1] This figure includes 982 US, 1130 Russian, 20 Chinese, 64 French, and 50 United Kingdom ICBMs and SLBMs.
[2] This figure includes 10 North Korean missiles, 110 Chinese missiles, 50 Israeli Jericho IIs, and 40 Saudi Arabian DF-3s.
[3] This figure includes 90 North Korean missiles, 70 Chinese missiles, 40 Saudi Arabian DF-3s, 50 Israeli Jerico IIs, 20 Pakistan Ghauri II missiles, 12 Indian Agni II missiles, and 20 Iranian Shahab II missiles.

**The Declining Threat**

In 1987, the Soviet Union aimed thousands of nuclear-tipped missiles at America. President Ronald Reagan negotiated agreements that slashed these arsenals in half. The Intermediate Nuclear Forces treaty eliminated two entire classes of missiles (intermediate-range and medium-range) from both Soviet and U.S. forces. The Soviet collapse then shrank the ballistic missile threat by orders of magnitude.

As attention shifted to smaller, potentially hostile states, ballistic missiles still garnered the lion's share of attention from policy-makers, though they constitute only one—and the most difficult—delivery method for nuclear, biological, and chemical weapons.

Despite this, the administration plans to spend more than $60 billion on anti-missile weapons over the next six years—more than during any similar period of the Cold War—with an estimated $10 billion specifically budgeted for countering a still-hypothetical missile threat from Iran.

At present, neither the United States nor Europe faces a serious new threat from nuclear-armed ballistic missiles. Russia still fields some 2,467 warheads on some 670 intercontinental and submarine-launched ballistic missiles,[12] but absent an accidental or unauthorized launch, it is unlikely these missiles would be used. Russia's forces will likely shrink dramatically over the next 10 years to about 1,000 warheads on a few hundred missiles. Negotiated agreements could reduce the force further and faster.

China still maintains its force of 20 warheads on 20 silo-based Dong Feng-5 (DF-5) intercontinental ballistic missiles, though it is trying to replace its aging force with a new generation of missiles it hopes to field by the end of the decade.[13] No other potentially hostile nation has a long-range, nuclear-armed missile that can reach central Europe or the United States from its territory.[14]

In sum, there is no imminent, new ballistic missile threat. The threat from a North Korean or Iranian long-range missile is still largely theoretical. Countries developing ballistic missile technology today are fewer in number, poorer, and less technologically advanced than the nations that were developing ballistic missile technology 20 years ago.

What, then, causes the concern over ballistic missiles?

**A Brief History of Recent Assessments**

The current anti-ballistic missile weapons programs are still on a glide path determined early in the first years of the current administration and heavily influenced by the 1998 Commission to Assess the Ballistic Missile Threat to the United States (known as the Rumsfeld Commission for its chair, Donald Rumsfeld). The Commission concluded:

> With the external help now readily available, a nation with a well-developed, Scud-based ballistic missile infrastructure would be able to achieve first flight of a long-range missile, up to and including intercontinental ballistic missile (ICBM) range (greater than 5,500 km), within about five years of deciding to do so. During several of those years the U.S. might not be aware that such a decision had been made.[15]

The Commission identified two countries as particularly dangerous: North Korea and Iran. The commissioners believed these states had made a decision to build an ICBM. Although neither the North Korean nor the Iranian ICBM programs have made significant progress since 1998, US policy is still guided by this out-dated and inflated assessment.

For example, both the 1993 and 1995 National Intelligence Estimates (NIE) of the ballistic missile threat had concluded that no new nation other than Russia and China was likely to field an ICBM in the next 15 years. Under heavy fire from anti-missile advocates in Congress, the intelligence community adopted the methodology of the Rumsfeld Commission for its 1999 NIE and the last publicly released NIE, submitted in December 2001 and released in unclassified form in January 2002.

Both these new estimates concluded that before 2015 the United States most likely will face ICBM threats from North Korea and Iran, and possibly Iraq – barring significant changes in their political orientations – in addition to the strategic forces of Russia and China. One agency disagreed in 2002, assessing that the United States was unlikely to face an ICBM threat from Iran before 2015.[16]

The 2002 estimate concluded ominously, "The probability that a missile with a weapon of mass destruction will be used against *U.S. forces or interests* is higher today than during most of the Cold War and it will continue to grow as the capabilities of potential adversaries mature." (emphasis in original). This was not true than and is not true today.

The 2002 assessment does note, however, that

> *U.S. territory* is more likely to be attacked with [chemical, biological, radiological and nuclear] materials from nonmissile delivery means—most likely from terrorists—than by missiles, primarily because nonmissile delivery means are less

> costly, easier to acquire and more reliable and accurate. They can also be used without attribution.[17] (emphasis added).

These cautions and caveats are often brushed aside in the political discussions and program decisions concerning the ballistic missile threat. For example, the Quadrennial Defense Review presented by the Department of Defense to Congress on October 1, 2001, argued that "In particular, the pace and scale of recent ballistic missile proliferation has exceeded earlier intelligence estimates and suggests these challenges may grow at a faster pace than previously expected."[18]

Then-Director of Central Intelligence George Tenet went beyond the official intelligence assessment and told the Senate Select Committee on Intelligence on February 6, 2002, "The proliferation of ICBM and cruise missile designs and technology has raised the threat to the U.S. from WMD delivery systems to a critical threshold."

However, by February 2003, Director Tenet's anxiety about the ballistic missile threat seemed to have been reduced. His testimony to Congress had only three short paragraphs on the missile threat:

> The United States and its interests remain at risk from increasingly advanced and lethal ballistic and cruise missiles and UAVs. In addition to the longstanding threats from Russian and Chinese missile forces, the United States faces a near-term ICBM threat from North Korea. And over the next several years, we could face a similar threat from Iran and possibly Iraq.
>
> Short- and medium-range missiles already pose a significant threat to U.S. interests, military forces and allies as emerging missile states increase the range, reliability and accuracy of the missile systems in their inventories.
>
> And several countries of concern remain interested in acquiring a land-attack cruise missile (LACM) capability. By the end of the decade, LACMs could pose a serious threat to not only our deployed forces, but possibly even [to] the U.S. mainland.[19]

His 2004 assessment of the ballistic missile threat to the United States was confined to brief descriptions of the North Korean and Iranian programs, supplemented by quick glances at the Chinese, Indian, Pakistani and Syrian missile development efforts.

In prepared testimony delivered to the Senate Select Committee on Intelligence in January 2007, Central Intelligence Agency Director Michael Hayden used the word missile just once:

> We focus on the WMD and missile programs of Russia and China, which are large enough to threaten US survival if their political leaderships decided to reverse themselves and assume a hostile stance.[20]

General Hayden did mention two other states as regional threats, and may have meant to include their missile programs in his assessment:

> We focus on North Korea and Iran, two states with WMD programs that threaten regional balances, US interests, and international arms control mechanisms like the Nonproliferation Treaty.[21]

Despite the CIA's reduced emphasis on the ballistic missile threat, there remains within the U.S. Department of Defense and the budget a core belief that the threat is increasing.

But is this true? More precisely, is the risk to U.S. cities from ballistic missile attack greater now than in the past and will it get worse? It is not, as this testimony will demonstrate, below. But it is largely the perceived threat to the United States and Europe that drives the rush to deploy anti-missile systems.

**Global Ballistic Missile Trends, 1987-2008**

The blurring of short, medium, intermediate and intercontinental ranges for the world's missile inventory often results in the misinterpretation of the oft-quoted assessment that some "30 nations have now deployed a ballistic missile capability" as the Missile Defense Agency says in this year's budget submission.[22] This statement is roughly true, but only the United States, China and Russia possess the ability to launch nuclear warheads on land-based intercontinental missiles. This has not changed since Russia and China deployed their first ICBMs in 1959 and 1981 respectively.[23]

- Analysis of global ballistic missile arsenals shows that there are far fewer ICBMs and long-range submarine-launched ballistic missiles (SLBMs) in the world today than there were during the Cold War.

- The number of intermediate-range ballistic missiles (IRBMs), i.e. missiles with a range of 3,000–5,000 km, has decreased in the past 20 years by an order of magnitude.

- The overall number of medium-range ballistic missiles (MRBMs), i.e. missiles with a range of 1,000-3,000 km, has also decreased. Five new countries, however, have developed or acquired MRBMs since the late 1980's.

- The number of countries trying to develop ballistic missiles has also decreased and the nations still attempting to do so are poorer and less technologically advanced than were the nations 20 years ago.

- The number of countries with short-range ballistic missiles (SRBMs), i.e. missiles with ranges up to 1,000 km, has remained fairly static over the past 20 years and is now decreasing as aging inventories are retired.

- Today, fewer nations potentially hostile to the United States and Europe are trying to develop MRBMs compared with 20 years ago (1980s: China, Iraq, Libya and the Soviet Union; 2007: China, Iran and North Korea).

- The damage from a ballistic missile attack carrying one or two nuclear warheads on U.S. territory, U.S. forces and European allies today is also lower by orders of magnitude than twenty years ago when thousands of warheads would have destroyed the country and possibly all human life on the planet.

**Table 1. Classes and Ranges of Ballistic Missiles**

| Ballistic Missile | Range |
|---|---|
| Intercontinental ballistic missile (ICBM) | Greater than 5,500km |
| Intermediate-range ballistic missile (IRBM) | 3,000km to 5,500km |
| Medium-range ballistic missile (MRBM) | 1,000km to 3,000km |
| Short-range ballistic missile (SRBM) | Less than 1,000km |
| Submarine-launched ballistic missile (SLBM) | Greater than 5,000km |

## I. LONG-RANGE BALLISTIC MISSILES

Force reductions in U.S. and Russian arsenals have dramatically decreased the number of long-range ballistic missiles in the world from their Cold War levels.

### Decreases

In 1987, the Soviet Union deployed 2,380 long-range missiles in its combined ICBM and SLBM arsenals.[24] The United States deployed 1,640 long-range missiles.[25] As of February 2007, Russia has 669 long-range missiles carrying 2,467 warheads[26] and the U.S. has 836 long-range missiles carrying 3,066 warheads.[27]

The United States retired 50 Minuteman III ICBMs at Malmstrom Air Force Base in 2007; decreasing the overall Minuteman III force from 500 to 450 missiles.[28]

The United Kingdom has also reduced its long-range missile arsenal, and is the only declared nuclear weapons state to abate its nuclear arsenal to a single deterrent system—the Trident II system. A White Paper presented to Parliament in December of 2006, "The Future of the United Kingdom's Nuclear Deterrent," stated Britain would reduce its "operationally available" arsenal from 200 to fewer than 160 nuclear warheads with a corresponding 20 percent decrease in their overall nuclear warhead stockpile.[29] With these changes, the United Kingdom will have reduced the explosive power of its nuclear arsenal (which is the smallest of declared nuclear weapons states,

comprising only 1 percent of the global stock of nuclear weapons) by 75% since the end of the Cold War.[30]

**Increases**

China has been working on a new long-range ballistic missile, the mobile DF-31 (and the DF-31A variant with longer range), which would replace the range capabilities of the current array of DF-4 IRBMs.[31]

In early March 2007, US naval intelligence documents reported in the press claimed China was conducting sea-exercises with the new Type-094 nuclear powered ballistic missile submarine (SSBN). The Type-094 is equipped with 12 launch tubes designed to carry the long-range Julang-2 SLBM (JL-2), which can hit Hawaii and Alaska from Chinese territorial waters. It is believed that China is currently deploying two Type-094 submarines.[32]

Russia has recently developed and begun deploying the new Topol-M1 ICBM, which will gradually replace the SS-25 ICBM. An estimated six Topol-M1s were deployed in 2007, with a total of 50 by 2015.[33] Unlike the silo-based Topol-M (SS-27 NATO designation), the Topol-M1 is road-mobile, and reportedly could utilize an advanced maneuverable targeting system being designed to evade the most advanced anti-ballistic missile defense arrays.[34]

For the first time in 17 years, Russia constructed and launched a new SSBN, the *Yuri Dolgoruki*, one of four such SSBNs to be built.[35] The *Yuri Dolgoruki* is to be fitted with recently developed Bulava-M SLBMs.[36]

France has reduced its nuclear arsenal overall, but now fields 48 M-45 long-range SLBMs[37] that it began deploying at the end of 1987.[38] France is slated to begin deploying the longer-range M-51.1 SLBM on its final *Triomphant* class SSBN, *Le Terrible*, upon its completion in 2010.[39]

Similarly, the United Kingdom has reduced its arsenal but now fields 50 long-range Trident II SLBMs[40] on its *Vangaurd* class SSBN that it did not have in 1987.[41] Furthermore, the British Parliament voted on March 15 2007, in favor of extending the life span of its current Trident II System. Included in the vote, was the decision to allocate 15 to 20 million pounds towards developing a new SSBN fleet that would enter service in 17 years and last through 2050.[42]

The Nuclear Posture Review submitted to Congress December 31, 2001 calls for the development of a new ICBM to be operational in 2018, a new strategic submarine and a new submarine-launched ballistic missile to be operational in 2029, and a new heavy bomber to be deployed in 2040. The United States has also begun research on a new conventionally armed submarine-launched intermediate-range ballistic missile (SLIRBM) for use on converted *Ohio*-class nuclear powered cruise-missile submarines (SSGNs).[43] In addition, the administration has proposed a new nuclear warhead development Reliable Replacement Warhead (RRW) that would be retro-fitted onto existing missiles.

**Status Quo**

During the past twenty years, China has maintained a force of about 20 DF-5 ICBMs.[44] Since the 1980s, China has worked to upgrade the DF-5s to DF-5As—a variant with longer range and greater payload capacity.[45] No other country potentially hostile to the United States has successfully developed an ICBM or long-range SLBM during this time period.

**Net Decrease**

By 2007, the total number of long-range ballistic missiles in the world (including those of the United States, the United Kingdom and France) has decreased 60 percent to 1,623[46] from the 4,040 deployed in 1987.[47]

More significantly, the total number of long-range missiles potentially threatening the United States has declined from 2,400 fielded by the Soviet Union and China in 1987 to 689 fielded by Russia and China today. This is a 71 percent decrease in the number of ICBMs that threaten U.S. territory.

## II. INTERMEDIATE- RANGE BALLISTIC MISSILES

Intermediate Range Ballistic Missile arsenals have undergone even more dramatic reductions. The Intermediate-Range Nuclear Forces (INF) Treaty eliminated this entire class of ground-based missiles (with ranges from 3,000 to 5,500 km) from the Soviet/Russian arsenal over a three-year period.[48] Changes in the structure of both the French and British nuclear forces have resulted in the elimination of intermediate-range SLBMs from these countries' arsenals as well.

**Decreases**

Final INF inspections took place on May 31, 2001, verifying the destruction of 660 intermediate-range Soviet ballistic missiles.[49] France has replaced the 16 M4A intermediate-range SLBMs it possessed in 1987 with long-range systems.[50] France also deactivated its limited arsenal of 18 land-based IRBMs in 1996 and has since destroyed them.[51] The United Kingdom has also replaced the 64 Polaris A-3T and Chevaline intermediate-range SLBMs it possessed with the long-range Trident system. The United States did not then and does not now field IRBMs.

**Status Quo**

China maintains approximately 22 DF-4 missiles of this range.[52] No other nation has deployed an IRBM during this time period, though North Korea has been pursuing the Taepo Dong II, with a theoretical range of 3,500 to 6,000 km.[53] During a series of missile tests on July 4, 2006, a test-flight of a missile that could have been a Taepo Dong II failed after less than a minute of flight time.

India continues to develop the Agni III (with a potential range greater than 3,000km)[54] despite its unsuccessful maiden test-flight on July 9, 2006 when, after

12km of flight, it plunged into the ocean missing its designated target.[55] Its second and most recent test-flight on April 12, 2007 proved successful.[56]

**Net Decrease**

Overall, IRBM arsenals have declined from a global total of 778 in 1987 to 22 today. The decrease from 680 IRBMs potentially threatening the United States, its forces and European allies in the 1980s to 22 today represents a 97 percent reduction from Cold War levels.

## III. MEDIUM-RANGE BALLISTIC MISSILES

The broad scope of the INF Treaty also covered ground-based medium-range ballistic missiles (MRBMs). Thus, the treaty resulted in the elimination of this class of missiles (with ranges between 1,000 and 3,000 km) from Soviet/Russian and U.S. ballistic missile arsenals. Changes in the French nuclear forces resulted in the elimination of MRBMs from its arsenal as well.

**Decreases**

A total of 149 Russian SS-4 and 234 U.S. Pershing II missiles were destroyed under the INF treaty. France possessed 64 medium-range M20 SLBMs in 1987 that it had replaced with longer-range systems by 1991.[57]

**Increases Geographically**

The most significant proliferation threat comes from the slow but steady increase in the number of states possessing medium-range ballistic missiles, even as Russia, France and the United States eliminated their arsenals. This development has attracted a great amount of attention and is often cited as evidence of a larger proliferation threat. China, India, Iran, Israel, Pakistan, North Korea and Saudi Arabia now possess land-based MRBMs. China also possesses a medium-range SLBM capability, though its operational status is in question.[58]

Only India, Iran, North Korea, Pakistan and Saudi Arabia have developed or obtained their missiles since the late 1980's, and of these countries all but India's missiles are based primarily on assistance or technology received from North Korea or China.

**Status Quo**

China has been gradually retiring its DF-3 MRBM force, which now stands at approximately 16 missiles with half as many launchers.[59] Concurrently, China's arsenal of DF-21 MRBMs has diminished to 21 missiles with approximately 36 launchers while its number of sea-launched JL-1 (CSS NX-3 NATO designation) MRBMs has remained static at 12.[60]

**Net Decrease Numerically**

Numerically speaking, even though MRBMs are now in the hands of more countries, the total number of MRBMs in existence in 2007 is smaller than the 547 MRBMs in

the combined U.S., French, Russian and Chinese forces in 1987.[61] Since then, Israel is believed to have deployed 50 operational Jericho II MRBMs[62] while Saudi Arabia has approximately 40 CSS-2 MRBMs that it purchased from China.[63] North Korea is believed to have deployed close to 100 No Dong MRBMs, but it may have produced at least 150 missiles of this type.[64] At least five Iranian Shahab III missiles were deployed in July 2003.[65] According to a March 2006 report by the National Air and Space Intelligence Center, Iran has fewer than 20 Shahab III launchers, however, it notes there might be several missiles for each launcher.[66] MRBMs in India and Pakistan and North Korea's Taepo Dong I are still in operational testing.[67] Assuming that each of these countries could deploy one to five missiles in a crisis during the next five years, the global total of MRBMs today is no more than 417 and likely as low as 285.[68] This represents a 24 and 48 percent decrease, respectively, in global MRBM arsenals from the 1987 level.

In terms of missiles potentially threatening American forces or interests, the threat has gone from 249 Chinese and Soviet missiles in 1987 to 49 Chinese, an estimated 100 North Korean No Dong, and 5 Iranian Shahab III missiles.[69] This tabulates to a total of about 154 missiles that could threaten U.S. forces or Europe, representing a 38 percent decrease in threatening systems. This threat could grow in the future if these three nations increase their missile production and deployment.

## IV. SHORT-RANGE BALLISTIC MISSILES

### Aging Scud Arsenals

In addition to the five recognized nuclear-weapon states, there are 25 nations with ballistic missiles. Of these nations, the vast majority has only missiles with ranges less than 1,000 km. Seventeen of the twenty-five nations only have Scud-B or similar missiles with approximate ranges of 300 km or less. Furthermore, many of these missiles are quite old, have not been well maintained, and are consequently declining in military utility. For the past nine years, the number of nations with these missiles has been decreasing as they abandon aging systems. Nevertheless, new production by some nations, such as Syria and North Korea, could replace or increase inventories in nations wishing to retain short-range missile capabilities.

## V. NUMBER OF COUNTRIES WITH BALLISTIC MISSILE PROGRAMS

Another factor by which proliferation can be measured is the number of states with missile development programs. The number of countries with ballistic missile development programs has also decreased from the number of countries pursuing missile programs during the Cold War. In addition to the five recognized nuclear-weapon states, countries such as Argentina, Brazil, Egypt, India, Iraq, Israel, Libya and South Africa had programs to develop long-range or medium-range missiles in 1987. By 2005, Argentina, Brazil, Egypt and South Africa had abandoned their programs. Libya's remains largely defunct. Furthermore, Iraq's threat has been eliminated (although we still count this country as possessing short-range ballistic missiles).

**Table 2. Countries with active intermediate-range or long-range ballistic missile development programs** *(apart from Five **NPT** Nuclear-Weapons States)*

| **1987** | **2007** |
|---|---|
| Argentina | India |
| Brazil | Iran |
| Egypt | Israel |
| India | North Korea |
| Israel | Pakistan |
| Iraq | |
| Libya | |
| South Africa | |

Today, the nations pursuing long-range missile development programs are smaller, poorer and less technologically advanced than were the nations with missile programs 20 years ago. U.S. threat assessments such as the 2001 National Intelligence Estimate on the Ballistic Missile Threat note that Iran and North Korea currently possess active programs. Syria and South Korea have active short-range ballistic missile programs, but have not yet demonstrated interest in or the capability to produce MRBMs. Thus, even with the inclusion of U.S. allies India and Pakistan, the NIEs highlight the limited nature of the missile proliferation threat, one that is confined to a few countries whose political evolution will be a determining factor in whether they remain threats to global security.

Nor have these programs advanced as quickly as predicted by the worst-case assessments that came to dominate U.S. policy on missile proliferation and anti-missile systems. The 1998 Rumsfeld Commission report asserted that "Scud-based ballistic missile infrastructures would be able to achieve first flight of a long-range missile, up to and including intercontinental ballistic missile (ICBM) ranges, within about five years of deciding to do so." The report concluded that Iran and North Korea had decided to do so: "The extraordinary level of resources North Korea and Iran are now devoting to developing their own ballistic missile capabilities poses a substantial and immediate danger to the U.S." The commissioner said, "Each of these nations places a high priority on threatening U.S. territory, and each is even now pursuing advanced ballistic missile capabilities to pose a direct threat to U.S. territory."[70] However, today, nine years later, neither country has achieved a successful flight of an ICBM.

Nevertheless, according to the Missile Defense Agency, "the proliferation of increasingly sophisticated ballistic missile systems and associated technologies and expertise continues to pose a danger to our national security. In 2006, more than sixty foreign ballistic missiles were launched around the world."[71] The report concluded, "ballistic missiles will remain the weapon of choice among our potential adversaries for the foreseeable future."[72] The current 2008 report notes, "foreign ballistic missiles were launched more than 100 times around the world in 2007."[73]

## VII. COUNTRY BALLISTIC MISSILE PROGRAMS OF CONCERN

### *Iran*

Iran's "Shahab III" program (a missile largely based on and perhaps nothing more than a North Korean No Dong missile) has progressed in fits and starts. U.S. officials (and security officials in other countries) have repeatedly raised the alarm about Iran's programs. The 2001 NIE noted, "All agencies agree that Iran *could* attempt to launch an ICBM/SLV about mid-decade, although most agencies believe Iran is *likely* to take until the last half of the decade to do so. One agency further judges that Iran is unlikely to achieve a successful test of an ICBM before 2015."[74] In his 2004 Worldwide Threat Assessment, DCI George Tenet asserted that Iran could begin flight-testing SLVs in the "mid- to latter-part of the decade."[75]

The Shahab program has fallen far short of these estimates. The Shahab III missile blew up in two of its three tests in 1998 and 2000 and failed again in July 2002. It enjoyed more success, though, in tests in May 2002 and July 2003. On August 11, 2004, Iranian officials claimed the test-flight of a Shahab III was a success, despite a skeptical response from the international press.[76] Iran tested a modified Shahab III missile officials claimed was a space-launch vehicle on February 4, 2008, though it appeared successful, video footage from the test clearly showed debris flying from the missile shortly into the flight, suggesting that Iran still faces technical hurdles (specifically in graphic jet vanes that may effect accuracy).[77] The vehicle seems to have only reached an altitude of 70 to 100 miles, far short of the capability required.

Over the past ten years there have been repeated claims of the imminent appearance of longer-range Shahab IVs and Vs. These continue today in the media and from some foreign officials. It is possible Iran is making progress, but there is no publicly available evidence to support these claims. If Iran does demonstrate the ability to build and launch a three-stage missile or space-launch vehicle, this would be a major leap in their capability and a cause of concern.

### *North Korea*

Until July of 2006, North Korea had only two publicly-known missile flight-tests in the past twelve years, one of a No Dong in 1993 and one of a Taepo Dong I in 1998. Without official notification, on July 4 and 5, 2006, North Korea lifted its self-imposed missile flight-test moratorium when it test-launched six or seven ballistic missiles. Among the missiles tested was one some claimed was a Taepodong-II, which might be able to fly over 3000km. The test missile, however, never got close to that range. It failed after 42 seconds of flight according to U.S. officials. The other launches were of the medium-range Nodong missile and a Scud-type missile with a range of 300 to 500 miles.[78]

North Korea is the most serious case of a potential new threat. It may be able to test a Taepo Dong II missile that could approach ICBM ranges, but it would require a third stage to be able to deliver a payload to the continental United States. The capability, reliability and payload of such a missile are highly speculative. Furthermore, unclassified photos of the North Korean test facilities revealed what many analysts

have long concluded: the missile program is primitive by world standards and of limited military utility. North Korea, hoping to open normal trade relations with its neighbors and the West, and desirous of food and energy assistance, seems willing to suspend a dubious program for real material gain.

North Korea's short-range ballistic missile capabilities already pose a threat to US interests and allies throughout the East Asian theatre. North Korea currently deploys the Hwasong-5 (SCUD-B variant) and Hwasong-6 (SCUD-C variant) that could strike targets throughout South Korea.[79] Furthermore, North Korea's No Dong-1 MRBM could threaten targets throughout Japan (including US forces stationed in the region). The missile's significant inaccuracy, however, has led some experts to view the "No-Dong 1 as a "terror weapon" for threatening population centers rather than a significant military-system—unless armed with a nuclear warhead."[80]

According to General B.B. Bell, commander of United Nations command and U.S. forces in South Korea, North Korea possesses over 800 ballistic missiles, comprised of over 600 Scud missiles of various types and as many as 200 medium-range Nodong missiles.[81]

The NIEs and the Rumsfeld Commission assumed an optimistic and fairly straightforward path for North Korea to scale up its existing missiles to true intercontinental range. Only the United States, Russia and China have been able to build missiles in this range thus far. One cannot completely rule out the possibility that North Korea could eventually develop a missile with enough range to reach the continental United States.

The obstacles, however, are formidable. As previous intelligence estimates have reported, the Taepo Dong II, III or IV would have to make remarkable progress in propulsion, guidance and reentry vehicle technology. Moreover, as the size of the missile increases, it requires a difficult manufacturing and engineering shift from the steel bodies employed by Scuds to low-weight, high-strength alloys.

Finally, for a nuclear-capable delivery system, North Korea would have to manufacture a nuclear warhead small enough and sturdy enough to fit on the tip of the missile. There is no evidence that North Korea has mastered these techniques, only speculation that it might be possible. As former commander-in-chief of the U.S. Strategic Command, General Eugene Habiger says, even if they were to successfully test an ICBM, North Korea would still face enormous challenges:

> There's a big leap of faith between developing a nuclear device—a weapon that operates in a laboratory kind of environment, in a concrete tunnel, no G-loading, no vibration, no temperature extremes—and to miniaturize something that's going to go in the nose cone of an ICBM, that is going to experience the kinds of things that I've just described. That takes a lot of technology, it takes a lot of work, and it takes a lot of time. I would submit that the miniaturization of a nuclear warhead is probably the most significant challenge that any proliferant would have to face.[82]

Habiger goes on to point out that it took the United States "six to eight years of very intensive engineering development and aggressive testing" to reduce its first ICBM

warheads from 5,000 kg to 1,000 kg. "The leap of faith is that the North Koreans would be able to go from a pristine laboratory weapon to 300 kg."[83]

Above all, if the 6-party talks with North Korea succeed, this entire program could be eliminated through mutual agreement.

***Pakistan***

Pakistan has developed its ballistic missile capability largely due to its close proximity and tense relationship with India. Despite the existence of a peace process, the two countries regularly test missiles. Pakistan's ballistic missile arsenal consists largely of SRBMs, while testing of medium- and intermediate-range ballistic missiles continues. After conducting several tests in 2007 using missiles like the Hatf VI (also known as Shaheen II MRBM) and the Hatf-II Abdali SRBM[84], the Pakistanis accelerated the test schedule in 2008. They have already conducted three tests in the first three months of the year with the Shaheen-1 SRBM and Ghauri MRBM and the Ghaznavi (Hatf III) SRBM.[85]

The most recent test involved the Ghaznavi, which has a range of 290 kilometers and believed capable of carrying a nuclear warhead. President Perves Musharraf maintains that missile testing is essential to the nation's deterrence capability. [86]

***India***

India has responded tit-for-tat with Pakistan's missile development program. India currently fields the Prithvi I and Prithvi II SRBMs, while research continues on a Prithvi III.[87] Press reports indicate that India has deployed the short-range Agni I as well as the medium-range Agni II.[88] Development of the Agni III IRBM (with a potential range greater than 3,000km[89] ) continues despite its unsuccessful maiden test-flight on July 9, 2006 when, after 12km of flight, it plunged into the ocean missing its designated target.[90] The missile was tested again successfully April 12, 2007, putting China within its range of attack.[91]

Some reports suggest India is also planning to develop an ICBM sometime in the next decade. While the existence of a long-range missile program is unclear, India has expanded its delivery vehicle options. On February 26, 2008, the Indians successfully tested a variant of the Agni III called the "Sagarika" launched from an underwater platform. This missile would eventually be used in submarines as a "second-strike option."[92] In response, Pakistani naval chief Admiral Muhammad Afzal Tahir warned that the action will trigger an arms race between the two nuclear nations.[93]

**Net Assessment**

Missile proliferation remains primarily a regional problem, though with global implications.

In South Asia and the Middle East, strategic interest and political dynamics have fueled continued development of ballistic missile technology as both a means of gaining international prestige as well as of obtaining strategic advantage vis-à-vis regional rivals and outside powers. Though relatively limited, the proliferation and

the transfer of ballistic missile technology originating in North Korea does continue to destabilize regional, and therefore global, security.

Overall, the development of the ballistic missile threat over the past 10 years has confirmed the correctness of the 1993 NIE that was so disparaged by anti-ballistic missile proponents.

It also confirms the common-sense judgment of the Joint Chiefs of Staff, who rejected the conclusions of the Rumsfeld Commission in 1998. Then-Chairman of the Joint Chiefs General Henry Shelton wrote:

> "While the Chiefs and I, along with the Intelligence Community, agree with many of the Commission's findings, we have some different perspectives on the likely developmental timelines and associated warning times."
>
> "After carefully considering the portions of the report available to us, we remain confident that the Intelligence Community can provide the necessary warning of the indigenous development and deployment by a rogue state of an ICBM threat to the United States."
>
> "For example:
>
> - "We believe that North Korea continues moving closer to the initiation of a Taepo Dong I Medium Range Ballistic Missile (MRBM) testing program. That program has been predicted and considered in the current examination."
>
> - "The Commission points out that through unconventional, high-risk development programs and foreign assistance, rogue nations could acquire an ICBM capability in a short time, and that the Intelligence Community may not detect it. We view this as an unlikely development."
>
> - "I would also point out that these rogue nations currently pose a threat to the United States, including a threat by weapons of mass destruction, through unconventional, terrorist-style delivery means. The Chiefs and I believe all these threats must be addressed consistent with a balanced judgment of risks and resources." [94]

The Chiefs' judgments were overturned by political decisions, but in hindsight their assessment and the intelligence estimates provided in 1993 and 1995 have proven sounder than the assessments subsequently produced by the Rumsfeld Commission and the intelligence agencies in 1999 and the early part of this decade.

Finally, those debating the urgency of the ballistic missile threat often lose sight of the vastly different scale of possible destruction that we face today compared to the threat we feared less than twenty years ago. Then the threat was a global thermonuclear war. A first strike of some 5,000 Soviet warheads would have delivered 2.75 million kilotons of destructive force on the United States.[95] On several occasions, the world seemed very close to that war.

Today, we fear that a few missiles carrying warheads of some 10 to 40 kilotons might destroy part of a city or at least impact somewhere in Europe or the United States.[96] Though still a catastrophe, this is less of a threat by several orders of magnitude. In terms of destructive power, in no way can one say that the threat today is worse than that of the Cold War years.

Thus, the most accurate way to summarize the existing global ballistic missile threat is:

1. There is a widespread capability to launch short-range missiles.

2. There is a slowly growing, but still limited, capability to launch medium-range missiles.

3. Most importantly, there are a decreasing number of long-range missiles from the levels of the Cold War and this number will continue to decline dramatically over the next fifteen years.

4. There is some possibility that one or two new nations could acquire a limited capability to launch long-range missiles over the next two decades.

5. The likelihood of any nation attacking the United States or Europe with a ballistic missile is exceptionally low.

In short, the ballistic missile threat today is limited and changing relatively slowly. There is every reason to believe that it can be addressed through diplomacy, deterrence and measured military preparedness. Officials during any year of the Cold War would have gladly traded the dangers they confronted then for today's limited threat.

If missile defenses prove feasible, particularly those designed to counter the more prevalent short-range missiles, they can be an important part of these efforts. But they should never dominate policy. The sooner the balance the Joint Chiefs called for ten years ago is restored to our assessments, budgets, and diplomacy, the better prepared the country will be for the genuine threats we face.

**Table 3. The 17 Countries with Only Short-Range Ballistic Missiles Deployed (ranges 1000km or less)[97]**

| COUNTRY | SYSTEM NAME | STATUS | RANGE (KILOMETERS) | PAYLOAD (KILOGRAMS) | ORIGIN | NOTES |
|---|---|---|---|---|---|---|
| AFGHANISTAN | Scud-B | O | 300 | 1,000 | USSR | Operational status questionable. |
| ARMENIA[1] | Scud-B | O | 300 | 1,000 | USSR | |
| BAHRAIN | MGM-140 (ATACMS) | O | 165 | 560 | USA | Missiles manufactured by Lockheed-Martin. |
| BELARUS[2] | SS-21 | O | 120 | 480 | USSR | |
| | Scud-B | O | 300 | 1,000 | USSR | |
| EGYPT | Scud-B | O/U | 300 | 1,000 | USSR/ DPRK | |
| | Project T | O | 450 | 1,000 | I / DPRK | Improved Scud. |
| | Scud-C | O? | 500 | 600–700 | DPRK | |
| GREECE | MGM-140 (ATACMS) | O | 165 | 560 | USA | Purchased 160 ATACMS between 1995 and 1996. |
| IRAQ | Al Samoud II | O/U | 180–200 | 300 | I | Liquid-fuel missile. From Scud B |
| | Ababil-100/ Al Fatah | O | 160 | 200–300 | I | Solid-fuel missile from Scud B. |
| KAZAKHSTAN[3] | Scud-B | O | 300 | 1,000 | USSR | |
| | Tochka-U (modified SS-21) | O | 120 | 480 | USSR | |
| LIBYA[4] | Scud-B | E | 300 | 480 | USSR/ DPRK | |
| SLOVAKIA | SS-21 | O | 120 | 480 | USSR | |
| SOUTH KOREA | Nike-Hercules I/A | O | 180 | 500 | I/USA | Modified SAM. |
| | Nike-Hercules II | D/T | 260–300 | 450–500 | USA | Modified SAM; Tested at reduced range in 1999.[5] |
| SYRIA | SS-12 | O | 120 | 480 | USSR | Transferred 1983. |
| | Scud-B | O | 300 | 1,000 | USSR | |
| | Scud-C[6] | O | 500–600 | 600–700 | DPRK | Syria can now produce its own Scud-Cs.[7] |
| | Scud-D | T | 700 | 500 | DPRK | Based on the No Dong; last tested September 2000; Syria may now be capable of producing its own Scud-Ds.[8] |
| TAIWAN | Ching Feng | O[9] | 130 | 270 | I/Israel | From Lance. |
| | Tien Chi[10] | O?[11] | 300 | 500 | I | Modified SAM Tested in 1997. |
| TURKEY | MGM-140 (ATACMS) | O | 165 | 560 | USA | Purchased 120 ATACMS in 1996. |
| | Project J[12] | D | 150 | 150 | I/PRC | Based on Chinese WS-1. |
| TURKMENISTAN | Scud-B | O | 300 | 1,000 | USSR | |
| UKRAINE | SS-21 | O | 120 | 480 | USSR | |
| | Scud-B | O | 300 | 1,000 | USSR | |
| UNITED ARAB EMIRATES[13] | Scud-B | O | 300 | 1,000 | Russia? | |

[1] In 1997 it was confirmed by an investigatory committee that Russia shipped 8 Scud launchers and 24 missiles to Armenia between 1992 and 1996. See Nikolai Novichkov, "Russia Details Illegal Deliveries to Armenia," Jane's Defense Weekly, April 16, 1997, p. 15.

[2] Belarus announced that they will acquire the Iskander-E from Russia by 2010. "Belarus to Acquire Russian Multi-Warhead Missiles by 2010," Financial Times, 12 November 2004.

[3] In December 2003, Libya privately pledged to the United States that it would eliminate all Missile Technology Control Regime (MTCR) - class missiles, that is, missiles that can travel over 300 kilometers with a payload of at least 500 kilograms. It was agreed, at the time, that the Scud-B missiles would be modified and kept for defensive purposes. See Paul Kerr, "Libya to Keep Limited Missile Force," Arms

Control Today, May 2004, p. 28. However, in September 2004, Paula DeSutter, assistant secretary of state for verification and compliance, testified before the House Subcommittee on International Terrorism, Nonproliferation, and Human Rights, saying, "Libya...has agreed to destroy its Scud-B missiles." See "Completion of Verification Work in Libya," Testimony of Assistant Secretary of State for Verification and Compliance Paula DeSutter before the Subcommittee on International Terrorism, Nonproliferation, and Human Rights, September 22, 2004. There have also been unconfirmed reports that Libya attempted to purchase No Dongs from North Korea prior to its December 2003 decisions to cease its pursuit of unconventional weapons.

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[5] An unidentified missile traveled 62 kilometers in a test firing on November 22, 2001. See Don Kirk, South Korea Launches Missile In Its First Test Since Las Year," The New York Times, November 23, 2001.

[6] The Jerusalem Post reported the development of an advanced Syrian modification of the Scud-C (which could possibly be the Scud-D tested in September of 2000), but this report has not been confirmed by Western sources. See Arieh O'Sullivan, "Syrian Super Scud Ready Soon—Source," Jerusalem Post, September 16, 1999.

[7] Nuclear Threat Initiative, "Syria: Missile Capabilities."

[8] Ibid.

[9] International Institute for Strategic Studies, Military Balance 2007, p.373.

[10] This program was reportedly initiated in autumn 1995 and is based on the Sky Bow II SAM.

[11] Jane's Defense Weekly reported March 26, 2001, that Taiwan had deployed up to 50 Tien Chi missiles on Tungyin Island and at an undisclosed second location.

[13] In 1989, the United Arab Emirates reportedly attempted to purchase 25 Hwasong-5 (Scud-B variant) missiles from North Korea. According to the Center for Nonproliferation Studies, the UAE was not happy with the missiles and they were never operationalized. There is no publicly available evidence to confirm these reports, however. See the Monterey Institute's Center for Nonproliferation Studies "A History of Ballistic Missile Development in the DPRK."

**Table 4. The Six Countries With Only Short-Range and Medium-Range Ballistic Missiles Deployed (ranges 3000km or less)[98]**

| COUNTRY | SYSTEM NAME | STATUS | RANGE (KILOMETERS) | PAYLOAD (KILOGRAMS) | ORIGIN | NOTES |
|---|---|---|---|---|---|---|
| INDIA | Prithvi-I (Prithvi-150) | O | 150 | 800–1,000 | I/USSR | From Russian SA-2 Army Missile. |
| | Prithvi-II (Prithvi-250) | O | 250 | 500–750 | I/USSR | From Russian SA-2 Air Force Missile. |
| | Dhanush | D/T | 250–350 | 500–700 | I | From Pithvi. Ship-launched. Last tested March 31, 2007.[1] |
| | Sagarika SLBM | D | 250–350 | 500 | I | From Pithvi. Expected to be operational after 2010.[2] |
| | Privthi-III (Privthi-350) | D | 350 | 500–1,000 | I/USSR | From Russian SA-2. |
| | Agni-I | O | 600-750 | 1,000 | I/USA/ France | From Scout; tested July 4, 2004.[3] |
| | Agni-II | O/P | 2,000–2,500 | 1,000 | I/USA/ France | Last tested August 29, 2004; India says limited production has begun. |
| | Agni-III | D/T | 3,000 | 1,300[4] | I | First test on July 9, 2006 failed. Second/most recent test April 12, 2007 successful. |
| | Surya 1/2 | D? | 9,000–12,000? | 2,500+? | I | Based on Agni. Three- stage; first and second phase solid-fueled, third liquid. Possible test by 2008.[5] |
| IRAN* | Mushak-120 | O | 130 | 190 | I | |
| | Mushak-160 | O | 160 | 190 | I | |
| | Fateh-110 (NP-110/ Guided variant of Zalzal-2) | O/P | 200 | 600 | I/PRC? | Possibly tested during series of missile tests January 2007. Last confirmed test September 6, 2002.[6] |
| | M-7 (CSS-8) | O | 150 | 190 | PRC | Modified SA-2 |
| | Scud-B | O/U | 300 | 1,000 | I/ DPRK | |
| | Scud-C | O | 500-600 | 500–700 | I/ DPRK | |
| | Shahab III | O/T/P? | 1,300 | 750–800 | I/ DPRK | From No Dong. Last confirmed test May 23, 2006.[7] |
| | Shahab IV | D/T? | 1,900–2,000 | 1,000 | I/ Russia | Based on Russian SS-4 |
| ISRAEL | Lance | O/S | 130 | 450 | USA | |
| | Jericho-I | O | 500 | 750–1,000 | France | Road-mobile. An aging arsenal as missile was first tested in 1968. |
| | Jericho-II | O | 1,500 | 1,000 | I/France | Road-mobile. |
| | Jericho-III | D? | 3,000–6,500? | 1,000? | I | Reportedly based on the Shavit SLV.[8] |
| NORTH KOREA | Scud-B | O/P | 300 | 1,000 | USSR/ Egypt? | |
| | Scud-C Variant | O/P | 500 | 600–700 | I | |
| | No Dong | O | 1,300 | 700–1,000 | I | Single-stage, liquid fuel missile. Derived from Scud technology. Last tested July 4, 2006. |
| | Taepo-dong I | T | 1,500–2,000? | 1,000? | I | Combined No Dong and Scud; tested August 31, 1998. |
| | Taepo-dong II | D | 3,500–5,500? | 1,000? | I | Reportedly, a Taepodong II was tested July 4 2006; failed after 42 seconds of flight.[9] |
| PAKISTAN | Hatf-I | O | 80 | 500 | I | |
| | Hatf-II/IIA (Abdali) | D/T | 180/280 | 500 | I/PRC? | First test fired in 2002. Last tested March 4, 2007.[10] |
| | Hatf-III (Ghaznavi/ M-11) | O | 280–300 | 500 | I/PRC | 2001 NIE lists the Hatf-III to be an M-11. Last tested Dec. 6, 2006.[11] |
| | Shaheen-I (Hatf-IV) | O/P | 700-750 | 500 | I/PRC | Solid-fueled. Thought to be an M-9 derivative. Last tested November 29, 2006.[12] |
| | Ghauri-I (Hatf-V) | O | 1,300 | 500–750 | DPRK | 2001 NIE lists the Ghauri to be a No Dong; last tested November 16, 2006.[13] |
| | Ghauri II | D/T | 1,500–2,300 | 700 | I/DPRK | From No Dong; last tested April 14, 1999. |
| | Shaheen II (Hatf-VI) | D/P | 2,000–2,500 | 750–1,000 | I/PRC? | Road-mobile, two-stage. Last tested successfully May 6, 2006.[14] |
| | Ghauri III | D/T | 2,500? | ? | I/DPRK | Thought to be based on the Taepodong-1. Engines tested, but flight test planned for June 2004 never occurred. |
| SAUDI ARABIA | Dong Feng-3 (CSS-2) | O | 2,600 | 2,150 | PRC | Purchased from China in 1987.[15] |

[1] See "Ballistic and Cruise Missile Threat" March 2006, Page 20. See also, "Dhanush Missile Test-Fired," The Hindu, 31 March 2007.

[2] "Ballistic and Cruise Missile Threat." National Air and Space Intelligence Center (NASIC), Wright-Patterson Air Force Base, Ohio. March 2006. Page 20. The Indian government first acknowledged the existence of the Sagrika in October 1998, identifying it as a 250-350-kilometer sea-launched cruise missile derived from the Pithvi. Other sources maintained that the Sagrika program also contained a ballistic missile division. US reports have classified it as an SLBM.

[3] Press Information Bureau, Government of India.

[4] See Siddharth Srivastava, "India Has China in its Range." Asia Times Online, 14 April 2007. The Agni III is cited as having payload capacity of 1.5 tons, which converts to 1,361 kg.

[5] See "Surya" at Global Security.org. Available: http://www.globalsecurity.org/wmd/world/india/surya.htm. See also, "India to Develop Intercontinental Ballistic Missile." Deccan Herald, 25 August 2005.

[6] DOD reported that Iran also produces a 200-kilometer "Zezal" missile and a 150 kilometer "Nazeat" missile, which may be variations of its "Mushak" series. Iran has also tried to acquire a complete North Korean No Dong system and the Chinese M-9 and M-11 missiles.

[7] Ali Akbar Dareni, "Iran Successfully Test-Fires Missile," Associated Press, 6 September 2002.

[8] "Iran Test-Fires Long Range Missile." Associated Press, reproduced in The Jerusalem Post. 23 May 2006. Reports on later Shahab III tests are conflicting, possible Shahab-III test in November 2006. See Nasser Karimi, "Iran Test-Fires Longer Range Missile."Associated Press, 2 November 2006.

[9] See the Monterey Institute's Center for Nonproliferation Studies "Weapons of Mass Destruction in the Middle East: Israel"

[10] See "North Korea Tests Long Range Missile." BBC News.

[11] See "Pakistan tests Hatf-II missile." The Hindu, 4 March 2007.

[12] See "Pakistan Tests Short-Range Hatf III." Reported by BBC and reproduced on Claremont Institute's Missile Threat.com.

[13] Agence France-Press, "Pakistan Test-Fires Nuclear-Capable Missile." Pakistan announced "serial production" of this missile in October 2000

[14] Associated Press, "Pakistan test-fires medium-range missile." Posted on MSNBC website, 16 Nov 2006.

[15] Seiff, Martin, "Pakistan Tests Shaheen Missile." United Press International, 10 May 2006. The Shaheen II was tested two weeks prior to the May launch, on April 29 2006. See "Pakistan Stages New Missile Test." BBC News, 29 April 2007.

[16] Missiles were purchased from China in 1987. The Missiles were operationally deployed only once, and are likely no longer operational as the arsenal is aging and would take substantial efforts to maintain.

**Table 5. The Five Countries With Long-Range Ballistic Missiles Deployed (ranges greater than 5,500km)[99]**

| COUNTRY | SYSTEM NAME | STATUS | RANGE (KILOMETERS) | PAYLOAD (KILOGRAMS) | ORIGIN | NOTES |
|---|---|---|---|---|---|---|
| CHINA | CSS-8 | O | 150–230 | 190 | I | Two stage, first solid, second liquid. Road Mobile. |
| | CSS-X-7 (DF-11/M-11) | O | 300 | 500 | I | Solid-fueled. Road Mobile. |
| | CSS-6 (DF-15/M-9) | O | 600 | 500 | I | Solid-fueled. Road Mobile. |
| | CSS-2 (DF-3/3A) | O/E | 2,650/2,900 | 2,150 | I | Liquid-fueled, gradually being retired. |
| | CSS-3 (DF-4) | O | 5,500 (maximum range) | 2,200 | I | CSS-3's range will be covered by new DF-31 once operational.[2] |
| | CSS-4 (DF-5/5A) | O | 12,000/13,000 | | I | Silo based. DF-5A has greater range and payload capacity than DF-5. |
| | CSS-5 (DF-21/21A) | O | 1,800 | 600 | I | |
| | DF-25 | D? | 1,700 | 2,000 | I | May just be the first two stages of the DF-31. |
| | CSS-X-10 (DF-31) | D/T | 8,000 | 700 | I | Deployment expected this decade. |
| | DF-31A | D | 12,000 | 800 | I | Road Mobile. Possible deployment by end of decade.[3] |
| | CSS-NX-3 (Julang-1) SLBM | O? | 1,700 | 600 | I | The JL-1 has been deployed, but never fully operational. |
| | CSS-NX-4 (Julang-2) SLBM | D/T | 7,200-8,000 | 700? | I | Expected to be deployed on Type 094 SSBN sometime this decade.[4] |
| FRANCE | M-45 SLBM | O | 6,000 | 1,000 | I | Scheduled to be replaced by M-51.1 in 2010. |
| | M-51.1 SLBM | D/T | 8,000 | 6 MIRV | I | Tested November 2006. M-51 renamed M-51.1. Scheduled deployment 2010.[5] |
| | M-51.2 SLBM | D | 6,000+? | ? | I | Upgraded M51.1. Scheduled deployment 2015.[6] |
| RUSSIA | Scud-B (SS-1c Mod 1) | O | 300 | 1,000 | I | Liquid fuel. |
| | SS-21 | O | 120 | 480 | I | Solid fuel. |
| | SS-18 (Satan) | O | 9,000–11,000 | 8,000 | I | Liquid fuel. Last tested December 21, 2006.[7] |
| | SS-19 (Stiletto) | O | 10,000 | 4,350 | I | Liquid fuel. |
| | SS-24 (Scalpel) | O | 10,000 | 4,050 | I | Solid fuel. Rail mobile. |
| | SS-25 (Sickle) | O | 10,500 | 1,000 | I | Solid fuel. Road-mobile. Last tested August 3 2006.[8] |
| | SS-27 (Topol-M) | O/P | 10,500 | 1,000–1,200 | I | 6 road- mobile SS-27 (the Topol M-1) scheduled to be deployed over 2007.[9] |
| | SS-X-26 (Iskander) | D/T | 300 | 480 | I | Solid fuel. Testing has been completed. |
| | Iskander-E | D/T | 280 | 480 | I | For export. Solid fuel. Belarus, Iran, and Syria interested in this missile. |
| | SS-N-18 SLBM | O | 6,500-8,000 | 1,650 | I | Last tested September 10, 2006.[10] |
| | SS-N-20 SLBM | R | 8,300 | 2,2550 | I | No longer in service. |
| | SS-N-23 (upgraded version is known as the Sineva) SLBM | O | 8,300 | 2,800 | I | Last tested September 9, 2006.[11] |
| | SS-N-27 (Bulava-M/Bulava-30) SLBM | D/T | 8,000–10,000 | 1,000–2,000 | I | SLBM version of the SS-27; last tested December 2006. Scheduled to be deployed on Borey class SSBN by 2008.[12] |
| UNITED KINGDOM | Trident II D-5 | O | 7,400+ | 2,800 | USA | The UK bought 58 missiles in 1998; tested 8 missiles. D-5s deployed on Vanguard class SSBN.[13] |
| UNITED STATES | MGM-140 (ATACMS Block I/IA/II) | O | 165/300/140 | 560/160/270 | I | All three versions have different ranges and payloads; all three versions have been delivered to the Army. |
| | Minute-Man III (MK-12/12A) | O | 9,650+[14] | 1,150 | I | Last confirmed test July 20, 2006;[15] service lives being extended until at least 2020. |
| | MX Peace Keeper | R/S | 9,650+ | 1,500 | I | Deactivated as of 2005. Although, neither silos nor missiles will be destroyed. |
| | Trident I C-4 SLBM | R | 7,400 | 1,500 | I | Retired in 2005. SSBNs that carried C-4s refitted with D-5s. |
| | Trident II D-5 | O | 7,400+ | 2,800 | I | Last confirmed test Nov. 21, 2006.[16] |

[1] Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2006." Prepared by the Natural Resources Defense Council.
[2] Ibid.
[3] Ibid.
[4] Ibid. See also Jim Manion, "China Ballistic Missile Submarine Force Growing." AFP, 2 March 2007.
[5] Robert S. Norris and Hans M. Kristensen, "French Nuclear Forces, 2005." Prepared by the Natural Resources Defense Council.
[6] Ibid.
[7] "Russia's Missile Forces Successfully Launch SS-18 ICBM Satan." RIA Novosti. 21 December 2006.
[8] "Nuclear Missile Testing Galore," Federation of Atomic Scientists. 30 January 2007.
[9] Robert S. Norris and Hans M. Kristensen, "Russian Nuclear Forces, 2007." Prepared by the Natural Resources Defense Council.
[10] "Nuclear Missile Testing Galore," FAS, 30 January 2007.
[11] Ibid.
[12] Recent tests of the Bulava have been failures, and the deployment date has been pushed back several times. The Bulava failed in tests on September 7, 2006, October 25, 2006, and again on December 24, 2006. See Richard Weitz, "Russian Missile Test failure Increases Fears of Nuclear 'Hair-Trigger.'" World Politics Watch, 10 November 2006. See also "Nuclear Missile Testing Galore," FAS.
[13] Hans M. Kristensen, "Britain's Next Nuclear Era," Strategic Security Blog, 7 December 2006.
[14] The Minute Man III missile may have a range of up to 13,000 kilometers, but the U.S. Strategic Command officially lists its range at "greater than" 9,650 kilometers.
[15] See "Nuclear Missile Testing Galore," FAS.
[16] Ibid. The Trident II D-5 may have a range greater than 7,400 kilometers, but this is the U.S. Strategic Command's officially listed range.

## Table 6. The Decreasing Global Ballistic Missile Threat

| Threat | Status (1987 vs. 2008) | Trends |
|---|---|---|
| ICBM & SLBM (> 5,500 km) | 60 % Decrease | ↓ |
| IRBM (3,000-5,500 km) | 97% Decrease | ↓ |
| MRBM ( 1,000-3,000 km) | 4 new national programs[A] | ↑ |
| SRBM (<1,000 km) | Declining as Scud inventories age. | ↓ |
| Number of nations with ballistic missile programs of concern | Fewer, less advanced[B]<br>(11 in mid-1980s, 6 today) | ↓ |
| Potentially hostile nations with ballistic missile development programs | Fewer and smaller overall arsenals[C]<br>(4 in mid-1980s, 3 today) | ↓ |
| Potential damage to the United states from a missile attack | Vastly decreased. | ↓ |

A India, Iran, North Korea and Pakistan.
B 1980s: Argentina, Brazil, China, Egypt, India, Iraq, Libya, Pakistan, the Soviet Union and South Africa. 2007: China, India, Iran, Israel, North Korea and Pakistan.
C 1980s: China, Iraq, Libya and the Soviet Union; 2007: China, Iran and North Korea.

## End Notes

[1] *Missile Defense Agency, Fiscal Year (FY) 2009 Budget Estimates, Overview*, Missile Defense Agency, Department of Defense, February 2008, p. 3.
[2] Official figures as reported by the Missile Defense Agency. MDA budget estimates do not include all anti-missile weapons spending as some systems, such as the Space-based Infrared System satellite network or the Patriot missile defense system, are not included.
[3] These numbers are from Block 3 and Block 4 funding in the MDA budget estimates, entitled ""Expand Defense of the U.S. to Include Limited Iranian Long-Range Threats" (Block 3, p. 27 of budget submission) which is $4.5 billion FY-08-FY13, plus "Defend Allies & Deployed Forces in Europe from Limited Iranian Long-Range Threats, Expand Protection of U.S. Homeland" (Block 4, p. 29) which is $4.7 billion, plus $1 billion in military construction. Department of Defense Fiscal Year (FY) 2009 Budget Estimates, Research, Development, Test, and Evaluation, Defense," Volume 2, Missile Defense Agency (MDA), February 2008.
[4] Iran has short-range missiles that could hit Turkey and southern Russia.
[5] Robert S. Norris and Thomas B. Cochran, *Nuclear Weapons Databook: U.S.-U.S.S.R/Russian Strategic Offensive Nuclear Forces, 1945-1996*, Natural Resources Defense Council, January 1997, p. 13
[6] Norris and Cochran, *Nuclear Weapons Databook: U.S.-U.S.S.R/Russian Strategic Offensive Nuclear Forces,* p. 12
[7] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Russian Nuclear Forces, 2007: *Bulletin of Atomic Scientists*, March/April 2007.
[8] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: US Nuclear Forces, 2007: *Bulletin of Atomic Scientists*, January/February 2007.
[9] The *Shahab* is adapted from the *No Dong*. Independent estimates range from ten to 25 *Shahabs* deployed; this analysis takes a middle estimate of 20. This estimate also does not count the *Taepo Dong* missile, which has failed in two tests to travel more than 1320 km and is not deployed.
[10] *Missile Defense Agency, Fiscal Year (FY) 2009 Budget Estimates, Overview*, Missile Defense Agency, Department of Defense, February 2008, p. 5.
[11] Joseph Cirincione and Andrew Wade, "Get Smart on Ballistic Missiles," *Center for American Progress*, May 2007.
[12] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Russian Nuclear Forces, 2007: *Bulletin of Atomic Scientists*, January/ February 2007.
[13] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Chinese Nuclear Forces, 2006. *Bulletin of Atomic Scientists, June 2006*.
[14] Iran has short-range missiles that could hit Turkey and southern Russia.
[15] Commission to Assess the Ballistic Missile Threat to the United States, "Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States" July 15, 1998, p 5.
[16] National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat to the United
States Through 2015" December 2001, p. 6
[17] National Intelligence Council "Foreign Missile Developments", p. 8
[18] Department of Defense, "Quadrennial Defense Review Report" Washington, D.C., September 30, 2002, pp. 6–7.
[19] George Tenet, "The Worldwide Threat in 2003: Evolving Dangers of a Complex World," Testimony before Senate Select Intelligence Committee, 11 February 2003.
[20] Statement for the Record: Senate Select Committee on Intelligence. General Michael V. Hayden, Director Central Intelligence Agency (as prepared for delivery). 11 January 2007.
[21] Ibid.
[22] *Missile Defense Agency, Fiscal Year (FY) 2009 Budget Estimates, Overview*, Missile Defense Agency, Department of Defense, February 2008, p. 5.
[23] France and the United Kingdom acquired intercontinental-range submarine-launched ballistic missiles in 1987 and 1995, respectively.
[24] Robert S. Norris and Thomas B. Cochran, *Nuclear Weapons Databook: U.S.-U.S.S.R/Russian Strategic Offensive Nuclear Forces, 1945-1996*, Natural Resources Defense Council, January 1997, p. 13
[25] Norris and Cochran, *Nuclear Weapons Databook: U.S.-U.S.S.R/Russian Strategic Offensive Nuclear Forces* p. 12
[26] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Russian Nuclear Forces, 2007" *Bulletin of Atomic Scientists*, March/April 2007.

[27] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: US Nuclear Forces, 2007" *Bulletin of Atomic Scientists*, January/February 2007.
[28] "Commander Announces Deactivation" Malstrom Air Force Base.
[29] "The Future of the United Kingdom's Nuclear Deterrent." Presented to Parliament by The Secretary of State for Defence and The Secretary of State for Foreign and Commonwealth Affairs by command of Her Majesty. Crown Copyright 2006: p.12.
[30] Ibid.
[31] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Chinese Nuclear Forces, 2006." *Bulletin of Atomic Scientists*, May/June 2006.
[32] "Chinese Submarine Patrols Rebound in 2007, but Remain Limited." Federation of American Scientists Strategic Security Blog.
[33] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Russian Nuclear Forces, 2007" *Bulletin of Atomic Scientists*, March/April 2007.
[34] Ibid.
[35] "Russia to Launch New Strategic Submarine-Deputy PM." *MOSNEWS*, April 10, 2007.
[36] Ibid.
[37] *IISS*, "The Military Balance: 2007." France's Strategic Nuclear Weapons: p.111.
[38] France first deployed the 6,000 km range M-4B SLBM on 9 December 1987 when the SSBN *Le Tonnant* departed on its first patrol, carrying 16 of these long-range missiles. Previously, the *Le Tonnant* had carried M- 4A SLBMs, which had a range of only 4,600 km and therefore qualify only as an intermediate-range system. See Robert Norris, Andrew S. Burrow, and Richard W. Fieldhouse, *Nuclear Weapons Databook Volume V: British, French, and Chinese Nuclear Weapons*. Boulder: Westview Press, 1994 p.257. France currently deploys only M-45 SLBMs on 4 SSBN's, three of the *Triomphant* class and one of the *L'Inflexible* class. All of its M-4B SLBMs have been retired.
[39] Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: French Nuclear Forces, 2005": *Bulletin of Atomic Scientists, 2003*. In addition, once the *Le Terrible* is fitted with the M-51.1 SLBM, the rest of the *Triomphant* class is to be refitted with the M-51.1.
[40] Hans M. Kristensen, "Britain Nuclear Era." Posted on *Strategic Security Blog*. December 7, 2006. Of the original 58 D-5 Trident IIs purchased in 1998, 8 were tested, leaving 50 missiles in the arsenal.
[41] Robert Norris and William Arkin. "NRDC Nuclear Notebook: British Nuclear Forces, 2001" *Bulletin of the Atomic Scientists*, November/December 2001,Vol. 57, No. 6, pp. 78–79.
[42] "Trident Plan Wins Popular Support." March 15, 2007. *BBC News*.
[43] On 12 July 2005 Alliant Techsystems and Lockheed Martin were awarded a $9.2 million contract by the U.S. Navy's Strategic Systems Program (SSP) office to "demonstrate and validate solid rocket motor technologies suitable for a Submarine Launched Intermediate Range Ballistic Missile (SLIRBM). SLIRBM is designed to precisely deliver a conventional payload on target at ranges in excess of 1100 miles within 10-15 minutes of launch. It is a 16month contract, and ATK will lead the Ground Demonstration Integrated Product Team (IPT) while Lockheed Martin will serve as overall systems integrator and lead a Missile System Trade Study IPT. After completing ground demonstrations, ATK and Lockheed Martin will work to transition the program to the flight demonstration phase in the 2008 timeframe." See also Norris and Kristensen, "US Nuclear Forces, 2007." 4 Ohio class SSBNs are to be converted to SSGNs, all of which are scheduled to be operational by 2008.
[44] This makes the generous assumption that China fielded all 20 DF-5 of its current missiles in 1987. The International Institute for Strategic Studies gives credit for only 2 systems. See *The Military Balance 1987-88* (Letchworth: Garden City Press p. 208. Others give credit for only 4 systems. See Norris et. al *Nuclear Weapons Databook Volume V* p. 359. See also Robert Norris and Hans M. Kristensen "NRDC Nuclear Notebook: Chinese Nuclear Forces:" *Bulletin of Atomic Scientists*, November/December 2003 Vol. 59, No. 6, pp. 77-80.
[45] Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2006."
[46] Assuming 48 French SLBMs; 50 British SLBMs; 20 Chinese ICBMs; 669 Russian SLBMs and ICBMs; 836 US SLBMs and ICBMs.
[47] In 1987, there were 2380 Soviet, 1640 U.S., and 20 Chinese long-range missiles for a total of 4040 long-range missiles in global arsenals. As of February 2007 there are 669 Russian, 836 U.S., 22 Chinese, 50 United Kingdom and 48 French long-range missiles for a global total of 1,623.
[48] The U.S. IRBM arsenal had long been eliminated by the time the INF Treaty entered into force. The United States deployed Thor IRBMs on UK territory in a joint agreement with the British government from 1958 to 1963. These missiles were retired in 1963 following improvements in the U.S. ICBM arsenal, and no further IRBMs were produced or deployed.
[49] U.S. Department of State, Fact Sheet on 1987 INF Missile Treaty, May 16, 2001.
[50] Norris, et. al *Nuclear Weapons Databook Volume V*, p. 257. Also, phone conversation with Hans M.

Kristensen of the Natural Resources Defense Council, January 21, 2005.
[51] Robert S. Norris and William M. Arkin "NRDC Nuclear Notebook: French Nuclear Forces, 2002" Bulletin of the Atomic Scientists, vol. 57, No. 4 pp. 70–71.
[52] Some sources, (including some U.S. government analysis at the time) classified the DF-4 as a "limited-range intercontinental ballistic missile" in part because its initial target was likely the U.S. military base in Guam. Though the range of the DF-4 has improved over time, it is believed that in 1987 the DF-4 likely only had a range of 4,750 km, making it an IRBM. See John Lewis and Xue Litai, *China Builds the Bomb* (Stanford: Stanford University Press, 1988), p.213 Current estimates credit the DF-4 with a range of 5,500 km, putting it on the cusp of ICBM status. The number of 20 DF-4 systems also is at the upper end of the 15-20 total DF-4s China may have had at the time. See Norris, et al *Nuclear Weapons Databook Volume V*, p. 363 and Norris and Kristensen, "Chinese Nuclear Forces 2006."
[53] Robert S. Norris, Hans M. Kristensen, and Joshua Handler, "NRDC Nuclear Notebook: North Korea's Nuclear Program, 2003" *Bulletin of the Atomic Scientists*, March/April 2003, Vol. 59, No. 2, pp. 74-77.
23 Robert S. Norris and William M. Arkin, "NRDC Nuclear Notebook: India's Nuclear Forces, 2002" *Bulletin of the Atomic Scientists*, March/April 2002, Vol. 58, No. 2, pp.70-72.
[54] U.S. Department of State, Fact Sheet on 1987 INF Missile Treaty.
[55] "India to Test Longer Range Missile in 2007."Staff Writers of New Delhi (AFP) Nov 9 2006.
[56] Siddharth Srivastava, "India Has China In Its Range," *Asia Times Online*, April 14, 2007.
[57] France actually possessed 5 SSBNs capable of carrying 16 M20 medium-range SLBMs. One of these submarines was always in refit, and therefore the actual operational stockpile is estimated to be 64. During 1987, the *Le Tonnant* was being refitted with the M4A intermediate-range SLBM system, which marked the beginning of the phase-out of the M20 SLBM. Norris et. al, Nuclear *Weapons Databook Volume V, p.253.* Also, phone conversation with Hans M. Kristensen of the Natural Resources Defense Council, January 21, 2005.
[58] The most recent National Intelligence Estimate notes that China possesses this capability but the NRDC states that as of November 2003, China's lone Xia class submarine is not fully operational. See National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat to the United States Through 2015" December 2001, p. 9 and Robert Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Chinese Nuclear Forces, 2003" *Bulletin of the Atomic Scientists*, November/December 2003, Vol. 59, No. 6,pp.77-80.
[59] Norris and Kristensen "Chinese Nuclear Forces, 2006."
[60] Ibid.
[61] In 1987 at the time of the signing of the INF Treaty the United States possessed 234 Pershing II MRBMs, and the Soviet Union possessed 149 SS-4 Sandal MRBMs. (See U.S. Department of State, *Fact Sheet on 1987 INF Missile Treaty.*) Precise Chinese figures for the time are difficult to determine and these figures assume a force structure similar to that which China fields today, including 40 DF-3 MRBMs, 48 DF-21 MRBMs and 12 CSS N-3 sea-launched MRBMs, See Norris et. al, *Nuclear Weapons Databook Volume V,* p 359 and Norris and Arkin "NRDC Nuclear Notebook: Chinese Nuclear Forces" p 71-72.
[62] This is an estimate, as reliable sources vary. Israel's missile arsenal is listed as 50 each of Jericho I and Jericho II missiles in CNS, *Nonproliferation Review* (Winter 1996), p. 201. There are "some" Jericho I and II missiles according to International Institute for Strategic Studies (IISS), *The Military Balance, 2004-2005*, p. 126. The "NRDC Nuclear Notebook" of September/October 2002 also lists 50 Jericho II missiles, and adds that the Jericho I is probably deployed in "approximately equal numbers."
[63] IISS, The Military Balance: 2001-2002 p. 146. Congressional Research Service Missile Survey: Ballistic and Cruise Missiles of Foreign Countries, updated March 5, 2004, p. 38.
[64] Robert S. Norris, Hans M. Kristensen, and Joshua Handler. "NRDC Nuclear Notebook: North Korea's Nuclear Program, 2003," *Bulletin of the Atomic Scientists*, March/April 2003, Vol. 59, No. 2, pp. 74-77.
[65] Najmeh Bozorgmehr. "Iran's Ballistic Missile Goes Into Service." *Financial Times*, July 21, 2003. "Russian Expert: Iran May Field Up to 20 Shahab-3 Missiles By 2005." *World News Connection/Itar-Tass*, July 21, 2003.
[66] "Ballistic and Cruise Missile Threat." National Air and Space Intelligence Center, Wright Patterson Air Force Base, Ohio, IL. March 2006.
[67] According to a January 9, 2003 CNN report, the Pakistani Ghauri MRBM was handed over from a research facility to the military. Little is known about how many Ghauri missiles have been produced and whether or not they have been fully deployed. The Ghauri was most recently tested on May 29, 2004.
[68] The 285 number assumes the lowest estimate of Saudi CSS-2/DF3A's (40), Israeli Jericho II's (50), North Korean No Dong's (90), Chinese DF-3's, DF-21's, and CSS-N-3/JL I's (100), Indian Agni II's (0), Pakistani Ghauri's, Ghauri II's, and Shaheen II's (0), and Iranian Shahab III's (5). The 417 number assumes the highest estimate of each of these missiles (40 Saudi CSS-2/DF3A's, 50 Israeli Jericho II's, 100 North Korean No Dong's, 104 Chinese DF-3's, DF-21's, and CSS-N-3/JL-1's, and 20 Iranian Shahab III's,

plus an additional five missiles for North Korea (Taepo Dong I), India (Agni II), and Pakistan (Ghauri, Ghauri II, or Shaheen II).

[69] This takes a skeptical view of the range of the Taepo Dong missile, which in its lone test traveled only 1320 km.

[70] Commission to Assess the Ballistic Missile Threat to the United States, "Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States" p 10-11

[71] *Missile Defense Agency FY2008 Budget Estimates Overview.* Page 3.

[72] *Missile Defense Agency FY 2008 Budget Estimates Overview.* Page 4.

[73] *Missile Defense Agency, Fiscal Year (FY) 2009 Budget Estimates, Overview*, p. 5

[74] National Intelligence Council, "Foreign Missile Developments", p. 12.

[75] *The Worldwide Threat 2004: Challenges in a Changing Global Context* Testimony of Director of Central Intelligence George J. Tenet before the Senate Armed Services Committee, March 9, 2004.

[76] The Guardian. "UK Sets Iran Deadline To End Nuclear Work." September 9, 2004.

[77] "Forden on the Shahab 3" Arms Control Wonk.

[78] Gertz, Bill, "North Korea Puts On Missile Show." *The Washington Times.* July 5, 2006

[79] CNS Special Report. " North Korean Ballistic Missile Capabilities." March 22, 2006, Center for Nonproliferation Studies Monterey Institute of International Studies.

[80] Ibid.

[81] Statement of General B. B. Bell before the Senate Armed Services Committee, March 7, 2006 (p.7).

[82] Remarks by General Eugene Habiger, "Alaska Missile Interceptor Site Has No Credibility," Carnegie Non-Proliferation Issue Brief, Vol. VII, No. 14, September 29, 2004. Carnegie Endowment for International Peace 16.

[83] Ibid.

[84] Joshi, Sharad, "Pakistan's Missile Tests Highlight Growing South Asia Nuclear Arms Race, Despite New Confidence Building Measures." April 2007. *James Martin Center for Nonproliferation Studies.*

[85] "Pakistan tests ballistic missile." February 13, 2008. *BBC.*

[86] "Pakistan tests nuclear-capable missile." February 1, 2008. *Reuters.*

[87] "Prithvi." *Federation of Atomic Scientists.*

[88] "India Begins Deploying Agni Missiles," August 31, 2004.

[89] U.S. Department of State, Fact Sheet on 1987 INF Missile Treaty.

[90] "India to Test Longer Range Missile in 2007." November 9, 2006. Staff Writers of New Delhi (*AFP*).

[91] Siddharth Srivastava, "India Has China In Its Range," *Asia Times Online.*

[92] "India Tests Underwater Missile." February 26, 2008. *Associated Press.*

[93] "India missile test to start arms race: Pakistan." February 27, 2008. *Reuters.*

[94] Henry H. Shelton, Chairman of the Joint Chiefs of Staff, letter to The Honorable James M. Inhofe, United States Senate, August 24, 1998. The author has modified the formatting of the letter to highlight the enumerated disagreements.

[95] Calculation based on the first-strike power of the Soviet Union in 1987.

[96] Calculation based on first-generation nuclear weapons on one or two missiles from Iran, Iraq, or North Korea.

[97] Wade, Andrew. "Global Ballistic Missile Arsenals, 2007." Center for American Progress.

[98] Ibid.

[99] Ibid.

Mr. TIERNEY. Thank you, Mr. Cirincione.
Mr. Spring.

**STATEMENT OF BAKER SPRING**

Mr. SPRING. Thank you, Mr. Chairman. I very much appreciate the opportunity to testify today on the ballistic missile defense program.

According to a statement by President Bush before the National Defense University last October, there are 27 states that possess ballistic missiles. That compares to about nine in 1972. The question is not, in my judgment, the overall number of the missiles as to the circumstances that are presented by the distribution of this.

By any measure, the United States now finds itself in a multipolar missile world. The key policy question facing the United States, now that it finds itself under this circumstance, is how it will respond. In my judgment, it basically faces to alternatives. On the one hand, the United States can multi-lateralize the cold war policy of purposeful vulnerability established in the bipolar cold war. This was called mutually assured destruction [MAD].

Alternatively, the United States can adopt a policy to defend its people, territory, allies, and forward deployed forces against missile attack to the best of its ability. I call this alternative a damage limitation strategy.

Analysts at the Heritage Foundation have revealed that multilateralizing mutually assured destruction would be a profoundly destabilizing choice, and that the damaged limitation strategy is the preferred option for maintaining peace and stability in a multipolar missile world.

Obviously, there has been extensive discussion, including today so far with regard to the emerging missile threats in the form of the state actors, specifically Iran and North Korea. Certainly we can continue to look at that.

I think it is important, though, from this policy perspective, that we also focus on the friends and allies of the United States that are also moving toward ballistic missile delivery systems, and in some cases nuclear weapons. These include Egypt, India, Israel, Pakistan, South Korea, and Turkey.

How the United States goes about reducing the likelihood that these allied or friendly states will be tempted to use their missile arsenals in a way that will draw the United States into a conflict has not been widely discussed, but this is at the core of the question of strategic stability in a multi-polar world.

This issue will become much more pressing as these same states may be tempted, perhaps, for example, in response to Iran's nuclear program, to pursue nuclear weapons insofar as that three of them—India, Israel, and Pakistan—are at least presumed to be de facto nuclear powers. It is adjusting to this particular circumstance of nuclear and missile multi-polarity—and I would extend that actually to other weapons of mass destruction, as well, using that delivery system, which I think is really the pressing question and what justifies the $10 billion that we are talking about here.

What is it that I would do with the missile defense program to make sure that it keeps on track, in my judgment, to execute the

damage limitation strategy that I have outlined in broad brush here?

First, I think it is important for Congress not to put procedural roadblocks in the way of the best technological path to effective missile defense. One of the reasons that, in my judgment, we are behind the curve with regard to addressing the missile threat is the United States had adopted that policy of mutually assured destruction and a treaty that went with it for a 30-year period that effectively blocked what I would view as the most effective avenues and cost-effective avenues to missile defense.

We are beyond that treaty now. President Bush has withdrawn the United States from it. But we are still in the process, in my judgment, of catching up over on the 30-year period where we were subject to those restraints.

I would maintain robust funding for the missile defense program, but that would still be within the 2 or 3 percent of our total defense budgets. I think it is unlikely that it would go much higher than that.

I think we should look at space-based options, including the space test bed that is in the President's budget request this year.

I think we should set aside the charge that a ballistic missile defense program would "weaponize space." My judgment is the ballistic missiles that fly through space are the capabilities that have resulted in the weaponization of space.

I think we should look at sea-based options more readily than the ground-based options, in balance.

And I think that we should make sure that we don't put any restrictions on putting developmental missile defense systems on operational alert when circumstances suggest that we should do so, as we did in 2006 with the North Korean salvo launch.

And I think we should shift responsibility, as missile defense programs mature, from the Missile Defense Agency to the services, as we are doing with the Patriot system now and I think we should start doing with the sea-based systems in the near future.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Spring follows:]

**Statement of Baker Spring**

**F.M. Kirby Research Fellow in National Security Policy**

**The Heritage Foundation**

**before**

**The House Subcommittee on National Security and Foreign Affairs**

**of**

**The House Committee on Oversight and Government Reform**

**on**

**Oversight of Ballistic Missile Defense: Threats, Realities, Tradeoffs**

March 5, 2008

Mr. Chairman, I appreciate the opportunity to testify today on the ballistic missile defense program. Today, according to a statement by President Bush before the National Defense University last October, there are 27 states that possess ballistic missiles. That compares to just nine in 1972. Thus, by any measure, the United States now finds itself in a multi-polar missile world. The key policy question facing the United States, now that it finds itself in this circumstance, is how it will respond. It basically faces two alternatives. On the one hand, the United States can mulilateralize the Cold War policy of vulnerability established in the bi-polar world of the Cold War, which was called mutually assured destruction (MAD). Alternatively, the United States can adopt a policy to defend its people, territory, allies and forward-deployed forces against missile attack to the best of its ability. I call this alternative a "damage-limitation strategy." Analysis at The Heritage Foundation reveals that multilateralizing MAD would be profoundly destabilizing and that the damage-limitation strategy is the preferred option for maintaining peace and stability in a multi-polar world.

First, however, let me highlight some of the worldwide developments in the field of ballistic missiles that have led the United States to this multi-polar outcome. According to the Missile Defense Agency, the nations that have active ballistic missile inventories, in addition to the established missile powers of China and Russia, include potentially hostile states like Iran and North Korea.

Again, according to the Missile Defense Agency, North Korea has four classes of missiles in its active inventory, two longer-range missiles that may be available and an additional two under development. North Korea's capabilities were highlighted by its July 4 and 5, 2006 salvo test launch. North Korea also conducted a nuclear test explosion on October 9, 2006.

Iran has three classes of ballistic missiles in its active inventory. It has four additional classes under development. One of these is a space launch vehicle that possesses similar characteristics to a long-range missile. The Iranian government launched this rocket on February 5$^{th}$, with uncertain results. While the November 2007 National Intelligence Estimate (NIE) states that Iran abandoned its indigenous nuclear weapons development program in 2003, it also states, "We cannot rule out that Iran has acquired from abroad…a nuclear weapon or enough fissile material for a weapon." Personally, I find it illogical that Iran is making large-scale investments in ballistic missiles with the intention of arming them solely with conventional warheads.

Less talked about, but that should still be of keen interest to the United States, are the allied or friendly states that are on the Missile Defense Agency's list. These include Egypt, India, Israel, Pakistan, South Korea and Turkey. How the United States should go about reducing the likelihood that these allied or friendly states will use their missile arsenals in a way that will draw it into a conflict has not been widely discussed. This issue will become much more pressing as these states pursue nuclear weapons, in as much as three of them, India, Israel and Pakistan, are at least presumed to be *de facto* nuclear weapons states.

Now let me turn to the United States's ballistic missile defense program. Congress and the American people need to understand that while the United States has made progress in putting missile defense systems in the field in recent years, in most respects the U.S. remains vulnerable to this threat. This is no time for the U.S. to slow the pace of developing and deploying effective defenses against ballistic missiles. Indeed, the Bush Administration and Congress need to accelerate the effort by focusing on developing and deploying the systems that offer the greatest capability.

A detailed proposal for proceeding with the most effective systems was issued by the Independent Working Group on missile defense in June 2006. The report specifically refers to space-based and sea-based defenses as the most effective components of the layered missile defense system design advocated by the Bush Administration. While the sea-based systems have continued to make progress in recent years, the effort to develop and deploy space-based interceptors has languished. Therefore, the Congress should take the following steps, which are consistent with the recommendations of the Independent Working Group report:

- **Support** ongoing programs to develop and field ballistic missile defenses through defense authorization and appropriations legislation by resisting attempts to put procedural roadblocks in the path to progress;
- **Maintain** robust funding for the missile defense program;
- **Support** the construction of a "space test bed" for missile defense;
- **Set aside** charges that the testing and fielding of missile defense systems will cross a threshold by "weaponizing" space;
- **Support** the deployment of sea-based defenses to protect U.S. coastal areas against short-range ballistic missiles launched from ships;
- **Oppose** efforts to deny the military the option of putting developmental missile defense systems on operational alert; and
- **Shift** responsibility for sea-based missile defense systems from the Missile Defense Agency to the Navy.

## Toward Defending America: Progress But Still Vulnerable

The Bush Administration has made significant progress toward fielding an effective defense against ballistic missiles. The greatest advances have come in the policy area. President George W. Bush kicked off the effort to change the Clinton Administration's negative policies toward missile defense with a speech on May 1, 2001, to the faculty and students of the National Defense University. In this speech, the President signaled his intention to put missile defense at the heart of the effort to transform the military and position it to meet the security needs of the 21st century.

President Bush followed up this speech by changing missile defense policy with a dramatic announcement on December 13, 2001, that the U.S. was withdrawing from the

1972 Anti-Ballistic Missile (ABM) Treaty with the former Soviet Union. The ABM Treaty blocked the development, testing, and deployment of effective defenses against ballistic missiles.

On January 9, 2002, the Department of Defense (DOD) announced the findings of the Nuclear Posture Review, a new strategic policy that made defenses a part of a new strategic triad. Under this policy, defenses were paired with offensive conventional and nuclear strike capabilities and a robust technology and industrial base to meet U.S. strategic needs.

Finally, on May 20, 2003, the White House released a description of a presidential directive signed earlier by President Bush related to his policy for developing and deploying a layered missile defense system as soon as possible to defend the people and territory of the United States, U.S. troops deployed abroad, and U.S. allies and friends. When fielded, this layered defense will be able to intercept ballistic missiles in the boost (ascent), midcourse, and terminal phases of flight.

The Bush Administration has also made significant advances in increasing funding levels for missile defense research, development, and deployment. In fiscal year (FY) 2001, which was the last Clinton Administration budget, funding for the Ballistic Missile Defense Organization was $4.8 billion. This level of funding was achieved only because of aggressive congressional support for ballistic missile defense in the face of a reluctant Clinton Administration. In FY 2002, funding for what is now the Missile Defense Agency was increased to $7.8 billion. The projected expenditure level for FY 2009 is $9.3 billion. Somewhat more than $1 billion in additional funding for missile defense will be provided to other elements of the Department of Defense, outside the Missile Defense Agency.

On the other hand, the American people still remain quite vulnerable to ballistic missile attack because missile defense programs have lagged behind advances in policy, funding, and—regrettably—the missile threat. To some extent, this is unavoidable. A policy for deploying effective missile defenses must precede actually fielding the defenses, and the necessary funding must be in place to move the programs forward. However, the American people remain vulnerable because the Bush Administration and Congress have compromised on the most effective technological options.

The most important of these regrettable compromises regards the failure to revive the technologies necessary to complete the development and ultimately to deploy the Brilliant Pebbles space-based interceptor, pioneered by the Reagan and George H. W. Bush Administrations. Congress weakened this rapidly advancing concept in 1991, and President Bill Clinton killed it in 1993. The current Bush Administration's failure to revive these technologies was noted early on by Ambassador Henry Cooper, former Director of the Strategic Defense Initiative Organization, in a 2001 letter to Lt. General Ronald Kadish, then Missile Defense Agency Director. The Brilliant Pebbles option remains dormant today.

The sea-based systems for countering ballistic missiles have fared better than the space-based programs. The system is based on giving the Aegis weapons system for air defense deployed on Navy cruisers and destroyers a capability to track and intercept ballistic missiles. The interceptors consist of late-model and new-model Standard Missiles. The system has also demonstrated a space protection capability by destroying an errant National Reconnaissance Office (NRO) satellite last month.

Despite the progress with sea-based missile defense systems, they are not as advanced as they could be. An accelerated approach to fielding sea-based ballistic missile defenses was described by Ambassador Cooper and Admiral J. D. Williams in an opinion piece in *Inside Missile Defense* on September 6, 2000. This approach advocated building on the existing Aegis infrastructure by increasing the interceptor missile's velocity to achieve a boost-phase intercept capability. It would also require changing the operational procedures that the Navy is permitted to use to perform missile defense intercepts. The Bush Administration, however, has taken several steps that have slowed progress on the sea-based option.

*First,* it canceled the Navy Area Program in 2001. This program consisted largely of the same technology that was successfully demonstrated in the 2006 Navy test of the terminal Standard Missile-2 Block IV. This decision deprived the Navy of a basic building block for evolving more capable sea-based missile defenses.

*Second,* the Missile Defense Agency initially sought to replace the Standard Missile family of interceptors with a variation of the Kinetic Energy Interceptor (KEI), which is too large to fit in the existing vertical launch system. While the Missile Defense Agency ultimately abandoned the KEI option for near-term sea-based deployment, precious time was lost.

*Finally,* the Bush Administration continues to insist on applying a firing protocol developed during the Clinton Administration that requires Navy ship commanders to wait until the target missile's rocket motors have burned out before launching the interceptor. This requirement effectively prohibits the sea-based defense from achieving a boost-phase or ascent-phase intercept capability.

## Seven Steps for Fielding Effective Missile Defenses

Obtaining a missile defense capability for the U.S. that matches the rhetorical support from the Bush Administration and Congress, particularly given the strengthened position of missile defense opponents in Congress, requires achieving certain programmatic goals. At the outset of the Bush Administration, support for missile defense required changing prevailing national security and arms control policies.

The Administration, with support from Congress, has achieved these important goals. The government is firmly committed to developing and deployed a layered, global

missile defense system, and the U.S. is no longer bound by the ABM Treaty. Now the Bush Administration and Congress need to take seven specific steps.

**Step #1: Avoid legislative proposals that would weaken the missile defense program.**

Further progress on developing and deploying a truly effective missile defense system starts with a procedural step: setting aside legislative measures that would weaken the missile defense program. This effort should be directed at FY 2009 defense authorization and defense appropriation bills. The cooperative strategy should start with identifying actions--whether of commission or of omission--that would clearly undermine the federal government's ability to provide the protection against missile attack that the American people are demanding and lead to specific measures for countering these actions.

**Step #2: Support adequate funding for the missile defense program.**

The missile defense program cannot provide an adequate defense unless it is properly funded. In general terms, this means maintaining the missile defense budget at no less than what is in the Bush Administration's fiscal year 2009 request—roughly $10 billion per year. In fact, Congress should seek incremental increases in the Navy's sea-based program and in space-based defenses.

**Step #3: Propose in Congress an effective program for putting missile defense interceptors in space.**

The Bush Administration's missile defense budget proposes $10 million in FY 2009 in initial funding to establish a space test bed. This is a request that Congress unwisely denied for the current fiscal year. Funding for this program is envisioned to reach $123 million in FY 2013. The funding proposal is categorized as one of several "capability development" programs that are designed to address future requirements.

Even though the Bush Administration's proposal to begin work on establishing a space test bed is very limited and in keeping with a slow, incremental approach, it is certain to face opposition in Congress again this year. If Congress intends to have an energetic debate over developing and deploying the most effective missile defense system available—namely space-based interceptors—it ought to debate a truly substantive program. Participants in the Independent Working Group believe that such a substantive program would provide $100 million in FY 2009, $500 million in FY 2010, and $1 billion in FY 2011 to create the space test bed. This approach should yield a capable development test bed in three to four years. The effort should be put in the hands of a small, competent management team and should focus on reviving the demonstrated technologies in the Brilliant Pebbles program. A constellation of space-based missile defense interceptors would provide missile defense to both the U.S. and its friends and allies.

**Step #4: Rebut the charge that U.S. development and deployment of space-based missile defense interceptors would constitute an unprecedented step to weaponize space.**

Arms control advocates are currently focused on preventing the "weaponization of space." They base their proposals on the assertion that space is not already weaponized, which is valid only if properly defining the term "space weapons" is

irrelevant to the exercise of controlling them.

The fact is that space was weaponized when the first ballistic missile was deployed, because ballistic missiles travel through space on their way to their targets. The threat that these weapons pose to U.S. security and the U.S. population is undeniable. The superior effectiveness of space-based interceptors in countering ballistic missiles is based on the fact that ballistic missiles transit space. As a result, space-based interceptors are ideally located to intercept ballistic missiles in the boost phase. Congress needs to reject the charge that space-based ballistic missile defense interceptors would constitute an unprecedented move by the U.S. to weaponize space.

An undefined ban on space weapons could be interpreted as requiring the U.S. to withdraw all satellites that are elements of broader U.S. strike weapons systems, all ballistic missiles and rockets capable of delivering a payload to low-earth orbit or higher, all nuclear weapons that can be mated to such ballistic missiles or rockets, a wide range of electronic jamming capabilities, kinetic kill vehicles capable of space flight, and strike systems capable of destroying satellite ground stations, just to name a few. The missile defense program would be crippled because most missile defense systems have some inherent anti-satellite capability, as was demonstrated by the recent operation involving the errant NRO satellite. An undefined ban on space weapons would effectively drive the U.S. military back to the mid-20th century.

**Step #5: Field a system to protect U.S. coastal areas from sea-launched shorter-range missiles.**

In the near term, lesser missile powers, maybe including terrorist groups, could attack U.S. territory by launching a short-range Scud missile from a container ship off the U.S. coast. Congress should express its concern about this threat and direct the Navy to take steps to counter it.

The best near-term capability for the Navy to counter this short-range missile threat was identified in the report of the Independent Working Group and successfully demonstrated by the Navy in 2006. The Navy conducted a test of the existing Standard Missile-2 Block IV as a terminal defense against a short-range missile near Hawaii.

Building on this successful test, Congress could direct the Navy to deploy the existing Standard Missile-2 Block IV interceptors on Aegis-equipped ships to provide a terminal defense against ballistic missiles. Further, it should direct the Navy to develop upgrades to this system so that it can perform boost-phase intercepts. Finally, Congress should provide the necessary funding to the Navy to conduct these development and deployment activities.

**Step #6: Move funding and management authority for sea-based missile defense systems from the Missile Defense Agency to the Navy.**

It has long been the expectation that mature missile defense systems developed under the management of the Missile Defense Agency would be transferred to the services to manage remaining development and procurement activities. In fact, press reports indicate that Under Secretary of Defense for Acquisition, Technology, and Logistics Kenneth J. Krieg approved a plan in September 2006 to transfer several ground-based ballistic missile defense systems from the Missile Defense Agency to the Army.

On a similar basis, Congress should direct the Defense Department to approve the transfer of these programs to the Navy. The sea-based systems developed by the Missile Defense Agency have matured to the point that such a transfer is warranted, as pointed out and recommended in the Independent Working Group's report. There is no reason to wait any longer. Congress should direct that this transfer give both management authority and the necessary funds to the Navy, but also make it clear to the Navy that it may use the funds only for this purpose.

**Step #7: Counter attempts to prohibit the Defense Department from putting developmental missile defense systems on operational alert.**

The Department of Defense is using a spiral development process to advance missile defense technology and systems. This means that it is putting developmental systems in the field to improve them incrementally. The spiral development process is not only appropriate for the missile defense program, but also essential because the missile defense "architecture" is a system of systems that must be built first in order to test it. This characteristic also gives developmental missile defense systems an inherent, although limited, operational capability.

The option to put the developmental missile defense on operational alert on at least an interim basis is now at hand. There may be the temptation, however, to use expedient procedural arguments to prevent the use of developmental missile defense systems to defend the American people against attack. They could include adding a provision in defense authorization or appropriations legislation that would deny the military the option of using the missile defense system until all system components have passed a full slate of operational tests.

Such a proposal will be advertised as just "fly before you buy" common sense. In reality, it will constitute an advertisement of American vulnerability to attack. If a country like North Korea is thinking about launching a missile at the U.S., it makes little sense for Congress to announce that the country can take a free shot at the U.S. because the U.S. will not use its limited missile defense capability.

Adopting such a prohibition would also set the predicate for an effort to prohibit the procurement of additional missile defense components until current ones have passed the same slate of operational tests. This will grind the overall missile defense program to a halt because the nature of the system is that it must be built in order to be tested.

## Conclusion

Mr. Chairman former Secretary of State Henry Kissinger observed in his memoirs that the opponents of strategic defense fashioned a policy during the Cold War that, "[f]or the first time a major country saw an advantage in enhancing its own vulnerability." In the current era, in which there are clear trends in the direction of both missile and nuclear proliferation, the default position for United States security strategy is to take the policy of vulnerability to the next level by enhancing America's vulnerability to any number of powers that obtain nuclear weapons and the ballistic missiles to deliver them, not just its vulnerability to a single superpower rival. Multilateralizing this policy of vulnerability would be profoundly destabilizing and would encourage further missile and nuclear proliferation.

Mr. TIERNEY. Thank you, Mr. Spring.
Mr. Hildreth.

**STATEMENT OF STEVEN A. HILDRETH**

Mr. HILDRETH. Thank you, Mr. Chairman. Chairman Tierney, Mr. Shays, distinguished members of the subcommittee, I want to thank you all very much for this opportunity to come here today and talk about this issue.

I want to acknowledge the collaboration of a couple of colleagues that are here and actually sit behind me in this effort: Mary Beth Nikitin and Paul Kerr. Their assistance, their work in this area is significant, and I want to acknowledge that here today.

There are any number of threats, different kind of threats, to the United States and its national security interests. What I want to focus on and what I did in my statement was focus on just one part of that, and that was ICBMs armed with nuclear weapons, nuclear warheads.

I last appeared before this subcommittee in 1992—Joe was here—during its investigation of the Patriot missile defense system performance during Operation Desert Storm. It is useful to recall that during the 1991 war with Iraq what we saw and what we were told with respect to the patriot SCUD engagements was not necessarily, as it turns out, what actually happened. This underscores the importance of rigorously examining assertions concerning weapon systems' performance and development.

Since the dawn of the rocket age, only five countries have demonstrated the ability to develop, test, and deploy or field ICBMs armed with nuclear weapons. Since the early 1960's, there have been any number of intelligence assessments and studies that predicted that number would be much higher.

The question is, why has that not happened? Why has this number not increased, as many had predicted. I believe that no small part of the reason lies with the serious technical challenges that countries face in building an operational ICBM.

The statement that I have briefly discusses some of these technical and organizational management challenges that nations face in developing such capabilities. The five countries that today have those capabilities all needed to overcome those challenges, and in some cases by receiving significant foreign assistance.

A review of those challenges can add what I would call perspective to look at all these issues, look at the challenge in developing ICBMs, and put that in perspective in trying to better understand the likelihood that countries might develop, deploy, and threaten U.S. national security interests. I think that this perspective helps lead to a better estimation of those likelihoods.

There are many key parts of an ICBM, and in my statement I go into those things, things like propulsion system, the payload or compact nuclear device, the re-entry vehicle, and then there are additional factors that we have seen in the successful development of an ICBM program such as testing and organization management that are all seen as important to see or to produce a successful ICBM for fielding. I am not going to go into all those right now because I know that many of you had a chance to see the statement, and I will leave that.

Basically, to sum up, saying that it is a daunting challenge. The fact that only five nations have ever accomplished this ability, this capability, in the past 50 years is perhaps testament to the fact that this is a technically daunting challenge. Not to say that other countries can't do this, but it is to say, in perspective, that it is a difficult, difficult task.

Each and every one of these things—RVs, propulsion systems, guidance systems, so forth—present a multitude of technical challenges and hurdles to overcome that are just not easily done, and that is basically the track record that we have had among the five ICBM countries.

There has been discussion in the past decades since the Rumsfeld Commission that some countries, such as Iran, Iraq, and North Korea, could develop ICBMs in a significantly different manner. Within those studies—and this extends also to efforts on the part of the intelligence community over the past decade—there are many assumptions made to support this thought.

First is that countries will pursue alternative paths to building missiles that will not require "high standards of missile accuracy, reliability, and safety, nor large numbers of missiles." Second, countries will obtain significant foreign assistance in developing those missiles. Third, having or building short-range ballistic missiles such as Scuds provides the means to develop ICBMs.

Each and every one of those are arguable. I just want to touch on one, and that is that this issue of deploying an ICBM without testing could be readily done, but, even according to the 1999 national intelligence assessment, doing so would result in significantly reduced confidence in the reliability of that system.

Also, foreign assistance, of course, could speed up development of ICBMs and nuclear warheads, but some observers—and I know Joe testified just last summer on that—most suppliers appear to be withholding meaningful assistance. Arguably, gaining foreign help with ICBMs has become more difficult over time. The fact that in recent testimony by the intelligence community to Congress before the Senate Armed Services Committee, if you read the prepared statements, there is nothing in their prepared statements about this kind of assistance for foreign missile development, where in previous years it was highlighted.

Two countries have successfully developed and deployed operational nuclear-armed ICBMs. The developmental records of their efforts indicate how challenging that effort has been. The fact that more nations have not done this, as I mentioned, is perhaps witness in part to the extraordinary technical effort it took. The long history of ICBMs demonstrates that such success took considerable resources and time, funding, knowledge, infrastructure, organization, and national commitment. It is this aspect of it, this perspective, that I think is lacking in so many of the discussions about ICBM threats to the country today.

On that note I would like to end. Thank you very much for your time.

[The prepared statement of Mr. Hildreth follows:]

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COMMITTEE ON OVERSIGHT & GOVERNMENT REFORM

**STATEMENT OF**

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**BEFORE THE**

**HOUSE COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM**

**SUBCOMMITTEE ON NATIONAL SECURITY AND FOREIGN AFFAIRS**

**HEARING ON**

**OVERSIGHT OF BALLISTIC MISSILE DEFENSE (PART 1):
THREATS, REALITIES AND TRADEOFFS**

**MARCH 5, 2008**

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COMMITTEE ON OVERSIGHT & GOVERNMENT REFORM

# Some Thoughts on ICBM Development and ICBM Threats

## Introduction

Chairman Tierney, Ranking Member Shays, distinguished members of the subcommittee, thank you for the opportunity to appear before you today. As requested, this statement provides some brief observations on the development of ICBMs and ICBM threats. I wish to acknowledge the collaboration of colleagues at CRS, especially Mary Beth Nikitin and Paul Kerr, in preparing this statement.

## Overview

There are any number of different kinds of threats to U.S. national security interests. Some of these include threats from ballistic missiles, which have a range from a hundred or so kilometers up to about 10,000 kilometers. This statement focuses on the issue of longer range ballistic missiles, or ICBMs (Intercontinental Ballistic Missile) armed with nuclear warheads.

ICBMs are long-range ballistic missiles,[1] with ranges exceeding 5,500 km (about 3,500 miles), that carry one or more nuclear warheads. Historically, most have been deployed in land-based silos. Long-range ballistic missiles also have been deployed on mobile land platforms and at sea on submarines, in which case they are referred to as SLBMs (Submarine Launched Ballistic Missile). ICBMs and SLBMs are sometimes referred to as strategic missiles. In the past 50 years, there have been many hundreds, and perhaps more than a thousand long-range ballistic missile flight tests between the five ICBM powers. There have also been some 2,000 nuclear tests.

I last appeared before this subcommittee in 1992 during its investigation of the Patriot missile defense system's performance during Operation Desert Storm. It is useful to recall that during the 1991 war with Iraq, what we thought we saw, and what we were told, was not necessarily, as it turns out, what actually happened.[2] This underscores the importance of rigorously examining assertions concerning weapon system development and performance.

## The Paths Taken

**Results.** Since the dawn of the rocket age, only five countries (the United States, Soviet Union/Russia, the People's Republic of China, Britain and France) have demonstrated the ability to develop, test, and field ICBMs armed with nuclear warheads. Since the early 1960s, there have been any number of intelligence assessments and studies that predicted there would be more than five nations that could have accomplished this capability at various times in the past 40 to 50 years.

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[1] A ballistic missile is guided through a relatively brief powered phase of flight after launch then it continues through space in free flight toward a predetermined target after reentering the Earth's atmosphere.

[2] *Performance of the Patriot Missile in the Gulf War,* Hearing before the Legislation and National Security Subcommittee of the Committee on Government Operations, April 7, 1992.

Why is this so? Why has this number not increased as many had predicted? I believe that no small part of the reason lies with the serious technical challenges that countries face in building an operational ICBM armed with a nuclear warhead.

This statement briefly discusses some of the technical and organizational and management challenges that nations face in developing nuclear armed ICBMs. The five countries that today have such capabilities all needed to overcome these challenges, and in some cases by receiving significant help from another country. A review of these challenges can add perspective to assessments of the likelihood that other countries might develop, deploy and threaten U.S. national security interests, and perhaps lead to a better estimation of those likelihoods.

**Technical Challenges in Developing ICBMs.** There many key parts of an ICBM, not counting a significant number of smaller components that all have to perform together successfully. This section briefly reviews some of the major parts, including the propulsion system, guidance system, payload or compact nuclear device, and reentry vehicle. Additionally, the issue of testing, especially that of the entire ICBM system, is discussed. Moreover, proper organization and management of ICBM development programs are also critical for their success.

***Propulsion Systems.***[3] Both solid- and liquid-fueled ballistic missiles present a variety of challenges for ICBM developers.

*Liquid-Fueled ICBMs.* A number of developing countries can manufacture fuel and at least crude components for short-range, liquid-fueled ballistic missiles. However, because of the greater stresses inherent in ICBMs during launch and powered flight, the challenges in designing and manufacturing components and engines for ICBMs is more difficult.

The Office of Technology Assessment (OTA) observed that, in order to control and terminate thrust precisely and avoid gross inaccuracies, liquid-fueled engines capable of delivering sufficient thrust to deliver a 500 kg payload more than 1,000 to 1,500 km must employ a much more complex system of valves, pressurizers, flow-control meters, and actuators than are needed for less powerful engines.

If ICBM developers choose to use inferior components, it might be necessary to include a post-boost vehicle that can provide course corrections during flight. Incorporating such a vehicle, however, "would present an entirely new set of design problems," according to OTA.

*Solid-Fueled ICBMs.* Solid fuel propulsion systems provide several advantages over liquid-fueled systems. For example, they can be readied for launch more quickly than liquid-fueled equivalents. However, such propulsion systems "require years of practical experience to design and develop successfully," according to OTA.

In solid-fueled missiles, the propellant is first mixed, then cast into the missile case, where it hardens. According to OTA, the casting process is the "most challenging aspect of manufacturing solid-propellant motors." For example, the propellant must be cast into the missile case in such a manner that the fuel bonds properly to the missile wall and avoids "cracks or voids," either of which

[3]This section is based on U.S. Congress Office of Technology Assessment, "Technologies Underlying Weapons of Mass Destruction," OTA-BP-ISC-115, December 1993.

could "expose additional surface areas within the propellant, causing it to burn erratically or reach the wall prematurely, resulting in catastrophic failure of the motor."

Additionally, the design of the propellant itself is important to ensure that it will both burn at a proper rate and withstand the stresses of flight. And as the propellant burns, the center of gravity for the missile changes throughout its powered flight, creating additional design, development, test and operational challenges.

Solid-fueled missiles can also present unique challenges for testing. For example, a missile that explodes on a test stand may leave little or no recoverable data useful for assessing the test failure, especially for countries with little to no experience from which to draw. It is one thing for a country such as the United States to experience a launch-pad failure and have the capability to draw on decades of experience and data, and another thing for a country to face a similar failure without having a historical development record of its own.

***Guidance System.*** One of the main parts of an ICBM is a guidance system that directs the missile and its payload toward its target. There are several possible guidance methods available, but some have proven unacceptable because they could be readily thwarted.[4] Instead, modern ICBMs use inertial guidance systems because they are completely self-contained, do not rely on external sensing, and have become quite accurate over time. They are immune to jamming and cannot be prevented from functioning short of tampering with the missile itself.[5]

Inertial guidance systems measure missile acceleration to determine position and velocity, calculate the velocity required to reach its target, and direct the rocket thrust to match that velocity.[6] As the missile accelerates in three dimensions, components such as accelerometers and gyroscopes allow the guidance system to measure the forces being applied to the missile from the time it lies in its silo to when the unpowered missile is accelerating under the force of gravity. As part of this system, on-board guidance computers use detailed mathematical models to help ensure the missile goes where it is intended.

Because ICBMs are somewhat unique in function, being unlike other military systems and to some degree different from shorter-range ballistic missiles, inertial guidance systems become a key challenge for a country developing ICBMs for the first time. ICBMs accrue navigational errors throughout their launch, flight and reentry.[7] Testing of such missiles and their reentry vehicles produces data in which mathematical models can be developed, tested, and fine-tuned against additional flight tests in an interactive manner. Such a process is technically challenging and time consuming. A pattern of ICBM flight testing is arguably necessary and cannot be hidden from the world.

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[4]A missile could be guided by electronic commands from ground stations, apparently with considerable accuracy. The problem, however, is that such missiles and ground stations become vulnerable to electronic jamming.

[5]"Ballistic Missile Guidance and Technical Uncertainties of Countersilo Attacks," Matthew Bunn and Kosta Tsipis, Report No. 9, Program in Science and Technology for International Security, Massachusetts Institute of Technology, August 1983, pp. 8-12

[6]Ibid.

[7]Ibid.

***Compact Payload.*** Developing a reliable nuclear warhead that can fit on an ICBM is a challenging task. Moreover, such an endeavor would be difficult to conceal because conducting an explosive test of a nuclear device is widely regarded as critical for developing such a warhead.

A 2002 report from the National Academy of Sciences (NAS) states that, without nuclear explosive testing, states can only develop and certify "simple, bulky, relatively inefficient unboosted fission weapons."[8] A 1996 Department of Defense report described a "simple fission weapon" as one that "could be delivered by aircraft or tactical missiles."[9]

According to the NAS report, an aspiring nuclear-weapons state might be able to build an implosion-type weapon weighing between about 450-900 kilograms. That country could have only limited confidence that such a device would work. Moreover, public reports suggest that even this type of device would be difficult, if not impossible, for countries such as North Korea and Iran to deliver via ICBM.

A 1999 Defense Intelligence Agency (DIA) report, for example, states that North Korea will not be able to develop a nuclear warhead lighter than 650-750 kilograms in the "near term." Pyongyang's Taepo Dong-2, even if operational, could only "deliver a 650-kilogram warhead to Alaska, Hawaii, and the Pacific Northwest, or a much lighter warhead to most of the United States," the report says.[10] The NAS study asserts that, without nuclear testing, Iran could produce only "heavy and inefficient first-generation fission weapons."

For the ICBM powers, the reliability requirements imposed on the nuclear warhead itself are reportedly more stringent than on the delivery system.[11] These requirements are quantified in the damage expectancy and the mathematical likelihood that a planned attack will destroy its intended target. The damage expectancy depends not only on the warhead's explosive yield, but on the overall weapon system performance: a successful ICBM launch, separation of the booster stages, performance of the guidance system, disengagement of the RV from the missile itself, and the accuracy of the RV as it approaches its target.

Whether countries could effectively deliver chemical or biological weapons via ICBMs is unclear. According to a 1993 Office of Technology Assessment report,

> Without very sophisticated technology, ballistic missiles are not well suited for delivering chemical or biological weapons to broad-area targets. Such targets are most effectively covered with an aerosol spray delivered at slow speeds and low altitudes upwind from the target, a delivery profile much better suited to cruise missiles or aircraft.

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[8]National Academy of Sciences, *Technical Issues Related to the Comprehensive Nuclear Test Ban Treaty*, 2002.

[9]*Proliferation: Threat and Response*, 1996.

[10]Excerpts from the report can be found in Rowan Scarborough, Rumsfeld's War: The Untold Story of America's Anti-Terrorist Commander. Regnerey Publishing, 2004

[11]"If it Ain't Broke: The Already Reliable U.S. Nuclear Arsenal," Robert W. Nelson, *Arms Control Today*, April 2006.

The report also described delivering a chemical or biological weapon via a separating warhead as a "theoretical possibility." It should be pointed out that no country is known to have deployed such warheads on ICBMs, in part because of what are considered enormous technical challenges.

Relatedly, a 2001 National Intelligence Estimate (NIE) argued that countries could well choose other means to deliver chemical and biological weapons:

> Some of the states armed with missiles have exhibited a willingness to use chemical weapons with other delivery means ... In fact, US territory is more likely to be attacked with these materials from nonmissile delivery means—most likely from terrorists—than by missiles, primarily because nonmissile delivery means are less costly, easier to acquire, and more reliable and accurate. They also can be used without attribution.

Nevertheless, the OTA report stated that "by the 1960s the United States had developed submunitions for ballistic missiles that would spread chemical and biological agents more efficiently than would release at a single impact point." And Richard Garwin argued that "ballistic missiles intended to cause damage to the United States are not likely to have nuclear warheads" because it is easier to develop "individual bomblets" deliverable via ballistic missile, that would disperse biological agents.12

***Reentry Vehicle.*** In the last stage of flight, the reentry vehicle (RV) enters the atmosphere with a velocity of several kilometers per second. Aerodynamic and other forces create the most severe environment in the life of an ICBM, heating the RV to temperatures of thousands of degrees centigrade, and tens of gravities of deceleration. For most of its reentry, an RV is surrounded by a field of ionized plasma and looks like a burning meteor streaking across the sky.[13] According to Bunn and Tsipis

> The design of vehicles that could survive such environments was one of the foremost challenges in the early days of ballistic missile development. To protect the warhead from the extreme heat of reentry, blunt high-drag RVs were designed, which would slow down quite rapidly as soon as they encountered the upper atmosphere, reducing the thermal load experienced later; large and heavy heat shields absorbed what heat did build up, protecting the warhead inside.

The disadvantages to this became apparent as the heavy weight reduced potential warhead yields and the high drag shapes of the RVs and relatively slower reentry meant the RV was more susceptible to winds and varying atmospheric densities, which in turn reduced accuracy. This approach gave way to what became a highly specialized reshaping of the RV tip to a more conal shape using materials covering the outside of the RV that burned off uniformly and predictably.

This new approach, and increasingly over time, the design of the external RV material allowed for extremely high reentry speeds under a variety of reentry conditions, thus permitting significant

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[12]Richard L. Garwin, "What We Did," *Bulletin of the Atomic Scientists*, November/December 1998, Vol. 54, No. 6; Garwin argued that states would be unlikely to place chemical warheads on such missiles because a "hundred- or thousand-fold greater mass of chemical agent [would be] required to equal the damage done by a bioweapon attack on an unprotected population."

[13]"Ballistic Missile Guidance," Bunn and Tsipis, p. 39.

accuracy improvements. However, reshaping the RV meant that the nuclear warhead component had to be redesigned and tested. Moreover, these specialized materials, characterized as militarily critical technology, required new manufacturing processes and infrastructure.[14]

[14]Frank T. Tracesk, "Assessing Industrial Capabilities for Carbon Fiber Production," *Acquisition Review Quarterly*, Spring 1999.

***Full System Testing.*** From the time a missile lies dormant in its launcher to its launch, powered and unpowered flight, atmospheric reentry and then fusing or detonation, navigational and other errors begin to develop and accumulate. Testing of all the component parts can help reduce as much as possible such structural or inherent errors even in proven systems, but according to experts they cannot be eliminated entirely.[15] It is generally accepted that operational tests of the system are necessary to know whether and how well the entire system will work, and the degree that further testing may be required to ensure the ICBM will launch successfully and operate as planned.

Some systems that have been considered fully vetted in developmental and operational tests have experienced problems, even after their deployment. For example, some of the deployed early U.S. long-range submarine ballistic missiles were later shown to have unacceptable failure rates.[16] Even more recently, some of the long-range ballistic missiles used as test intercept targets for testing the U.S. ballistic missile defense (BMD) program have failed to launch or operate to allow those BMD tests to proceed. This, despite 50 years of considerable U.S. long-range ballistic missile flight test experience.

Additionally, it is worth noting that to date there has never been an end-to-end full system test of an operational ICBM where a deployed strategic missile was launched from its silo or from a submarine to a target at ICBM range to include a successful nuclear warhead detonation. The closest examples occurred in 1962 when a U.S. submarine test launched a medium-range ballistic missile and its warhead impacted and detonated near Christmas Island in the Pacific,[17] and in 1966 when the Chinese test launched a short-range DF-2 to its nuclear test site at Lop Nuar and air-bursted a nuclear warhead.[18]

***Management and Organization.*** In addition to having access to the appropriate materials and technology, states wishing to deploy ICBMs must also have a strong development program.[19] Aaron Karp argues that

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[15]Ibid., pp. 128-138.

[16]For instance, a safety feature on the Polaris A1 warhead worked well in development and testing, but often jammed in operational situations such that three out of four of these warheads were considered potential duds. Bunn and Tsipis, "Ballistic Missile Guidance," p. 128

[17]U.S. Nuclear Tests: July 1945-1992, Department of Energy, DOE/NV-209 (Rev. 14), December 1994, p. 13. This test is known as Operation Frigate Bird.

[18]John Wilson Lewis and Xue Litai, China Builds the Bomb, Stanford University Press, 1988, pp. 202-203.

[19]This section is based on Aaron Karp, Ballistic Missile Proliferation: The Politics and Technics. SIPRI/Oxford University Press 1996. pp. 51-98.

> There is much more to any major R&D project than just assembling metal and plastic. Easily overlooked are the necessary skills, experience and judgment required of engineers and programme managers. Also behind every missile programme are conceptual, organizational, financial, and command and control factors, each imposing its own problems for ballistic missile development.

Particularly for a program as ambitious as developing an ICBM, it is critical to devise the proper design strategy, as well as provide competent program management, the appropriate number of personnel, and sufficient financial resources.

As a point of illustration, the early U.S. ICBM development effort involved an estimated 80,000 people and extensive industrial participation.[20] Gen. Bernard Schriever, who led the effort to produce an operational U.S. ICBM, chose what he called a risky development path and a revolutionary change in management and administration of a military program. This included clear and vertical decision-making channels on overall program and policy matters, high national level priority for funding, and complete responsibility and authority for program direction at the operating management level.

Karp also states that, although countries may receive considerable amounts of foreign assistance in their missile programs, "would-be rocket makers are almost entirely on their own" in the area of program management. "Foreign companies and governments can offer advice and their own example, but little else," he adds.

For example, both appropriate organizational and managerial choices have proven critical to missile programs when governments are choosing their development strategies. Karp argues that an "incremental development" strategy, in which a missile program moves "in sequence through progressively larger designs, improving the performance of major components, and gradually introducing new ones," is the most effective. Citing France's program as the best example of this strategy, Karp notes that development of new French missiles "never required more than 14 test-firings and never took longer than six years to reach deployment."

By contrast, states that have begun their missile programs by taking "huge leaps" tend to face greater difficulties. For example, the United Kingdom began by developing an IRBM (Intermediate Range Ballistic Missile); the program eventually collapsed. Similarly, India began its program with work on space launchers in the early 1970s. According to Karp, New Delhi "endured false starts and serious delays."

Karp acknowledges that incremental development strategies are "not a panacea" and that the United States and Israel successfully leapt "over stages in rocketry development." However, he also says that "small powers" and countries with "weak technological-industrial capabilities" face "grave risks" if they take any approach other than the incremental one. Countries with "scarcer resources" are less able to recover from mistakes.

**Space Launch Vehicles (SLVs).** Some countries could develop a civilian space launch capability as a cover for foreign acquisition of technologies relevant to ballistic missiles.

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[20]It has been estimated that 18,000 scientists, 17 prime contractors, 200 subcontractors, and 3,500 suppliers, employing about 70,000 people were involved in the early U.S. ICBM development effort in the mid-late 1950s. "The Man Who Built the Missiles," Walter J. Boyne, *Air Force Magazine*, October 2000, p. 85

Nevertheless, according to experts conversion of an SLV to an ICBM is technologically challenging and is not necessarily the intention of a civilian program.

An SLV capability would give a country experience in building large boosters and high-quality guidance systems relevant for an ICBM program. Nevertheless, unlike SLVs, ICBMs need to reenter the atmosphere toward a predetermined target. Simply put, SLVs must go up but ICBMs must also come down again and therefore require a reentry vehicle (presumably with a warhead) capable of surviving the forces and stresses of reentering the Earth's atmosphere at those velocities. Changes would need to be made to the engine, the airframe (to survive reentry), and guidance and control systems would need to be reprogrammed to fly a ballistic missile trajectory. Additionally, SLVs typically require long launch preparation time, which a country would normally want to avoid for its ballistic missiles to retain military relevance and survivability. It is also not crucial that an SLV be precise in its boost phase to place a satellite in orbit, whereas minor deviations are significant for surface targets, even with weapons of mass destruction as the payload.[21]

A country with a demonstrated SLV capability may be considered capable of developing ballistic missiles generally, but the obstacles to success dramatically rise when talking about converting an SLV to an ICBM. The quantity and sophistication of the technologies that need to be integrated increase significantly. A September 1999 NIE stated, "many SLVs would be cumbersome as converted military systems and could not be made readily survivable, a task that in many cases would be technologically and economically formidable."[22] A country could not mask an ICBM reentry vehicle test as a space launch test. Without testing the reentry vehicle, the country could not have confidence in delivering the weapon.

All five ICBM states also have active space programs. Outside of these five cases, two others – India and Japan – are particularly illustrative. India's space program is an example of a civilian program used as means for ballistic missile development. India first adapted its SLV-3 to create the medium-range ballistic missile "Agni." There is now discussion in the open-source literature of whether (and why) India might convert its Polar Space Launch Vehicle (PSLV) to a presumably nuclear-armed ICBM (the "Surya"). The "Surya" would reportedly be a three-stage missile with the first two stages derived from the PSLV and a third stage potentially derived from India's Geosynchronous Space Launch Vehicle (GSLV).[23] Japan, on the other hand, has had a SLV program for 30 years, with its most advanced system the H-IIA. Japan reportedly has consistently made engineering decisions that make these systems less useful militarily.[24] While many analysts seem to

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[21]U.S. Congress Office of Technology Assessment, "Technologies Underlying Weapons of Mass Destruction," OTA-BP-ISC-115, December 1993; Aaron Karp, Ballistic Missile Proliferation: The Politics and Technics, SIPRI, Oxford University Press, 1996.

[22]"Foreign Missile Developments and the Ballistic Missile Threat to the United States Through 2015," National Intelligence Council, September 1999.

[23]See Richard Speir, "India's ICBM– On a "Glide Path" to Trouble?", The Nonproliferation Policy Education Center, February 7, 2006.

[24]Japan has focused on SLV's that use the most energetic propellants available (cryrogenics – liquid hydrogen and liquid oxygen), which is a logical choice for SLV's as it maximizes the payload to orbit capabilities. Cryrogenic propellants, however, are ill suited for ICBMs, as they are not "storable." Having to fuel a missile prior to launch (an hours long process) is considered strategically unacceptable. SLVs, on the other hand, can be launched according to readiness, so fueling times are not relevant.

agree that Japan could develop an ICBM if it wanted to, the SLVs it has made are apparently not designed to be converted to military use.[25]

## Alternative Paths to ICBM Development

There has been much discussion in the decade since the 1998 report by the Rumsfeld Commission that some countries such as Iran, Iraq and North Korea could develop ICBMs in a significantly different manner. There are several key assumptions made to support this line of thought.

First, countries will pursue alternative paths to building ballistic missiles that will not require "high standards of missile accuracy, reliability and safety, nor large numbers of missiles." Second, countries will obtain significant foreign assistance in developing ballistic missiles. Third, having or building short range ballistic missiles such as SCUDs provides the means to develop ICBMs.

As discussed above, there are basic components necessary for building an ICBM, regardless of development path. Integrating the numerous components of an ICBM is a true technical challenge. Additionally, a country will not be able to hide their testing of reentry vehicles. Deploying an ICBM without testing would, according to the 1999 National Intelligence Assessment (NIE), result in "significant reduced confidence in their reliability."

[25]Jeffrey W. Thompson and Benjamin L. Self, "Nuclear Energy, Space Launch Vehicles, and Advanced Technology," in Japan's Nuclear Option, The Henry L. Stimson Center, 2003.

Foreign assistance of course could speed up development of ICBMs and nuclear warheads, but some observers state most suppliers appear to be withholding meaningful assistance. Arguably, gaining foreign help with ICBMs has become more difficult over time.[26]

Additionally, the Rumsfeld report tends to assume that there is a straight line in development from short-range, single stage SCUDs to an ICBM. Arguably, there are significant differences in the requirements to develop a successful ICBM program with multiple stages that will transit through space and reenter the atmosphere under extremely different conditions.

Even without a "high standard" of accuracy and reliability, a country still needs to develop propulsion and guidance systems, compact payloads, and reentry vehicles that will simply work together successfully and not terminate in a catastrophic failure. From the experience of the ICBM powers, such efforts are not easily hidden or masked.

Current long-range ballistic missile threat assessments from the intelligence community appear to rely heavily on the key assumptions seen in the Rumsfeld Commission report from a decade ago. These assessments appear to be a key driver in the U.S. BMD effort. Some would argue that perhaps these assessments should be revisited.

## Summary

Few countries have successfully developed and deployed operational, nuclear-armed ICBMs. The developmental record of their efforts indicate how challenging that effort was. The fact that more nations have not done this is perhaps witness in part to the extraordinary technical effort it took. The long history of ICBM development in the five ICBM states demonstrates that such success

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[26]Joe Cirincione stated that China reportedly aided the missile programs of Iran, Iraq, Libya, North Korea, Pakistan, Saudi Arabia, and Syria, although the extent of that assistance has been greatly reduced in recent years. See, Joseph Cirincione, Testimony before the U.S.-China Economic and Security Review Commission, Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China, July 12, 2007. Additionally, some of the annual intelligence briefings to Congress included discussion of foreign ICBM development and foreign assistance. In this year's briefings there was no mention of such assistance. See, "Annual Threat Assessment of the Intelligence Community," J. Michael McConnell, Director of National Intelligence, Hearing before the Senate Committee on Armed Services, February 27, 2008, and "Current and Projected National Security Threats to the United States, Lt. Gen. Michael D. Maples, Director, Defense Intelligence Agency, Hearing before the Senate Committee on Armed Services, February 27. 2008.

took considerable resources in time, funding, knowledge, infrastructure, organization and national commitment. Even so, those efforts experienced significant failures along the way. And after 50 years of commitment and experience, some of these nations still experience occasional failures.

Moreover, alternative approaches will not necessarily be successful. It is difficult to see how a developing country could simply escape the demands of such resources and produce and deploy successfully a nuclear-armed ICBM without transparent failures or development along the way that can be observed.

Mr. Chairman, distinguished members of the subcommittee, this concludes my testimony. Thank you again for the opportunity to appear before you to discuss these issues. Mary Beth, Paul and I will be pleased to respond to any questions you might have.

# Appendix
# ICBMs: Who Has What?

Currently, the five nuclear-weapons states – China, France, Russia, the United Kingdom, and the United States, are also the countries which have ICBMS. Iran and North Korea are suspected of developing such missiles; those programs are most frequently cited as potential threats to the United States. Below are brief discussions of some of these countries.

## China

China has approximately 20 ICBMs (liquid-fueled CSS-4s, range 12,900 + km). According to the 2007 Department of Defense "Annual Report to Congress on the Military Power of the People's Republic of China," Beijing's solid-fueled, road mobile DF-31 ICBM "achieved initial threat availability in 2006, and will likely achieve operational status in the near future, if it has not already done so." That missile has an estimated range of 7,250 km.

The United States projects that China will expand and continue to modernize its nuclear arsenal. The 2007 DOD report projected that by 2010 China's nuclear forces will "likely" include "enhanced" CSS-4s, DF-31s, and the DF-31A. The latter is a longer-range (11,270 km) variant of the DF-31, and was "expected to reach initial operational capability" in 2007, the report said. The National Air and Space Intelligence Center (NASIC) reported in 2006 that Beijing could increase its number of "ICBM warheads capable of reaching the United States ... to well over 100."

China is also expected to deploy a new SLBM, the JL-2, on a new JIN-class (Type 094) nuclear-powered ballistic missile submarine, which is in development. According to the Office of Naval Intelligence, the first of these submarines could reach initial operating capability "as early as 2008." The JL-2, which has an estimated range of over 8,000 km, is expected to reach initial operational capability between 2007 and 2010.

## France

France has four ballistic missile submarines, each of which can carry 16 4,000 km-range M45 SLBMs. Each missile can hold up to six warheads. Although these missiles are not of ICBM range, Paris is developing the 6,000 km-range M51 SLBM to replace the M45. Paris has also been developing a new class of ballistic submarines; the last of the four is to come into service in 2010.

As of July 2007, Russian strategic nuclear forces included 104 10-warhead SS-18 ICBMs (range 5,500-6,000 km), 136 6-warhead SS-19 ICBMs (range 5,500 km), 222 single-warhead SS-25 road-mobile missiles (range 7,000 km), single-warhead, silo-based SS-27 ICBMs (range 7,000 km), and 3 single-warhead, mobile SS-27 ICBMs (range 7,000 km). Moscow also has 14 ballistic missile submarines, equipped with a total of 288 SLBMs (ranges 3,500-5,500 km).

## Russia

Although Russia's strategic nuclear forces are expected to decline, Moscow might be able to deploy its new SS-27 ICBM with three warheads, instead of one. According to NASIC, Moscow may also be developing another missile, which "could be deployed in both land- and sea-based version,"

with an estimated range of over 5,500 km. The Strategic Offensive Reductions Treaty limits Russia and the United States to 1700-2200 strategic warheads, but each side can maintain a stockpile of nuclear weapons and the treaty expires the same day it enters into force-December 31, 2012.

## The United Kingdom

The United Kingdom has fewer than 160 operationally available nuclear warheads. These are deployed on four Vanguard-class submarines, each of which carries up to 48 warheads on a maximum of 16 Trident D5 SLBMs. That missile has a range of about 7,400 km.

## North Korea

North Korea has not successfully flight-tested an ICBM. Both a 1998 test of its 2,000-km range Taepo Dong-1 and a 2006 test of its Taepo Dong-2 failed. According to U.S. intelligence reports, the range of the Taepo Dong-2 is estimated to be 5,000-15,000 kilometers, depending upon whether it is deployed in a two or three stage configuration. The short flight time of the 2006 test, however, complicated a more exact determination of the launch vehicle's range and payload.[27]

Although former Defense Intelligence Agency (DIA) Director Lowell Jacoby told the Senate Armed Services Committee in April 2005 that North Korea had the capability to arm a missile with a nuclear device, Pentagon officials later backtracked from that assessment. A 2008 Director of National Intelligence report to Congress says that "North Korea has short and medium range missiles that could be fitted with nuclear weapons, but we do not know whether it has in fact done so."

## Iran

Iran claims to have flight-tested a variant of its Shahab-3 ballistic missile with a range of 2,000 km. – the longest range Iran has claimed to date. Iranian officials have stated that Tehran's Ashura and Ghadr missiles also have a range of 2,000 km. Iran reportedly conducted an unsuccessful flight test of the Ashura missile this past November.[28]

U.S. intelligence officials told the Senate Armed Services Committee in February 2007 that the intelligence community believes that Iran could develop an ICBM by 2015.

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[27] Paul Kerr, "Security Council Condemns NK Missile Tests," *Arms Control Today*, September 2006.

[28] Peter Crail, "Iran Lauds Development of Solid-Fuel Missile," *Arms Control Today,* January/February 2008.

Mr. TIERNEY. Thank you, Mr. Hildreth.

Dr. Flynn, your testimony, please?

**STATEMENT OF STEPHEN E. FLYNN**

Mr. FLYNN. Thank you very much, Mr. Chairman.

Like Joe Cirincione, I have some linkage to yourself and the ranking member here. I spent the first 18 years of my life growing up in your District, and the last 20-plus years living in Mr. Shays' State of Connecticut. Mr. Burton, I am heading to Indianapolis at the end of this month. I will have a chance to talk to the Indianapolis Committee on Formulations and spend a day at the University of Indiana in Bloomingdale, so I am looking forward to that.

Mr. TIERNEY. Your problem is that we are now joined by somebody from Kentucky, so you have to find a link there.

Mr. FLYNN. Yes, I have to work all this in here.

Thank you so much, all of you, for being here today. It is an honor to be here today.

I think I am particularly grateful for the fact that you have asked me to offer some perspectives this morning about how this threat sits in the context of other ways in which one could target the U.S. homeland with nuclear weapons.

Despite the events of September 11th, Washington continues to look at security challenges confronting the United States as if national security starts and stops at the water's edge. Debates about threats, tactics, and strategies within the traditional national security community have remained remarkably and disturbingly isolated from the assessment of threats, vulnerabilities, and policies commonly associated with homeland security.

The U.S. national security community also continues to assign a higher priority to programs designed to confront conventional military threats such as ballistic missiles than unconventional threats such as a weapons of mass destruction smuggled into the United States by a ship, train, truck, or even private jet.

While terrorists demonstrated on 9/11 that their preferred battle space is in the civil and economic space, the Pentagon has made clear its preference for other entities to be assigned the responsibility for managing that new reality when it falls at or within the U.S. borders. The White House and congressional staff with oversight responsibilities for defense, intelligence, and foreign affairs have also held the homeland security mission at arm's length.

As a consequence, there is no place within the U.S. Government where tradeoff issues associated with national security and homeland security are routinely raised or adjudicated. This hearing is very much an exception to that rule, and I commend you, Mr. Chairman, for having it.

I cite in my testimony about one of the examples about how this bridge between national security and homeland security can leave Americans less secure by pointing to, for instance, the amount of money we spend on force protection here inside the United States for U.S. military basis. Of a budget last year of about $16.5 billion, that money, about two-thirds, went to protecting U.S. bases on U.S. soil. That amount reflects more than 20 times what we are spending protecting critical infrastructure at major cities within the United States.

The logic of this is that we essentially are hardening military bases and making civilian assets more attractive, softer targets for our adversary. This clearly isn't the intention, but it is the outcome of not looking at the threat environment, the homeland and national security, in a kind of strategic context.

In the same way I would argue we have the same disconnect here in the area of ballistic missile defense. The executive and legislative advocacy to build the defenses for nuclear missiles have not included a side-by-side consideration of the risks that nuclear or biological weapons might be smuggled into the United States by other means, such as on board a small vessel, within a cargo container, aboard a private aircraft, or carried across U.S. land borders, nor is the investigation in programs whose aim is to mitigate the non-missile threat weighed against the investment associated with developing ballistic missile defense.

The reason for this is that addressing the smuggling issue is viewed primarily as a Homeland Security responsibility to be managed by agencies such as the Domestic Nuclear Protection Office, Customs and Border Protection, and the Coast Guard. This translates into having the program reviewers at OMB and the congressional authorization appropriation processes move along separate tracks.

In the end, the sum of the combined budgets for funding the domestic and international maritime and port of entry interdiction efforts pursued by Customs and Border Protection, Coast Guard, and the DNPO is about one-half the amount that we are allocating for missile defense. Nowhere in the U.S. Government has there been or is there now an evaluation of whether that represents an appropriate balance.

What seems clear, however, is this: should missile defense continue to be developed without a parallel commitment and putting in place protective measures to detect and intercept the transport of nuclear weapons by non-missile means, the Department of Defense will end up providing less protection by fueling the development of our adversaries into the non-missile realm.

These two things clearly have to be considered in parallel.

I lay out four reasons that essentially I would place a non-missile threat as a higher threat. I would be happy to go into them in detail a little bit later. The first is that it represents the only realistic option for our current clear and present adversary, our non-state actor, al Qaeda. That is the folks we are dealing with. Non-traditional is their option.

The second, that even for a state actor there is the benefit, as you said in your opening statement, for anonymity when you bring it in by a surrogate or you use a terrorist to bring it here. You don't have the blueprint of where or the footprint of where the missile came from.

Third, there simply is so much opportunity—and this is based on my two decades of experience being on the front lines and assessing it—for essentially penetrating legitimate conveyances into the United States. I go through and talk through, and I would be happy to talk to you later, an example of how open that system still remains by effort since 9/11.

In light of that, I also highlight here, as a final set of issues here, that when you use a commercial conveyance for potentially getting the weapon in, you also get a two-fer. You not only get the destruction that the nuclear weapon would present, but you also get the cascading economic consequences when we are spooked by those conveyances. I particularly am concerned about, that if it came to us by a box and our response is to essentially shut down all boxes to sort this out, we will bring our global economy literally to its knees in about 2 weeks, because the intermodal transportation system will grind to a halt.

So if our adversaries are thinking in terms of economic disruption, not just loss of life, then we clearly have to think in that kind of totality.

Now let me, in conclusion, say that I believe there are three bottom-line conclusions:

First, the emphasis ballistic missile defense has been receiving since the post-9/11 era is disproportionate to the more probable risk that other means will be sought by America's current and future adversaries to our U.S. homeland.

Second, to the extent that the U.S. Government continues to invest in ballistic missile defense, it should be committed to a parallel effort to deal with the non-missile risk, particularly since success at BMD would only elevate the non-missile risk.

Finally, Congress needs to take a hard look at the oversight process to manage this duality, the non-missile on the one side and the threat ballistic missile defense. I think that strikes to the very heart of what you are trying to achieve here today by hosting this hearing.

Thank you very much, Mr. Chairman, for the opportunity to present this testimony.

[The prepared statement of Mr. Flynn follows:]

# COUNCIL ON FOREIGN RELATIONS

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**"Weighing the Non-Missile Threat to the U.S. Homeland"**

Written Testimony before

a hearing of the

National Security and Foreign Affairs Subcommittee Committee
Committee on Oversight and Government Reform
United States House of Representatives

on

"Oversight of Ballistic Missile Defense: Threats, Realities, and Tradeoffs"

by

Stephen E. Flynn, Ph.D.
Jeane J. Kirkpatrick Senior Fellow in National Security Studies
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Room 2154
Rayburn House Office Building
Washington, D.C.

10:00 a.m.
March 5, 2008

**"Weighing the Non-Missile Threat to the U.S. Homeland"**

by
Stephen E. Flynn, Ph.D.
Jeane J. Kirkpatrick Senior Fellow
for National Security Studies

Chairman Tierney, Ranking Member Shays, and distinguished members of the House Subcommittee on National Security and Foreign Affairs. Thank you for inviting me this morning to assess whether the priority that has long been assigned to the ballistic missile threat is appropriate given that our adversaries might exploit other ways to target the U.S. homeland with a nuclear weapon.

First, I would like to commend the subcommittee for requesting a homeland security perspective when undertaking an assessment of Ballistic Missile Defense. Despite the events of September 11, 2001, Washington continues to look at the security challenge confronting the United States as if it was exclusively an away game. Debates about threats, tactics, and strategies within the traditional national security community have remained remarkably—and disturbingly—isolated from an assessment of the threats, vulnerabilities, and policies commonly associated with homeland security.

The U.S. national security community also continues to assign a higher priority to programs designed to confront conventional military threats such as ballistic missiles than unconventional threats such as a weapon of mass destruction smuggled into the United States by a ship, train, truck, or even private jet. While terrorists demonstrated on 9/11 that their preferred battle space is in the civil and economic space, the Pentagon has resisted becoming engaged in that reality when it translates into working closely with civilian agencies, state and local governments, or the private sector. White House and Congressional staff with oversight responsibilities for defense, intelligence, and foreign affairs have also held the homeland security mission at arms length. As a consequence, there is no place within the U.S. government where trade off issues associated with national security and homeland security are routinely raised or adjudicated. This hearing today is an exception to that rule.

An example of how the national security/homeland security divide can end up generating harmful unintended consequences for the nation is highlighted by the disparity between what the Department of Defense is spending to protect its military bases within the United States and what state and local governments are spending to safeguard ports, mass transit, and critical facilities. In 2006, the Pentagon asked for and received $16.5 billion to protect its forces—the majority of which are located inside the United States—from terrorist attacks. This amount represents nearly twenty times more than the federal government will make available in 2008 to safeguard critical infrastructure around the United States. The imbalance between the funding to harden U.S. military assets on U.S. soil and the funding available to safeguard critical civilian infrastructure has an inevitable and disturbing consequence: the Department of Defense is actually creating a situation where American civilians are becoming relatively softer and more attractive potential targets than military ones.

This same disconnect is at work in the area of ballistic missile defense. The executive and legislative advocacy to build defenses for nuclear-armed missiles has not included a side-by-side consideration of the risk that nuclear weapons might be smuggled into the United States by other means such as aboard a small vessel, within a cargo container, or carried across U.S. land borders. Nor is the investment in programs whose aim is to mitigate the non-missile threat weighed against the costs associated with developing BMD. The reason for this is that addressing the smuggling issue is viewed primarily as a homeland security responsibility to be managed by agencies such as the Domestic Nuclear Detection Office (DNDO), the Customs and Border Protection Agency, and the U.S. Coast Guard. The program reviewers in the Office and Management and Budget and the congressional authorization and appropriations process move on separate tracks. In the end, the combined budgets for funding all the domestic and international maritime and port of entry interdiction efforts pursued by CBP and the Coast Guard plus the nuclear detection activities performed by DNDO is equal to roughly one-half of the annual budget for developing missile defense. No where in the U.S. government has there been or is there now an evaluation of whether that represents an appropriate balance. What seems clear however is this: should a missile defense system continue to be developed without a parallel commitment to putting in place protective measures to detect and intercept the transport of a nuclear weapon by non-missile means, the Department of Defense will end up fueling the incentive for America's adversaries to rely on non-missile conveyances.

In assessing the non-missile versus missile risk to the U.S. homeland, there are four attributes associated with smuggling a nuclear weapon that suggest it presents the higher probability risk. First, it is the only realistic option for a non-state actor like al Qaeda to pursue. While North Korea rattles the nuclear saber from time to time, and Iran seems intent on acquiring a nuclear weapon at some point, the United States is currently at war with al Qaeda. Al Qaeda options for deploying a nuclear weapon should they acquire it will not include a long-range missile. In short, we should be keeping our eye on the ball. The adversary we are now combating has made clear its desire to target us with a weapon of mass destruction. Since a ballistic missile will not be a part of al Qaeda's arsenal, we can safely presume the more immediate danger comes from radical jihadists pursuing a non-missile alternative.

Second, even for a state actor, smuggling a nuclear weapon into the United States provides an advantage that a ballistic missile does not: the potential for anonymity. When a missile is launched, the United States will have immediate and verifiable evidence of where it originated from. Given our overwhelming military capacity to retaliate, a state who undertakes a ballistic missile attack will face total annihilation. This represents a powerful deterrent. The best option for a rogue state armed with a small nuclear arsenal and intent on the attacking the United States is to obscure it connection to the nuclear weapon by relying on surrogates or covert operatives that will allow it to deny culpability. This suggests a smuggling option will be far more attractive.

Third, the millions of cargo containers, trains, trucks and vehicles that arrive at America's sea and land borders each year along with the tens of thousands overseas private jet flights provide a rich menu of non-missile options to exploit for getting a nuclear weapon into the United States. While some controls are in place, the current array of radiation portals in U.S. seaports and along U.S. borders would not detect a nuclear weapon. This is because the materials used to encase these weapons prevent high enough levels of radioactivity bring released to generate alarms by these portal monitors.

Finally, using a commercial conveyance, especially a cargo container, as a nuclear weapon delivery vehicle has another important advantage over a ballistic missile: its ability to generate cascading economic consequences by disrupting global supply chains. This results not so much from the specific attack—though the loss of a major transportation hub such as the Port of Los Angeles or on the Ambassador Bridge between Detroit, Michigan and Windsor, Ontario could be profoundly disruptive on a regional basis and have ripple effects throughout the national transportation system. The danger lies primarily with the inevitable response by the U.S. government that will almost certainly include efforts to conduct careful inspections of other containers to determine that they are not carrying additional nuclear weapons. Such efforts would create gridlock throughout the global intermodal transportation system.

Consider this scenario that presented to the Senate Permanent Subcommittee on Investigations on March 26, 2006.

A container of athletic foot wear for a name brand company is loaded at a manufacturing plant in Surabaya, Indonesia. The container doors are shut and a mechanical seal is put into the door pad-eyes. These designer sneakers are destined for retail stores in malls across America. The container and seal numbers are recorded at the factory. A local truck driver, sympathetic to al Qaeda picks up the container. On the way to the port, he turns into an alleyway and backs up the truck at a nondescript warehouse where a small team of operatives pry loose one of the door hinges to open the container so that they can gain access to the shipment. Some of the sneakers are removed and in their place, the operatives load a dirty bomb wrapped in lead shielding, and they then refasten the door.

The driver takes the container now loaded with a dirty bomb to the port of Surabaya where it is loaded on a coastal feeder ship carrying about 300 containers for the voyage to Jakarta. In Jakarta, the container is transferred to an Inter-Asia ship which typically carry 1200-1500 containers to the port of Singapore or the Port of Hong Kong. In this case, the ships goes to Hong Kong where it is loaded on a super-container ship that carriers 5000-8000 containers for the trans-Pacific voyage. The container is then off-loaded in Vancouver, British Columbia. Because it originates from a trusted-name brand company that has joined the Customs-Trade Partnership Against Terror, the shipment is never identified for inspection by the Container Security Initiative team of U.S. customs inspectors located in Vancouver. Consequently, the container is loaded directly from the ship to a Canadian Pacific railcar where it is shipped to a railyard in Chicago. Because the dirty bomb is shielded in lead, the radiation portals currently deployed along the U.S.-

Canadian border do not detect it. When the container reaches a distribution center in the Chicago-area, a triggering device attached to the door sets the bomb off.

There would be four immediate consequence associated with this attack. First, there would be the local deaths and injuries associate with the blast of the conventional explosives. Second, there would be the environmental damage done by the spread of industrial-grade radioactive material. Third, there would be no way to determine where the compromise to security took place so the entire supply chain and all the transportation nodes and providers must be presumed to present a risk of a potential follow-on attack. Fourth—and perhaps most importantly—all the current container and port security initiatives would be compromised by the incident.

In this scenario, the container originated from a one of the thousands of companies that now belong to the Customs-Trade Partnership Against Terrorism. It would have transited through multiple ports—Surabaya, Jakarta, Hong Kong, and Vancouver—that have been certified by their host nation as compliant with the post-9/11 International Ship and Port Facility Security (ISPS) Code that came into effect on 1 July 2004. Because it came from a trusted shipper, it would not have been identified for special screening by the Container Security Initiative team of inspectors in Hong Kong or Vancouver. Nor would it have been identified by the radiation portal. As a consequence, governors, mayors, and the American people would have no faith in the entire risk-management regime erected by the administration since 9/11. There will be overwhelming political pressure to move from a 5 percent physical inspection rate to a 100 percent inspection rate, effectively shutting down the flow of commerce at and within our borders. Within two weeks, the reverberations would be global. As John Meredith, the Group Managing Director of Hutchison Port Holdings, warned in a Jan 20, 2004 letter to Robert Bonner, the former Commissioner of the U.S. Customs and Border Protection: **". . . I think the economic consequences could well spawn a global recession – or worse."**

How probable is it that an adversary of the United States would undertake such a scenario with a nuclear weapon instead of a dirty bomb? Many analysts legitimately point to the issue that by placing a nuclear weapon within a container, a terrorist would give up direct control over a very precious weapon. Thus, if the goal of an adversary is to go after a specific target within the United States at a desired time, it is more likely that they will undertake a conventional smuggling effort using a small vessel, private jet, or other conveyance to enter the country. However, for an adversary intent on using its tiny nuclear arsenal as a "weapon of mass disruption," as I have just outlined with the Surabaya scenario, using a cargo container will be far more consequential in economic terms. At a minimum, a reasonable assessment that weighs non-missile and ballistic threat side-by-side suggests that the motivation and opportunities for U.S. adversaries to focus their energies on smuggling a weapon into the United States are far greater than the ballistic missile threat.

I believe there are three bottom-line conclusions to draw from my testimony. First, the emphasis that ballistic missile defense has been receiving in the post-9/11 era is disproportionate to the more probable risk that other means will be sought by America's

current and future adversaries to target the U.S. homeland with a nuclear weapon. Second, to the extent that the U.S. government continues to invest in Ballistic Missile Defense, it should be committed to a parallel effort to deal with the non-missile risk particularly since success at BMD will only elevate the non-missile risk. Finally, Congress needs to take a hard look at how it is organized to provide oversight of the missile and non-missile risk. The current jurisdictional barriers that separate an evaluation of the budgets for homeland security efforts to deal with the nuclear smuggling threat and the Department of Defense efforts to construct Ballistic Missile Defense must come down.

Thank you and I look forward to responding to your questions.

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Mr. TIERNEY. Thank you, Dr. Flynn.

I want to thank all of you for excellent testimony, both what you presented here today orally and what you submitted in writing.

I am going to start the questioning period, if we can. We have 5 minutes, so you will find that Members sometimes get a little testy if you start to go on too long. They don't mean to be rude; they are just trying to get their questions in. If it is all right with the panel, I think we will try to do more than one cycle through here if we can on that.

Let me just ask, Mr. Cirincione, Mr. Spring, and Mr. Hildreth—I know where Mr. Flynn stands on this—and limit you if I can to agree or disagree to the following statement: it is more likely that a nuclear weapon is going to be delivered into the U.S. territory via an unconventional means as opposed to an intercontinental ballistic missile. Agree or disagree, Mr. Cirincione?

Mr. CIRINCIONE. I completely agree.

Mr. TIERNEY. Mr. Spring.

Mr. SPRING. I disagree, certainly in the context that if we were to purposefully leave ourselves open with regard to the avenue of missile attack. And by the way, I would include in that cruise missile. So I think I disagree.

Mr. TIERNEY. Mr. Hildreth.

Mr. HILDRETH. I don't know. I know that the challenge of building an ICBM that would reach the United States is extraordinarily challenging, and I just haven't taken the time to look. The answer is I don't know. I know that building an ICBM capable of delivering something to the United States from a couple of these countries, in particular, is an extraordinarily technical accomplishment and challenging.

On the other side, it is not something I have looked at in detail, with the same rigor, the capability to deliver something smaller scale into the United States, although I do know the literature tends to support that it is relatively easier.

Mr. TIERNEY. Thank you.

Mr. Cirincione, Mr. Spring in his testimony seemed to indicate that he thought the ABM Treaty was a detriment to our defense on this, so let me ask you whether you think that the ABM was actually successful in any way in the decrease that you have seen in the number of exposures to intercontinental ballistic missiles, or whether you also think it was somehow detrimental to our situation.

Mr. CIRINCIONE. At the time, the Anti-Ballistic Missile Treaty was a necessary part of the U.S. effort to limit and then decrease the soviet missiles that threatened us, so yes, the ABM Treaty played a very important part in the decreasing of ballistic missile threat through the efforts of Republican and Democratic Presidents. I believe it is a myth that the ABM Treaty in any way inhibited our technological development of effective anti-ballistic missile weapons.

The current administration came into office fervently believing that, and their No. 1 priority in 2001 was to scuttle the Anti-Ballistic Missile Treaty. They believed once that was out of the way that they could advance rapidly toward deploying effective missile defenses, that they scuttled the treaty. It has been 7 years. We are

no closer to anti-ballistic missile defenses that work now than we were during the Reagan era.

Mr. TIERNEY. The last phrase, we are no closer to systems that work, I think we will probably get into more of that in the next technical hearings that we have on that, but let me ask this question: if a country that did somehow get the ICBM capability—and Mr. Hildreth raises the very serious question of how likely or unlikely that actually is for some of these countries, but if they did, what leads any of us to believe that an Iran or a North Korea or something like that would actually take their limited capability and target the United States, with the knowledge that the retaliation would be devastating?

Mr. CIRINCIONE. I believe deterrence is alive and well. I don't believe in the myth of the mad mullahs who are intending on bringing about an apocalypse. I think Iran, as a recent national intelligence estimate indicated last November, has a cost/benefit analysis to their decisions and that they would be dissuaded from taking such a suicidal act by the certainty of a swift and overwhelmingly devastating response from the United States.

I believe that there are military measures we can take to enhance that deterrent effect on Iran. I believe the administration made a mistake by turning down President Putin's offer to use the radar facility at Azerbaijan and allow the United States to deploy short-range anti-ballistic missile weapons on Aegis cruisers in Turkey. That would have been an effective enhancement to the already existing deterrent capability.

Mr. TIERNEY. Thank you.

Dr. Flynn, I know that when we look at these there are people that say we have hundreds of thousands of potential targets in the United States for unconventional attack, but aren't there really a defined number of realistic targets that some terrorist might want to target in the United States that we could identify?

Mr. FLYNN. Yes. I think it is important to see that there are really two ways, when we talk about particularly conveyances coming to the United States, there are two ways to think about this. There are clearly the number of nuclear weapons that were maybe available to a terrorist would be incredibly small. That means they have to be pretty conservative about how they use those, and they want to get the biggest bang for their buck. So the things that are most critical for our country are most likely to be target critical in terms of loss of life potential and disruption for our society.

The other component—and it is one more on the lower end of the spectrum—is a dirty bomb in the system, bringing something in a container, not because that may be the best way to get here, but because you spook the system. You lead us to over-react, having huge cascading consequences. So it is an economic mass disruption.

A nuclear weapon clearly could be also, when you have one of them, could be used in a way that would be a weapon of mass destruction. What you are really doing is you are creating uncertainty that there are other such weapons in the system, and when you don't have the means to manage that threat—just like we did on 9/11, we shut the system down to sort it out—you start having incredible cascading effects.

So it is one part that we have scenarios that would target specific things, loss of life, and take a regional kind of focus; others go after the system, themselves, and create uncertainty and fear that leads to significant economic consequences.

Mr. TIERNEY. But in your expertise, is there a finite number of sites that we could focus on that would give us a reasonable comfortability that we are protecting those most likely targets?

Mr. FLYNN. Absolutely. Absolutely. There are places that either would be, because of loss of live potential—a lot of people live there—or business, that are incredibly important with a lack of redundancy in other systems that would cause real effect.

Mr. TIERNEY. And we have the potential to put in place systems that would actually provide us with a fair modicum of protection?

Mr. FLYNN. Yes. We have to think broadly about protection. For instance, one way in which you could protect the pipeline coming from Alaska is have a quick and rapid response force to repair any damage done. It wouldn't make much sense for a terrorist to be hanging out in the tundra to take out a piece of the pipeline if you could fix it in 24 hours. The visual is lousy, so probably nobody is going to capture it, and it would have no real measurable effect if it is fixed quickly, so you don't need to put a National Guardsman up and down the gas line.

So it is combination of thinking some things do need to be hardened, like the White House. You have to think about other things where there is redundancy. You can put extra systems, or you react quickly, but the fact is there are a finite number of critical assets in the country, most of which today have been largely unprotected in the ways that I just described, and therefore raise some great vulnerability.

Mr. TIERNEY. What would be the budget that you would need, and how much time would it take to actually implement a protective system like that?

Mr. FLYNN. Well, as I highlighted in my testimony, we are just very much out of proportion with what we are willing to invest in the conventional threat scenarios.

Mr. TIERNEY. How much money are you talking about, and over what period of time to get it fully implemented?

Mr. FLYNN. I can't provide a precise answer, unfortunately, for that because we really haven't completed the threat assessment or the site assessments, and we haven't thought through these different controls. But it is within the kinds of range of dollars we are talking about here in the missile defense line that would get us significantly ahead of where we are right now to safeguard those critical assets.

Mr. TIERNEY. Thank you.

Mr. Burton, you are recognized for 5 minutes.

Mr. BURTON. Thank you, Mr. Chairman.

First of all, Mr. Flynn, I agree with your approach. I think we really need to pay more attention to other forms of attacks here in the United States other than just intercontinental ballistic missiles.

We had a colleague of mine, Curt Weldon, who was on a television show I had every month bringing in a mock-up of a briefcase nuclear weapon which could destroy eight square blocks and prob-

ably kill 100,000 people with radioactive fallout, as well. So I share your concern about that, so that there probably needs to be a balance, and I would be one of those who would work with you or anybody to advocate that we come up with some kind of a balance.

I do believe, however, that we do need an intercontinental ballistic missile system and also intermediate and short range.

I would just like to say to my friends at the table there I am probably a little older than most of you.

Mr. TIERNEY. There is no probably about that, Dan.

Mr. BURTON. There is no probably about that. Now do I get more time for that? [Laughter.]

When I was a boy, I remember my father was reading the funny papers, we called it, on Sunday morning, and they had Flash Gordon, and he was flying through outer space with a backpack and looking at a television set, and I never will forget it, he said, That is crazy. You can't shoot pictures through the air without a movie camera. You can't fly without wings. And you certainly can't go into outer space like that. How are you going to get around with nothing but a backpack, and how are you going to breathe, and all that sort of thing. Well, every one of those things happened. Every one.

And in World War I the President and the leaders of the world after World War I said, the best way to stay out of war is to just destroy our weapons. If everybody doesn't have these weapons, we won't have to worry. We sunk our ships and we destroyed our aircraft and we did all that, and so did our allies.

And there was some guy named Adolph Hitler who violated the Treaty of Versailles and took a 100,000-man army that was supposed to be and built a multi-million-man army. He bought airplane engines from Great Britain, the Rolls Royce, and built the Luftwaffe, and he was developing a nuclear weapon, the V–2 rocket, and jet planes, and all the rest of the world said, hey, that ain't going to happen. But it did, and 62 million people died.

Now, I don't have a crystal ball, but I don't think anybody else does, either, and I think the technology that we have seen make quantum leaps in my lifetime, and in the last 10 years even more quantum leaps, would indicate that the delivery system of nuclear weapons could even become more effective and better with new technology, and that we need to defend ourselves against crazies that might launch them or people that bring briefcase nukes into the country. We need a multifaceted approach to dealing with the nuclear threat or any other kind of threat like that.

So I don't think we should do away with our intercontinental ballistic missile system or defense system because I think it is extremely important.

I also think that, in the process of developing this defense system, that we can also probably perfect it to where we can hit shorter-range and intermediate-range missiles that might be launched off the shore with the new technology and the ability to instantaneously see what is going on.

I would just like to make one other comment about the mutual assured destruction. I always thought that was crazy. You say nobody is going to be a madman and launch a war like that. There have been madmen throughout history that have done those crazy things. All you have to do is get in the history books. And if you

had some kind of a nut case that developed a nuclear system under the mutually assured destruction system, they could launch an attack that could, in effect, destroy the whole world and mankind as we know it.

So it is my opinion that we need to have a multifaceted approach to deal with these horrific weapons, but that should include—and maybe to a lesser degree. Maybe, as my colleague here in the Chair feels, maybe we ought to reevaluate it and cut back the amount of money we are spending on a defense missile system, and maybe allocate more to what Mr. Flynn is talking about.

But I think that this is a very, very dangerous world, and I think we need to do everything we possibly can to protect this country. We have very porous borders. We are very vulnerable to all kinds of things. And to do like they did in World War II or after World War I and say, we don't have to develop new weapons. We will destroy the old ones. We won't have to worry about a war. And we ended up with a war that killed 62 million people. Just think what it would be like if we had a nuclear war where they did start delivering these ICBMs and there was no defense for it.

With that, thank you, Mr. Chairman.

Mr. TIERNEY. Thank you, Mr. Burton.

Mr. Welch, you are recognized for 5 minutes.

Mr. WELCH. Thank you, Mr. Chairman.

Mr. Cirincione, you pointed out in your prepared testimony that six countries have had active intermediate- or long-range ballistic missile programs 20 years ago and they have halted them in countries like Argentina to South Africa. Can you comment on what lessons we learned from their decisions to halt ballistic missile programs, and can these be applied to North Korea and Iran?

Mr. CIRINCIONE. Sure. Would the staff put up table two on there, the chart of where we were in 1987 and where we were in 2007—I am sorry, that is graph two. Table two is the list of countries with active intermediate-range.

I draw on those lessons for my conclusion that we do face threats. We do need to have a balanced approach. That includes military measures. That includes research on and deployment of effective anti-ballistic missile weapons. But it also includes measured diplomacy, because the history tells us that it has been the diplomacy that has worked to eliminate these threats more so than the deployment of anti-ballistic missile systems.

So you look at those countries we saw in 1987, these were all countries we were worried about—Argentina, Brazil—not because they were opponents of the United States, but they were engaged in missile programs, and Argentina was in cooperation with Libya and South Africa on an intermediate-range ballistic missile program.

These were serious efforts, well-funded, a better technological base than most of the countries who we are worried about now. They were convinced to give them up by changes in their own regime—Argentina and Brazil ended the military juntas and restored civilian rule—and by diplomacy, including on the part of the United States to have conflict resolution between Argentina and Brazil, and export controls that limited the ability of these countries to get the technology they need.

And 1987 is a very significant year. That is when President Reagan started the missile technology control regime where the countries that make this stuff agreed to limit their exports to help reduce the risk that some of these other countries would get it.

South Africa is another case in point similar, a regime change that brought the majority rule, and export controls that slowed down the progress in their program had much more to do with them ending the program than any deployment of anti-missile systems.

Mr. WELCH. Thank you. Thank you very much.

Mr. Spring, there is use of asymmetric warfare that is the trump card for the terrorists. My question to you is your own assessment. Do you consider the ballistic missile threat to be more imminent than the nuclear terrorist threat? In other words, when we have to make choices in a world where there are limits on what we can do, how much time and effort we have, how much money we have, should we be focusing first on defending the United States from a nuclear armed ballistic missile or defending the United States from a nuclear device that is smuggled in or launched at close range?

Mr. SPRING. I would certainly hope we would never face that particular question as an either/or choice; that the United States would make a decision that we are so concerned about one avenue of attack that we are going to ignore another, or a series of others.

What I am here to say is really two things. One is that the cold war policy of retaliation-based deterrents I think is being overwhelmed by the complexities of the multi-polar world. That includes asymmetric warfare capabilities. That includes different delivery means. That includes a different coalition dynamic. That includes a whole host of things that did not go into the underlying analysis of what produced strategic stability during the bipolar years of the cold war.

Mr. TIERNEY. But let me interrupt—I am sorry.

Mr. SPRING. And so what I find very interesting here is that—and the conversation between the chairman and Mr. Flynn is in my judgment a very clear example of a damage limitation strategy. What they were going back and forth about, admittedly within the terrorist realm, not within the ballistic missile defense realm, is an element of a damage limitation strategy that I think is exactly the path that we should be on. I think that we are getting on the verge of forming a consensus.

Mr. WELCH. That we should be on damage limitation?

Mr. SPRING. We should be on a damage limitation strategy.

Mr. WELCH. There really are choices that you make, obviously budgetary choices. Or are you going to have your scientists and engineers and technologists working on plan A or plan B, and they can't be on both necessarily.

If I understand Dr. Flynn, the likelihood of a threat from a terrorist's use of a nuclear device that is smuggled in, where there is no return address, is probably a higher threat, at least if I understand Dr. Flynn. The threat assessment on that would be higher than there would be a missile launch from Iran or North Korea.

And, bottom line, I am just wondering what your view is. I mean, we don't live in a world where we can make this country guaran-

teed to be completely safe and never, ever have any possibility of a threat.

Mr. SPRING. I don't think that we are going to be able to ever answer that question precisely with perfect foresight. The fact of the matter is that the threat dynamic is dynamic enough. Let me put it in perspective. Let me put it in retrospect in this way: the United States, on the basis of an assessment that air defenses were not contributing very effectively to its primary cold war adversary, the Soviet Union, effectively dismantled the air defense system in this country. As we faced 9/11, we succumbed to the fallacy of the lesser excluded case. We didn't have the air defense capabilities to shoot down an airliner that was flying toward the World Trade Center in time because we basically dismantled that system.

Mr. WELCH. Let me interrupt for a second, because this is important. I mean, my colleague, Mr. Burton, raised the specter of mad-man being out there, and that is obviously a possibility. Somebody could do that. It is not all rationed. But, on the other hand, we can't defend against every mad-man everywhere. At least that is my view.

I would just want to read something that was written by the CIA's point person, Mr. Walpole——

Mr. TIERNEY. I would just ask you to try to wrap it up so the other Members can ask their questions, as well. We have one remaining question and a relatively short answer expected? We are going to have another round, as well.

Mr. WELCH. All right. I don't want to overstay my welcome here. I was just hitting pay dirt. You know what I mean?

Mr. TIERNEY. Go for it.

Mr. WELCH. Well, here's the question. I think we are really in this conflict of the dilemma that we face, but what Mr. Walpole said was, "In fact, we project in the coming years U.S. territories are probably more likely to be attacked with weapons of mass destruction from non-missile delivery means." My question is: do you agree with that? And if you do agree with that, wouldn't we then direct our resources toward meeting that threat first?

Mr. SPRING. Again, I think I would agree with it if all things were equal, but they are not all equal. In other words, the question is if you are going to leave yourself relatively vulnerable or completely vulnerable to a particular avenue of attack, then I think it will be exploited.

Mr. WELCH. OK. Thank you.

Mr. TIERNEY. Thank you, Mr. Welch.

Mr. Lynch, you are recognized for 5 minutes, more or less.

Mr. LYNCH. Thank you, Mr. Chairman. I want to thank the ranking member, as well.

Let me just continue on that line of thought. We do have a situation right now where we have a group that has, in fact, declared war on the United States. We have Al Qaeda. They have declared war, they have demonstrated an ability to strike within this country. If you follow the pattern of activity of these terrorists, Al Qaeda and affiliates, we have seen train bombings in Mumbai, London, Madrid. We have seen the aviation-related attacks on 9/11 and some attempts elsewhere out of London and out of Indonesia and the Philippines. So I am not asking for a crystal ball to

think about what might happen as much as I am asking us to look at what is, in fact, happening right now around the world, in other countries. There is a pattern of conduct here that we don't have to guess. It is happening.

All I am saying, I am a little surprised, Mr. Spring, that you think that it is more likely that, even though this conduct is happening now, you think that the unconventional threat is probably less than an intercontinental ballistic missile threat, and that puzzles me because this is a question of resource allocation for many of us, and especially for the appropriators, and so we see this stuff happening now with people who have declared war, and yet you think that the threat is greater for people who don't have the technology yet and have not declared hostile intent against the United States. I need to know how you reached that conclusion.

Mr. SPRING. Well, again, I reached the conclusion, as I stated earlier, because I don't think you can say that everything is equal in terms of the comprehensive assessment of the threat.

I would also say this as it relates to resource allocation, because you are exactly right about that, is that if you look at the broad array—and let's just limit ourselves to the military capabilities, and certainly Mr. Flynn has made some important points with regard to homeland security, and we can re-address this, but let's confine ourselves to the military. If you include what we are doing with regard to the projection of our conventional capabilities, as well as what we do with regard to providing for the protection of U.S. assets here at home in the military budgets——

Mr. LYNCH. You are going pretty far afield of what I was talking about.

Mr. SPRING. But you——

Mr. TIERNEY. I know what——

Mr. SPRING. But you are going to find——

Mr. LYNCH. Sir, you are eating up my time and you are not really answering the question.

Mr. SPRING. The fact of the matter is on resource allocation we are spending several times what we are spending on missile defense when you look at that broad array of even within the military budget.

Mr. LYNCH. Let me ask the other panelists, and, look, I appreciate everybody coming up here. Mr. Spring, even though we are at odds here on this one single point, I appreciate the work you are doing and trying to help the committee with its work.

Let me ask the other panelists: on a question of proportionality, which is one of resource allocation for us, is our current approach here—and I just want to talk about the ICBM issue, the intercontinental. I am not talking about medium-range that Mr. Burton was talking about, because I agree with him on that. That is more of a theater issue, and protecting our troops, as well as the situation perhaps in Israel and medium-range. I am talking about the ICBM threat here. Is our allocation of resources, I have numbers here from GAO that says we spent about $120 billion on this ICBM defense system. Is that proportional to the threat right now, given everything else we have going on here. Mr. Cirincione?

Mr. CIRINCIONE. Let me start. Absolutely not. I believe that the ballistic missile defense program is the longest-running scam in the

history of the Department of Defense. This is an enormous waste of money. And if you leave this decision to the Joint Chiefs, they won't spend anything near what this administration is requesting. In fact, the last time the Joint Chiefs were asked about this, in 1993, the JRC, the Joint Requirements Council, headed up by Admiral Owens at the time recommended to then-President Clinton that we spend only $3 billion a year on these kinds of programs, and, of that, 2.3 should go to theater missile defense system—in other words, the weapons we were actually facing that are real threats to our troops and to our allies.

This program is out of whack, and, Mr. Burton, if you are an advocate of continuing this program, I am going to tell you this budget is unsustainable. You have been here—some of the staff may not have been—when budgets don't go up all the time. They do come down, and this budget is heading for a crash, so we should be looking for how to budget a program that will have some sustainable technological base. Sorry.

Mr. LYNCH. No, that is OK.

Mr. Chairman, is it OK to have Mr. Hildreth address that, as well?

Mr. TIERNEY. It is.

Mr. LYNCH. Thank you, sir.

Mr. HILDRETH. You can ask, but you may not like the answer, because of the hat I wear. This is an issue of policy and resource prioritization, and because of where I am it is not something that I can really address. I can talk about some of the issues, but sort of taking that next step of what to do about it, it is not something that we can really do.

Mr. TIERNEY. Thank you. Fair enough, Mr. Hildreth. We appreciate that.

Mr. Yarmuth, you are recognized for 5 minutes.

Mr. YARMUTH. Thank you, Mr. Chairman. I also think this has been a very valuable conversation. I appreciate all the testimony.

I want to just continue the line of questioning. With $120 billion having been spent on ABM technology, is there any way to assess, if you had unlimited funds, if we had unlimited funds, is there any way to project what the program would cost to reach some kind of successful conclusion?

Mr. CIRINCIONE. Such budget projections have been done in the past. During the Reagan years there were estimates ranging from $1 trillion to $2 trillion to deploy the programs, including the space-based weapons that were then under consideration. The ground-based systems are expensive, but still relatively cheap compared to the space-based weapons. This is as close as we have ever come to an unconstrained budget, and I would say we are no further along in our ability to actually hit a real enemy missile now than we were 20 years ago. Some advances in sensors and guidance systems, but not significantly beyond where we were in the 1980's.

Mr. YARMUTH. So we really——

Mr. FLYNN. If I might just say that if you achieve that, you will create the incentive for the non-missile realm to be exploited, so that is just a key point.

Mr. YARMUTH. That sounds like a very important point. You made the comment, Mr. Cirincione, that if you left it up to the

Joint Chiefs of staff. What is the proper process for coming to the most logical decision and cost-effective decision? And the followup question, which I would like any of you to address, is: what do you see as the biggest threats to that process working properly?

Mr. CIRINCIONE. If it was up to me, the first thing I would do is restore a budget process that starts with an accurate threat assessment, and I would add to my testimony and Dr. Flynn's recommendations that you have a comprehensive threat assessment of what the most serious security threats are facing the United States and then have a budget allocation based on that. I believe that the No. 1 threat is nuclear terrorism, so I would be devoting significantly more funds to promote preventing that.

The second is I would bring the Joint Chiefs into this process. History of these ballistic missile defense programs are the Joint Chiefs are happy to support a President's pet rock as long as the budget continues to expand, but as that budget contracts they want to spend the money on programs that they really care about, that meet their real conventional needs. That is the kind of budget crunch that is about to hit the budget overall and ballistic missile defense, in particular.

I would devolve all these missile defense programs back into the services' budgets, let them weigh in, and see whether they would rather spend the money on jets, planes, tanks, and replacement for the equipment that has been chewed up in Iraq, or they want to continue with digging holes in the frozen tundra of Alaska.

Mr. FLYNN. I would just add to that it would clearly need to be broadened beyond the Joint Chiefs and incorporate the issues that are going to fall under the Department of Homeland Security realm, because the Customs Service plays an important role in some of these, the Domestic Nuclear Detection Office, the Coast Guard, and they are not even at the table with those discussions about resources. If you look at the overall investment we are making on the conventional military national security apparatus, my key, I guess, recommendation I am trying to advance here, particularly on Congress in its oversight function, is at some point in time a comparative analysis, both on the threat assessment but also on the oversight of these programs.

When these programs percolate up to the Pentagon they go through an OMB reviewer who looks at them against other Defense priorities, but not against other competing Government entities' budgets to deal with a portion of this threat. That is a structural problem that I argue that Congress needs to get into so that we can start to balance these resources appropriately around this range of challenges of which this threat may materialize.

Mr. YARMUTH. And my second question about what are the biggest threats to this process. I understand that you have a President who thinks that it is politically desirable to demagogue this issue and that is just some way that they could achieve political clout. I know that is a threat, but are there other threats that you see to having the right type of process?

Mr. FLYNN. I would put fundamentally here what I think has been echoed across here: we haven't got a good threat assessment. We haven't got a good intelligence estimate that looks at the nonmissile threat with the missile threat.

The work that I did with the Hart Rudman Commission before 9/11, providing them a briefing—I shared with the staff here the actual presentation I gave to them in 2000—that work was basically to say your attention is in the aerospace. Your attention is beyond our borders, but there is a whole conduit by which things come to the United States, and commercial conveyances across our borders at sea and so forth, where there is virtually no understanding in the defense apparatus of how it works, and you need to draw experts who are outside that realm into this process.

Mr. YARMUTH. So just one quick followup. No pun intended, but so we have had a silo approach to it where we compartmentalized the various threats and we don't consider them altogether? Is that fair?

Mr. FLYNN. Absolutely. This is the first hearing I am aware of—it may have been. I have been up here about 20 times since 9/11—where you have traditional sort of national security side looking at an element that falls into my arena, which we call homeland security. I usually don't get invited to the National Security and Foreign Affairs Committees. I end up talking about Customs and so forth. That is a problem, because we are not seeing the totality of the threat.

Mr. SPRING. I would say this, too, which is that another threat to that is I don't think that we have yet fully arrived at a consensus-based strategy for dealing with the post cold war.

Mr. TIERNEY. Thank you. And that is one of the reasons why this committee is actually having this hearing, Dr. Flynn, is that we have the unique positioning of being able to cut across different agencies in our oversight, so while Homeland Security may have an oversight committee, and armed services may have one, or whatever, they couldn't necessarily poach into each other's area. We have that jurisdiction that we are able to go across and combine, so I think there is some good work done here by Members and by the staff on making sure that we get that perspective.

Mr. Van Hollen, you are recognized for 5 minutes.

Mr. VAN HOLLEN. Thank you, Mr. Chairman. Thank you for holding this series of hearings. And thank you to all of the members of the panel.

We have had a lot of discussion about the nature of the threat and the severity of the threat, ballistic missile threat versus non-ballistic missile type threats. I think it is pretty clear, and obviously some differences of opinion, but clearly, in this day and age, given the capabilities other countries do have, that the non-ballistic missile threat now is much greater than any kind of ballistic missile threat, and the question is what happens in the future.

As we have all talked about, this is largely a question of resource allocation, because you do have a limited amount of resources. How best are you going to spend the money of the American people on their defense? And one is assessing the nature of the threat, and the other is trying to determine whether what you are doing to beat that threat is actually going to work.

I know we are going to have other hearings on this, but I do want to just raise this issue now because we are sort of talking about it in a way that, OK, we have these two different threats; what if we had a ballistic missile system that really worked. Even

if it worked, our sense is that the threat from these other areas would be greater.

Let me just note that in 2003, when Bush administration officials came before the Senate, they said that the interceptors would be capable of shooting down missiles with 90 percent efficiency and that they would be put in place by September 2004. They made that statement despite the fact that a majority of tests that had been performed before that time had failed, and that none of the tests that were performed using realistic decoys and the kind of other systems that you would expect to actually be part of an attack were in place.

Despite that testing record, the Bush administration essentially said by fiat, not by evidence but by fiat, we are going to deploy this thing—a very different approach than they have taken in many other systems.

So once they said deploy it, the Pentagon, recognizing that the testing wasn't going so well, they didn't do additional tests until it was "deployed." Since it has been deployed, you have a 50 percent test success rate in tests that are done, but, again, these are tests that have been dumbed down. They have been dumbed down so that now, yes, you can hit something with a 50 percent accuracy when you know in advance exactly what is coming, where it is coming from, and there are no decoys involved.

So I guess my question to you all is—and it gets to how many resources you should put behind this at this particular point in time until you get a little bit of better sense of whether or not this would actually succeed in defeating an attack of the different scenarios that we are talking about.

Mr. Cirincione, if you could lead off, and I would be interested in other's comments.

Mr. CIRINCIONE. Thank you, Mr. Congressman. Did I mention, Mr. Chairman, that I live in Maryland?

Mr. TIERNEY. No, you didn't. I am glad you are covering the ground. [Laughter.]

Mr. CIRINCIONE. In Mr. Van Hollen's district.

I believe the history of this program has been that the threats have been inflated, the capabilities have been inflated, so it is no wonder that the budgets have been inflated. I believe $12.3 billion, which is what the request is for this year, is completely out of proportion to both the threats we face and the capabilities we currently have. You have to restore some realism to the program.

I am not saying we cut it out, but you bring it back down to reality. You do an accurate threat assessment and you restore operational testing, common sense, to the program. You don't buy it before you fly it. We have never in the history of the last 20 years had a realistic test of any of these systems, the kind you describe, that has flown up against what we would actually expect even a primitive country to deploy, like North Korea or Iran. The NIE indicates that any country that can fly an ICBM is going to be capable of deploying one of or perhaps all of six basic countermeasures, including chaff, balloons, other countermeasures that can defeat the system.

We have never had a test of these weapons, and until we do how can the Congress possibly justify sticking these things in holes in

Alaska or straining our alliance to try to convince Poland or the Czech Republic to deploy it? Fly before you buy, accurate threat assessments—that would be the rule of thumb. And then shift some of the money out of missile defense to the No. 1 priority that we have, which is making sure that the next 9/11 attack is a non-nuclear 9/11. Let's prevent nuclear terrorism, the No. 1 threat facing the United States today.

Mr. VAN HOLLEN. Thank you.

Mr. SPRING. I am afraid that what you have described there is what I would call a cycle of failure. That is, if what we do if say we are going to reduce money for the testing until we can prove the system will work, is basically then you are de-funding the testing that you acknowledge would need to go forward to make sure the system works.

So I think that actually, if you want to improve technological progress, then you are going to have to make the investments in order to achieve that.

Let me speak also just very briefly about fly before you buy. This is a system of systems approach that we are doing in missile defense. It means, because of the nature of the system, you have to build it in order to test it.

We didn't do full constellation end-to-end testing of global positioning system satellite network; we started putting satellites in place in pieces, building it, fielding it, testing it concurrently. That is not the answer, admittedly, in all defense programs, but in systems of systems approaches it is an unavoidable requirement.

Mr. FLYNN. The only thing, it is almost surreal for me coming from the other end of the spectrum. Whatever you whack away, if you have scraps I will take them for the non-missile threat. If I could just point out, if I could just share this with you here, this is just a few pictures of the world that I operated in. Just so you have an idea, this was the longer one that is here.

[Slide.]

Mr. FLYNN. This gives you a scenario of the environment that I worked through.

This is what I gave the Hart Rudman. We have this guy, Osama bin Ladin, who did this to our embassy. If we move on to the next slide, my scenario would be to come out of the Port of Karachi, we have cut-and-sew shops there where you basically stuff containers with day labor. That container ends up in situations like these, local coastal barges loaded onto these inter-Asia ships that carry about 300 barges.

They will go to a port like Hong Kong in a place like this that moved 5.5 million containers last year on a ship like this that carries about 5,000 or 6,000, up to 10,000, land in a place like Long Beach, move on rail into places like switch stations in Chicago where you have boxes like this, or the Port of New York and New Jersey, which is directly adjacent to a place like Newark International Airport, where New Jersey Turnpike runs directly adjacent to, which is also where our pipeline is at its head for New England, basically the throat for New England, as this shot illustrates.

What I was basically making the case of here is that there is a world out there where you can have access to conveyances that

really is about access to a truck driver who gives you hold of a container, and that is how containers get to the United States and then end up in Wal-Mart and on our shelves.

That is the world that I operate in. And the amount of resources that we have dedicated to that problem is minuscule compared to the kind of resources we have obviously invested in dealing with ballistic missile threat. That is the kind of disconnect we are operating under.

Mr. TIERNEY. And we will all sleep well for that. Thank you. The question is, do you sleep at night?

Mr. Burton, would you like to add something onto the record and ask some questions?

Mr. BURTON. Yes, Mr. Chairman.

Mr. TIERNEY. You are recognized for 5 minutes.

Mr. BURTON. I will try to be more brief than that, because we have votes coming up here in just a few minutes.

I am going to enter this into the record, and I ask that we do this.

Mr. TIERNEY. Without objection, so ordered.

Mr. BURTON. This is the ballistic missile defense system, and the Missile Defense Agency conducted 10 hit-to-kill intercepts in 2007, including 6 intercepts of the Aegis BMD element, 3 intercepts of the terminal high altitude area defense element, and an end-to-end intercept of a long-range target by the ground-based mid-course defense system in California.

In addition to these flights in 2007, they conducted successful tests of the sea-based X-band radar command control battle management and communications system and other sensors, radars over multiple time zones.

And since 2001, there have been 34 of 42 terminal and mid-course hit-to-kill intercepts in atmosphere in space. Those aren't hypotheticals. They actually did that. And I understand in just the last year or so there has been even more successes.

I agree, as I said before, with what you said. I think we are really vulnerable at our seaports and in our cities, and our borders are very porous, and I think we ought to have a more complete threat assessment, Mr. Chairman, where we find out really what we should be doing that we are not doing right now to make sure that the homeland is secure from some internal operation or something in our seaports.

At the same time, though—and I know how vehemently you feel about this. I mean, you come across pretty strong—I still think that we need a very strong anti-missile system, and it should be effective in all three areas—intercontinental, short-term, and intermediate-distance missiles.

With that, Mr. Chairman, since we are short on time I will just submit this for the record.

Thank you, gentlemen, very, very much. We are going to be having votes in a minute, so I won't be with you, but thanks for your testimony. I really appreciate it.

Mr. TIERNEY. Thank you very much, Mr. Burton.

Mr. Burton, we are going to enter this on today's record. I have no problem with that. You might want to bring it back or have Mr. Shays bring it back for the next hearing when we will be talking

about capabilities and things, as well, so it gets on both records for that, if that is the point you want to make.

Mr. BURTON. I will have Mr. Shays bring me back, too.

Mr. TIERNEY. OK. I didn't want to make a statement on that. I understand that statement made those points, but I caution all of us to recognize what is a success and how it is defined. My experience with this thing over a dozen years or so has been that the agency tends to define success of a rather animated process where they simulate tests and then call it a success, where they use compartments or aspects of that program that are not the final operational aspect at all, but rather a prototype, which is not the one they are finally going to use, where the target is identified in advance.

There are a lot of issues around what they call success and what has actually hit to kill, but when we get into that next week I think those are legitimate questions to ask. We should really define what has been successful and what hasn't, whether or not there has been realistic and operational testing on that, and whether or not, as the Congressional Budget Office suggests, we ought not go back to an evolutionary process where we actually test before we build.

This is the crux of the thing. The whole DTO&E Office was designed to stop the Defense Department from running amuck, as they had with so many systems of building, only to find out that it didn't work and that we lost not only the money but the time. So even for those who believe this is a system worth pursuing, you would think that they would have some feeling for the idea of pursuing it in a logical sense that is economical so we can take care of all of our risks at the same time and not be exclusive, but focus on the testing where we don't lose time and money going down the path of actually building, deploying before they are actually ready to work.

But we talk about our own system, and that is going to be for the next hearing. But, Mr. Hildreth, I want to talk to you a little bit about our tendency to over-estimate the capacity of others, particularly Iran and North Korea. From my understanding, and I have a window through the Intelligence Committee, as well as this committee's work and general open source knowledge on that, they still have issues about their propulsion systems; am I right?

Mr. HILDRETH. Yes.

Mr. TIERNEY. And they still have serious issues about their guidance systems?

Mr. HILDRETH. You can raise questions about every single one of those elements of an ICBM, yes.

Mr. TIERNEY. And neither one of them has perfected the way of compacting a payload in order to put it on a missile head so they can be sent somewhere; isn't that correct?

Mr. HILDRETH. Correct.

Mr. TIERNEY. All right. And neither one of them has perfected the re-entry vehicle issues and challenges that are out there?

Mr. HILDRETH. To my knowledge they haven't tested that outside the laboratory. If they have done it inside the laboratory at all.

Mr. TIERNEY. OK. And you write in your testimony something I think is very important, a need for a full system testing, just as

we have never had that with our defensive operation with that, neither of these countries even come remotely close to fully testing a start-to-finish system, correct?

Mr. HILDRETH. I would argue so, yes.

Mr. TIERNEY. And that is an enormous undertaking. Tell us a little bit about what that entails.

Mr. HILDRETH. Most of the discussion is touched on in the statement, but basically an ICBM is a complex set of technologies that need to be integrated together. Each one of those elements, those main elements, themselves, constitute a whole range of technical challenges that must be overcome. They need to be tested independently and proven to be successful. A lot of that stuff can be done internally inside labs.

A lot of it, probably much of it could probably be done in ways that could be masked or hidden, but in the end even those major subsystems like re-entry vehicles or propulsion systems is not something you can buy a computer model for and say this is what we are doing and plug the numbers in and it shows that we are going to have success. You have to go out and test these things in a way that are, by a large measure, observable.

You can't hide these things very well, especially the testing of RVs. I mean, you just can't gain the kind of experience you need to understand the dynamics that an RV will experience inside a laboratory. They don't make wind tunnels that mimic the same kind of stresses that an re-entry vehicle will experience when it is coming in at several velocities per second, and massive deceleration.

You can't do that inside a lab. The only way you can do it is to actually go out and do it, and those things can't be hidden. You can't hide the fact that people will test a missile, and you may be able to shoot something up under the guise of a space launch vehicle, for example, and show that you have developed the capacity to shoot a missile and launch something into orbit, but it is a totally separate challenge and problem to have something re-enter the Earth's atmosphere and survive re-entry. It is not an easy thing. You can't get around that by not testing.

So these are just things you don't see these other countries doing.

Mr. TIERNEY. You make the point in your written testimony that some of the long-range ballistic missiles that we use to test intercept targets for our own ballistic missile defense program have failed to launch or operate in order to allow the test to proceed, and that is with 50 years of considerable U.S. long-range experience, which none of these, neither Iran or North Korea, or, for that matter, any of the other countries have on that. I think that is an excellent point.

The other aspect that I don't have time to question you on is the whole idea of management organization of some 80,000 people sometimes involved in a program as evolves on that and all the necessary coordination to overcome these challenges that doesn't exist.

The bottom line of my point on this being that if we are serious about this, we have the time to do this right. For those who believe we can have an effective ballistic missile intercept, or whatever, we have the time to do it right, to test and then build as we get things

that are accomplished, or whatever. That way if it doesn't work we don't have to spend all that money in that direction, but if it does work we can have the confidence to move to the next system on that.

Testing, reliability, and confidence that it is reliable are as important to our defense system as it is to them when they think of whether or not they are going to use something offensive against us. If we go back and take the CBO's recommendation on that, it gives us the opportunity to allocate resources to testing and allocate resources to making this country confident again that we are doing everything that we can do, and relying on our resilience because we know that if something goes outside we will have done all we can do but we are a resilient Nation. Dr. Flynn has said in his written comments that we can move on from there.

Mr. Welch, you have no further questions, and I understand the same with Mr. Yarmuth. Mr. Van Hollen, do you have any further questions?

Mr. VAN HOLLEN. No, sir.

Mr. TIERNEY. Gentlemen, would any of you like to make a final remark? Is there something that we left unsaid that you would like to address?

Mr. CIRINCIONE. Just on your last point, sir. One of the justifications that Secretary Rumsfeld gave for exempting the anti-ballistic missile programs from normal operational testing process was the urgency of the threat. I believe that the threat is not urgent; that it is limited and developing rather slowly. So the two are related, the inaccurate threat assessment and thorough and realistic operational testing. If you get one right, it helps you get the other right, as well.

Mr. TIERNEY. Thank you. Does any other person on the panel wish to——

Mr. FLYNN. Just the last point to say that the non-missile threat I firmly believe from my analysis is the higher probability threat, and it also is a vast distance behind what we have been trying to develop in the ballistic missile defense, so we need to be thinking about whatever we do in this area done in concert with the non-missiles, just to reinforce that point.

Mr. TIERNEY. Thank you.

Mr. Spring, would you like to say something?

Mr. SPRING. I would just say that I would like to urge the committee to focus on the requirements, the damage limitation strategy, and say why not missile defense among the other requirements for protecting the American people, our friends and allies, and forces afield.

Mr. TIERNEY. I want to thank all of you. Mr. Hildreth, the work that CRS in not just this area but in many areas is very helpful to us. It is a great resource, and we use it on a number of different committees.

All the other witnesses, thank you for your expertise, your frankness with us, and the way that you approach this. It is very, very helpful.

Mr. Burton, thank you. I thought you brought a great perspective to it. We look forward to working with you.

Other members of the committee, thank you for your input.

I thank the staff for your work, as well. I think you got us off to a good start on a very serious issue that is enormously expensive and very, very important to our defense.

With that, this hearing is closed. Thank you.

[Whereupon, at 11:40 a.m., the subcommittee was adjourned.]

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