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**ADAPTING U.S. MISSILE DEFENSE FOR
FUTURE THREATS: RUSSIA, CHINA
AND MODERNIZING THE NATIONAL
MISSILE DEFENSE ACT**

HEARING

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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CONTENTS

CHRONOLOGICAL LIST OF HEARINGS

2014

	Page
HEARING:	
Wednesday, July 23, 2014, Adapting U.S. Missile Defense for Future Threats: Russia, China and Modernizing the National Missile Defense Act	1
APPENDIX:	
Wednesday, July 23, 2014	27

WEDNESDAY, JULY 23, 2014

ADAPTING U.S. MISSILE DEFENSE FOR FUTURE THREATS: RUSSIA, CHINA AND MODERNIZING THE NATIONAL MISSILE DEFENSE ACT

STATEMENTS PRESENTED BY MEMBERS OF CONGRESS

Cooper, Hon. Jim, a Representative from Tennessee, Ranking Member, Sub- committee on Strategic Forces	2
Rogers, Hon. Mike, a Representative from Alabama, Chairman, Subcommittee on Strategic Forces	1

WITNESSES

Coyle, Philip E., Senior Science Fellow, Center for Arms Control and Non- Proliferation	5
Joseph, Ambassador Robert G., Former Under Secretary of State for Arms Control and International Security	3
Woolsey, Ambassador R. James, Jr., Chairman, Foundation for Defense of Democracies	2

APPENDIX

PREPARED STATEMENTS:

Cooper, Hon. Jim	33
Coyle, Philip E.	55
Joseph, Ambassador Robert G.	44
Rogers, Hon. Mike	31
Woolsey, Ambassador R. James, Jr.	35

DOCUMENTS SUBMITTED FOR THE RECORD:

CBO letter of July 21, 2014, on Ground-Based Midcourse Defense pro- gram budgets	71
Chinese ministry of defense news release announcing land-based anti- missile test	74

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING:

[There were no Questions submitted during the hearing.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING:

Mr. Cooper	82
Mr. Garamendi	83
Mr. Rogers	77

**ADAPTING U.S. MISSILE DEFENSE FOR FUTURE
THREATS: RUSSIA, CHINA AND MODERNIZING THE
NATIONAL MISSILE DEFENSE ACT**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, July 23, 2014.

The subcommittee met, pursuant to call, at 2:49 p.m., in room 2118, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MIKE ROGERS, A REPRESENTATIVE FROM ALABAMA, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. ROGERS. Good afternoon. I call this hearing of the Strategic Forces Subcommittee to order. We are here today to discuss an issue of rising importance to the United States. According to the Missile Defense Agency, quote, “there has been an increase of over 1,200 additional ballistic missiles over the last 5 years. The total of ballistic missiles outside the United States, the North Atlantic Treaty Organization, Russia and China has risen over 5,900. Hundreds of launchers and missiles are currently within the range of our deployed forces today,” close quote. And as we know, Russia and China are both engaged in aggressive modernization programs pointing hundreds of missiles of all sizes and ranges at the U.S., its allies, and our deployed forces. That is why we are here today for this hearing titled, “Adapting U.S. Missile Defense for Future Threats: Russia, China and Modernizing the NMD Act.”

We have another of our panel of distinguished witnesses joining us today. First, we have Ambassador James Woolsey, Jr., Chairman, Foundation for Defense of Democracies; Ambassador Robert Joseph, former Under Secretary of State for Arms Control and International Security; and Mr. Philip Coyle, Senior Science Fellow, Center for Arms Control and Non-Proliferation.

As usual, I will introduce my own statement for the record, and without objection, that is so ordered, and I will recognize the distinguished gentleman from Tennessee, who is going to take us all out for Memphis barbecue after Alabama wins the SEC [Southeastern Conference] this year. I yield to the ranking member.

[The prepared statement of Mr. Rogers can be found in the Appendix on page 31.]

**STATEMENT OF HON. JIM COOPER, A REPRESENTATIVE FROM
TENNESSEE, RANKING MEMBER, SUBCOMMITTEE ON STRA-
TEGIC FORCES**

Mr. COOPER. Thank you, Mr. Chairman. Nearly everything you say is accurate except for that last part. Nashville barbecue is way better than Memphis anyway.

I am honored that the witnesses are here. I apologize for the delay. I look forward to the testimony.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 33.]

Mr. ROGERS. Thank you, Mr. Cooper.

I now recognize our distinguished panel of witnesses. If you would please summarize your prepared statements for not more than 5 minutes, and your full statement will be made a part of the record.

First, we will start with you, Ambassador Woolsey. Thank you for being here with us.

**STATEMENT OF AMBASSADOR R. JAMES WOOLSEY, JR.,
CHAIRMAN, FOUNDATION FOR DEFENSE OF DEMOCRACIES**

Ambassador WOOLSEY. Thank you. It is an honor to be with you.

Mr. Chairman, I wanted to say just a few words about electromagnetic pulse because it is a threat that is not really debated in the public much. It is known to specialists, but it has been highly classified until relatively recently. It is essentially the vulnerability of our infrastructure, and particularly our electric grid, to pulses that either could come from the sun, for example, Quebec's electric grid was nearly completely wiped out back in 1989 by a solar generation. But it can also occur as a result of a detonation of a relatively simple nuclear weapon up at low Earth orbit level a few tens of miles, and that detonation, by utilizing the fireball and gamma rays from a nuclear detonation, can be extremely destructive to our electric grid.

We have a lot of remarks by Chinese and Russian specialists talking about the utilization of electromagnetic pulse. The Russians have bragged to us in private that they have been helping the North Koreans figure out how to use a simple nuclear weapon and a simple ballistic missile to attack the grid of the United States, and this possibility is not just theoretical. It is something that is well understood by physicists because the earth has been receiving shocks of this kind from the sun for hundreds of millions of years.

So one of the things that we really need to do is move quickly to build resilience into our electric grid, and here we are talking really about a few dollars per person in cost. And at the same time, we need to figure out how to deal with the threat of utilization of nuclear weapons in very limited numbers by not only Russia or China, but a rogue state, such as North Korea or, after, I am afraid, probably just a few more months, Iran. This deserves the kind of attention that only this committee and its Senate counterpart, I think, could bring to this type of debate because there is a strong desire to avoid trouble and avoid needing to deal with something that might cost some money on the part of much of industry.

My friend, who was the chairman of the ARPA-E, Eric Toone, the Advanced Research Project Agency for the Energy Department,

2 years ago moved the numbers himself and reviewed them, and he said there is more R&D [research and development] annually by the American dog food industry than there is by those who are seeking to build resilience into our electric grid. Now I guess it is a good thing for us to have healthy dogs, but in any kind of balance of proportion of where R&D money ought to go, I would urge strongly the review of the threat to our electric grid from electromagnetic pulse, how easily that can be put together and what types of work on material and devices at modest cost could build the sort of things we need in order to avoid this, I think, extremely serious threat. Thank you.

[The prepared statement of Ambassador Woolsey can be found in the Appendix on page 35.]

Mr. ROGERS. Thank you.

Ambassador Joseph.

**STATEMENT OF AMBASSADOR ROBERT G. JOSEPH, FORMER
UNDER SECRETARY OF STATE FOR ARMS CONTROL AND
INTERNATIONAL SECURITY**

Ambassador JOSEPH. Mr. Chairman, thank you for the invitation to testify today. I have submitted a prepared statement for the record, and in that statement, I address the questions that are before the committee. I contrast the fundamentally different approaches of the Bush and Obama administrations to the development and deployment of a limited missile defense system.

At the program level, the Obama administration from the outset substantially reduced the funding for missile defense and particularly for those capabilities that were to provide for the protection of the American territory and population centers. Programs intended to keep pace with the threat were cancelled, such as work on fast interceptors, including boost phase capabilities, as well as the airborne laser that had destroyed both solid and liquid missiles in flight. The multiple kill vehicle designed to provide a counter to the anticipated deployment of countermeasures was ended without replacement, and even critical sensors were mothballed, including initially the Sea-Based X-Band Radar that provided the most effective precision tracking.

At the policy level and again in very stark contrast to his predecessor, President Obama has repeatedly demonstrated a willingness to cut back on missile defenses in seeking other objectives, such as enticing Russia to negotiate offensive arms reductions. This was reflected in the 2009 decision to cancel a third site in Europe and again last year with the termination of the SM3-IIB [Standard Missile 3]. While U.S. strategic defenses have been reduced in numbers and capabilities for the future have been abandoned, the threat to the U.S. homeland has grown, not just from North Korea and Iran, but from Putin's Russia, which has embarked on a strategic build-up of offensive and missile defense capabilities reminiscent of the Soviet days.

The consequences of downgrading U.S. defenses, the increase in the threats that we face, and the policy failures to deal with these threats have major implications for U.S. missile defenses. I will summarize very briefly six conclusions.

One, we must restore the priority of homeland missile defense to keep pace with the qualitative and quantitative nature of the rogue state missile threat. Major budget cuts and multiple program cancellations have left us with an inadequate and obsolescing defense against missile attacks from states like North Korea.

Two, current problems with the GMD [Ground-Based Midcourse Defense] system and, in particular, the kill vehicle, must be fixed. Last month's successful test marked progress in this area, but improved reliability of the system must be demonstrated through active testing and spiral improvements. The number of interceptors must be increased beyond the 14 announced last March. These are interceptors that would already have been deployed under the Bush plan. Cancellation of the SM3-IIB program intended to field in Europe a counter to Iranian long-range missiles in the future makes additional GBI [Ground Based Interceptor] deployments at a third site in the United States essential.

Three, the GMD system must also evolve with improved sensors, as well as with capabilities that can defeat countermeasures and provide greater cost efficiency for intercepting larger numbers of missiles. At-sea capabilities that can contribute to the defense of the U.S. homeland should be supported, recognizing the mobility and the cost advantages offered by Aegis-class ships.

Four, the United States must reassess the role of missile defenses with Russia and China. Past calls for fielding a capability against accidental or unauthorized launches such as that proposed earlier by Senator Nunn are even more relevant today given the state of U.S. relations with Russia and China. We also should examine how defenses might contribute to deterrence of Russia and China. This is not a new concept but one that has been incorporated in past Presidential guidance of both Democrat and Republican administrations. While today's security setting is much different from that of the Cold War, Russia's increased reliance on its nuclear forces, and the greater prospect for a miscalculation with both Moscow and Beijing argue for a review of past strategic thinking.

Five, we cannot defend against larger-scale missile attacks from Russia, or potentially China, in the same manner that we are defending against rogue states. What we can do is explore how non-kinetic approaches, such as directed energy, can be integrated into our BMD architecture. We should also explore the full potential of space for the deployment of sensors and as well as interceptors to meet future defense requirements by taking full advantage of advances in critically important areas, such as computing and lightweight materials.

And, six, the way forward I have described will require additional funding in a time of budget austerity. The amount likely will be far less than the cuts imposed over the past 6 years. Funding could also come from shifting resources back from theater programs to strategic defenses. The current imbalance with about \$4 out of every \$5 going to theater programs is simply out of sync with our defense requirements.

Thank you, Mr. Chairman.

[The prepared statement of Ambassador Joseph can be found in the Appendix on page 44.]

Mr. ROGERS. Thank you.
And, Mr. Coyle, you are recognized.

**STATEMENT OF PHILIP E. COYLE, SENIOR SCIENCE FELLOW,
CENTER FOR ARMS CONTROL AND NON-PROLIFERATION**

Mr. COYLE. Chairman Rogers, Ranking Member Cooper, and distinguished members of the Strategic Forces Subcommittee, I very much appreciate your invitation to appear before you today to support your study of adapting U.S. missile defense for future threats. In my opening remarks, I want to describe why it would be unwise for the United States to pursue a missile defense against the intercontinental ballistic missile forces of Russia and China. There are basically three important reasons.

First, U.S. missile defenses, especially U.S. defenses against ICBMs [intercontinental ballistic missiles], can at best deal only with limited attacks, and even that goal remains a major technological challenge. All missile defense systems can be overwhelmed. All missile defense systems have limitations, and those limitations can be exploited by the offense. By definition, it is only if the attack is limited that the defense can have a hope of not being overwhelmed. If the enemy also employs countermeasures, such as stealth, radar jamming, decoys, and chaff, as Russia and China do, U.S. defenses are even more vulnerable. The technology is simply not in hand to deal with an all-out Russian or Chinese ICBM attack. The U.S. has experimented with many different ideas for decades hoping to find a way. A few examples are the nuclear-bomb pumped x-ray laser; Brilliant Pebbles, a constellation of perhaps as many as 1,000 orbiting interceptors; and the Safeguard ABM [anti-ballistic missile] system deployed in North Dakota that the U.S. Congress cancelled because Russian ICBMs could overwhelm it. These and other systems were cancelled as unworkable, ineffective, or too costly, as when Secretary of Defense Robert Gates ended the Airborne Laser program.

The second reason is cost. In 2002, the Congressional Budget Office [CBO] estimated the cost of several different DOD [Department of Defense] missile defense programs, assuming they all would continue through 2025, as part of a layered missile defense system. The CBO estimated that a system of Ground-Based Interceptors, analogous to the current Ground-Based Midcourse system, would cost between \$26 billion and \$74 billion. A system of interceptors launched from ships, similar to the Navy Aegis system would cost \$50 billion to \$64 billion, and a space-based laser system would cost \$80 billion to \$100 billion. In today's dollars, the 2002 CBO estimate for the space-based laser could be as high as \$132 billion. CBO cautioned against adding all these numbers together because the systems might share some common elements such as early-warning satellite systems, and CBO did not estimate the cost of a full, layered system. Of course, the GMD system and the Navy Aegis system are ongoing today. The space-based laser program office was shut down in 2002 and its research transferred to the MDA [Missile Defense Agency] Laser Technologies Directorate. All of these systems were for a limited defense. CBO didn't estimate the cost of a massive system designed to stop all of Russia and China's ICBMs, as there was no such program in 2002.

The third reason is strategic stability. If the U.S. had missile defenses that could handle ICBMs, the ICBM arsenals of Russia and China, a kind of Maginot Line against ICBMs, and if, unlike the Maginot Line, those defenses could not be defeated, it would be strategically destabilizing. Russia and China would need to respond with all manner of new forces, perhaps even more attacking missiles, perhaps extensive deployment of cruise missiles against which our ballistic missile defense systems are useless, or perhaps the deployment of large numbers of troops in regions that are currently stable and peaceful. Then our missile defenses would have upset the strategic balance and provoked new military responses from Russia and China.

Of course, under such conditions, Russia would certainly not agree to further reductions in their strategic nuclear arsenals, as the U.S. and Russia have been doing under START [Strategic Arms Reduction Treaty], the Strategic Offensive Reductions Treaty, and New START. Russia might consider aggressive new U.S. missile defense programs as justification to withdraw from the agreements that have significantly reduced the threat from nuclear weapons.

In a May 28 talk at the Atlantic Council, Vice Chairman of the Joint Chiefs of Staff, Admiral James Winnefeld, summarized why limited defenses are in the best U.S. interests. As you know, he said, "we have told Russia and the world that we will not rely on missile defense for strategic deterrence of Russia because it would simply be too hard and too expensive and too strategically destabilizing to even try." Later, the Admiral reiterated this point saying, "And let me be clear once again: It is not the policy of the United States to build a ballistic missile defense system to counter Russian ballistic missiles."

Mr. Chairman, that completes my opening remarks. I am happy to take your questions.

[The prepared statement of Mr. Coyle can be found in the Appendix on page 55.]

Mr. ROGERS. Great. I thank all of you for those statements. I thank you for your preparation to be here. I know it takes a lot of effort to prepare for these hearings, and I do appreciate it.

I will start with my questions. First, I would say, Mr. Joseph, you just heard Mr. Coyle's comments. I would love to hear your thoughts about those observations.

Ambassador JOSEPH. Mr Chairman, I have heard the same talking points from missile defense critics for really the past 30 years. Missile defense won't work. Missile defense is too expensive. Missile defense will start an arms race. Missile defense is destabilizing. These are the same arguments that were used to support adherence to the ABM Treaty for three decades, and this left us, they left the United States defenseless against not just missile threats from the Soviet Union, but also from emerging threats like North Korea. When the U.S. withdrew from the ABM Treaty, the sky didn't fall. There was no arms race. But what happened was missile defense critics refocused the same talking points on the Bush administration's missile defense plans. And, in fact, those talking points have been used against every missile defense undertaking that I am aware of.

Last night, in preparation for this hearing, I Googled “Iron Dome” and Mr. Coyle’s name, and up pops an article from the New York Times from last March, entitled “Weapons Experts Raise Doubts about Israel’s Antimissile System.” You guessed it. It is too expensive. It won’t work, and it is a rush to failure. The talking points of the critics are not only sort of repetitive. They are also wrong. And in particular, the talking points that are often used that the Bush administration rushed to failure, that there wasn’t adequate testing, in fact, and I have the statistics here, when President Bush made the decision to deploy in late 2002, seven intercept tests had been conducted, five of which were successful. Three additional successful flight tests had taken place of the booster to be deployed. During the Bush years, 7 of 10 intercept tests were successful, and the reasons for the failures of the other 3 were identified and corrected.

It is true that the initial approach to GMD did not follow the standard acquisition practices. This was a deliberate policy choice. It was deliberate because we had no defenses against the North Korean threat, and we needed to move forward, but we did so in a very deliberate and measured way, including with testing of the program.

Mr. ROGERS. Thank you. We deploy missile defense systems for anti-ship ballistic missiles from China. How do we explain or do you think it is reasonable for us to expect the American people to find that acceptable that we go to that extent for 5,500 sailors, but yet we aren’t willing to spend money to protect 5 million Americans in either Seattle or Los Angeles with missile defense capability? Do any of you understand why we are unwilling as a nation from a policy standpoint to deal with that risk? I open that to any one of you. Mr. Joseph.

Ambassador JOSEPH. I have always found it difficult to explain things that don’t make sense, and I don’t think it makes sense to the American people.

Mr. ROGERS. And I would argue I don’t think the American people even realize that we have the ICBM and SLBM [submarine-launched ballistic missile] threats that are there and without adequate resources to protect us. This is another question for all the witnesses. We are deploying a cruise missile defense capability to protect the National Capital Region from cruise missiles, including, according to the commander of NORTHCOM [U.S. Northern Command], Russian cruise missiles. Does it make sense that we deploy cruise missile defenses to protect the Capital from Russian cruise missiles, but we do not deploy missile defenses to protect the American people against a Russian ballistic missile? Ambassador Woolsey.

Ambassador WOOLSEY. Mr. Chairman, I don’t think it makes any sense, and I think it makes even less sense given the devastating nature of what could be an electromagnetic pulse attack. A launch from a freighter off the coast of a simple Scud missile with a very primitive nuclear weapon on it to up 30, 40, 50 miles above the East Coast would detonate, make possible a single detonation that could effectively destroy the East Coast grid. And if the electric grid is destroyed, the EMP Commission says that within 12 months of an EMP event, approximately two-thirds of the American popu-

lation would likely perish from starvation, disease, and societal breakdown. Other experts estimate the likely loss to be closer to 90 percent. We would be back, not in the 1980s pre-Web, but back in the 1880s, pre-electric grid, and very few of us have enough plow horses and water pump handles to live in the 19th century.

It seems stunning that something like this can happen, but the electronics we have today are approximately a million times more sensitive to electromagnetic pulse than the electronics that were taken out in 1962 by the very last atmospheric tests before the Atmospheric Test Ban Treaty cut in, in 1962. Both the Soviets and we were stunned by the degree of destruction many hundreds of miles away of even the primitive electronics of the time. But now at a million times more sensitive and a million times more vulnerable, the control systems of our electric grid are vulnerable to destruction by a single nuclear detonation up 40, 50, 60 miles into the atmosphere. It can occur by a, as I said, a Scud missile being launched from a freighter off the coast. It could take place by what the Soviets call a fractional orbital bombardment system, a FOBS, which essentially means a satellite, in this case containing a nuclear weapon, that is launched to the south, instead of to the north. To the south, we have virtually no observation, virtually no radars, virtually no sensors, essentially nothing. If they launch to the south and the satellite comes around the earth over the south pole and then up into the Northern Hemisphere and detonates, it could have the effect of exactly what was described by the EMP Commission report that I just read.

Mr. ROGERS. And does that commission report indicate that our public utilities have not taken appropriate steps to harden their grid?

Ambassador WOOLSEY. They are—Mr. Chairman, I've got to be careful how I phrase this. They are as ineffective and as uncommitted to making those improvements as any action by any American industrial or business group that I have ever been acquainted with or seen. They will not admit that this is a problem. They invent numbers. It is a trade association. NERC [North American Electric Reliability Corporation], the National Electrical Resources Corporation, North American Electric Resilience—not Resilience. I will get the acronym right in a second, but it is essentially the trade association for industry. And they have had people in NERC, including one who was head of NERC at one point, who has taken these issues responsibly and tried to work on them. But generally speaking, they do not do anything that would help the country deal with this problem. And if you look at how much it would cost, you are talking from the commission report, about \$7 per American to build resilience into the grid. That is one really, really nice cup of coffee in the morning.

Mr. ROGERS. Thank you very much.

My time is expired.

I now recognize the ranking member for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman.

I was just wondering sitting here listening to the testimony if we need to have another hearing to allow some of these folks to give the counterarguments because some pretty serious charges have

been made here, including inventing numbers and things like that. So, I think that might be a fair hearing to consider. I was also wondering if Mr. Coyle would like a chance to respond to Ambassador Joseph, because he made some pretty serious charges against you. If you would like to respond, I want to give you that opportunity at least.

Mr. COYLE. Well, I don't know what Ambassador Joseph found when he was Googling me, so I am not sure what he was referring to. We also talked for a minute there about cruise missiles as a threat, and I could just add to that, that the effort we are putting into cruise missile defenses is currently way, way less and more primitive than what we are doing for ballistic missiles. And some analysts regard a cruise missile threat as more likely because, as was referred earlier, a nation with not a lot of sophistication could put a cruise missile on some kind of a vessel and get close to our shores and launch that way. So the balance between the effort we put into cruise missile defenses and ballistic missile defenses, I think is a legitimate thing to be looked at.

Mr. COOPER. Ambassador Woolsey made some very interesting points about electromagnetic pulse. We used to have a colleague here, Roscoe Bartlett, who rode this hobby-horse for some time, and I do not want to in any way underestimate the threat, but I do suggest that it is probably better to build coalitions than to champion causes individually. I know Ambassador Woolsey has been on the Board of Trustees of Stanford University, of many other distinguished places, think tank for Booz Hamilton. Have you had any success persuading your colleagues on those boards about the EMP threat?

Ambassador WOOLSEY. I was on the Stanford board back some years ago, Congressman. I have been interested in this issue really for the last couple of years and have been doing a good deal of reading and work on it in that amount of time, but if we go back to either the time I was at Booz Allen, which began shortly after 9/11 for a few years, or way back when I was a Stanford trustee, I was not involved in this particular set of issues, EMP, at those times, but I would be delighted to work with anybody who wants to work with me on this. I think it is an extremely important issue.

Mr. COOPER. I was just thinking in terms of persuading people that it is a genuine threat, you are a relative newcomer to the issue. You served in and out of government for many, many years. Did you just suddenly become aware of this?

Ambassador WOOLSEY. Not suddenly. I suppose 2 to 3 years ago, I began to develop a serious interest in it, having done some reading that piqued my interest.

Mr. COOPER. And the chief barrier to persuasion with other people is?

Ambassador WOOLSEY. I think a lot of it is that people have a very hard time admitting to themselves that it could be as awful as what I have described. We all like to have manageable problems. There is a sense of success in being able to see something that is difficult to do and then succeeding against it. Electromagnetic pulse is very, very challenging. It makes most of our other dilemmas in the world I think look comparatively straightforward by comparison. And I think that we need to step up to the

fact that although defending against the ballistic missiles that would set off EMP is extremely difficult, we might well be able to build resilience into our electric grid relatively quickly and relatively affordably if we could get our country organized to deal with it.

Part of the problem is that the electric grid has FERC [Federal Energy Regulatory Commission]. It has NERC. It has Department of Energy. It has electricity commissions in the individual States. It is a situation where there are lots and lots of people dashing off in all different directions in terms of managing the grid. And to pull together and have a coherent approach is technically possible, I think, but organizationally, it is a really stunning challenge.

Mr. COOPER. It is my understanding that our former colleague, Roscoe Bartlett, is living largely off the grid and has hardened his network so that he is prepared. Are you prepared for this threat?

Ambassador WOOLSEY. Not completely, but I do have solar panels on my house, and I have various improvements like that, geothermal heat pump and so forth, that would make me partially grid-resilient I guess.

Mr. COOPER. Thank you, Mr. Chairman.

I see a number of our colleagues are here.

I yield back the balance of my time.

Mr. ROGERS. I thank the gentleman.

The chair now recognizes my friend and colleague from Alabama, Mr. Brooks, for 5 minutes.

Mr. BROOKS. Thank you, Mr. Chairman.

This question is for all the witnesses. In 2009, the administration sent Poland a Patriot battery with no missile interceptors. The Poles called this deployment a potted plant. Presumably this was done to attempt to mitigate Russian concerns. What is the damage done to our alliances when we make such nondeployment deployments?

Mr. COYLE. I don't know why that decision was made the way it was made. I just can't comment.

Ambassador JOSEPH. Sir, I think there is a pattern of these types of decisions, at least that I have discerned in our foreign policy over the last few years. We don't back up what we say. We don't impose consequences for red lines that are established and then crossed, and I think the consequence is an erosion of the confidence of our allies in the United States and a view on the part of our adversaries that they have little to fear from the United States.

Mr. BROOKS. Ambassador Woolsey, do you have anything to add? You don't have to.

Ambassador WOOLSEY. I think Bob summed it up very well.

Mr. BROOKS. This one is also to all witnesses. Last week this subcommittee held a hearing on Russia's violation of the INF [Intermediate-Range Nuclear Forces] Treaty. What are the implications of the administration's refusal to provide the annually required report and to finally, years overdue, confirm that Russia is in violation of that treaty? What do our allies take away from this meekness, and how about Russia and Putin?

Ambassador WOOLSEY. Congressman, I have not spent much time on the INF Treaty, but I was the head of delegation and chief negotiator for the Conventional Forces in Europe Treaty, which Mr.

Putin has also walked away from. It is a treaty that, among other things, not only locked in the deployments country by country that ended the Cold War, but when it was negotiated in 1989, 1990, 1991, it had a provision that prohibited any country from placing troops on the land of another without formal written permission, so what Mr. Putin has done in Georgia and what he has done in Ukraine and what he may well be doing in other parts of Central and Eastern Europe are clearly in violation of that treaty, and that is why he walked away from it, just as he walked away from the INF Treaty. He will basically walk away from whatever treaty limits Russia in any way that he doesn't want.

Ambassador JOSEPH. I think President Obama said it best: "All arms control commitments must be scrupulously observed, and if they are not, there must be consequences." The fact that it appears that Russia is in clear material breach, I would argue, of this INF Treaty and that there are no consequences, I think undermines not just the confidence in the United States, but the whole arms control process. Because if you can't depend on other countries observing and if they don't observe that there are consequences, what good is the process? What good are arms control agreements? They are certainly not going to be something that you want to pin your security on.

Mr. COYLE. Mr. Brooks, I am aware that there is a debate about whether or not this is a violation. I have looked at it enough myself to know that it certainly is getting close, if it is not. But I think part of the issue here has been whether or not the administration wants to treat it as a violation, and that involves statecraft and other things that I am not an expert about.

Mr. BROOKS. Well, just quickly, one last question. In view of the issues associated with Russia and the United States and the treaties that we have with Russia and particularly the INF and apparent violation of that treaty by Russia, what weight do you give to any treaties between the United States and Russia?

Ambassador WOOLSEY. I think only treaties that the Russian leader, particularly this Russian leader, thinks are in Russia's interests at any one point of time are going to be binding on Russia. He does not have a sense at all of the rule of law, of the standards to which he is sometimes held by statements at the United Nations and the rest. He is a KGB officer, and not to put too fine a point on it, as far as I am concerned, he is a thug. He has no interest in, no sense of obligation to treaties and the rule of law. He will observe one or more for some time if he thinks that it is in his interest and he is not ready to violate them in order to move Russia's interest as he perceives it forward by some other means. But he simply lacks, as far as I am concerned, the sense of obligation that most Western leaders and certainly American leaders have toward a treaty that one has signed and has been approved by our Senate, and therefore, is something we should observe. He doesn't think that way as far as I am concerned.

Mr. ROGERS. Gentleman's time is expired.

The chair now recognizes the gentleman from Georgia, Mr. Johnson, for 5 minutes.

Mr. JOHNSON. Thank you. Ambassador Joseph, you just mentioned about consequences for Russia's violation of which treaty?

Ambassador JOSEPH. The INF Treaty from 1987.

Mr. JOHNSON. And what consequences would you recommend and for what violations of that treaty?

Ambassador JOSEPH. Well, the violation that has been I know the subject of consideration by this subcommittee has been the development of a ground-launched cruise missile that has a range that is banned by this treaty, a range between 500 and 5,500 kilometers. This is the one treaty that outlawed an entire class of missiles, of ballistic missiles and cruise missiles within that range. It applies only to the United States and to Russia, which is what the Russians are arguing: Why should we live with this restriction when other countries, such as China, don't have this same restriction? But it, I think, shows the cynicism of Russia's attitude toward arms control in the sense that, instead of legally withdrawing from this treaty, as we did under the ABM Treaty, we did it according to the provisions of the treaty, they simply violate it because they don't want to pay the political price or what they see may be a political price. It shows the contempt that they have for the rule of law, as Jim just mentioned in this context.

What should we do about it? Well, if you go back to the history of INF, the reason we were deploying INF missiles was that the Soviet Union had been deploying SS-20 missiles by the hundreds. We deployed 464, were on course of deploying 464. The agreement was made that we would eliminate all of these weapons. The question was, how do we ensure a credible deterrent with our European partners in the context of the Soviet Union and the Red Army and the Cold War? That is not the security environment today. I don't believe we are living in the Cold War today, even though some of the actions that Russia have taken and particularly their buildup of nuclear forces is reminiscent of those days. So what do we do? Well, I think we have to think about sanctions, sanctions with Europeans. I think we have to think about—

Mr. JOHNSON. Do you think Europeans are going to respond to sanctions like they have with respect to the Ukraine?

Ambassador JOSEPH. I hope not, but I think it is going to depend on American leadership.

Mr. JOHNSON. Well, I tell you. What—if America—assuming that what you say is correct and the Russians are developing this class of banned cruise missiles, is there a way that those missiles gain an advantage over our defenses right now?

Ambassador JOSEPH. Absolutely. Absolutely.

Mr. JOHNSON. So then what you would recommend then would be that we go into another arms race and try to counter what they have done?

Ambassador JOSEPH. Of course not. I am not recommending an arms race. But again, if you go back to the context in which this treaty was negotiated, the Soviet Union had deployed SS-20s in order to cut the link between the United States and our European allies, to de-link the Europeans from the United States. This was about deterrence. This was about deterrence in the context of the Cold War.

Things have changed, but the Europeans still, I would argue, feel a need for a strong nuclear deterrent. At the last NATO summit, they talked about that need. So this may require, this may require

more capabilities. It certainly requires us, I believe, not to withdraw the remaining dual-capable aircraft and B61 bombs that are our only remaining theater nuclear deterrent in Europe. I think we need to look at what those options are, but we need to have consequences, as President Obama said.

Mr. JOHNSON. All right. Thank you. With my last question, I would like to ask Ambassador Woolsey, an EMP assault, who would be the likely perpetrator? Is it a state or non-state actor, and what do you see their end game being, having been successful at creating a successful attack? What would happen? What do they expect to gain out of it?

Ambassador WOOLSEY. Well, this would be undertaken only by someone or a country or group that wanted to absolutely destroy the United States because the consequences, as the commission mentioned, the range of debate is between those who think two-thirds of the American population would die and those who think 90 percent of the American population would die.

Mr. JOHNSON. The cause of death being?

Ambassador WOOLSEY. The cause of death being starvation, disease, societal breakdown. We have 18 critical infrastructures, and 17 of them depend upon electricity. So without electricity, you have no food, you have no water, you have no finances, you have no communications. You are back in the 19th century without the ability to support the U.S. population. I think that that is something that even at its worst, China and Russia are unlikely to want to bring about, but we had several incidents, including one very dramatic one during the Cuban Missile Crisis during the Cold War in which we came very, very close to nuclear war. In one case, the Cuban portion of the confrontation in the Cuban missile crisis, in one case, one Soviet navy admiral—or, rather, navy captain turning a key as his two colleagues had turned it——

Mr. ROGERS. Excuse me, Ambassador. We are way over time. I am going to have to go to the next Member.

Gentleman from Oklahoma, Mr. Bridenstine, is recognized for 5 minutes.

Mr. BRIDENSTINE. Thank you, Mr. Chairman.

Ambassador Woolsey, question for you regarding EMP. If we did have an event, such as an EMP, the electric grid, of course, would be at stake. Would all of our electronic gadgets as well be at stake?

Ambassador WOOLSEY. As I understand it, and you realize you are getting this from a lawyer/history major, Congressman, not from a double E. As I understand it, there are three types of pulses that would come from an electromagnetic pulse detonation of, say, a nuclear weapon. One is rather similar to lightning, and we can discount it because we have dealt with seeing to it that our buildings and electronics can operate even when there is lightning. One has very short wavelengths and operates generally at line of sight, so if it were detonated up at a particular altitude, it would more or less travel to the horizon in all directions and would knock out everybody's computers, whether it is in your car or in your refrigerator at home or in this voice-magnifying box.

The really terrible one is the third kind, which has very long wavelengths, and the waves ride along transmission lines and destroy transformers as they go. The transformers are the heart of

our electrical grid. They are what step up the voltage so it can be moved, step it down again so we can use it in our homes and businesses and industry. That situation is one in which the transmission lines run so far and the electromagnetic pulse with the long wavelength carries so far, that the effect could be devastating over very large areas. It could be possible, although everything would have to work just right for it, for the entire continental grid of the United States to be taken out by one detonation.

Mr. BRIDENSTINE. So if we were to harden the grid, is that sufficient, or would the calamity that you speak of happen as computers and systems are fried across the country? Like is the grid enough?

Ambassador WOOLSEY. The grid is not enough, but it helps a lot. If one could harden the grid against the long wavelength and the destruction of the transformers via the transmission lines carrying the long pulse, it would make it possible for us to come back, and it would not destroy the whole infrastructure. We would still have a lot of losses of local computers and automobiles and so forth, but those, once we started manufacturing again, could be redesigned in such a way that the computer in your car would not be knocked out any more than it is by lightning. So the thing that is a huge problem is this knocking out of the transmission lines and the transformers because the transformers are the heart of our electrical system. If they go down, everything goes down.

Mr. BRIDENSTINE. Got it. Ambassador Joseph, question for you regarding Ground-Based, Midcourse Defense. We have had tests in the past that have been very successful. We have had tests in the past that have not been successful. It seems like every time there is an unsuccessful test, some people use that as evidence that, look, it can't be done. We need to stop. When we have successful tests, the same people aren't saying, hey, look, we just accomplished something mighty. Let's continue to advance this capability.

In your opinion, Ambassador Joseph, how important is it for the United States of America to have a very robust R&D capability for missile defense and on top of that, the infrastructure to do not just testing but validation and operational, how is it going to be used operationally? Can you talk about that for a second and also just for us as legislators, we have got to make sure that we are funding these kind of capabilities, but we don't want to be funding them if they are going to be used to say, oh, look this one test failed. Therefore, we need to scrap the whole system.

Ambassador JOSEPH. Thank you. Yes, I think it is essential that we have a robust research and development program. We do need, as I said in my prepared statement, to fix the problems with GMD, and I think we are on course to do that. I think that we need to increase the number of interceptors. We need to do research and development, and I would argue, deploy capabilities like fast interceptors and multiple kill vehicles that will keep pace with the threat, because the threat is dynamic. The North Koreans are improving their capabilities. The Iranians will be doing the same thing. There is just no question about that. So this is dynamic. You can't just stop with GMD in place. You have to develop for the future.

Also I think we need a robust R&D to take us beyond a limited missile defense. We need to explore those capabilities that will

allow us to use missile defense as part of our deterrent with regard to Russia and I think probably China in the future, which means that we are going to have to have capabilities beyond the terrestrial-based type interceptors. We are going to have to have strong directed research in the field of directed energy for example.

And I think space is very important. We need to explore the full potential of space because I think if we are going to have an option for dealing with larger-scale Russian-type threats, it will only come if we are able to deploy effectively in space. We need to find out what our options are, and to do that, we need to have a very robust R&D capability, and we have to maintain an infrastructure that can provide us with the capabilities that we need in the future to keep up with the multiple nature of the threats that we face.

Mr. ROGERS. Thank the gentleman.

Gentleman's time is expired.

The chair now recognizes the gentleman from Arizona, Mr. Franks, for 5 minutes.

Mr. FRANKS. Thank you, Mr. Chairman, and thank all of you for being here.

Director Woolsey, I can call you, Ambassador, Director. There is a lot of things I can call you. You have got a pretty amazing curriculum vitae. And I won't try to pretend my attitude toward you is somehow neutral. I consider you a friend, and I am a fan and especially was grateful for your testimony here today. You know the privilege I have of chairing the EMP caucus gives me a special interest in some of the comments that you made. And I guess it is important, I would like to point out that, you know, we talked a lot about the EMP Commission which is the gold standard study, but there are 11 studies, 11 major studies all the way from NASA [National Aeronautics and Space Administration] to the Academy of Sciences to the Department of Defense to FERC, to all of these, and they all come to very similar conclusions. It is not as if this somehow, that this was some anomaly. And, again, I just appreciate your courage to be able to articulate this.

Over time, sometimes it seems like things happen. I would like to say one thing before I ask you a question that I hope would be some encouragement to you. I have the privilege of chairing the World Summit on Electric Infrastructure Security, and we did our fifth year in London, and for the first time, I saw the industry, the major leaders, not NERC—NERC is still that trade association that you mentioned—but some of the major players now have come 180 degrees and are on board, and it is really very, very encouraging, so I look forward to some significant advances here.

But you raise a few interesting points in your testimony about the potential Scud in the tub scenario, and you essentially answered my question and you kind of got ahead of me. But let me ask you, do you think and to what extent is not having a protected grid an invitation to certain opponents of America to exploit that vulnerability?

Ambassador WOOLSEY. Congressman, I think it is a really open invitation if we don't have a resilient grid. The two countries I am the most worried about would be North Korea and Iran. North Korea already has nuclear weapons. It already has ballistic missiles, and it has launched toward the south in the sort of FOBS

configuration, fractional orbit bombardment system, so that something that was launched on that trajectory into orbit would come around at us from the south where we have no radars, or effectively none, and no ability to perceive what is coming. So I think they have demonstrated something that they have, and we know from the Russians that the Russians have helped them. The Russians have told us this. And North Korea is ruled by a madman as far as we can tell. This is not someone who is just as stolid and someone who has great challenges for us in figuring out how to negotiate with him and deal with Kim Jong Un. Iran presents a different kind of problem because although they have not tested a nuclear weapon yet, they have tested ballistic missiles of course. They have tested ballistic missiles launched from platforms in the water. They have tested ballistic missiles firing toward the south. And moreover, the leaders, Khamenei and the others are, at least if you listen to what they say and take them seriously, they have very strong religious views that it is their mission in eternity to destroy us. It is not just hostility. It is a religious commitment that we should be gotten rid of.

Mr. FRANKS. I think, for me, that is one of my greatest concerns. When someone feels transcendentally justified, it becomes a different equation and some of the traditional deterrents is of little impact. Let me ask you one more quick question. As you know, the Defense Department over the years has spent literally billions now over the last four or five decades hardening many of our defense critical assets against EMP. We are very aware of it on the military side of it, and we don't have difficulty convincing generals, but the civilian grid issue, we remain completely vulnerable. If Iran were to, say, gain a nuclear weapons capability today that they might delegate to some nonstate actor, what do you think would be our reaction toward hardening our grid at that point?

Ambassador WOOLSEY. I would hope our interests would pick up quickly because it takes very little sophistication to launch something like this. The books by Peter Pry talk for example, about the possibility of launching a nuclear weapon up to low Earth orbit altitude with a weather balloon. One is not necessarily talking even about a ballistic missile. So anything that can get a simple nuclear weapon weighing a few tens of pounds up to 30 miles could create this EMP effect. And for the Iranians to make it possible for Hezbollah to have a nuclear weapon in a weather balloon is not beyond the reach of imagination.

Mr. FRANKS. Well, let me just suggest to you, I am very grateful to you for your courage, and I have said once here just a few days ago that perhaps former Vice President Dick Cheney was one of the most articulate spokesmen on this issue, but I may have to change my mind here.

Ambassador Joseph, there is a great deal of respect on my part for you, too, sir. They say that one of the most encouraging things in the world is to hear your own convictions fall from another's lips, and that is certainly what has happened here today, and I appreciate you.

President Obama said, in 2001, that I, "don't agree with missile defense systems." In 2008, as a candidate, he stated, "I will cut tens of billions of dollars in wasteful spending. I will cut invest-

ments in unproven missile defense systems.” Now he has implemented these what I think are radical political ideologies rather than defense principles, and how would you describe the impacts of these campaign speeches on our national defense?

And Mr. Chairman, before I ask you to make that question, could I ask that the Congressional Budget Office letter of July 21 be placed in the record that would show how this administration has affected missile defense?

Mr. ROGERS. Without objection, so ordered.

[The information referred to can be found in the Appendix on page 71.]

Mr. FRANKS. And if you still remember the question here.

Ambassador JOSEPH. First of all, I think you characterized the position of Senator Obama correctly. I mean, he was a missile defense critic. He used the same talking points: It won't work, it is too expensive, it will be destabilizing. He in 2008 ran against basically missile defense, pledging that he would cut tens of billions of dollars. He certainly has cut billions of dollars from the budget, but it is interesting to point out that in 2010, the DOD Ballistic Missile Defense Review, President Obama's administration made the statement that we are now, we, the United States, are now protected against—against threats from North Korea and other rogue states because we have a limited missile defense, and that capability is due to the investments that had been made in prior years in GMD. So apparently the policy has—has evolved since—since 2001, and certainly since 2008.

Mr. FRANKS. Thank you, Mr. Chairman. I will stop there, but I would—

Mr. ROGERS. We will do another round.

Mr. FRANKS. Okay.

Mr. ROGERS. I appreciate it. Our clocks are screwed up, so I am trying to make sure to give everybody plenty of time going over, but let's go to our friend and colleague from California, Mr. Garamendi, for 5 minutes or thereabouts.

Mr. GARAMENDI. I am sure you will let me know when thereabout arrives.

Ambassador Joseph, you were discussing the success of the limited missile defense system. Do you still hold the view that it should be a limited missile defense system against North Korea, Iran, and an unintended missile from Russia or China, or should we go to a full-out missile defense system against the Chinese and Russian numerous missiles that they have?

Ambassador JOSEPH. So that is a—a very important question. Clearly I think, and I believe that there is a consensus, or a general consensus, that we need to have a defense against rogue state threats that would provide a limited capability against a limited threat. On that, there is consensus.

I believe that there is greater cogency to the argument that we need a capability for accidental and unauthorized launch, which may not be the limited defense that you need for a North Korea-type threat.

Mr. GARAMENDI. Describe. What did you just say and why did you just say that?

Ambassador JOSEPH. Well, if you look at the missile defense plan for the Bush 41 administration, it was a global protection against accidental launches—or limited strikes, GPALS, Global Protection Against Limited Strikes, and the defining requirement was to protect the United States against, if I remember correctly, about 200 warheads, which would be one Soviet, one Russian boat that had been taken by, you know, by a rogue commander. So you had, you know, an accidental and limited capability, but it was much more than the limited capability that you can get through terrestrial-based GMD-type interceptors, which, you know, are—

Mr. GARAMENDI. I got the difference. Do you—should we then go to the 1990—excuse me, 1991 policy or stay with the 1999 policy?

Ambassador JOSEPH. Well, I think given the change in our relationship with Russia, which has certainly not been a change for the positive, given that there is a huge—I would argue, a huge prospect for miscalculation—I don't think this is first strike, second strike, this is not cold war, but I think we are in a situation where miscalculation can take place very easily. It could have taken place in Georgia. I have been told by Russian sources that in the context of Georgia, the Russians were preparing, not—not—they didn't have their finger on the trigger; they were preparing and they had plans for a nuclear exchange with the United States, because they didn't know how this would escalate.

And they think about nuclear weapons a lot differently than we think about nuclear weapons. My sense is that of the hundreds if not thousands of analysts on our side who were following Georgia, not one was thinking about a nuclear exchange. That is a very dangerous situation. That is a situation in which miscalculation can occur, and I think we need to protect against that. What are our options? I think we need to explore what those options are. That is why we need to invest in research and development—

Mr. GARAMENDI. If we need to explore, why don't you help us explore.

Ambassador JOSEPH. Well, I think we need to emphasize directed energy in our research and development and we need to emphasize space. We need to consider a space testbed, which was proposed earlier in the Bush administration, to find out what our options are and whether those options are for an unauthorized or accidental launch of the type I have described, or whether we have options for larger-scale attacks on the part of Russia or China. We should know what those options are, because we do know that we are going to be surprised in the future and that miscalculation with Beijing and with—and with Moscow can happen.

Mr. GARAMENDI. I want you to put—the three of you to put—yourself in China and Russia's shoes with the same questions. How do they perceive us? You said that we don't have one analyst. Have we ever gone to a situation in which we are preparing, in recent times, for a nuclear exchange?

Ambassador WOOLSEY. I think Russia is more of a problem than China.

Mr. GARAMENDI. No. You are in their shoes.

Ambassador WOOLSEY. In—I think if I were—

Mr. GARAMENDI. How do look at the United States?

Ambassador WOOLSEY. In my old job, but in Russia rather than in the United States, I could be tempted to think that I couldn't accomplish my country's objectives of dominating Europe and as much of Eurasia as possible without being rather aggressive; and that Putin, as KGB officer and with his history and the KGB's history of what they call disinformation, dezinformatsia, essentially adopting as their own, their propaganda.

Mr. GARAMENDI. So do you want to have your own missile defense system because the United States has so many offensive weapons?

Ambassador WOOLSEY. Oh, I want as much as I can get if I am the head of the KGB. I want—

Mr. GARAMENDI. So are you building those? Does Russia build missile defense systems?

Ambassador WOOLSEY. I am—yes, I think I am building missile defense systems, I am building offensive systems, I am working on electromagnetic pulse, all of the above.

Mr. GARAMENDI. Ambassador Joseph.

Ambassador JOSEPH. Well, first of all, Putin has declared the United States—

Mr. GARAMENDI. No, no. You are—

Ambassador JOSEPH [continuing]. Is the largest adversary. So from a Russian perspective, we are the adversary. Putin has undertaken a large-scale modernization of their offensive nuclear forces, all three legs of the triad. I understand from open Russian sources, I don't have access to the intelligence, that Russia plans by 2020 to spend more on missile defense than the United States.

Mr. GARAMENDI. Sufficient to overwhelm our strategic weapons?

Ambassador JOSEPH. Well, I think that as—you know, as—you know, looking at it from Putin's perspective, that would be exactly what he would want.

Mr. GARAMENDI. Do you have the money—

Ambassador JOSEPH. Look, this notion of destabilizing—

Mr. GARAMENDI. Do you have the money to do it?

Ambassador JOSEPH. This notion of destabilization and an arms race, this is a western concept. It is—it was at the core of the ABM treaty. The Russians never bought that.

Mr. GARAMENDI. Mr. Coyle, I don't have much time; in fact, I am well over time, so—assuming the clock is half accurate.

Mr. COYLE. Well, Congressman Garamendi, just to quote Admiral Winnefeld again, "it is not the policy of the United States to build a ballistic missile defense system to counter Russian ballistic missiles."

I believe he is correct when he says that. And so if I put myself in the Russians' shoes and we suddenly declare that we are going to do that, we are going to build a defense like that, I think they will use it as an excuse to build more offensive systems, perhaps more cruise missiles, perhaps all kinds of things that they don't have an excuse for now.

Mr. ROGERS. Gentleman's time has expired. I thank the gentleman.

And we will start round two now, and I believe everybody had had a first round, so I will start off. And before I ask my first question, I do want to point out that, you know, you made the comment

about Admiral Winnefeld in your opening statement. He is the vice chairman of the Joint Chiefs, and I think he has to espouse the position of the administration. I think that that policy is really a policy of the Obama administration. I am not sure that he is espousing that as his best military judgment, but that is just an observation on my part.

Let me ask this: China and Russia seem to want to do—and they seem to be openly doing things for their own benefit in that they are modernizing and building up their nuclear forces, but at the same time openly developing missile defense capabilities to neutralize the American strategic forces. In fact, China's ministry of defense announced this morning that he conducted another test today.

So given that we know openly China's doing this, Russia's doing it, why do you think that it is America's policy to go along with this and get along and not be more aggressive in trying to face and push back against those trends for those two countries? Start with Mr. Coyle.

Mr. COYLE. Well, I think the main reason, just speaking from a technological point of view, is we don't know how to do it, we don't know how to build a missile defense system that would stop all of Russia's or China's intercontinental ballistic missiles. And there is the question, well, if we did know how, what would that cost? CBO has never been able to estimate it, because nobody's been able to describe what that system would look like. And then there is this argument, which you have been hearing today, about whether or not it would be destabilizing. But I think the first thing is we just don't know how to do it right now, and—and so that is the first step and that is the first problem.

Mr. ROGERS. Mr. Joseph.

Ambassador JOSEPH. Well, I think there is a strong ideological dimension to it, and I think that is there is a sense that there is an arm—on our part, there is an arms control solution to every problem.

I think that there clearly isn't in this case. The Russians have no interest, and they have said so explicitly, no interest in arms control, whether it is for offensive, strategic forces, or for their theater forces, in large part, because we have already made concession after concession, we have very little to give and they have, at least in the theater category, an 8-to-1 or 10-to-1 advantage. Why would they?

So there is this—there is this notion that we should be going to global zero; we should be—we should be negotiating with the Russians; the Russians object to our missile defenses, therefore, we make concessions on missile defenses. We have seen this pattern of behavior over and over, and it doesn't work.

We did get the Russians to the negotiation table—to the negotiating table for New START, we did do that, and we did that through a missile defense concession, and we did get an agreement, but if you look at the agreement, we are the ones that go down. The Russians go up.

So if you are into, my view, unilateral disarmament, you pursue these issues like we are pursuing them.

Mr. ROGERS. Ambassador Woolsey.

Ambassador WOOLSEY. I was an advisor, a delegate at large and then ambassador and chief negotiator for four different arms control negotiations from 1969 through 1991, and the one that I negotiated as chief negotiator covered all the countries of Europe and all of their conventional weapons in six languages, 101 pages, we did it in about a year, and I thought it was a real achievement. It turned out that Putin junked it as soon as it was inconvenient for him.

And I think that the United States has been, on the whole, really quite naive about thinking that arms control agreements are in fact going to limit the likes of Mr. Putin. It is, I think, just not in the cards.

Fouad Ajami, who sadly died a month or two ago, a marvelous scholar of the Near East, American journalist and scholar, said that President Obama is a constitutional scholar lost in a world of thugs, and I am afraid there is some truth to that. We are in a world of thugs, and one of them is Putin in spades. And it is important that we realize that, and that that is what we are dealing with, not a group of collegial, law-abiding countries that will kind of go along with whatever we sign and treat it with the same degree of respect that we treat things we sign. It is just not who we are dealing with. I wish it were otherwise.

I felt a real sense of achievement in negotiating that treaty. It lasted only as long as Putin didn't need to get rid of it.

Mr. ROGERS. Well, let me ask this: We have heard observations today about Russian policy, China policy, North Korea, and our responses thereto. We haven't heard anything about Iran. I would love to hear your thoughts about what we should be doing with regard to the threat from Iran. And each one of you, just whichever order you want to go in. Start with you, Ambassador Woolsey.

Ambassador WOOLSEY. Bernard Lewis, a great scholar at Princeton of the Middle East, says that during the Cold War, mutual assured destruction was a deterrent. Unfortunately now, with respect to the leaders of Iran, it is an inducement. And what he means by that, I believe, is that the set of beliefs I described earlier in which the Iranian leadership really believes there is a theological case to be made and that should really dominate their thinking for destroying, particularly the United States and Israel and our civilizations, not just one government, that is, I am afraid, something that drives a lot of the decisionmaking at the top level of the Iranian government.

Mr. ROGERS. And what should we do about it from a policy standpoint?

Ambassador WOOLSEY. First—first thing is to recognize it and not to get bogged down in wishful thinking. The Persians invented chess, and they are good at it. And the way I think of it is that they have one pawn that they are moving down along the side of the board down to the King's row to turn him into the most lethal piece, the Queen, which for—in the real world would be the nuclear weapon. In the meantime, they are distracting their opponent by doing other things on other parts of the chessboard, but the objective is to get that nuclear weapon.

I think they will do anything they can to see to it that they are able to turn this situation with a limited number of devices and the

rest into a relatively quick nuclear weapon as soon as they want it and need it, and I think that is their objective.

Mr. ROGERS. Ambassador Joseph.

Ambassador JOSEPH. Let me focus on the negotiations. We, of course, don't know whether there will be an agreement with Iran reached by the time of the latest deadline. If there is an agreement, we don't know whether there will be ex—how many centrifuges will be allowed, what will be the restrictions on R&D, how long the—you know, the restrictions will last, what will be the verification procedures. There are many, many things that we don't know, but we do know what won't be in that agreement right now. We do know that there will be no limits on Iran's ballistic missile program. And the supreme leader has recently said that, we need to redouble our efforts in this area. And we know from our own sources that, in fact, they are doing just that. They already have the largest ballistic missile defense force in the region, and it is improving, including capabilities that will provide them with continental range missiles. We also know that there will be no ban on enrichment.

So the two things we know combined means that Iran will be a nuclear weapons threshold state with an expanding ballistic missile capability. We know that.

Secretary Kerry has stated that the goal of the negotiations is no longer to deny Iran a nuclear capability, but it is to extend the time for breakout from 2 months to 6 months or 12 months. I think this is a fundamental mistake. I think other countries in the region will want the same capability, and it will lead to further proliferation. I think it will undercut decades-old U.S. policy to discourage enrichment by other countries. And we have been discouraging our friends for many, many years, but once we say yes to Iran, how do we say no to the Australians? How do we say no to—you know, to the South Koreans? How do we say no to others?

And I come at this from a non-proliferation perspective, and I am very concerned about that. It will put—you know, this type of agreement will put Israel behind the eight ball, make it more difficult for them to use force, because Iran will be allowed to continue its nuclear program, something that the Israelis have said is unacceptable.

Mr. ROGERS. Mr. Coyle, how would you suggest our policy respond to the growing concerns with Iran's nuclear capability?

Mr. COYLE. Well, it is—Mr. Chairman, it is obvious that the negotiations between the P5 and Germany and Iran have been very difficult, now being extended for another 4 months, I guess it is. And I am hopeful, of course, that those negotiations will be successful. So far, they have halted the growth in Iran's nuclear program for 10 months. I hope it is much longer than that, but anything that can be done to limit the growth and the size of Iran's nuclear program, I think is in our national interest.

Mr. ROGERS. Thank you. Thank the gentlemen.

I now recognize the gentleman from Tennessee for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman. I would just like to reiterate my call for a more balanced witness panel. I think we have heard a number of bold, sometimes almost wild and intemperate

statements. So if we do want to pursue them, they should be fleshed out with a more balanced approach so that this committee and the Congress could have more sources of information, but I have no further questions at this time.

Mr. ROGERS. The chair recognizes the gentleman from Oklahoma, Mr. Bridenstine, if he has any additional questions.

Mr. BRIDENSTINE. Ambassador Joseph, just out of curiosity, if the United States of America has a \$17 trillion GDP and Russia has a \$2 trillion GDP, if our economy is that much larger than theirs, is there any reason why we should seek parity with them as it relates to our defenses?

Ambassador JOSEPH. Well, I don't think our defenses should be focused or should be sized to that of Russia, because we have a different set of threats than Russia faces. Russia is, of course, developing and modernizing its strategic defenses, particularly of the Moscow region, which is a region that is large enough to incorporate ballistic missile fields, offensive fields, but we have—we have interests that are much different than the Russians, we have adversaries that are different than the Russians, and so we need to size and scale our ballistic missile defense according to our needs, not according to some concept of parity.

Mr. BRIDENSTINE. And I just—I appreciate that testimony. It seems to me that if we are economically in a stronger position, then it would make sense that militarily we should be in a stronger position, and to constrain ourselves because Russia is constrained by their GDP, I think that leads us down a path of instability. I think a strong America is a safe world, and that when we try to constrain ourselves, we get what is happening right now where Vladimir Putin has invaded Georgia and he still occupies South Ossetia and Abkhazia.

He has threatened nuclear war in Poland; he has threatened the Baltic States, Latvia, Lithuania, Estonia. He has cut off energy, and people have suffered and died. When you talk about, you know, the aggression in Crimea and in eastern Ukraine, you know, these things don't just happen because—because, you know—I guess, because, the United States of America is doing the right thing. These things happen because people perceive right now that we are not going to do what is necessary to protect free countries and countries that are fighting for their independence.

When you look at Syria, I mean, the Russians are helping the Assad regime in Syria, and the mullahs in Iran are going around sanctions and building nuclear centrifuges, and, of course, those are built by the Russians. It seems like wherever you go in the world, the Russians are on the wrong side, and it overwhelmingly appears to me that there is no balance to this, and that if we constrain ourselves because the Russians are constrained, and, of course, they are constrained because their economy is weak, and their economy is weak because it is run by organized crime and they can't attract investment.

We have a very different system here in the United States, and it has resulted in us being economically and militarily very powerful. And for us to turn around and use those gifts—or to constrain ourselves when those gifts are bequeathed upon us, it would seem that we would be turning our backs on our obligations.

I am a strong advocate that the United States needs to remain the superpower that it is. And to constrain ourselves because a country run by organized crime is constrained naturally, I think that is a bad direction for our Nation.

Thank you. Thank you all for your testimony.

Mr. ROGERS. The chair recognizes the gentleman from Arizona to bat cleanup.

Mr. FRANKS. Well, thank you, Mr. Chairman.

Ambassador Joseph, let me begin here again with you. First of all, again, I appreciate your testimony so much. I don't usually ask metaphysical questions, but sometimes it is a rather challenging thing for me to understand why our friends on the left seem to be so antithetical toward missile defense. You and I know that—that the limited capability that we have at least affords us the opportunity to defend ourselves against an early attack, whether it is an accident or whatever it might be a limited attack, so that then we have the opportunity, not to have to respond overwhelmingly. We know that a Russian Federation strike would overwhelm our system immediately, we understand that. And for those that say, you know, we can't protect against all of them, that it doesn't—it doesn't matter at all. We know that the situation in Israel has been borne out where Iron Dome has afforded them the opportunity to hold off some offensive attacks and then allows them the time to go in and take out and dismantle those offensive capabilities. We understand all that.

And yet, in all loving deference to my friend, Mr. Coyle, just a few years back, you know, the argument, and I don't want to put the words in his mouth, but as I understood them were to suggest that, you know, the bullet hitting bullets technology is fantasy. And at that time, of course, we were beginning to hit a dot on the side of a bullet with a bullet consistently, in the words of General Obering.

So what is it—there was this notion that you tried to articulate that GMD was rushed into development without adequate testing. You addressed that. What is it that makes our friends on the left seem so antithetical to this capability, when all through history, the paradigm of warfare has been a new capability offensively is met with a defensive capability, and we just keep going till we—and now we face the most dangerous weapons in the world, an incoming nuclear missile that could ruin your whole day if it lands. Why is there this hesitation to have some sort of defensive capability?

Ambassador JOSEPH. Sir, I don't know the answer—

Mr. FRANKS. You don't answer metaphysical questions. Is that what you are saying?

Ambassador JOSEPH. Well, I am—I am always willing to throw out an answer, or a guess, in this case. And my sense is that there is still a hangover from the ABM Treaty days. There is a legacy of thought from the ABM Treaty days where defenses were considered to be bad by the United States. Okay. Soviet Union went along with the ABM Treaty, but they cheated on that treaty, just like they cheat on INF and other agreements. But we had sort of ingrained in our strategic thought this notion that mutual assured destruction is the best means of protecting the United States.

These are not people who don't want to defend the United States, but these are people who believe that by being defenseless against large-scale attack, against the destruction of our society by ballistic missiles with nuclear warheads, we will actually be safer, because that will be stabilizing, because if both sides can destroy the other, et cetera, you know, you——

Mr. FRANKS. Yeah.

Ambassador JOSEPH. You know the logic. And I think this, to me—and I have an academic background. This, to me, proves the staying power of bad ideas. I think it has been a bad idea for a long time. You can certainly differ, I am open to other arguments, but this bad idea just doesn't go away, and it didn't go away when the ABM treaty went away. We still have that legacy.

And the second factor is that we very much long for the day in which we can all just get along, and the means to get there is another arms control agreement.

Mr. FRANKS. Yeah.

Ambassador JOSEPH. That is how we approach this stuff.

Mr. FRANKS. Yeah. All right.

Ambassador JOSEPH. And our adversaries don't. They don't. They see the world differently. They see the world in power terms.

Mr. FRANKS. Obviously I couldn't agree with you more.

Ambassador WOOLSEY, let me save the last question here for you. First of all, like you, I consider the potential of an offensive EMP attack against us to be one of the more dangerous short-term national security threats that we have. And so my question to you is, given the consequences of a massive EMP attack, or GMD event, as you have laid out in your testimony, what practical steps do you give us to address this step? Is legislation necessary or to get industry to move? And what practical ideas do you propose that we can move toward protecting the electric grid and taking away the incentive of a potential enemy to exploit this vulnerability?

Ambassador WOOLSEY. Congressman Franks, that is a great question. I have thought about this. And I believe that although they will not want it, there is only one institution in the U.S. Government that could take charge and get something done and do it quickly, and that is the Department of Defense. I would charge the Secretary of Defense with whatever support he needed from other agencies, FERC would be one that would be very helpful to him, by the way, I think, put him in charge, give him the job of protecting the grid now, and the resources that he needs.

I think you also need a Presidential commitment, but without someone in charge, including officials at the State level, this is an emergency, I think without someone in charge, this will fail. The electric grid is just too diverse in the influences on it and the people who have some kind of control over parts of it.

Mr. FRANKS. Well, thank you all. And thank you, Mr. Chairman.

Mr. ROGERS. Thank all of you. And that brings us to—yes, sir, Mr. Coyle. You had something to say?

Mr. COYLE. I just wanted to make a comment, if that would be okay.

Mr. ROGERS. Certainly. Certainly.

Mr. COYLE. Just in my own defense, I have never said that you can't hit a bullet with a bullet, and we know from the tests that we have done it many times now.

Mr. FRANKS. That was a long time ago.

Mr. COYLE. I would point out that there is common ground in my testimony and in Ambassador Joseph's testimony. We both want the Ground-Based Midcourse system to work. And in my testimony, I call for both sides of the aisle to work together to fix some of the problems that have been plaguing that system. It will involve new investment and new ideas. I think the best science and technology should be put towards missile defense just as we put it towards everything else that we do in life, American—the best of American science and technology. And so I think there is some common ground there.

Mr. ROGERS. And one piece of good news on that front is that, I think it is 168 million new dollars over and above what had been requested has been put into GMD in this coming year. So the folks seem to recognize just what you said, that it needs a little more attention, love and attention.

I would like to offer for the record the release that I mentioned earlier from the Chinese minister of defense about their test today. Without objection, so ordered.

[The information referred to can be found in the Appendix on page 74.]

Mr. ROGERS. And thank you all for being here. We are adjourned. [Whereupon, at 4:21 p.m., the subcommittee was adjourned.]

A P P E N D I X

JULY 23, 2014

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

JULY 23, 2014

**Draft Statement, as prepared for delivery:
Chairman Mike Rogers, Subcommittee on Strategic Forces**

HEARING ON

**Adapting U.S. Missile Defense for Future Threats: Russia, China and
Modernizing the NMD Act**

July 23, 2014

Good afternoon. I call this hearing of the Strategic Forces Subcommittee to order.

We are here today to discuss an issue of rising importance to the United States. According to the Missile Defense Agency:

"There has been an increase of over 1,200 additional ballistic missiles over the past five years. The total of ballistic missiles outside the United States, the North Atlantic Treaty Organization, Russia, and China has risen over 5,900. Hundreds of launchers and missiles are currently within the range of our deployed forces today."

And, as we know, Russia and China are both engaged in aggressive modernization programs, pointing hundred of missiles of all sizes and ranges at the U.S., its allies and deployed forces.

That is why we're here today for this hearing, "Adapting U.S. Missile Defense for Future Threats: Russia, China and Modernizing the NMD Act."

We have another distinguished panel of witnesses today; we have experts in the field of missile defense policy:

- Ambassador R. James Woolsey, Jr.
Chairman
Foundation for Defense of Democracies
- Ambassador Robert G. Joseph
Former Under Secretary of State for Arms Control and International Security
- Mr. Phil Coyle
Senior Science Fellow
Center for Arms Control and Nonproliferation

We are here today at an increasingly perilous time for the United States.

Everywhere we look, at seemingly every longitude and latitude, we see threats to the United States, our allies and our deployed forces.

At exactly the time we should be strengthening our defenses, we are instead tearing them down or allowing them to atrophy.

Perhaps nowhere has this been more pronounced than in our missile defenses.

From the beginning of the Administration, before the President even rolled out his missile defense policy in 2010, he has been tearing down our missile defenses:

- Our GMD system was cut by a third (only lately proposed to be restored – with the restoration mostly occurring after he leaves office);
- The modernization of the system was terminated when the Multiple Kill Vehicle was terminated (which may possibly be restored, but not until the 2020s);

- Our only boost phases developments were cut: the Kinetic Energy Interceptor and Airborne Laser;
- The Third Site was cancelled (and then later the fourth phase of the European Phased Adaptive Approach was also cancelled) leaving allies feeling insecure and the homeland less secure as well;
- The Missile Defense Agency was cut in its first year from almost \$10 billion to less than \$8 billion merely as a matter of ideology, it seems; and
- We no longer have any plans for a space layer, whether sensors or defenses.

We have a President who says “I do not believe in a missile defense system.” His actions prove it.

We are a far cry from where we should be.

In 1983, some thirty one years ago this past March, President Reagan offered the American people a vision of a better and safer America:

What if free people could live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation to deter a Soviet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies? (1983)

Instead, we “limit” our missile defenses. Why?

Is it because the threats to our citizens and our allies have receded?

Hardly.

Is it because our adversaries are limiting their defenses to maintain some conception of “stability”?

Not even close.

Is it because if we deploy robust and effective defenses we won’t achieve arms control treaties?

Is this even a serious concern?

We are here today because this subcommittee and this Congress need to consider the next steps in our missile defenses.

We are here today because it is clear that we will have to lead this President to the policies that deploy the missile defenses that defend our allies and citizens, whether the missile is Iranian, North Korean, Russian or Chinese.

Who here today, based on the actions of the past year, believes he can predict what China’s leaders will do as they attempt to turn the Pacific into a Chinese dominion?

Who here today believes he can predict Russia’s actions next?

Because we can’t see the future, we must defend against its risks, wherever they are.

**Hearing on Adapting U.S. Missile Defense for Future Threats:
Russia, China and Modernizing the NMD Act**

Strategic Forces Subcommittee Hearing

Ranking Member Jim Cooper
July 23, 2014

I join Chairman Rogers in welcoming our witnesses, Ambassador Woolsey, Ambassador Joseph and Mr. Coyle.

Improving missile defense to effectively address the growing threats is important, but must proceed in alignment with other stark realities, including technological feasibility, affordability, and the national security imperative of avoiding a second nuclear arms race.

The National Missile Defense Act of 1999 declared it U.S. policy to “deploy as soon as technologically possible a National Missile Defense (NMD) system capable of defending U.S. territory against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) (...) and seek continued reductions in Russian nuclear forces.” Fifteen years later, our national security outlook has changed in important ways: terrorism, and preventing terrorist acquisition of weapons of mass destruction, have risen in priority; we asked a great deal of our military; we face historic budget pressure; and additional states, including Iran and North Korea, are developing threatening ballistic missile capabilities. We also see continuity in important areas: negotiated arms control and threat reduction remain our most effective tools for maintaining strategic stability with Russia, as we improve missile defense technology needed to defend the United States, our deployed forces, and our allies against the North Korean and Iranian missile threats. Taken together, these factors demand a national missile defense policy that addresses emerging threats without destabilizing our key strategic relationships and that is consistent with our technical capabilities and budget.

I must disagree with the Chairman’s view of the President’s approach on missile defense. We spend \$9 billion annually on missile defense to protect the United States, our deployed troops, and our allies, including over \$1 billion on national missile defense. Far from “tearing down our missile defenses,” the President has made effective missile defense against growing threats a priority for national security.

We have a regional missile defense to defend all of NATO, which NATO has endorsed, we have robust cooperation with Israel on missile defense, and we work closely with our allies in Asia and the Middle East to provide a capable missile defense against the growing threats from North Korea and Iran.

The Administration is also prioritizing a national missile defense system that is effective and reliable. If we are going to spend billions more in taxpayer dollars, we must have a system that works. According to Admiral Syring, we have spent \$24 billion to date on the ground-based midcourse system, with a FY15 budget request of \$1.3 billion. After three back-to-back flight intercept test failures which had left us with no successful flight intercept test since 2008, we finally had a successful test in June 2014. As the missile threats from North Korea and Iran grow, Congress has provided bipartisan support for the Administration’s efforts to make much needed progress on discrimination and reliability, improving our sensors, developing next-generation ground-based interceptor, and increasing the number of deployed interceptors. Congress has exercised close oversight of the missile defense programs and sought to ensure that our missile defense addresses and keeps up with the threat.

As we continue these necessary and important investments, we must focus on missile defense improvements that will most effectively add to our security and provide a defense that works. We must build a solid foundation for effective missile defense and avoid investing prematurely in unaffordable and immature programs that waste limited resources and opportunities.

As the National Academy of Sciences noted in its 2011 report, after significant cost-increases and schedule delays in expensive and unproven programs, then-Secretary of Defense Robert Gates terminated the Kinetic Energy Interceptor (KEI) program and converted the Airborne Laser (ABL) program to a research and development activity “in recognition of the operational and technical difficulties of intercepting missiles during the boost phase of flight” and terminated the multiple kill vehicle (MKV) technology program “because the threats anticipated in the next few years [were] not likely to be accompanied by penetration aids sophisticated enough to defeat the existing systems.” The National Academy of Sciences report also concluded that, “While technically possible in principle, boost-phase missile defense—whether kinetic or directed energy, and whether based on land, sea, air, or in space—is not practical or feasible.”

Sound investments and a plan to build on our missile defense system to improve our defense against evolving threats must drive technological and funding decisions for an effective layered defense.

Lastly, preserving strategic stability, and understanding the impact of US missile defense, particularly expanding missile defense, on Russian and Chinese nuclear weapons programs and perception of deterrence requirements, should also continue as key considerations. The 2009 Congressional Commission on Congressional Commission on the Strategic Posture of the United States (of which Ambassador Woolsey was a distinguished member) concluded that “The United States should develop and, where appropriate, deploy missile defenses against regional nuclear aggressors, including against limited long-range threats” but that “[t]he United States should ensure that its actions do not lead Russia or China to take actions that increase the threat to the United States and its allies and friends.”

The commission also stated:

“For more than a decade the development of U.S. ballistic missile defenses has been guided by the principles of (1) protecting against limited strikes while (2) taking into account the legitimate concerns of Russia and China about strategic stability. These remain sound guiding principles. Defenses sufficient to sow doubts in Moscow or Beijing about the viability of their deterrents could lead them to take actions that increase the threat to the United States and its allies and friends. Both Russia and China have expressed concerns.”

Thank you Mr. Chairman. I look forward to the witnesses’ testimony.

**U.S. National Missile Defense and the Growing Threat:
*Is a “Limited Defense” Enough?***

Amb. R. James Woolsey
Chairman, Foundation for Defense of Democracies
Former Director of Central Intelligence 1993-95

House Armed Services Committee
Subcommittee on Strategic Forces

Washington, DC
July 23, 2014



1726 M Street NW • Suite 700 • Washington, DC 20036

Mr. Chairman, Ranking Member Cooper and Members of the Subcommittee,

I am honored to be asked to testify before you today on this important subject.

I have incorporated in this testimony my answers to the five sets of questions sent to me by the Committee:

1). In my view, a policy of limited missile defenses against limited threats makes no sense in today's threat environment because the threat increasingly refuses to stay limited.

2). Although many types of increases and other changes will no doubt mark the development of threats in the years between now and 2020-2025, this testimony will concentrate on those posed by electro-magnetic pulses (EMPs) due to the seriousness of that threat and the role of ballistic missiles in its implementation.

EMPs are super-energetic radio waves that, in the form of coronal solar ejections by the sun, have been striking the earth since the two have existed. But it is only since the late 1850s that the existence of rudimentary electronics (e.g. telegraphs) have demonstrated that even the solar generation of such random pulses can destroy the electronics portion of our terrestrial infrastructure.

Then in 1962, as atmospheric nuclear tests were coming to a treaty-dictated end, some Russian and American atmospheric tests produced surprising results: destruction of electronics at great distances. It was not a nuclear blast that caused the destruction, but rather pulses generated by gamma rays and the fireball. And we have learned that modern electronics are a million times more

vulnerable to EMP than the electronics of the 1960's. In 1989, a solar-generated pulse effectively destroyed Quebec's electric grid.

For the last half-century or so the certain destruction of electronics in a nuclear war has been considered by most policymakers and students of these phenomena to be just one of the many awful things that would happen in a nuclear exchange. We have eighteen critical infrastructures and seventeen of them (food, water, communications, finances, hospitals, law enforcement, etc.) all depend directly or indirectly on the eighteenth - the electric grid. But except for some electronic shielding of portions of our strategic forces, little attention has been paid for decades to the ease of an enemy's generating EMPs by detonating a nuclear weapon that is passing above us in orbit and thus bringing our civilization to a cold, dark halt.

But the recent declassification of a substantial amount of information about EMPs, the works of Dr. Peter Pry and others, and the thorough reports of two congressional commissions and numerous other major U.S. government studies that have dealt with the subject in detail, have begun to bring attention to the issue. There is now an increasing likelihood that rogue nations such as North Korea (and before long, most likely, Iran) will soon match Russia and China in that they will have the primary ingredients for an EMP attack: simple ballistic missiles such as SCUDs that could be launched from a freighter near our shores; space launch vehicles able to launch low- earth-orbit satellites; and simple low-yield nuclear weapons that can generate gamma rays and fireballs. In 2004, the Russians told us that their "brain drain" had been helping the North Koreans develop EMP weapons.

Further, the Russians invented years ago a way to launch satellites into orbit using a trajectory that does not approach us from the north, where our few modest ballistic missile defenses are located, but rather from the south. It is called a Fractional Orbital

Bombardment System (FOBS). A missile launched to put an EMP-carrying nuclear device into orbit can come upon us from the South, and does not require accuracy, size, or numbers to be effective.

The nuclear weapon would be detonated in orbit, perhaps during its first orbit, in order to destroy much of the electric grid from above the US with a single explosion. Some of the destructive effects would reach to the horizon; others, via transmission lines, can reach further. Unlike the situation if we are attacked with a traditional nuclear missile we may not know the source of what blacks out our electric grid. It might be the sun or it might be the Iranians. We might not be able to tell.

3). The impact on our ballistic missile programs of assessing only limited threats and deploying only limited defenses makes such defenses wholly ineffective against threats such as EMP.

4). To preserve our society against our the vulnerabilities from the destruction by coronal solar ejections and by any enemy, present or future, who can obtain a simple ballistic missile and a rudimentary nuclear weapon, we must change our policy to assess these threats and deploy defenses against them. The EMP Commission estimates that within 12 months of an EMP event two-thirds of the US population would likely perish from starvation, disease, and societal breakdown. Other experts estimate the likely loss to be closer to 90 percent.

5). First of all, we need to move rapidly to harden the grid against EMP attack. Much of what needs to be done could use simple devices that already exist. The EMP Commission's cost estimate is \$2 billion. (This is the equivalent of a one-time charge of seven dollars per American—roughly the cost of a Venti Frappuccino.)

We could consider taking other steps, such as advocated by William Perry and Ashton Carter (later Secretary and Deputy Secretary of Defense) in the Washington Post seven years ago—destroy all launch vehicles of North Korea before launch. But even with the backing of two prestigious and respected advocates, applying it only to probably the world's craziest dictator, this idea never got off the launch pad. And to be thoroughly effective against EMP, it would have to include pre- or immediately post-launch destruction of all nations' launches of all types, including Russia and China. It's hard to imagine an idea that more deserves the appellation "political non-starter."

Compared to what we have today, in spite of the greater flexibility, of some types of ballistic missile defenses that we've abandoned—Brilliant Pebbles and some space-based directed energy BMD systems that could shoot down space vehicles before their ballistic missile launchers could put anything into orbit—we still don't have a good answer to our toughest problem: EMP

We need to move extremely rapidly to build resilience into our electric grid and also to put the best minds we have on this problem of defending against EMP. Now.

R. JAMES WOOLSEY

Ambassador R. James Woolsey, a former Director of Central Intelligence, chairs the board of the Foundation for Defense of Democracies, and is a Venture Partner with Lux Capital Management.

Ambassador Woolsey also currently chairs the Advisory Board of the Opportunities Development Group and the Strategic Advisory Group of Paladin Capital. He previously was a venture partner and senior advisor with VantagePoint Venture Partners. In 2009 he was the Annenberg Distinguished Visiting Fellow at the Hoover Institution at Stanford University and in 2010-2011 was a Senior Fellow at Yale University's Jackson Institute for Global Affairs. From 2002-2008 Mr. Woolsey was a Vice President of Booz Allen Hamilton in McLean, Virginia, specializing in energy and security issues, and prior to that a partner with Shea & Gardner in Washington D.C., specializing in commercial litigation and alternative dispute resolution (arbitration and mediation). He practiced at the law firm for 22 years on four different occasions and served in the U.S. Government 5 times for 12 years, holding Presidential appointments in 2 Republican and 2 Democratic administrations. In addition to serving as DCI, he was ambassador to and chief negotiator for the Conventional Armed Forces in Europe (CFE) Treaty (1989-91), General Counsel of the Senate Armed Services Committee, and Under Secretary of the Navy. He has served on numerous corporate and non-profit boards, including as a Trustee of Stanford University and as a Regent of the Smithsonian Institution. He speaks publicly and contributes articles to national newspapers and other major periodicals on such issues as national security, energy, foreign affairs and intelligence.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Amb. R. James Woolsey

Capacity in which appearing: (check one)

☒ Individual

☐ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented:

FISCAL YEAR 2014

federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
n/a			

FISCAL YEAR 2013

federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
n/a			

FISCAL YEAR 2012

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
n/a			

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2014): n/a ;
 Fiscal year 2013: n/a ;
 Fiscal year 2012: n/a .

Federal agencies with which federal contracts are held:

Current fiscal year (2014): n/a ;
 Fiscal year 2013: n/a ;
 Fiscal year 2012: n/a .

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2014): n/a ;
 Fiscal year 2013: n/a ;
 Fiscal year 2012: n/a .

Aggregate dollar value of federal contracts held:

Current fiscal year (2014): n/a ;
 Fiscal year 2013: n/a ;
 Fiscal year 2012: n/a .

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2014): n/a _____;
 Fiscal year 2013: n/a _____;
 Fiscal year 2012: n/a _____.

Federal agencies with which federal grants are held:

Current fiscal year (2014): n/a _____;
 Fiscal year 2013: n/a _____;
 Fiscal year 2012: n/a _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2014): n/a _____;
 Fiscal year 2013: n/a _____;
 Fiscal year 2012: n/a _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2014): n/a _____;
 Fiscal year 2013: n/a _____;
 Fiscal year 2012: n/a _____.

House Committee on Armed Services

Subcommittee on Strategic Forces

“Adapting U.S. Missile Defense for Future Threats: Russia, China and Modernizing the National
Missile Defense (NMD) Act”

Prepared Statement of Dr. Robert G. Joseph

Former Under Secretary of State for Arms Control and International Security

July 23, 2014

Chairman Rogers, Congressman Cooper, and distinguished members present today:

Thank you for the opportunity to testify before the Committee. It is a privilege for me to appear before you and provide my views on the future of missile defenses to protect the American homeland.

Background

Since the U.S. withdrawal from the ABM Treaty in 2002, the United States has pursued a policy of limited missile defense. In broad terms, this has meant the development and deployment of active defenses to protect the U.S. homeland against relatively small ballistic missile attacks from states such as North Korea and Iran. In practice, the policy of limited missile defense has been implemented in fundamentally different ways by the Bush and Obama Administrations.

As articulated in 2002 by President Bush (NSPD-23), U.S. missile defense policy had the following objectives and characteristics:

- The development and deployment of a layered defense capable of protecting U.S. forces, U.S. allies, and the U.S. homeland against ballistic missiles of all ranges “in all phases of flight.” The focus was on hostile states that were “aggressively pursuing the development of weapons of mass destruction and long-range missiles as a means of coercing the United States and our allies.” This was assessed to be the principal threat at that time.
- The intention was to begin in 2004 the deployment of capabilities to protect the United States against such attacks. Until that time, the U.S. possessed no defense against these threats. This was seen not as a “silver bullet” but as a rudimentary capability that would be improved over time. In contrast to the normal DOD approach to development and procurement, this was to be a “starting point” for an “evolutionary approach” for fielding defenses capable of evolving “to meet the changing threat and to take advantage of

technological developments.” Instead of a traditional fixed architecture, the U.S. would pursue a range of capabilities that would be expanded taking into account the dynamic nature of the threat and rapidly changing technology. Presidential guidance stated that initial capabilities “may be improved through additional measures” such as: development of boost phase interceptors, enhanced sensors and the “development and testing of space-based defenses.”

- Countering the ballistic missile threat from states such as North Korea was described as “an essential element of the United States’ broader efforts to transform our defense and deterrence policies and capabilities to meet the threats we face.” President Bush stressed that “defending the American people against these new threats is my highest priority as Commander and Chief, and the highest priority of my Administration.”

Obama Administration policy, as reflected in the 2010 DOD Ballistic Missile Defense Review, also emphasized the priority of defending the U.S. homeland in the context of a layered defense. Beyond this rhetorical policy statement, the Administration’s actions have departed dramatically from those of its predecessor:

- The Ground-based Midcourse Defense (GMD) system was cut back significantly in President Obama budget submissions, with funding declining substantially in each successive proposed budget. The number of Ground-based Interceptors (GBIs) deployed at Fort Greely and Vandenberg AFB was reduced from the planned 44 (with an option of going to 100 or more) to 30. In addition to slashing the annual Missile Defense Agency (MDA) top line budget from about \$10 billion to about \$7.5 today, substantial funding was shifted from programs to protect U.S. territory and population centers to programs to defend against short- and medium-range missiles. In total, compared to the requests of the Bush Administration, the Obama Administration has reduced funding for missile defense programs over the past six years by approximately \$10 billion. Of that total, funding for capabilities to protect the United States – its stated first priority – has been slashed by about five billion dollars.

- Missile defense programs intended to keep pace with the threat from long range missiles were cancelled. This included all work on fast, including boost phase, interceptors such as the Kinetic Energy Interceptor (KEI), as well as the Airborne Laser that had intercepted and destroyed both solid and liquid missiles in flight. The Multiple Kill Vehicle (MKV), designed to provide a counter to the anticipated future deployment of countermeasures by adversaries, was ended without replacement. Even critical sensors were mothballed, including initially the sea-based X-band radar that provided the most effective capability for precision tracking. Collectively, these funding cuts and program cancellations sent a clear message to industry: the priority of homeland missile defense has been downgraded with the result that industry reduced substantially its own investments in related research and development.

- In stark contrast to his predecessor, President Obama and his top officials have repeatedly demonstrated a willingness to cut back on missile defenses in seeking other, presumably higher priority objectives such as Russian agreement to negotiate offensive arms control reductions.

This was evident in the 2009 cancellation of the original third site in Poland and the Czech Republic which would have increased by 10 the number of interceptors deployed to protect the United States from a future long range Iranian missile threat. It was also seen in the cancellation of Phase Four of the European Phased Adaptive Approach – the only phase that would have provided a capability to contribute directly to the defense of the U.S. homeland. Secretary Kerry carried the same message to Beijing last year when he reportedly offered to cut back on U.S. missile defense efforts in Asia for greater Chinese pressure on North Korea. Finally, and most telling, was President Obama’s 2012 hot-mike comment to then President Medvedev that, particularly for missile defenses, “after my election, I have more flexibility.”

Today’s Security Environment

While a welcome recognition of the need to strengthen U.S. defenses, last year’s decision to deploy 14 additional interceptors in Alaska and last month’s successful GBI intercept test do not alter the downward path of U.S. strategic defense programs. The result of deep budget cuts, cancelled programs and a clear shift in policy priorities is an inadequate and obsolescing missile defense capability to protect the U.S. homeland against a growing threat.

Members of this committee have access to highly classified assessments of the missile threats facing the United States. To provide context for the recommendations below, I would offer the following:

North Korea: Pyongyang under Kim Jong Un has continued the buildup of nuclear capabilities and ballistic missiles of all ranges. Last year, the North threatened preemptive nuclear attack on the United States and, in defiance of multiple UN Security Council resolutions, conducted its third nuclear test and numerous missile launches. Despite the hopes of many North Korean watchers, this provocative behavior has become even more frequent under the Dear Successor. Last week, Pyongyang conducted additional missile tests and reaffirmed its self-declared status as a nuclear weapon state with a growing arsenal derived from both plutonium reprocessing and uranium enrichment. The North’s proliferation activities also continue, including ballistic missile support to Iran. These activities, as seen in Syria, extend to the nuclear field.

Iran: Teheran possesses the largest ballistic missile force in the Gulf/Middle East and has rejected any limits on its modernization and expansion. Iran has successfully launched space satellites on multi-stage vehicles which has demonstrated the ability to execute the critical technologies associated with intercontinental range missiles. The 2014 Annual Report on Military Power of Iran notes that “Iran continues to develop technological capabilities that could be applicable to nuclear weapons and long-range missiles which could be adapted to deliver nuclear weapons, should Iran’s leadership decide to do so.” And intelligence officials have reaffirmed the assessment that Iran, with significant foreign assistance, could flight test an ICBM-class missile by 2015. Teheran has continued to stonewall IAEA inspectors on evidence of weaponization, reportedly efforts to design a nuclear payload for ballistic missile delivery.

Russia: Moscow has embarked on an aggressive, revisionist quest to re-establish Russia as a great power. This is reflected in the annexation of Crimea and its continuing pattern of support to the separatists in eastern Ukraine. It is also seen in the strengthening of its conventional forces following their poor performance in the 2008 invasion of Georgia and in the ongoing strategic modernization of its nuclear TRIAD and missile defense capabilities. Russia has increased reliance on nuclear weapons in its defense and deterrence planning. It is determined to expand its ICBM and SLBM nuclear forces on a scope and scale reminiscent of the Soviet Union. Unlike the U.S. nuclear force posture, which is limited by a self-imposed policy of “no new nuclear capabilities,” Russia is developing and deploying new missiles and warheads, along with new submarines and a new strategic bomber. Russian officials have identified its nuclear build up as the number one military priority.

Russian open sources have indicated that Moscow is also increasing funding for missile defenses, reportedly intending to spend more on these capabilities by 2020 than the United States. The goal, according to information provided to this Committee by the Joint Staff, is to “ensure defense of critical political and military targets in the Moscow area from a ballistic missile attack, either by the United States or any other nation with nuclear or conventional ballistic or cruise missile capabilities.” This is in contrast to U.S. statements that U.S. missile defenses are neither intended for, nor capable of, defending against Russian offensive forces. But it is consistent with President Putin’s public declarations that the primary threat to Russia comes from the United States.

China: The U.S.-China relationship is of vital importance to both countries. The complex interdependencies that exist make it essential that Washington and Beijing make every effort to manage and improve the relationship. Yet, the strategic uncertainties are enormous and the future of the relationship highly uncertain. The U.S. pivot or re-balance to Asia has been interpreted by Chinese leaders as a policy of containment, just as China’s expansive territorial claims and rapid military modernization, including of its nuclear forces and missile defenses, have been seen in the west as evidence of China’s growing and aggressive ambitions.

Two additional principles should inform any consideration of the future missile threat. First, while the deployment of ICBM-class missiles may take place in a longer time frame than assessed, the U.S. cannot wait until the confirmed appearance of the threat missiles before it deploys defenses. It is imperative to be ahead of the threat. Second, experience has demonstrated the enduring fact of strategic surprise with regard to both the capabilities and intentions of adversaries.

Need for a Policy Review

There is an urgent need for a fundamental review of U.S. missile defense policy and capabilities. This is a consequence of the downgrading and dismantlement of U.S. homeland defense programs in the past six years, the increasingly dangerous security environment described above, and the failure of Obama Administration policies to deal with these challenges.

Few would disagree that U.S.-North Korea policy has failed, going back three administrations. Denuclearization of the Peninsula, while still the stated goal, is increasingly unachievable as the North expands its nuclear and missile capabilities. China, while undoubtedly frustrated with its partner in Pyongyang, shows no sign of abandoning its longtime ally, or even threatening to withhold its assistance that is the lifeline of the regime.

U.S.-Iran policy, despite the hope of a “comprehensive agreement” on the nuclear program, is also best characterized by its failures. The objectives of suspending all of Iran’s enrichment activities and denying Iran a “nuclear weapons capability” have been replaced by the goal of extending Iran’s time for breakout from two to six or twelve months.

U.S.-Russia relations are at their lowest level since the Cold War. Both the Bush and Obama Administrations assumed a mostly benign Russia -- an assumption that has turned out to be false. Concessions by the Obama Administration, such as the abrupt cancellation of the original third site, did achieve the goal of getting Moscow to the negotiating table but did not lead to real reductions in Russian forces as New START requires only the U.S. to reduce warheads and launchers, while Russia is permitted to build up to these levels. More recent missile defense concessions, such as the cancellation of the SM3 IIB program that was to provide some European-based capability against Iranian long-range missiles, have been met by Moscow with demands for more concessions. Further U.S. unilateral cuts to its theater nuclear forces have not enticed Moscow to accept limits on this class of weapons, likely because it now enjoys an estimated 8 or 10 to one advantage.

There does not appear to be a comprehensive U.S. strategy to manage the relationship with China or to shape outcomes in which China and the United States have intersecting or competing interests. But it is apparent that U.S. restraint in offensive nuclear arms and missile defenses is not being practiced by Beijing. In January 2007, China conducted an ASAT test with a ground-launched ballistic missile. More recently, the PLA conducted a military exercise that highlighted nuclear attacks against U.S. cities. While U.S. officials have declared that U.S. missile defenses are not designed to counter China’s offensive missiles, Beijing has failed to reciprocate.

The consequence of these policy failures is likely a more proliferated and more dangerous world with greater uncertainties in key relationships and increased prospect for miscalculation on all sides. The implications for defending the U.S. homeland against missile attacks are significant.

Conclusions and the Path Forward

A number of conclusions concerning U.S. missile defense policy can be drawn from the above.

1. We must defend the U.S. homeland against ballistic missile threats from countries such as North Korea and Iran. While such threats are growing, our ability to defend U.S. territory against missile attack is atrophying and obsolescing. Through major budget cuts, multiple

program cancellations, and repeated concessions and policy failures, the U.S. capability to protect the United States has been undermined. The priority of homeland missile defense must be restored to keep pace with the quantitative and qualitative nature of that threat.

2. The GMD system, at the center of the homeland defense architecture, must evolve to meet the dynamic threat. Current problems with the ground-based interceptor, in particular the kill vehicle, must be fixed. Last month's successful test marked progress in this area but improved reliability of the system must be demonstrated through active testing and spiral improvements. The number of interceptors must be increased beyond the 14 announced last March. Cancellation of the SM3 IIB program, which was intended to be deployed in Europe to counter Iranian long-range missile threats to the U.S. homeland, makes additional GBI deployments at a third site in the United States essential. Even before the cancellation of the SM3 IIB program, the National Research Council recommended a third site in the continental United States.
3. The GMD system must also evolve over time with improved sensors, including in space, and with capabilities that can defeat countermeasures and provide greater cost efficiency for intercepting larger numbers of ballistic missiles. To start, the MDA should relook, and perhaps re-start, fast interceptor and MKV programs taking into account new technologies. At-sea capabilities that can contribute to the defense of the U.S. homeland should be supported recognizing the mobility and cost advantages offered by AEGIS-capable ships.
4. In addition to defending against limited missile threats from North Korea and Iran, the United States must reassess the role of missile defenses with Russia and China. Past calls for fielding a capability against accidental or unauthorized launches, such as that proposed earlier by Senator Nunn, are even more relevant today given the state of U.S. relations with Russia and China. Beyond protection against accidental and unauthorized launch, the United States should examine how defenses might contribute to deterrence of Russia and China. This is not a new concept but one that has been incorporated in presidential guidance of a number of past democrat and republican administrations. The Carter Administration envisioned a role for strategic defenses in defeating a Soviet nuclear warfighting strategy and President Reagan's SDI program defined requirements for missile defenses with the goal of complicating Soviet war planning, thereby strengthening deterrence. While today's security setting is much different from that of the Cold War, Russia's increased reliance on its nuclear forces and the greater prospect for miscalculation argue for a review of past strategic thinking.
5. We cannot defend against larger-scale missile attacks from Russia, or potentially China, in the same manner we are defending against rogue state threats. We likely cannot build or afford enough terrestrial based interceptors to counter such threats. What we can do is explore how non-kinetic approaches, such as directed energy, can be integrated into our

BMD architecture. We can also explore the full potential of space, for the deployment of sensors and interceptors, to meet future missile defense requirements. With advances in key technologies, including tremendous progress in computing and lightweight materials, space-based interceptors may provide, according to a 2010-2011 operational assessment by the Institute for Defense Analysis, “a unique capability when used as a boost-phase system...an effective defense layer against medium and long range threat missiles equipped with decoys and other countermeasures.” While the U.S. has made the policy choice of not pursuing space-based interceptor options following the cancellation of the GPALS system by the incoming Clinton Administration, Russia and China have not matched U.S. restraint. While both have called for outlawing the “militarization of space,” these calls are aimed at foreclosing U.S. missile defense options, not their own. The U.S. policy review should examine the strategic implications of deploying defenses in space and the strategic implications of not doing so in the projected security environment.

6. The way forward described above for homeland missile defense will require leadership at the policy and agency level. It will also require additional top line funding in a time of budget austerity. The amount likely will be far less than the cuts imposed over the past six years. Funding could also come from shifting resources from theater programs back to strategic defenses. Here, it is necessary to restore the balance between investments in theater capabilities and homeland defenses. These efforts should be complementary, working together in a layered defense architecture, rather than viewed as competitors for scarce dollars. The current balance, with about four out of every five dollars going to theater programs, is out of sync.

Robert Joseph is Senior Scholar at the National Institute for Public Policy. From 2005 through 2007, he was Under Secretary of State for Arms Control and International Security and Special Envoy for Nonproliferation. From January 2001 through November 2004, Ambassador Joseph served in the National Security Council as Special Assistant to the President and Senior Director for Proliferation Strategy, Counterproliferation and Homeland Defense. Earlier, he was Principal Deputy Secretary of Defense for International Security Policy and Deputy Assistant Secretary of Defense for Nuclear Forces and Arms Control. Dr. Joseph was also Professor of Defense Studies and the founder and Director of the Center for Counterproliferation Research at the National Defense University. He holds graduate degrees from the University of Chicago (MA) and Columbia University (PhD).

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Robert Joseph

Capacity in which appearing: (check one)

☒ Individual

☐ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented:

FISCAL YEAR 2014

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
NA			

FISCAL YEAR 2013

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

FISCAL YEAR 2012

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2014): NONE ;
 Fiscal year 2013: NONE ;
 Fiscal year 2012: NONE .

Federal agencies with which federal contracts are held:

Current fiscal year (2014): _____ ;
 Fiscal year 2013: _____ ;
 Fiscal year 2012: _____ .

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2014): _____ ;
 Fiscal year 2013: _____ ;
 Fiscal year 2012: _____ .

Aggregate dollar value of federal contracts held:

Current fiscal year (2014): _____ ;
 Fiscal year 2013: _____ ;
 Fiscal year 2012: _____ .

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2014): NONE;
 Fiscal year 2013: NONE;
 Fiscal year 2012: NONE;

Federal agencies with which federal grants are held:

Current fiscal year (2014): _____;
 Fiscal year 2013: _____;
 Fiscal year 2012: _____;

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2014): _____;
 Fiscal year 2013: _____;
 Fiscal year 2012: _____;

Aggregate dollar value of federal grants held:

Current fiscal year (2014): _____;
 Fiscal year 2013: _____;
 Fiscal year 2012: _____;

Prepared Statement before the:

House Committee on Armed Services,
Subcommittee on Strategic Forces

Adapting U.S. Missile Defense for Future Threats: Russia, China and Modernizing the NMD
Act.

Wednesday, July 23, 2014

2:00 p.m.

2212 Rayburn House Office Building

Philip E. Coyle, III
Senior Fellow

Center for Arms Control and Non-Proliferation

Chairman Rogers, Ranking Member Cooper, and Distinguished Members of the Strategic Forces Subcommittee, I very much appreciate your invitation to appear before you today to support your study of Adapting U.S. Missile Defense for Future Threats.

I am a Senior Fellow at the non-profit Center for Arms Control and Non-Proliferation, a Washington, D.C.-based national security study center. To help ensure our independence, the Center does not accept any funding from the Federal government, nor from any defense contractors.

I have considered it an honor to serve four U.S. Presidents. Most recently I served as the Associate Director for National Security and International Affairs in President Obama's White House Office of Science and Technology Policy.

In 2005 I was appointed by President George W. Bush to the nine-member Base Realignment and Closure Commission (BRAC).

For seven years during the Clinton administration, I served in the Pentagon as Assistant Secretary of Defense and Director, Operational Test and Evaluation. In this capacity, I was principal advisor to the Secretary of Defense and the Undersecretary of Defense for Acquisition, Technology and Logistics on test and evaluation in the DOD. I had OSD OT&E responsibility for over 200 major defense acquisition systems.

And during the Carter administration, I served as Principal Deputy Assistant Secretary for Defense Programs in the Department of Energy with responsibility for the nuclear weapons research, development, production and testing programs of the Department.

From 1959 to 1979, and again from 1981 to 1993, I worked at the Lawrence Livermore National Laboratory. Over those 33 years I worked on a variety of high technology programs, and retired from the Laboratory in 1993 as Laboratory Associate Director and deputy to the Director.

Opening Statement

In my opening remarks I want to describe why it would be unwise for the United States to pursue a missile defense against Russia and China. Here I'm referring to the strategic Intercontinental Ballistic Missile forces of those two countries. There are basically three important reasons. First, U.S. missile defenses, especially U.S. defenses against ICBMs can at best deal only with limited attacks, and even that goal remains a major technological challenge. All missile defense systems can be overwhelmed. All missile defense systems have limitations and those limitations can be exploited by the offense. By definition, it is only if the attack is limited that the defense can have a hope of not being overwhelmed. If the enemy also employs countermeasures such as stealth, radar jamming, decoys, and chaff, as Russia and China do, U.S. defenses are even more vulnerable. The technology simply is not in hand to deal with an all-out Russian or Chinese ICBM attack. The U.S. has experimented with many different ideas for decades hoping to find a way. A few examples are the nuclear-bomb pumped x-ray laser, "Brilliant Pebbles" (a constellation of perhaps as many as 1,000 orbiting interceptors), and the Safeguard ABM system deployed in North Dakota that the U.S. Congress canceled because Russian ICBMs could overwhelm it. These and other systems were canceled as unworkable, ineffective, or too costly as when Secretary of Defense Robert Gates ended the Airborne Laser program.

The second reason is cost. In 2002 the Congressional Budget Office estimated the cost of several different DOD missile defense programs, assuming they all would continue through 2025 as parts of a layered missile defense system.¹ The CBO estimated that a system of ground-based interceptors, analogous to the current Ground-based Midcourse Defense (GMD) system would cost between \$26 and \$74 billion. A system of interceptors launched from ships, similar to the Navy Aegis system would cost \$50 to \$64 billion, and a Space-Based Laser system would cost \$82 to \$100 billion. Inflated to today's dollars, the 2002 CBO estimate for the Space-Based Laser could be as high as \$132 billion. CBO cautioned against adding all these numbers together because the systems might share some common elements such as early-warning satellite systems, and CBO did not estimate the cost of a full, layered system. Of course the GMD system and the Navy Aegis system are ongoing today. The Space-Based Laser program office was shut down in 2002 and its research transferred to the MDA Laser Technologies Directorate. All of these systems were for a "limited" defense. CBO didn't estimate the costs of a massive system designed to stop all of Russia's and China's ICBMs, as there was no such program in 2002.

The third reason is strategic stability. If the U.S. had missile defenses that could handle the ICBM arsenals of Russia and China, a kind of Maginot Line against ICBMs, and if - unlike the Maginot Line - those defenses could not be defeated, it would be strategically destabilizing. Russia and China would need to respond with all manner of new forces, perhaps even more attacking missiles, perhaps extensive deployment of cruise missiles against which our ballistic missile defense systems are useless, or perhaps deployment of large numbers of troops in regions that are currently stable and peaceful. Then our missile defenses would have upset the strategic balance and provoked new military responses from Russia and China.

Of course, under such conditions, Russia would certainly not agree to further reductions in their strategic nuclear arsenals, as the U.S. and Russia have been doing under START, the Strategic Offensive Reductions Treaty, and New START. Russia might consider aggressive new U.S.

missile defense programs as justification to withdraw from New START and other agreements that have significantly reduced the threat from nuclear weapons.

In his May 28 talk at the Atlantic Council, Vice Chairman of the Joint Chiefs of Staff Admiral James A. Winnefeld, Jr. summarized why limited defenses are in the best U.S. interest.² “As you know,” he said, “we’ve told Russia and the world that we will not rely on missile defense for strategic deterrence of Russia because it would simply be too hard and too expensive and too strategically destabilizing to even try.” Later the Admiral reiterated this point, saying, “And let me be clear once again: it’s not the policy of the United States to build a ballistic missile defense system to counter Russian ballistic missiles.”

The National Missile Defense Act of 1999

The discussion above explains why the word “limited” is necessary in the National Missile Defense Act of 1999. As this Committee well knows that Act reads, “It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) with funding subject to the annual authorization of appropriations and the annual appropriation of funds for National Missile Defense.” In the Clinton years the emphasis was on stopping an accidental or unauthorized launch from Russia or China, and was not intended to effect global strategic stability with Russia and China. In the Bush years the emphasis shifted to North Korea and Iran, and to the threat those countries pose to their neighbors in the region. But we were still talking about a limited attack. One or two missiles.

President Obama continued the policies of his predecessors, sustaining the Ground-based Midcourse Defense System (GMD) deployed in Alaska and California, still focusing on North Korea and Iran, while also to have the capability of stopping an accidental or unauthorized launch from Russia or China. In addition, President Obama announced September 17, 2009, the Phased Adaptive Approach in Europe that was focused first on near term threats to Europe from the Middle East, shorter-range threats first, longer range threats later. At first, the shorter-range of these missiles would be slower-moving missiles capable of reaching only the southernmost part of Europe, certainly not ICBMs which Iran didn’t have then or now. The EPAA consists of interceptors, such as THAAD and SM-3, with ranges too short for ICBMs and is not aimed at Russia or China.

For the EPAA, President Obama also set a goal of hopefully being able to handle “raids” that is, more than one or two incoming ballistic missiles, but say 20 incoming missiles at once. That capability has not been developed, let alone demonstrated. And the EPAA is not intended to, nor capable of defending against Russian ICBMs in any number.

Five important questions

In the balance of this testimony I address each of the five important questions the Committee posed for today’s hearing, and take each one in turn.

1) How do you see this threat emerging? What will it look like in 2020? 2025?

In 2020 or 2025, how we will see the threat from Russia and China will depend on our relations with those countries. At the end of the Cold War, it appeared to many observers that the prospect of all-out nuclear war had faded; after all, the specter of possible nuclear conflict had loomed for many years between the Soviet Union and the United States or, less likely, China and the United States, and all sides had worked successfully to avoid it. With Russia and China nuclear deterrence still works, and is a more dependable factor in sustaining the peace than missile defenses. In 2020 or 2025 I expect the strategic situation will be much the same as it is today unless something arises to upset today's strategic stability, such as dramatic changes to U.S. missile defense policy.

The conflicts that have developed over the Russian seizure of Crimea, Russia's interference in Eastern Ukraine, the situation in Syria and other places have undermined relations between the United States and Russia, but do not make a nuclear confrontation any more likely than since the end of the Cold War.

However, five or ten years from now, the threat from terrorism may still be growing. As this Committee well knows, there is much unrest in the world today. We need only to look at the situation in Syria and Iraq to imagine further turmoil in that region. If terrorist groups acquire more of the usual rockets and missiles, U.S. missile defenses may need to focus on short-range conventional rocket threats, not on ICBMs from Russia or China.

2) Does a policy of limited missile defenses against limited threats continue to make sense in today's threat environment?

The current articulation of the "threat" does not meet the test of common sense. From time to time the Missile Defense Agency (MDA) produces a map showing the countries it considers a threat because those countries possess short or medium range missiles. The list has included Libya, Egypt, Iran, Yemen, Pakistan, India, Belarus, Ukraine, Syria, Turkmenistan, Kazakhstan, Vietnam, and North Korea. While some of these countries, like Belarus, Ukraine, Turkmenistan and Kazakhstan possess Scud missiles, these countries are hardly a threat to the United States or Europe. Pakistan and India may be a threat to each other, but not to Europe or the United States. Libya, Egypt, Syria, and Yemen have experienced internal political turmoil, but again they are not a missile threat to Europe or the United States in the near term. To the extent that MDA buys into the notion that any country with short or medium range missiles is a threat to Europe and the United States, MDA clouds its thinking about the nature of the missile defense systems we need and where we need them.

While the North Korean and Iranian missile programs are certainly of great concern, it can be asked whether either country would be so suicidal as to attack the United States, whether Iran would be so suicidal as to attack Europe, or North Korea so suicidal as to attack Japan. In each case, such an attack would justify massive retaliation by the U.S. military and others. Iran and North Korea have done some reckless things, but they are not so reckless as to bring about their own destruction and an end to their regimes.

I am not suggesting that North Korea or Iran is NOT a threat, only that things can change and that U.S. policies need to be responsive to those changes. Recall the 1998 Rumsfeld Commission report that said North Korea and Iran would have nuclear-armed ICBMs that “would be able to inflict major destruction on the U.S. within about five years of a decision to acquire such a capability.”³ That was 16 years ago.

A new look at the threat is warranted, and whether the U.S. needs to consider every nation that possesses even short-range missiles a threat to America. The proliferation of missiles of all sizes around the world is a growing problem, but expecting U.S. missile defenses to deal with all those missiles everywhere is unrealistic.

The proliferation of offensive missiles should be fought and is being fought in many ways. However, the idea that say, Russia or China will give up or relax their offensive capabilities because of U.S. missile defenses is not supported by the facts. Those countries use U.S. missile defenses as justification for building more and more capable offensive missiles; and from the results of U.S. missile defense tests they can see that the easiest way to defeat those defenses is by building more and more offensive missiles to overwhelm U.S. defenses.

There is now a worldwide arms race in missile defense. Russia, China, India, Pakistan, South Korea, Japan, and Israel all claim to have effective missile defenses, and these claims push military planning by their adversaries in unwanted directions as they in turn build more and more offensive systems and/or new decoys and countermeasures to defeat those defenses. At the same time, there are serious questions whether any of these countries have an effective defense against long-range missiles.

3) Does this “limited” policy impact the programs we develop and deploy?

Today, America has missile defense systems deployed all around the world. This includes the Ground-based Midcourse Defense (GMD) system in Alaska and California, the Phased Adaptive Approach in Europe (EPAA), and regional systems in the Middle East to protect Iran’s neighbors from Iran, and in Asia to protect North Korea’s neighbors from North Korea. At the Atlantic Council Adm. Winnefeld explained that “Going forward, we will continue to emphasize the importance of developing regional ballistic missile defense systems.” I expect that emphasis on regional missile defense systems to continue for the next five or ten years, and note that these regional systems - THAAD, Aegis SM-3, and PATRIOT – now have a much better track record in successful flight intercept tests than does the Ground-based Midcourse Defense (GMD) system. However, as Adm. Winnefeld noted, the deployment of regional U.S. missile defense systems “is a very politically sensitive topic for several of our regional allies.” Accordingly, deployment of regional U.S. missile defense systems is being undertaken on a case-by-case basis with the support of our friends and allies who may be affected by such decisions.

4) Does this policy need to evolve or change? Why? If so, how?

The missile defense systems the U.S. deploys will be first and foremost a function of the threat, which might go up or down depending on geo-political developments. If, for example, negotiations with Iran to reduce the scope of its nuclear program to clearly peaceful civil purposes are successful, then – depending on the details of what is agreed - the emphasis on the

European Phased Adaptive Approach (EPAA) could be reduced. Similarly, the argument for an East Coast missile defense site could be weakened.

If on the other hand, North Korea becomes more aggressive towards its neighbors, increased U.S. missile defenses in that region may be part of the response.

If tensions break out in new parts of the world, our government will need to respond to those circumstances as well.

Here it is also worth noting that there have been significant reductions in Scud inventories. These have come about for a variety of reasons but the net effect has been a reduction in SRBM missiles. International Traffic in Arms Regulations and Missile Technology Control Regime restrictions also have made an important difference, as they are observed by reputable vendors and nations alike; and so today, with the exception of Russia, China, and the U.S., there is no other demonstrated, current ICBM capability, and SRBM/MRBM numbers are not increasing.⁴

5) How does the U.S. deal with the Russian Federation and the People's Republic of China, in particular, which are both developing missile defenses and nuclear weapons targeting the U.S.? What programs and policies need to be in place to deal with these potential threats and adversaries?

All missile defense systems can be overwhelmed. Russia and China could overwhelm the missile defense systems we have today even if they worked as intended. That's why Vice Chairman of the Joint Chiefs of Staff Admiral James A. Winnefeld, Jr. made a special point in saying in his May 28 talk at the Atlantic Council that U.S. missile defenses are not aimed at Russia. To quote the Admiral, he said, "As you know, we've told Russia and the world that we will not rely on missile defense for strategic deterrence of Russia because it would simply be too hard and too expensive and too strategically destabilizing to even try." Later the Admiral reiterated this point, "And let me be clear once again: it's not the policy of the United States to build a ballistic missile defense system to counter Russian ballistic missiles."

Similarly the U.S. can overwhelm the missile defenses of Russia and China. Both countries make announcements about their missile defenses but they know, as we do, how difficult missile defense is, and that their missile defenses can be overwhelmed also.

It is very difficult for Americans not to want to rely on technology. Technology has produced some amazing advances, such as personal computers and the Internet that have changed our lives at home and at work. But too often America relies on technology as the last, best hope to save us from our problems. We see this in defense, in health, and in the environment. By appealing to a single-point technological fix, we hope we can avoid dealing with a long-term problem. In defense, as in other fields, we use our hope for technological relief as an excuse to avoid accommodating or dealing with our adversaries in the global environment in which we all exist.

Moving Forward

Going forward, here are some important considerations:

The existing U.S. missile defense systems have many important needs. These include the Ground-based Midcourse Defense (GMD) system in Alaska and California, the Phased Adaptive Approach in Europe (EPAA), and regional systems in the Middle East and Asia. Unfortunately these systems lack workable architectures, and many of the required elements either don't work or are missing. Notwithstanding the recent test success, GMD performance in tests has gotten worse with time, when it ought to be getting better. The latest GMD test did not involve an ICBM-range target and the MDA has never tried to defend against an ICBM-range target in a missile defense flight intercept test. I would hope that both sides of the aisle would work together to address these needs.

America's missile defenses face an enduring set of issues, especially target discrimination in the face of even limited attacks designed to overwhelm the defenses, such as stage separation debris, chaff, decoys, and stealth. Dealing with target discrimination while also replacing, upgrading, or adding to the many needed elements of U.S. missile defenses will present new budget challenges. Adding to this burden, America's allies overseas expect a substantial commitment in U.S. defense dollars. They see the United States as well able to afford missile defenses, and in good measure hold the U.S. responsible for the defense of its friends and allies. In fact, the capability to defend America's friends and allies is a declared objective for U.S. missile defense systems. This work will produce better results than trying to build an impregnable defense against Russian and Chinese ICBMs.

The biggest challenge facing both the GMD and EPAA systems is target discrimination; that is, the ability of the interceptors and the sensors that guide them being able to tell the difference between debris from stage separations, and/or chaff and decoys made to resemble the target reentry vehicle. The National Academy of Sciences/National Research Council (NAS/NRC) commented on threat discrimination in a April 30, 2012 letter to Congress before the full report "Making Sense of Ballistic Missile Defense" was released, saying, "There is no effective ballistic missile area defense that does not require dealing with midcourse discrimination (or shooting at all potential threat objects!)."⁵ The NAS/NRC comment about shooting at all potential threat objects related to the limited number of interceptors that could quickly be exhausted by the defense trying to shoot down everything whether threatening or not. "Moreover," the NAS/NRC panel explained, "early" intercept, even if achievable from a forward-based interceptor system, cannot obviate the need for midcourse discrimination, because countermeasures and payload deployment can be achieved very rapidly (as historical experience shows) after threat booster burnout."

In a March 9, 2013 hearing before the Senate Armed Services Committee, J. Michael Gilmore, the DOD Director, Operational Test and Evaluation, put it plainly, "If we can't discriminate what the real threatening objects are, it doesn't matter how many ground-based interceptors we have. We won't be able to hit what needs to be hit."⁶

The Defense Science Board was the first official DOD entity to break the ice on the need for target discrimination, even though independent scientists have been pointing out the need for decades. As the DSB Task Force explained in its September 2011 report, "Science and Technology Issues of Early Intercept Ballistic Missile Defense Feasibility,"⁷ "These analyses ... did not account for interceptors launched at non-warhead bodies." "If the defense should find

itself in a situation where it is shooting at missile junk or decoys, the impact on the regional interceptor inventory would be dramatic and devastating.” The DSB Task Force was pointing out that if the defense must shoot at non-threatening objects, the supply of interceptors would soon be exhausted.

For this reason, both the DSB and the NAS/NRC panel discussed the doctrine of “Shoot-Look-Shoot.” The current doctrine might be called, “Shoot-Shoot-Shoot;” that is, just keep shooting hoping that the defense will hit all the incoming enemy missiles in the midst of confusing chaff or decoys. Just to overcome the poor test record of the GMD system could require firing five, six, or seven interceptors at each incoming missile, quickly exhausting the available interceptors.⁸ Unfortunately, while “Shoot-Look-Shoot” is an appealing concept, it is still an impractical dream. Shoot-Look-Shoot requires “Looking”, that is kill assessment, knowing whether or not a target has been hit and killed. That kill assessment must be done between each attempt to bring down an enemy missile, and it must be done rapidly. This would require sensors, discrimination, and communication systems we don’t have, or yet know how to build.

The Ground-Based Midcourse (GMD) system with interceptors in silos based at Fort Greely, Alaska, and at Vandenberg AFB in California has never had a complete architecture. For example, the Sea-Based X-Band Radar intended to be deployed at Adak, Alaska, is often put in for repairs and maintenance in Hawaii or Seattle, and has proven to be so unreliable that the MDA considered mothballing the system to reduce costs. Also, the satellite systems required for early detection, tracking, and characterization of enemy targets, and to provide that information to the GMD system, have never been completed.

Much work is needed on the GMD system. In particular, the Pentagon has yet to decide whether to take the advice of the 2012 National Academy of Sciences/National Research Council study and develop a new bigger and more capable Exo-atmospheric Kill Vehicle and a new faster two-stage booster for the GMD interceptors.

The Missile Defense Agency has announced that it will make improvement to the existing kill vehicle; but as Defense Undersecretary for Acquisition, Technology, and Logistics, Frank Kendall put it so well, “Just patching the things we’ve got is probably not going to be adequate. So we’re going to have to go beyond that.”⁹

In the wake of the successful June 22 flight intercept test, the Agency should build on that accomplishment to develop the next generation kill vehicle as recommended by the National Research Council. But the United States should not be blinded by one good test every five and one-half years to deploy more flawed interceptors. In pursuing a redesigned kill vehicle, it only makes sense to avoid past mistakes by taking the time to get it right.

¹ “Estimated Costs and Technical Characteristics of Selected National Missile Defense Systems,” The Congressional Budget Office, January 31, 2002. Available at <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/32xx/doc3281/nmd.pdf>

² Transcript: Admiral James A. Winnefeld, Jr. at Global Missile Defense Conference, The Atlantic Council. Available at <http://www.atlanticcouncil.org/news/transcripts/transcript-admiral-james-a-winnefeld-jr-at-global-missile-defense-conference>

³ The Report of the Commission to Assess the Ballistic Missile Threat to the United States, July 15, 1998. Available at <http://fas.org/irp/threat/bm-threat.htm>

⁴ “Characterizing the North Korean Nuclear Missile Threat”, RAND TR-1268, Marcus Schiller, ISBN: 978-0-8330-7621-2, available at http://www.rand.org/pubs/technical_reports/TR1268.html

⁵ Letter to Representatives Michael R. Turner and Loretta Sanchez, House Armed Services Committee, from L. David Montague and Walter B. Slocombe, Committee on an Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives, April 30, 2012.

Committee on an Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives, National Research Council, “Making Sense of Ballistic Missile Defense,” National Academy of Sciences, 2012, http://www.nap.edu/catalog.php?record_id=13189.

⁶ Hearing, Ballistic Missile Defense Policies and Programs, Senate Armed Services Committee, Subcommittee on Strategic Forces, May 9, 2013. Available at <http://www.armed-services.senate.gov/hearings/oversight-ballistic-missile-defense-policies-and-programs>

⁷ Defense Science Board (DSB), “Task Force Report on Science and Technology Issues of Early Intercept Ballistic Missile Defense Feasibility,” September 2011, <http://handle.dtic.mil/100.2/ADA552472>.

⁸ See Edward Aldridge Jr., Statement before the House Armed Services Committee, March 20, 2003, http://www.archive.org/stream/hearingsonnation2004unit/hearingsonnation2004unit_djvu.txt; Lt. Gen. Henry A. Obering, Statement before the Subcommittee on National Security and Foreign Affairs, House Committee on Oversight and Government Reform, April 30, 2008, <http://www.gpo.gov/fdsys/pkg/CHRG-110hhrg48813/html/CHRG-110hhrg48813.htm>.

⁹ “Pentagon plans work on new missile defense interceptor,” Andrea Shalal, *Reuters*

Philip E. Coyle

Philip E. Coyle is a recognized expert on U.S. and worldwide military research, development and testing, on operational military matters, and on national security policy and defense spending. He is currently a senior science fellow at the Center for Arms Control and Non-Proliferation.

In 2010 and 2011 Mr. Coyle served as the Associate Director for National Security and International Affairs (NSIA) in the White House Office of Science and Technology Policy (OSTP). In this position he had primary responsibility for supporting President Obama and the Director of OSTP in developing and executing a wide variety of science and technology initiatives. This included supporting the Universities and Laboratories that comprise the R&D capabilities of the Department of Defense, the Department of Energy and other agencies and their research programs in fields such as homeland and national security research, development, testing and acquisition; nuclear, chemical, and biological defense; counterproliferation, cybersecurity; international science and technology cooperation; and nuclear security.

From 2001 to 2010, Mr. Coyle served as a Senior Advisor to the President of the World Security Institute and to its Center for Defense Information, a Washington D.C.-based national security study center.

In 2005 and 2006, Mr. Coyle served on the nine-member Defense Base Realignment and Closure Commission (BRAC), appointed by President George W. Bush and nominated by Speaker of the House Nancy Pelosi. Prior to this appointment, Mr. Coyle served on Governor of California Arnold Schwarzenegger's Base Support and Retention Council.

From September 1994, through January 2001, Mr. Coyle was Assistant Secretary of Defense and Director, Operational Test and Evaluation, in the Department of Defense, and is the longest serving Director in the 27 year history of the Office. In this capacity, he was the principal advisor to the Secretary of Defense on test and evaluation in the Department of Defense. While he served in this position, a 2001 New York Times profile by William Broad referred to him as "the technical conscience of the Pentagon." Mr. Coyle has 40 years experience in national security research, development, and testing matters.

During the Carter Administration, Mr. Coyle served as Principal Deputy Assistant Secretary for Defense Programs in the Department of Energy (DOE). In this capacity he had oversight responsibility for the nuclear weapons research, development, production and testing programs of the Department, as well as the DOE programs in arms control, non-proliferation, and nuclear safeguards and security.

From 1959 to 1979, and again from 1981 to 1993, Mr. Coyle worked at the Lawrence Livermore National Laboratory (LLNL) in Livermore, California. Over those 33 years Mr. Coyle worked on a variety of nuclear weapons programs and other high technology programs. Mr. Coyle also served as Deputy Associate Director of the Laser Program at LLNL. In 1993, Mr. Coyle retired from the Laboratory as Laboratory Associate Director and deputy to the Director. In recognition of his years of service to the Laboratory and to the University of California, the University named Mr. Coyle Laboratory Associate Director Emeritus.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Philip E. Coyle, III

Capacity in which appearing: (check one)

☒ Individual

☐ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented:

FISCAL YEAR 2014

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None		zero	

FISCAL YEAR 2013

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None		zero	

FISCAL YEAR 2012

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None		zero	

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2014): _____ None _____;
 Fiscal year 2013: _____ None _____;
 Fiscal year 2012: _____ None _____.

Federal agencies with which federal contracts are held:

Current fiscal year (2014): _____ None _____;
 Fiscal year 2013: _____ None _____;
 Fiscal year 2012: _____ None _____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2014): _____ None _____;
 Fiscal year 2013: _____ None _____;
 Fiscal year 2012: _____ None _____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2014): _____ Zero _____;
 Fiscal year 2013: _____ Zero _____;
 Fiscal year 2012: _____ Zero _____.

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2014): _____ None _____ ;
 Fiscal year 2013: _____ None _____ ;
 Fiscal year 2012: _____ None _____ .

Federal agencies with which federal grants are held:

Current fiscal year (2014): _____ NA _____ ;
 Fiscal year 2013: _____ NA _____ ;
 Fiscal year 2012: _____ NA _____ .

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2014): _____ NA _____ ;
 Fiscal year 2013: _____ NA _____ ;
 Fiscal year 2012: _____ NA _____ .

Aggregate dollar value of federal grants held:

Current fiscal year (2014): _____ Zero _____ ;
 Fiscal year 2013: _____ Zero _____ ;
 Fiscal year 2012: _____ Zero _____ .

DOCUMENTS SUBMITTED FOR THE RECORD

JULY 23, 2014



CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas W. Elmendorf, Director

July 21, 2014

Honorable Jeff Sessions
Ranking Member
Subcommittee on Strategic Forces
Committee on Armed Services
United States Senate
Washington, DC 20510

*Re: Historical and Planned Future Budgets for the Missile Defense Agency's Ground-Based
Midcourse Defense Program*

Dear Senator:

This letter responds to your request that the Congressional Budget Office (CBO) analyze the historical and planned future budgets for the Missile Defense Agency's Ground-Based Midcourse Defense (GMD) program. As shown in the attached table, CBO has compiled the amounts of funding that were provided for fiscal years 2008 through 2014 and the Defense Department's planned budgets for fiscal years 2015 through 2019. All of the budget numbers are based on Department of Defense budget justification documents and are given in nominal dollars (that is, they have not been adjusted for inflation).

To illustrate how budgets for specific activities within the GMD program have changed, CBO has broken out the GMD budget by appropriation title and by project. The relevant appropriation titles are: Research, Development, Test, and Evaluation (RD&E); Operation and Maintenance (O&M); and Procurement. Initially, the full GMD program was funded entirely with RD&E funds; at Congressional direction, starting in 2014, some GMD activities have been moved to the O&M and Procurement accounts. The individual projects within the RD&E category have changed in both name and project content over the years. To better display trends in budgets for specific activities over time, CBO used the list of projects in the Fiscal Year 2015 budget for the attached table and presented the budget for projects in earlier years using those categories.

If you would like further details, we would be pleased to provide them. The staff contact in CBO's National Security Division is Michael Bennett, who can be reached at (202) 226-2900.

Sincerely,

Douglas W. Elmendorf

Honorable Jeff Sessions
Page 2

cc: Honorable Mark Udall
Chairman
Subcommittee on Strategic Forces
Senate Committee on Armed Services

Honorable Carl Levin
Chairman
Senate Committee on Armed Services

Honorable James Inhofe
Ranking Member
Senate Committee on Armed Services

Budget for Ground-Based Midcourse Defense Program^a
(Millions of Dollars)

	Historical Budget							Department of Defense Plans				
	2008 ^b	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Research, Development, Test, and Evaluation (RDT&E)												
Ground-Based Midcourse ^c	1,432	996	725	924	875	679	761	766	750	554	495	509
Improved Homeland Defense Interceptors	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	100	264	262	67	13
Ground-Based Midcourse Test	250	149	98	88	67	69	99	80	51	63	82	62
Ground-Based Midcourse Development Support ^d	278	250	187	182	154	130	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Program-Wide Support	133	78	12	51	48	45	51	58	66	59	47	45
Total RDT&E	2,093	1,473	1,022	1,245	1,144	923	911	1,004	1,131	938	691	629
Operation and Maintenance ^d	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	138	146	151	157	167	169
Procurement ^e	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	150	153	156	160
Total	2,093	1,473	1,022	1,245	1,144	923	1,049	1,150	1,432	1,248	1,014	958

Source: Congressional Budget Office based on information from the Department of Defense.

Note: n.a. = not applicable

a. This table includes only funding contained in the Ballistic Missile Defense Midcourse Defense Segment program element within the Missile Defense Agency budget, and does not include funding for other support activities that are contained in other program elements.

b. For consistency, the 2008 total does not include \$106 million in Ground-Based Midcourse Block 4 RDT&E funding for that year. GMD Block 4 consisted of a European interceptor site; funding for that effort was moved to a separate program element starting in 2009.

c. Includes the budget for the Cyber Operations project.

d. Before 2011, Ground-Based Midcourse Development Support was referred to as Ground-Based Midcourse Sustainment; starting in 2014 it was moved to the Operation and Maintenance appropriation title.

e. Funding for the purchase of GMD interceptors provided through 2014 and proposed for 2015 was categorized as RDT&E.



Reporters learned from the Ministry of National Defense Information Office, July 23, 2014, in the territory of China conducted a land-based anti-missile technology test, test to achieve the desired goal.

[Editor: Feng Lingling]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

JULY 23, 2014

QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. Russia is developing new missile defenses (for example, the S-500 and the nuclear tipped Gazelle system, which it tested in its recent March 2014 nuclear force exercise) and China has also recently tested missile defenses. In a report provided to the committee last year by the Chairman of the Joint Chiefs of Staff, he stated that,

“Russia’s objective with its ballistic missile defense (BMD) capabilities is to ensure defense of critical political and military targets in the Moscow area from a ballistic missile attack either by the United States or any other nation with nuclear or conventional ballistic or cruise missile capabilities.”

a. We have spent years trying to convince Russia that our missile defenses aren’t about them, yet Russia and China are openly developing missile defenses against us. Why do we continue to take this position? Does it continue to make sense (to the extent it ever did)?

b. We adopted the policy of “limited national missile defenses” in 1999. How has the world changed since then in terms of proliferation of ballistic missile technology, proliferation and modernization of WMD capability, and Chinese and Russia relations with the U.S. and our allies?

c. What are your recommendations to this committee on updating the NMD Act? Ambassador WOOLSEY. a.1 There is no good reason any more.

a.2 No.

b. Ballistic missile technology is coming to be highly proliferated and modernized as has WMD capability. Relations with Russia and China are cool to cold.

c. The act should be thoroughly restructured to account for the above changes.

Mr. ROGERS. China and Russia seem to want to have their cake and eat it too: they are both modernizing and growing their nuclear forces (China and Russia are both developing and fielding a modernized TRIAD of nuclear forces, and Russia has undertaken a material breach of the INF treaty and is cheating on the CTBT) while developing missile defenses to neutralize American strategic deterrent forces.

a. Why do we play along with their notion of “strategic stability”? Doesn’t this current situation prove what former Defense Secretary Harold Brown once summed up as “when we build, they build; when we cut, they build”?

b. At what point does it pose an unacceptable threat?

c. Does Putin feel assured, because of his nuclear forces, that he has a certain freedom of action? Have we seen that play out recently?

Ambassador WOOLSEY. a.1 We should not.

a.2 Yes.

b. Now.

c.1 Yes.

c.2 Yes.

Mr. ROGERS. We deploy missile defenses to deal with Chinese anti-ship ballistic missile capabilities, don’t we? How do we explain to the American people that we are willing to defend the 5,500 sailors on an aircraft carrier, but not the 5 million residents of (the greater Seattle area or LA) who are threatened by Chinese ICBMs and SLBMs?

Ambassador WOOLSEY. a. Yes.

b. We cannot do so persuasively.

Mr. ROGERS. We are deploying a cruise missile defense capability to protect the National Capital Region from cruise missiles, including, according to the CDR of NORTHCOM, Russian cruise missiles. Does it make sense that we deploy cruise missile defenses to protect the Capital from Russian cruise missiles, but we will not develop and deploy missile defenses to protect the American people against Russian ballistic missiles?

Ambassador WOOLSEY. No.

Mr. ROGERS. Do you believe the United States needs a layered missile defense capability? So, boost, mid course, and terminal missile defenses?

a. What is the impact, then, of the Obama administration terminating all of our boost phase missile defense programs in 2009?

Ambassador WOOLSEY. Yes, and immediate attention to the vulnerability of our electric grid to an orbited nuclear weapon.

a. Dangerous.

Mr. ROGERS. In 2009, the administration sent Poland a PATRIOT battery, with no missile interceptors. The Poles called this deployment a "potted plant." Presumably, this was done to attempt to mitigate Russian concerns.

a. What is the damage down to our alliances when we make such silly-looking deployments?

Ambassador WOOLSEY. a. Substantial.

Mr. ROGERS. What should the future of missile defense look like?

Ambassador WOOLSEY. Boost-phase, including space-based. EMP attacks from orbiting nuclear weapons appear impervious to BMD unless all launches of any kind from a particular country are destroyed on the pad or early in boost phase (as advocated several years ago by William Perry and Ashton Carter).

Mr. ROGERS. President Obama said in 2001 that "I don't agree with a missile defense system." In 2008, as a candidate, he stated, "I will cut tens of billions of dollars in wasteful spending. I will cut investments in unproven missile defense systems." Has he implemented these political ideologies? How would you describe the impacts of these campaign speeches on our national defense?

Ambassador WOOLSEY. a. Yes.

b. Highly damaging.

Mr. ROGERS. In 2009, President Obama slashed our deployment of GBIs from 44 to 30 and cut our GMD budget in half, and terminated kill vehicle modernization programs like the MKV.

a. Is it any wonder our only national missile defense system has encountered difficulty?

Ambassador WOOLSEY. No.

Mr. ROGERS. Some on the Left say we need to make concessions on U.S. missile defense or they fear we won't be able to obtain further nuclear reductions. Would you care to comment on whether that is true and if so, what recommendations would you offer the subcommittee?

Ambassador WOOLSEY. Since Russia cheats on its treaty obligations most reductions disproportionately affect us and are therefore not worth bargaining for.

Mr. ROGERS. The administration is refusing to brief this committee, including its chairman, on the facts of its proposals to Russia to make agreements on our missile defense deployments.

a. Do you believe the administration owes it to the people's representatives in Congress to keep it informed on these matters?

b. What should the Congress do if the administration continues to hide these matters from it? Would you support efforts to fence or limit funding until Congress' oversight responsibility is respected?

Ambassador WOOLSEY. a. Absolutely.

b. Limit funding desired by the administration, not the small amounts going to BMD.

Mr. ROGERS. It has been reported that Ukraine has asked for the deployment of a PATRIOT battery to defend its territory. Is there any good reason not to deploy it?

Ambassador WOOLSEY. No.

Mr. ROGERS. A week prior to this hearing, this subcommittee held a hearing on Russia's violation of the INF treaty.

a. What are the implications of the administration's refusal to provide that annually required report and to finally, years overdue, confirm that Russia is in violation of that treaty? What do our allies take away from this meekness? How about Russia and Putin?

b. How should the U.S. and our NATO and Asian allies respond?

c. Is further arms control possible when one party to treaties decides it does not have to comply with them?

Ambassador WOOLSEY. a. 1, 2 and 3. Demonstrates excessive willingness to accommodate Russia, dangerously so.

b. Deploy BMD ourselves while chronicling Russia's violations. Withdrawing from treaty is one strong possibility.

c. No.

Mr. ROGERS. What should Congress prioritize in terms of future investments to our missile defense system?

Ambassador WOOLSEY. Space-based boost phase and defenses against EMP attacks, including making electric grid far more resilient.

Mr. ROGERS. In 2010, Vice President Biden offered that one of the reasons the Senate should ratify the New START treaty was to strengthen the hand of then

President Medvedev versus Mr. Putin? Did that theory work out any better for us than any of the Vice President's other foreign policy recommendations in his almost 40-year Federal Government experience?

Ambassador WOOLSEY. No.

Mr. ROGERS. Russian nuclear doctrine, according to Russian press reports, envisions the use of nuclear weapons in a conventional conflict. Can the U.S. or its allies afford not to defend itself from such a escalatory use of nuclear weapons?

Ambassador WOOLSEY. No.

Mr. ROGERS. Russia is developing new missile defenses (for example, the S-500 and the nuclear tipped Gazelle system, which it tested in its recent March 2014 nuclear force exercise) and China has also recently tested missile defenses. In a report provided to the committee last year by the Chairman of the Joint Chiefs of Staff, he stated that,

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Ambassador JOSEPH. [The information was not available at the time of printing.]

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a. What is the impact, then, of the Obama administration terminating all of our boost phase missile defense programs in 2009?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. In 2009, the administration sent Poland a PATRIOT battery, with no missile interceptors. The Poles called this deployment a "potted plant." Presumably, this was done to attempt to mitigate Russian concerns.

a. What is the damage down to our alliances when we make such silly-looking deployments?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. What should the future of missile defense look like?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. President Obama said in 2001 that "I don't agree with a missile defense system." In 2008, as a candidate, he stated, "I will cut tens of billions of dollars in wasteful spending. I will cut investments in unproven missile defense sys-

tems.” Has he implemented these political ideologies? How would you describe the impacts of these campaign speeches on our national defense?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. In 2009, President Obama slashed our deployment of GBIs from 44 to 30 and cut our GMD budget in half, and terminated kill vehicle modernization programs like the MKV.

a. Is it any wonder our only national missile defense system has encountered difficulty?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. You served in the previous administration. It has been suggested by some witnesses, including Mr Coyle, that GMD was rushed into deployment without adequate testing, etc. Would you care to provide the facts as you know them?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. Some on the Left say we need to make concessions on U.S. missile defense or they fear we won't be able to obtain further nuclear reductions. Would you care to comment on whether that is true and if so, what recommendations would you offer the subcommittee?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. The administration is refusing to brief this committee, including its chairman, on the facts of its proposals to Russia to make agreements on our missile defense deployments.

a. Do you believe the administration owes it to the people's representatives in Congress to keep it informed on these matters?

b. What should the Congress do if the administration continues to hide these matters from it? Would you support efforts to fence or limit funding until Congress' oversight responsibility is respected?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. It has been reported that Ukraine has asked for the deployment of a PATRIOT battery to defend its territory. Is there any good reason not to deploy it?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. A week prior to this hearing, this subcommittee held a hearing on Russia's violation of the INF treaty.

a. What are the implications of the administration's refusal to provide that annually required report and to finally, years overdue, confirm that Russia is in violation of that treaty? What do our allies take away from this meekness? How about Russia and Putin?

b. How should the U.S. and our NATO and Asian allies respond?

c. Is further arms control possible when one party to treaties decides it does not have to comply with them?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. What should Congress prioritize in terms of future investments to our missile defense system?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. In 2010, Vice President Biden offered that one of the reasons the Senate should ratify the New START treaty was to strengthen the hand of then President Medvedev versus Mr. Putin? Did that theory work out any better for us that any of the Vice President's other foreign policy recommendations in his almost 40-year Federal Government experience?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. Russian nuclear doctrine, according to Russian press reports, envisions the use of nuclear weapons in a conventional conflict. Can the U.S. or its allies afford not to defend itself from such a escalatory use of nuclear weapons?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. ROGERS. You have mentioned several times the report by the National Academy of Sciences. Do you endorse its recommendation that the U.S. develop and deploy an East Coast site?

Mr. COYLE. The National Academy committee emphasized that an East Coast site should not be built unless and until several other actions were completed first. These are the development of a new two-stage booster for the GMD interceptor, and a new larger and more capable kill vehicle. The Committee also pointed out that the Missile Defense Agency does not have the sensors required to support an East Coast site, and without which an East Coast site would be unable to achieve its intended purpose. I agree with the Committee.

Mr. ROGERS. What is your assessment of the success of the Iron Dome system deployed by Israel? How has your assessment shifted, if at all, during the recent Hamas-instigated violence in Gaza?

Mr. COYLE. The successes that Iron Dome reportedly has had in battle are so far more evidence of the possibilities of Iron Dome than a demonstration of an operationally effective system. As we saw with Patriot in the first Gulf War, it is very difficult to get information in battle with real "ground truth". During my time in the Pentagon I saw this also in military exercises that were not instrumented. However, when military exercises were instrumented a very different picture emerged as to what actually had happened. Accordingly I am skeptical of the claims of 90 or 95% effectiveness made for Iron Dome. News reports show that Iron Dome often misses, and Prime Minister Netanyahu reported this also on "Meet the Press." From these reports it appears the Israeli civil defense system deserves at least as much credit for saving lives as Iron Dome, if not more. Reports from the recent violence in Gaza reinforce these conclusions.

From the publicly available evidence, it appears that Iron Dome is not working nearly as well as what is being claimed. Considering the millions of dollars that the Congress has authorized for Iron Dome, the Congress should request data on the performance of Iron Dome from Israel. This data could be provided to an appropriate U.S. national laboratory that has the in-house technical expertise to analyze it. Without such data there is no way to know if the system is working at the high levels of performance claimed.

Mr. ROGERS. You have suggested that the threat data has changed and Iran is now not expected to be able to flight test an ICBM in 2015.

a. Are you aware of the comments of Gen Flynn, "as stated by the chairman in his opening statement where he talked about our assessment being in the 2015 timeframe, you know, given—given the development that we see that's accurate; so by about 2015."

b. Have you read the classified appendix to the 2014 Iran Mil Power Rept? Well, I have. You should be careful about referring to the conclusions of a report when you have not seen them, sir. People who do that run the risk of looking uninformed and foolish.

Mr. COYLE. a. Yes, I am familiar with the Senate Armed Services Committee hearing held on February 11, 2014, in which General Flynn made that comment. However, General Flynn misspoke. It was not Chairman Levin who brought up Iranian missile capabilities in his opening statement, it was Ranking Member Inhofe.

b. No, I have not read the classified appendix. In my testimony I was not referring to the conclusions in that report. I was making my own assessment.

Mr. ROGERS. The administration is refusing to brief this committee, including its chairman, on the facts of its proposals to Russia to make agreements on our missile defense deployments.

a. Do you believe the administration owes it to the people's representatives in Congress to keep it informed on these matters?

b. What should the Congress do if the administration continues to hide these matters from it? Would you support efforts to fence or limit funding until Congress' oversight responsibility is respected?

Mr. COYLE. a. Yes.

b. The Congress should be informed when in the course of negotiations the administration believes it can reach an agreement which both parties are likely to honor. The Congress always has the authority to express its opinions with respect to funding for executive branch activities but needs to be thoughtful and prudent about establishing precedents that might impact future international negotiations. In the instant case, no, I would not support efforts to fence or limit funding as such efforts would be counterproductive.

Mr. ROGERS. It has been reported that Ukraine has asked for the deployment of a PATRIOT battery to defend its territory. Is there any good reason not to deploy it?

Mr. COYLE. A single PATRIOT battery could not defend the Ukraine.

Mr. ROGERS. In 2010, Vice President Biden offered that one of the reasons the Senate should ratify the New START treaty was to strengthen the hand of then President Medvedev versus Mr. Putin? Did that theory work out any better for us that any of the Vice President's other foreign policy recommendations in his almost 40-year Federal Government experience?

Mr. COYLE. The New START Treaty was ratified in the U.S. Senate by a vote of 71 to 26 with 13 Republican Senators voting for it. America's NATO allies also strongly supported the treaty. In Russia President Medvedev introduced the treaty for consideration by the Duma, and signed the ratification resolution passed unanimously by the Russian Federal Assembly, demonstrating a strong hand throughout.

Mr. ROGERS. Russian nuclear doctrine, according to Russian press reports, envisions the use of nuclear weapons in a conventional conflict. Can the U.S. or its allies afford not to defend itself from such an escalatory use of nuclear weapons?

Mr. COYLE. During the Cold War, the United States had an analogous nuclear doctrine to counter what were seen at the time as superior Soviet conventional forces if the Soviet Union were to attack West Germany through the Fulda Gap. This included atomic demolition mines, the Davy Crockett recoilless rifle for firing small nuclear projectiles, and A-10 ground attack aircraft. Then as now missile defenses are not capable of defending against such battlefield tactical nuclear weapons systems.

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. What was the cost of phase 1 and phase 2 of Strategic Defense Initiative (SDI)?

What would the cost be of a system that could defend against Chinese and Russian warheads today?

Ambassador WOOLSEY. I don't know.

a. I don't know.

Mr. COOPER. What was the cost of phase 1 and phase 2 of Strategic Defense Initiative (SDI)?

What would the cost be of a system that could defend against Chinese and Russian warheads today?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. COOPER. What was the cost of phase 1 and phase 2 of Strategic Defense Initiative (SDI)?

Mr. COYLE. According to James A. Abrahamson and Henry F. Cooper, about \$30 billion were spent on SDI between 1985 and 1993 when it was cancelled. See "What Did We Get for Our \$30-Billion Investment in SDI/BMD? September 1993.

Cost estimates for the Strategic Defense Initiative vary widely. In a 1987 paper the Heritage Foundation wrote, "While it is unlikely that SDI will be as cheap as the 40 billion claimed by some SDI backers, the price tag probably will be in the range of \$115 billion to \$120 billion spread out over ten years."

Other estimates are much higher, up to \$1 trillion attributed to former Secretary of Defense Harold Brown. See Heritage Backgrounder #607, Strategic Defense: "How Much Will It Really Cost?" October 2, 1987

Mr. COOPER. What would the cost be of a system that could defend against Chinese and Russian warheads today?

Mr. COYLE. A complete system has never been designed or costed. A 1982 Defense Department report said that a system of space-based lasers, not including all the associated systems for detection, coordination, and command and control that a complete SDI system would need to have, might cost up to \$500 billion (see "Strategic Defense and Anti-Satellite Weapons," Hearing before the Senate Committee on Foreign Relations, April 25, 1984, p. 67).

Mr. COOPER. What are your views on the value and feasibility of boost-phase missile defense?

Mr. COYLE. I agree with the conclusion of the Defense Science Board report of September 2011 that because the timelines for boost-phase missile defense are so short, early intercept is not itself "a useful objective for missile defense in general or for any particular missile defense system." See Defense Science Board Task Force Report on "Science and Technology Issues of Early Intercept Ballistic Missile Defense Feasibility," September 2011.

Mr. COOPER. Do you agree with the National Academy of Sciences conclusion that the "DOD should not invest any more money or resources in systems for boost-phase missile defense" and that "boost-phase defense is not practical or cost effective under real world conditions for the foreseeable future"?

Mr. COYLE. For all practical purposes, yes. The NRC committee wrote, "All boost-phase intercept (BPI) systems suffer from severe reach-versus-time-available constraints." There are specialized systems that might work in the boost phase against relatively small country such as North Korea. But those systems would not be effective against larger countries such as Iran, Russia or China.

Mr. COOPER. Why was the multiple kill vehicle program canceled?

Mr. COYLE. Defense Secretary Robert Gates made the decision to cancel the Multiple Kill Vehicle in the spring of 2009. According to the GAO, "MDA terminated the Multiple Kill Vehicle element because of feasibility issues raised about this technology, which was still in its early stages of development, as well as a decision to refocus MDA's resources on new technologies aimed at early intercept of ballistic missiles." See GAO-10-311.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. In 2009, just 5 years ago, the Nuclear Posture Review Commission, supported the conclusion that "For more than a decade the development of U.S. ballistic missile defenses has been guided by the principles of (1) protecting against limited strikes while (2) taking into account the legitimate concerns of Russia and China about strategic stability." Do you now disagree with this conclusion? Did you agree at the time?

Ambassador WOOLSEY. I disagree with the proposition that these should be guiding principles, but I acknowledge that five years ago and today these principles influence many and in fact provide the underlying assumptions of much of our government's actions with regard to BMD programs.

Mr. GARAMENDI. What kind of missile defense system(s) would be needed and would be feasible to counter Russian and Chinese nuclear weapons?

Ambassador WOOLSEY. Space-based boost phase.

Mr. GARAMENDI. What actions might China and Russia take in response to a U.S. missile defense against their capabilities? Would it affect the number and type of their offensive systems? What are the cost of offensive versus defense systems? Would Russia or China be more likely to perceive the need to strike first?

Ambassador WOOLSEY. a. More emphasis on both offense and defense—blaming U.S. for the size of their programs.

b. Probably little.

c. I don't know.

d. It would depend highly on the circumstances.

Mr. GARAMENDI. What kind of missile defense system(s) would be needed and would be feasible to counter Russian and Chinese nuclear weapons?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. GARAMENDI. What might the impacts to strategic stability be of expanding missile defense systems to counter Russian and Chinese warheads? Why would this action not result in an arms race?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. GARAMENDI. What actions might China and Russia take in response to a U.S. missile defense against their capabilities? Would it affect the number and type of their offensive systems? What are the cost of offensive versus defense systems? Would Russia or China be more likely to perceive the need to strike first?

Ambassador JOSEPH. [The information was not available at the time of printing.]

Mr. GARAMENDI. What might the impacts to strategic stability be of expanding missile defense systems to counter Russian and Chinese warheads? Why would this action not result in an arms race?

Mr. COYLE. Expanded missile defense systems to counter Russian and Chinese ICBMs would be strategically destabilizing because—if Russia and China believed those systems were effective—those nations would need to respond to counter what they would see as a new threat. Their responses could include new tactical and strategic forces, perhaps even more attacking missiles to overcome those new U.S. defenses, perhaps extensive deployment of cruise missiles against which our ballistic missile defense systems are useless, or perhaps deployment of large numbers of troops in regions that are currently stable and peaceful. Then our missile defenses would have upset the strategic balance and provoked new military responses from Russia and China.

Of course, under such conditions, Russia would certainly not agree to further reductions in their strategic nuclear arsenals, as the U.S. and Russia have been doing under START, the Strategic Offensive Reductions Treaty, and New START. Russia might consider aggressive new U.S. missile defense programs as justification to withdraw from New START and other agreements that have significantly reduced the threat from nuclear weapons.

Mr. GARAMENDI. What actions might China and Russia take in response to a U.S. missile defense against their capabilities? Would it affect the number and type of their offensive systems? What are the cost of offensive versus defense systems? Would Russia or China be more likely to perceive the need to strike first?

Mr. COYLE. China and Russia might launch new offensive missile programs to overwhelm new U.S. missile defenses against their capabilities. China and Russia also might initiate new military actions in its regions against which U.S. missile defenses would be useless. For example, they might choose to increase their land-, sea-, or air-based offensive systems and to deploy those systems in new regions.

With respect to the cost of offensive versus defensive systems, during the Reagan years, Paul Nitze, the highly regarded scholar and statesman, presented three criteria that any missile defense system must meet before being considered for deploy-

ment. Nitze's criteria were formally adopted as National Security Directive No. 172 on May 30, 1985.

The Nitze criteria were:

1. The system should be effective;
2. Be able to survive against direct attack; and
3. Be cost effective at the margin—that is, be less costly to increase your defense than it is for your opponent to increase their offense against it.

So far U.S. missile defenses do not meet the Nitze criteria.

By definition, First Strike is a preemptive surprise attack using overwhelming force. A missile defense system capable of continental coverage and also of defending against most or all attacking ICBMs, is considered by nuclear strategy analysts as enabling First Strike because it would allow for a nuclear strike to be launched with reduced fear of retaliatory destruction. No such missile defense system exists, but if the U.S. had such a system China and Russia would worry about the U.S. being the one to strike first. Similarly, if Russia or China had such a system, America would worry about Russia or China striking first.

