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RESHAPING THE UNITED STATES MILITARY

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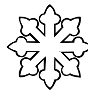

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RESHAPING THE UNITED STATES MILITARY

THURSDAY, FEBRUARY 16, 2017

U.S. SENATE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

The committee met, pursuant to notice, at 9:33 a.m. in Room SD–G50, Dirksen Senate Office Building, Senator John McCain (chairman of the committee) presiding.

Committee Members present: Senators McCain, Inhofe, Wicker, Fischer, Cotton, Rounds, Ernst, Tillis, Sullivan, Perdue, Sasse, Strange, Reed, Nelson, McCaskill, Shaheen, Gillibrand, Blumenthal, Donnelly, Hirono, Kaine, King, Heinrich, Warren, and Peters.

OPENING STATEMENT OF SENATOR JOHN McCAIN, CHAIRMAN

Chairman MCCAIN. Well, good morning.

The Senate Armed Services Committee meets this morning to receive testimony on reshaping the U.S. military and make America great again.

I would like to thank our witnesses for appearing today: David Ochmanek, Senior Defense Research Analyst at the RAND Corporation; James Thomas, Principal at the Telemus Group; Thomas Donnelly, Resident Fellow and Co-Director of the Marilyn Ware Center for Security Studies at the American Enterprise Institute; and Bryan Clark, Senior Fellow at the Center for Strategic and Budgetary Assessments.

For the last 25 years, Americans have taken our Nation's military superiority for granted. We watched as the Cold War ended with the collapse of our only superpower rival and the so-called "end of history." We quickly grew accustomed to military dominance. After all, no U.S. Navy ship has been sunk in an active conflict since 1952. No member of American ground forces has been killed by an enemy airstrike since 1953. No American fighter aircraft has been shot down in an air-to-air engagement since 1991. Every one of our Nation's recent military conflicts resulted in a lopsided conventional military victory from the Gulf War to Bosnia and Kosovo to the early phases of the wars in Afghanistan and Iraq.

This confidence in our military is reflected in the rhetoric of many or our Nation's civilian and military leaders who reassure us that ours is the most capable fighting force on the face of the earth, or that our defense budget is so much larger than our competitors. These statements are undoubtedly true, and to be very, very clear,

any adversary that chooses the path of aggression against the United States or its allies would, indeed, pay a terrible price.

But ultimately such statements shed little light on the most important question: whether our military can achieve the mission assigned to it to deter and, if necessary, defeat aggression and at what cost. The testimony of our military leaders and the work of some of our foremost defense experts leads me to believe there is real reason for concern.

For the last 20 years, our adversaries have gone to school on the American way of war, and with focused determination, they have invested in, developed, and/or fielded the capabilities to counter it: long-range, accurate ballistic and cruise missiles that can target our ground forces, ships, military installations, and critical infrastructure; dense, integrated air defenses that pose a threat to even our most advanced aircraft; large numbers of modern fighter aircraft, including some fifth generation platforms, armed with capable air-to-air missiles that in some cases outrange our own; more advanced surveillance and reconnaissance systems, resilient command and control networks, electronic warfare capabilities, and anti-satellite and cyber weapons that, taken together, threaten our ability to achieve information dominance.

By expanding contested battlespace and exacerbating the tyranny of distance, our adversaries are threatening our military's ability to project power, upon which rests the credibility of American deterrence. As they grow more capable, our adversaries are increasingly emboldened to engage in acts of provocation, coercion, and aggression that threaten our interests and our allies.

Pick up this morning's paper and you will see how a Russian ship is now operating off the east coast of the United States.

Here at home, we have only exacerbated the problem. In recent years, preoccupied with the fight against terrorism, hampered by a broken acquisition system, and shackled by the budget cuts and fiscal uncertainty, our military has prioritized near-term readiness at the expense of future modernization, giving our adversaries a chance to close the gap. Our military leaders have described this as, quote, mortgaging the future. But it appears few realized how soon the future would arrive.

What all these developments mean is that America's military advantage is eroding and eroding fast. The wide margin for error we once enjoyed is gone, and in some of the most difficult scenarios our military may some day confront, we can no longer take victory for granted. In short, we will now hear from some of our witnesses today the risk is growing, that our Nation's military could lose the next war it is called upon to fight. If it does prevail, as I surely hope it would, success could very well come at a cost in blood and treasure we as a Nation have not paid since the Vietnam War.

The question now is what we must do to reverse these trends and sustain and advance America's military advantage for the 21st Century.

Yes, we need to rebuild military capacity deliberately and sustainably, particularly in areas like undersea warfare where our Nation still maintains an advantage over our adversaries. But there is still a lot of truth in the old adage that quantity has a quality all its own. But adding capacity alone is not the answer.

More of the same is not just a bad investment against increasingly advanced adversaries, it is downright dangerous.

That means we have to reshape our military by investing in the modern capabilities necessary for the new realities of deterring conflict and competing with great powers that possess advanced military forces: longer-range, more survivable platforms and munitions; more autonomous systems; greater cyber and space capabilities, among other new technologies.

It is not enough, however, just to acquire these new technologies. We must also devise entirely new ways to employ them. It would be a failure of imagination merely to conform emerging defense technologies to how we operate and fight today. Doing so would simply play into our adversaries' hands. Ultimately, we must shape new ways of operating and fighting around these new technologies.

The good news is that our civilian and military leaders at the Department of Defense see this challenge clearly and are developing solutions to address these issues. But the progress they have made remains limited because of budget cuts and fiscal uncertainty that prevent effective, long-term strategic planning and investment. This is just one more reason why we have to remove the shackles of the Budget Control Act from the Department of Defense, and we have to do so immediately. Rebuilding and reshaping our military will not happen quickly. But the decisions we need to make to realize those goals are upon us. The future is now.

In short, to sustain and advance America's military advantage for the 21st Century, we must not only rebuild our military, but we must rethink, re-imagine, and reshape it. This will entail tough choices. But these are the choices we must make to ensure that our military will be ready to deter and, if necessary, fight and win our future wars.

Senator Reed?

STATEMENT OF SENATOR JACK REED

Senator REED. Well, thank you, Senator McCain, for calling this very, very important hearing.

Also, let me thank the witnesses for being here today. Thank you, gentlemen, very much.

The United States has relied on our military's dominance in every battle sphere since the end of the Cold War. We have not had a near-peer competitor for decades, and that has allowed us to take for granted certain fundamental aspects of projecting power and deterring and defeating aggression.

Unfortunately, we are no longer in a position to assume our air, land, naval, space, and cyber superiority against potential adversaries. We are no longer able to assume that we can project power from the United States instead of being forward-based, and we can no longer assume that we have months to mobilize and move forces uncontested to respond to aggression.

It should also not be a surprise to anyone that 15 years of fighting the wars in Afghanistan and Iraq forced us to make tradeoffs on long-term defense investment in order to support near-term readiness and to pay the costly bills from these two wars. During that time, other countries have modernized and made technological

advances. Now we must focus on what our military needs to keep our competitive edge.

I would also like to emphasize the need to be clear-sighted about our ability to predict conflicts and adversaries 15 to 20 years out. As Defense Secretary Gates told West Point cadets, "When it comes to predicting the nature and location of our next military engagements, since Vietnam, our record has been perfect. We have never once gotten it right." If past is prologue, it is very possible that 20 years from now we will be facing adversaries and competitive environments that we did not expect. Therefore, we must ensure that our military is, above all, adaptable to the new crises that lurk unseen over the horizon.

I hope that some of the technological innovations and organizational concepts that are being explored by the Defense Department will allow us to have a more effective, agile, and adaptable military. But underlying all of these considerations is, of course, the question, what will our national security strategy look like? We should not advocate for substantially higher investments that have a long spending tail unless and until we have fully articulated the strategy that will drive our budget. We also need to carefully examine the current budgets and programs of the services and agencies to ensure that they are aligned to meet the threats of the future in the time frames that we need.

One additional point that cannot be overemphasized in my view. Our national defense strategy has always assumed a strong NATO alliance and an unwavering commitment to our allies in Asia since the end of World War II. Any disruption to those assumptions will require a fundamental rethinking of our strategy. Our successes in recent operations are due in large part to the allies and partners that stand shoulder to shoulder with our troops. Our commitment to those partners and allies is essential.

Thank you, Mr. Chairman. I look forward to the testimony.

Chairman MCCAIN. I thank the witnesses for being here. We will begin with you, Mr. Ochmanek.

STATEMENT OF DAVID A. OCHMANEK, SENIOR DEFENSE RESEARCH ANALYST, RAND CORPORATION

Mr. OCHMANEK. Thank you, Chairman McCain, Ranking Member Reed, members of the committee, and staff. I appreciate the opportunity to share insights that my colleagues and I have gained from our analysis of future military operations. Our war games and simulations, as the chairman suggested, point to the conclusion that U.S. Forces could fare poorly in the next war they are called upon to fight. As you requested, I will focus my remarks on what might be done to change these sobering projections.

Specifically, I would like to highlight investment options that have the potential to address three important operational challenges facing the U.S. Forces. These are: one, threats posed by long-range strike systems; two, threats posed by advanced air defenses; and three, the simple tyranny of distance that we face when we try to project power overseas.

So, number one, long-range strike systems. Because our adversaries are fielding large numbers of accurate ballistic and cruise missiles, our land and sea bases today are subject to attack as

never before. There is no single silver bullet solution to this problem. Currently available ballistic missile defense systems are expensive and can be overwhelmed by modest-sized missile salvos, and hunting down mobile ballistic missiles deployed deep in enemy territory is not a promising solution.

Our wargaming, however, points to a number of ways in which we can increase the resiliency of forward bases and allow them to generate sustained combat power even in the face of these kinds of threats. Chief among these are: one, dispersing our forces across more bases, not concentrating them; two, creating uncertainty about the location of our forces by deploying them in redundant low-cost shelters, moving them frequently, and using decoys and deception measures; three, disrupting enemy reconnaissance capabilities; and four, making the bases themselves more resilient, more difficult to attack and suppress often through prosaic measures like rapid runway repair materials, fuel bladders, and fuel pumping facilities that are more survivable than the things we have today.

Analysis also shows that active defenses against cruise missiles can be a very promising way to protect our forces abroad. The Army's short-range air defense system, the IFPC–2, seems particularly well suited to defeating even large salvos of cruise missiles.

Another part of the solution will be to rely more heavily on long-range bombers and submarines. Repeatedly in our war games, our bombers operate relatively unscathed by missile attacks, but fail to make decisive contributions to the defense because they run out of suitable munitions. U.S. Forces could get much more capability from the existing bomber fleet by expanding inventories of weapons like the JASSM–ER cruise missile, the MALD, miniature air-launched decoy, and accelerating the development of new weapons such as anti-ship cruise missiles and swarming unmanned aerial vehicles that the bombers could deliver.

Similarly, the *Virginia*-class submarine has unparalleled stealth capabilities and can fight from areas off the coast of adversary states, but it has limited weapons carrying capacity. The *Virginia* payload module boosts this capacity, and other promising concepts such as unmanned underwater vehicles that are being developed.

Challenge two is overcoming advanced air defenses. Russia and China are fielding air defenses of such density and sophistication that our forces will not have time to comprehensively suppress them before going after the invading forces that they need to attack. Therefore, our forces need to find ways to reach into the air defense zone to find and strike targets of highest priority from the outset of the campaign. Three types of capabilities are called for to achieve this capability.

One is sensors that can survive in contested environments and allow us to see the battlefield from space, from airborne platforms, and from land-based sensors or surface-based sensors. The idea is to spread these sensor networks across a number of different platform types and domains so that some portion of them will be available at all times.

Second is communication links that can effectively connect sensors, control centers, and shooters even in the presence of heavy

jamming threats. Again, robustness will be achieved here through versatility and redundancy.

Three, distributed networks of delivery platforms and weapons that can strike key targets both within and beyond the contested area. Examples of these include the sort of standoff attack missiles that I spoke of earlier for the bomber and submarine forces, but also swarms of inexpensive autonomous weapons and specialized weapons for attacking armored vehicles, ships, and surface-to-air missile systems.

Finally, the tyranny of distance. A big part of the problem we face in NATO today can be remedied simply by putting appropriate forces, munitions, and support assets back into Europe. Russia's armed forces are not superior to ours in most dimensions, but they have geographical advantages. They can amass ground forces on NATO's borders far more quickly than we can respond. Last year's European Reassurance Initiative, which funded the deployment of Army ground forces into Europe, is a step in the right direction, but our analysis suggests that more is necessary, and our allies have shown that they are willing to do their part.

I have included in my written statement a chart that provides a more complete list of the types of capabilities that our research suggests merit the highest priority for investments.

Again, thank you for the opportunity to appear before this committee. I look forward with my colleagues to answering your questions.

[The prepared statement of Mr. Ochmanek follows:]

PREPARED STATEMENT BY DAVID OCHMANEK [1], THE RAND CORPORATION [2]

Good morning, Chairman McCain, Ranking Member Reed, members of the committee, and staff. I appreciate the opportunity to share insights that my colleagues and I have gained from more than a decade of analyzing emerging threats to U.S. military operations. Our work has revealed some serious and growing gaps in the capabilities of U.S. Forces, raising questions about their ability to accomplish the strategically important mission of deterring and defeating aggression by adversary states. I therefore applaud the committee's efforts to focus attention on how the Department of Defense (DOD) can best act to reverse the deterioration in the military balance of power in key regions.

The security environment in which U.S. Forces operate and for which they must prepare is, in important ways, more complex and more demanding than the one that DOD has used to build and evaluate today's force. To be clear:

- Our force planning prior to Russia's attacks on Ukraine did not take account of the need to deter large-scale aggression against the North Atlantic Treaty Organization (NATO).
- We also have not moved quickly enough to provide the capabilities and basing posture needed to meet the manifold challenges posed by China's rapidly modernizing armed forces.
- The prospect of deliverable nuclear weapons in the hands of North Korea and, potentially, Iran poses challenges for which we do not have satisfactory answers.

As these threats have emerged and our forces have carried on a multifaceted campaign against Salafist-jihadi forces in several locales, the Nation has not committed the resources called for to build and sustain the capabilities that our forces need to succeed in this more demanding environment. As a result, the United States now fields forces that are simultaneously:

- larger than needed to fight a single major war,
- failing to keep pace with the modernizing forces of great power adversaries,
- poorly postured to meet key challenges in Europe and East Asia,
- insufficiently trained and ready to get the most operational utility from many active component units.

Put more starkly, our wargames and simulations suggest that U.S. Forces could, under plausible assumptions, lose the next war they are called upon to fight. [3]

Of course, DOD has not been idle in the face of these developments. The defense development community, the services, and industry are generating new ideas, technologies, and operating concepts that offer real promise for countering the threats that are the cause for greatest concern. For the remainder of this testimony, I would like to highlight a few of these new approaches and show how they can enable a robust defense in the face of emerging challenges.

One of the most vexing problems facing power projection operations stems from the proliferation of accurate, long-range strike systems—ballistic and cruise missiles. Our land and sea bases today are exposed to attack as never before.

There is no single, "silver bullet" solution to these threats. Hunting down mobile missiles deployed deep in enemy territory is not a promising solution. Currently available ballistic missile defense systems are expensive and can be overwhelmed by modest-sized missile salvos. But wargaming shows that a number of complementary efforts can significantly increase the resiliency of forward bases and allow them to generate sustained combat power even in the face of repeated attacks. Chief among these are:

- dispersing forward-based forces across a larger number of bases

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[1] The opinions and conclusions expressed in this testimony are the author's alone and should not be interpreted as representing those of the RAND Corporation or any of the sponsors of its research.

[2] The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest.

[3] For a succinct assessment of the military balance between Russia and NATO and the prospects for a defense of the Baltics, see David A. Shlapak and Michael W. Johnson, *Reinforcing Deterrence on NATO's Eastern Flank,* Santa Monica, CA: RAND Corporation, RR–1253–A, 2016. For an assessment of trends in China's armed forces and their implications for U.S. defense strategy and planning, see David Ochmanek, *Sustaining U.S. Leadership in the Asia-Pacific Region,* Santa Monica, CA: RAND Corporation, PE–142–OSD, 2015.

- creating uncertainty about the location of those forces by parking them in redundant, low-cost shelters, moving them frequently, and using decoys and deception measures
- disrupting enemy reconnaissance capabilities
- making bases themselves more resilient; this generally calls for rather prosaic steps, such as positioning rapid runway repair materials and fuel bladders at each base and reducing the vulnerability of key nodes, such as fuel pumping facilities.

Analysis also shows the value of active defenses against cruise missile attacks. The Army's new short-range air defense system, IFPC–2, seems particularly well suited to defeating even sizable salvos of cruise missiles.

Another part of the answer to the vulnerability of forward bases is to rely more heavily on platforms that can fight either from afar (long-range bombers) or from sanctuary (submerged submarines). In wargames, U.S. bombers—B–52s, B–1s, and B–2s—often operate relatively unscathed by missile attacks but fail to make decisive contributions to defense because they run out of munitions that they can survivably deliver. U.S. Forces could get much more capability from the bomber fleet by greatly expanding inventories of weapons like the Joint Air-to-Surface Standoff Missile—Extended Range (JASSM–ER) and miniature air-launched decoy (MALD) cruise missiles and by accelerating the development of new weapons, such as antiship cruise missiles and swarming unmanned aerial vehicles (UAVs), that can be delivered by our bombers.

Similarly, the *Virginia*-class submarine has unparalleled stealth capabilities and can fight from areas off the coast of adversary nations, but it has limited weapons carrying capacity. The *Virginia* Payload Module modification boosts this capacity. Other promising concepts for affordable delivery of payloads from undersea are being developed, such as unmanned underwater vehicles.

A second priority for the force is to find more robust ways to rapidly detect, track, and attack key military targets—the enemy's operational centers of gravity, if you will—in contested areas from the outset of a campaign. What do I mean by this? Traditionally, U.S. Forces open military campaigns by first establishing freedom of maneuver in the air, at sea, and on land. Once the enemy's air defenses have been suppressed, for example, our air forces are free to observe and attack other targets—the enemy's ground forces, naval forces, command and control centers— more or less at will. This approach has been central to the success of U.S. military operations since World War II.

Russia and China are fielding air defenses of such density and sophistication that our forces will not have time to comprehensively suppress them before going after the invading force they need to defeat. Therefore, our forces need to find ways to "reach into" defended airspace to find and strike the targets of highest priority.

What will it take to do this? Three types of capabilities:

1. *Sensors that can survive in defended environments.* These may be deployed on a range of platforms, such as small satellites; stealthy UAVs; swarms of small, expendable UAVs; and robotic sensors on the surface. The idea is to spread sensors across a number of different platform types so that some portion will be available at all times.
2. *Communication links* that can function effectively in conditions of heavy jamming and maintain data pathways among sensors, control centers, and shooters. Again, robustness will be achieved through versatility and redundancy. Airborne and terrestrial systems may be called for to back-up key capabilities on satellites, such as GPS and communications.
3. *Distributed networks of delivery platforms and weapons* that can strike key targets from both within and beyond the contested area. Examples of these include the sorts of standoff attack missiles that I spoke of earlier for the bomber and submarine forces, swarms of inexpensive autonomous weapons, and specialized weapons for attacking armored vehicles, ships, and surface-to-air missile systems.

One other observation: A significant portion of the capability gap we face on NATO's eastern flank today can be remedied simply by putting appropriate forces, munitions, and support assets back in Europe. Russia's armed forces are not superior to ours in most dimensions, but they have the advantage of geographical proximity: Today they can mass ground forces on NATO's borders far more quickly than NATO can respond. Last year's European Reassurance Initiative, which funded, among other things, the deployment of Army ground forces in Europe, is a step in the right direction. But more is necessary, and our European allies have shown that they are ready to do their part.

At the conclusion of this statement, I have included a chart that provides a more complete list of the types of capabilities that our research suggests merit the highest priority for investments intended to redress the growing imbalance between the capabilities of U.S. Forces and those of our most capable adversaries. Those capabilities are grouped according to the adversary to which they are most relevant.

One caveat: The research on which this testimony is drawn focused on understanding and countering the threats posed by state adversaries, such as China, Russia, North Korea, and Iran. My work has not delved deeply into issues of the readiness of U.S. Forces, or the stresses that high operational tempos may be imposing on people and units. I have also not addressed the need to recapitalize U.S. Nuclear Forces. The absence of recommendations in these areas should not be taken as implying that investments there are not warranted.

CONCLUSION

DOD's leadership knows generally what is needed in order to counter most, if not all, of the operational challenges posed by our most capable adversaries. Many of the technologies needed to make innovative reconnaissance, communications, and weapon systems into realities are mature, and the services are devising and testing new operational concepts for employing these systems.

The two things that are needed now are money and insight: additional money to allow the DOD to move swiftly to develop, acquire, and field new systems and postures, and insight based on analysis to guide decisionmaking, so that funding goes to investments that have the potential to make the greatest and most enduring contributions to a robust defensive posture vis-á-vis China, Russia, and other adversaries. The Trump Administration and the 115th Congress have the opportunity to rectify the strategy-forces mismatch that has arisen over the past several years and put the United States back on a path toward fielding forces that can defeat any adversary.

One note of caution: Fielding the sorts of capabilities I have highlighted here should not, in most cases, be expected to restore to U.S. Forces the degree of overmatch that they enjoyed against regional adversaries of the past, such as Iraq and Serbia. Any major conflict involving China, Russia, or North Korea is bound to be a costly and bloody affair. But I believe that it is within our means—technologically, operationally, and fiscally—to field forces capable of confronting even the most capable adversaries with the prospect of defeat if they choose aggression. That is the gold standard of deterrence, and it is the standard to which we should aspire.

Again, thank you for the opportunity to appear before this committee. I look forward to answering your questions.

Table 1. Priority Enhancements to U.S. Forces and Posturea

China	• Accelerated development and fielding of a longer-range, fast-flying radar-homing air-to-surface missile* and a longer-range air-to-air missile* • Forward-based stocks of air-delivered munitions, including cruise missiles (e.g., joint air-to-surface standoff missile and joint air-to-surface standoff missile-extended range, long-range antiship missile),* surface-to-air missile suppression missiles (e.g., homing antiradiation missile, miniature air-launched decoy),* and air-to-air missiles (e.g., AIM–9X and AIM–120)* • Prepositioned equipment and sustainment for ten to 15 platoons of modern short-range air defense systems (SHORADS) for cruise missile defense • Additional base resiliency investments, including airfield damage repair assets and expedient aircraft shelters, and personnel and equipment to support highly dispersed operations • Accelerated development of the Next-Generation Jammer* • A high-altitude, low-observable UAV system* • More-resilient space-based capabilities (achieved by dispersing functions across increased numbers of satellites and increasing the maneuverability, stealth, and ''hardness'' of selected assets)* • Counter-space systems, including kinetic and nonkinetic (e.g., lasers, jammers) weapons*
Russia	• Items listed under ''China'' that are marked with an * • Three heavy brigade combat teams and their sustainment and support elements forward based or rotationally deployed in or near the Baltic states • One Army fires brigade permanently stationed in Poland, with 30-day stock of artillery rounds; one additional fires brigade set prepositioned . Forward-based stocks of artillery and multiple launch rocket system rounds; antitank guided missiles • Forward-based stocks of air-delivered antiarmor munitions (e.g., Sensor Fused Weapon Pre-Planned Product Improvement) • Station or rotationally deploy eight to 12 platoons of SHORADS forces in NATO Europe • Increased readiness and employability of mechanized ground forces of key NATO allies
Iran	• Improved, forward-deployed mine countermeasures . High-capacity close-in defenses for surface vessels
North Korea	• Improved intelligence, surveillance, and reconnaissance systems for tracking nuclear weapons and delivery systems • Exploratory development of boost-phase ballistic missile intercept systems • Continued investments to improve the reliability and effectiveness of the ground-based intercept system to protect the United States
Salafist-Jihadi Groups	• Improved intelligence collection and analysis capabilities and capacity • Acquire next-generation vertical takeoff and landing aircraft • Acquire Light Reconnaissance and Attack Aircraft • Develop powered exoskeleton, also known as the Talon Project • Develop swarming and autonomous unmanned vehicles

a David Ochmanek, Peter A. Wilson, Brenna Allen, John Speed Meyers, and Carter C. Price, U.S. Military Capabilities and Forces for a Dangerous World: Rethinking the U.S. Approach to Force Planning, Santa Monica, Calif.: RAND Corporation, RR–1782–IRD, forthcoming.

Chairman McCain. Mr. Thomas?

STATEMENT OF JAMES P. THOMAS, PRINCIPAL, THE TELEMUS GROUP

Mr. THOMAS. Good morning, Mr. Chairman, Ranking Member Reed, and distinguished members of the committee. I appreciate the opportunity to appear before you today.

The chairman's recent white paper, "Restoring American Power," rightfully argues that reshaping the U.S. military should be given priority over resizing. I certainly agree. Getting the shape right is, in fact, more important over the long haul before we think about the question of size. This will involve determining the desired characteristics of the force, its attributes, as well as its organizational design.

The truth of the matter is today our force is simply misshaped for many of the military challenges we face. It remains too rooted in the 1990s design that was over-optimized for conventional regional wars more akin to Operation Desert Storm, and it is relatively less prepared for protracted counter-insurgencies, global counterterrorism, and the expansion of warfare into new domains like cyber and space.

Take cyber warfare, for example. We know that this is emerging as one of the most important domains of military competition as countries and non-state actors alike attempt to protect the viability of their networks while disrupting those of adversaries, including the United States. Yet, we have only begun to take rudimentary steps, initial steps to begin better organizing, training, and equipping our forces for this critical mission.

More broadly, our conventional military overmatch is rapidly eroding in the face of great power revisionist states like Russia and China that have adapted particular asymmetric strategies to circumvent traditional U.S. military strengths while imposing costs on the United States and its allies in ways that are becoming very difficult to counter. They are developing anti-access and area denial capabilities, modernizing their nuclear forces, engaging in gray zone activity below the threshold of war, and conducting cyber attacks even in peacetime. These can no longer be considered future challenges and we can no long afford to defer efforts to reshape the U.S. military to address them.

The United States finds itself today confronting these challenges with a much narrower margin of military advantage but with far greater fiscal constraints and with a less unified set of allies and partners than it had during the Cold War or its immediate aftermath.

There is no single approach or strategy that can effectively address the full range of these challenges. Instead, as Chairman McCain noted in "Restoring American Power," the Department of Defense will need to fashion regionally tailored strategies and force packages suited to the unique requirements of Europe, East Asia, and the Middle East. This is a point worth underscoring.

Efforts to reshape the force should be focused on specific, particular military operational problems. Each potential adversary in the theater will necessitate a unique approach, and across the board, we will need a new high-low mix of capabilities.

At the low end, the key attributes will be to reduce procurement and sustainment costs and the ability to field large numbers of

weapons and platforms for steady state operations in relatively permissive operating environments. Many of our legacy forces and capabilities already fit this bill.

On the high side, we will need two basic elements. First is regionally tailored forces that are highly lethal and survivable and can deter local aggression by potential adversaries. These, in turn, will have to be backstopped by a more globally fungible surveillance and strike swing force that can operate at long ranges both physically and virtually to penetrate denied areas and hold at risk large numbers of hostile military forces and other targets with conventional, nuclear, or nonkinetic weapons.

Regionally tailored forces in Europe and Asia in particular would place a premium on permanently forward-stationed ground forces because it may be too risky to deploy them in crisis or time of war, and they may be too slow arriving to make a difference.

The globally fungible, long-range surveillance and strike element of the force would include offensive cyber warfare, as well as air, naval, and missile systems to rapidly respond to threats globally while operating from great distances with large sensor and weapons payloads, penetrate into denied areas, evade detection, and persist to strike elusive targets, conduct electronic and cyber attacks, and sustain with minimal theater basing or logistical support.

Together it is these two components which should serve as the basis for reshaping the U.S. military. Now is the time to make this transition to begin to reshape at least a portion of our military so that we can effectively deter and prevail across the range of competitions and conflicts we will face over the next several decades.

This concludes my opening statement, and I look forward to your questions. Thank you.

[The prepared statement of Mr. Thomas follows:]

PREPARED STATEMENT BY JAMES P. THOMAS

Chairman McCain, Ranking Member Reed, and distinguished members of the Committee, I appreciate the opportunity to appear before you today to discuss the security challenges our Nation confronts, the urgent need to reshape our military forces, and the attributes our forces will need moving forward. The Chairman's recent white paper, Restoring American Power, rightfully argues that reshaping the U.S. military should be given priority over resizing. There is little question that we need to do both, but too often in American force planning discussions, there is a tendency to rush to judgment about the size of the U.S. military before first figuring out what kind of military forces are most appropriate for the strategic circumstances we anticipate. I strongly support the idea that determining the shape of the force—in terms of its desired characteristics, attributes, and organization design—should precede questions of force size.

Our military today remains too rooted in the force design of the early 1990s. The return of great power competitions, however, makes it imperative to reshape the U.S. military to ensure it has an appropriate high-low mix of regionally-tailored forces coupled with a global surveillance and strike "swing force" to deter aggression and deny adversaries their objectives. Moving toward this new force design should be a matter of great urgency for the Pentagon and the Congress.

ORIGINS OF THE U.S. MILITARY'S PRESENT SHAPE

Understanding why the U.S. military needs to be reshaped warrants a brief review of the current force's origins. In the immediate aftermath of the Cold War, we over-optimized our forces for conventional regional wars akin to Operation DESERT STORM, leaving them less prepared for protracted counterinsurgencies, global counterterrorism, and the expansion of warfare into new domains like cyber and space. We narrowly viewed the revolution in precision weaponry as benefiting the U.S. military, while failing to appreciate how other powers could leverage such capa-

bilities to achieve local air and sea denial, as well as build up missile strike forces to hold our theater bases at risk. We assumed a degree of conventional military overmatch that would last for many decades to come but that we now see is rapidly vanishing. And we have been too slow to walk away from overly rosy force planning assumptions that undergirded the shape of the post-Cold War force, including that:

- Wars would be short, conventional and intense;
- Operating conditions would be fairly permissive—we would have at the outset (or quickly achieve) air superiority, naval supremacy, information dominance, and land control;
- Munitions inventories could be smaller because a single precision-guided weapon could destroy a single target;
- Ground forces could rely more on air forces for assured air superiority and strike, and thereby shed their organic short-range air defenses and indirect fires;
- Combat aircraft could be based ashore close to a potential regional adversary and aircraft carriers could sail just off an enemy's coast;
- Enemy integrated air defense systems (IADS) could quickly defeated;
- Land and air combat forces could largely be based in the continental United States and then surge forward expeditionary-style to evict hostile invaders;
- An increasing share of the Navy's surface fleet could be dedicated to defending against ballistic missiles while sacrificing some of its offensive strike capabilities;
- The submarine force could be allowed to shrink because it would be less relevant in operations against regional states;
- Commercial "just-in-time" logistics could be leveraged to achieve cost savings and efficiencies;
- Communications networks would be assured;
- Space would be a sanctuary that could be exploited freely to gain tactical, operational and strategic advantages; and
- Nuclear weapons could be de-emphasized and replaced by conventional precision strike capabilities.

These assumptions have largely been invalidated by the realities we now face at the end of the post-Cold War era.

ADDRESSING A PANOPLY OF THREATS

Today, the United States faces major challenges to world order across three distinct geographic regions on the periphery of Eurasia—Europe, East Asia, and the Middle East. Testifying before this Committee last winter Dr. Henry Kissinger observed, "The United States has not faced a more diverse and complex array of crises since the end of the Second World War." In lieu of a single hegemonic threat as the Soviet Union posed during the Cold War, the United States now confronts a more complex panoply of threats. Great power revisionist states like Russia and China, nuclear outlaw states like North Korea, foes bent on sectarian war like Iran, and transnational Jihadist groups—all have adopted particular asymmetric strategies to circumvent traditional U.S. military strengths while imposing costs on the United States and its allies in ways that are difficult to counter. Smaller states and non-state actors have resorted to irregular warfare and terrorism. Larger powers are exploiting Gray Zone actions below the threshold of war, pursuing conventional precision strike systems to create anti-access / area denial battle networks, leveraging cyber warfare to hack U.S. systems, and modernizing their nuclear forces for escalation control.

For its part, the United States finds itself approaching these challenges with a narrower margin of military advantage but with far greater fiscal constraints, and a less unified set of allies and partners than it had during the Cold War or its immediate aftermath. The viability of America's traditional means of projecting military power abroad is waning, while its ability to check regional aggression by potential adversaries is limited. A survey of the three major theaters of concern to the United States demonstrates these deficiencies:

In Europe, Vladimir Putin's Russia is attempting to reestablish itself as a great power and restore its historic sphere of influence to the maximum extent over its "near abroad." To achieve this vision, the Chief of the Russian General Staff, Valery Gerasimov, has outlined what he calls "New Generation Warfare," blurring the distinctions between peace and war, while blending covert action, political and economic warfare, conventional military force, radio-electronic combat, and cyber warfare, as well as nuclear and other forms of strategic attack to prevail in full-spectrum conflicts and long-term great power competitions. It has fielded ground-launched cruise missiles in violation of the 1987 Intermediate Nuclear Forces (INF)

Treaty. Russia's particular style of confrontation, moreover, exploits the minority status of ethnic Russians in neighboring states as a pretext for undermining the sovereignty of those states while potentially providing sanctuary for Russian regional power projection (as already demonstrated in eastern Ukraine). Moscow has ordered large-scale snap exercises close to the Baltic states and Poland, flexing its muscles in the form of armor and rocket artillery, in sharp contrast with the paucity of comparable NATO forces on the territory of allied frontline states. Russia, moreover, has concluded some of these exercises with simulated tactical nuclear strikes on NATO cities. The Russian military has steadily modernized both its strategic and tactical nuclear forces and adopted a doctrine that envisages the early use of tactical nuclear weapons to "escalate to deescalate" and thereby prevail in local wars, exploiting favorable asymmetries in interest, geographic proximity and time. Beyond its nuclear forces, Russia is also expanding its other options for strategic attacks on the United States ranging from political warfare and active measures, to cyber warfare, to attacks on America's undersea infrastructure and offensive space control operations.

In East Asia, China's sustained economic growth has propelled a massive defense build-up of advanced conventional air, missile and naval capabilities for the past twenty years that dwarfs comparable efforts by Russia in all but its strategic nuclear force modernization. In turn, China's growing military strength has backstopped its diplomatic assertiveness over unilateral claims in the East and South China Seas. It has steadily expanded its air and sea denial capabilities while improving its ability to hold the small number of U.S. air and naval bases in the Far East at risk and thereby impede the ability to flow additional forces into the theater and force the United States to fight from range. China has built up a sizable inventory of mobile-launched, precision-guided, intermediate- and medium-range conventional ballistic missile forces, advanced air combat and naval strike forces, as well as integrated network and electronic warfare capabilities it believes are needed to prevail in a short, unrestricted local war against a distant, "informationized" enemy like the United States. Underneath the aegis of its "anti-access/area denial" shield, it can employ non- and paramilitary forces, including its fishing fleet and coast guard, to expand its maritime presence in the East and South China Seas, while constructing and militarizing reefs with artificial land features in the latter. Finally, China has achieved a credible second-strike nuclear deterrent and recently tested an intercontinental range ballistic missile dispensing multiple independently targeted warheads.

While North Korea is by no means a great power, it nevertheless presents an acute threat to the United States and its proximate neighbors—particularly, but not limited to, our close allies Japan and South Korea—through its pursuit of increasingly survivable intermediate- and intercontinental-range ballistic missiles, coupled with the continued expansion of its nuclear weapons inventory. North Korea represents the most salient case where deterrence may not hold, given the erratic behavior of its ruler, Kim Jong Un. North Korean leaders may believe that if they were able to demonstrate a credible capability to mate and deliver a nuclear warhead with an intercontinental ballistic missile, that they could attack South Korea or Japan with impunity while deterring the United States from intervening for fear of nuclear strikes against the U.S. homeland.

In the Middle East, the United States is confronted not so much by a great power hegemonic threat as by the prospect of further disorder and disintegration as the longstanding political order melts down. As a latent nuclear (albeit not a classic great) power Iran poses the greatest military threat to U.S. interests in the region. It has improved its ability to wage unconventional warfare and support proxy conflicts throughout the region, for example by using the Quds Force and its Lebanon-based surrogate Hezbollah in the Syrian conflict. It is building up advanced deep strike missile forces, aerial drones and other unmanned strike systems, as well as anti-ship weapons. And Iran has the potential to breakout from international monitoring efforts and acquire a nuclear weapon within a few years. At the same time, Jihadist organizations like Al Qaeda and the quasi-state of ISIL present very different sorts of threats, coupling hybrid warfare (unconventional uses of advanced weaponry) with terrorism. The nuclear and unconventional threats posed by Iran on the one hand, and the insurgent and terrorist threats posed by al Qaeda and ISIL on the other, will present the United States with counter-proliferation and counter-terrorism challenges for many years to come.

Together, these challenges suggest the United States is entering a new strategic era characterized by the return of great power competitions overlaid on a map where regional nuclear dangers and the persistent threat posed by violent transnational Jihadist movements are already prominent terrain features. These can no longer be considered future challenges, and we can no longer afford to defer

efforts to reshape the U.S. military to address them. Similarly, there is no single approach or strategy that can effectively address all of these challenges. Instead, as the Chairman McCain noted in Restoring American Power, the Department of Defense will need to fashion regionally tailored strategies and force packages, suited to the unique requirements of these different challenges and the military capabilities required to address them.

RESHAPING THE MILITARY FOR A NEW STRATEGIC ERA

Addressing these threats effectively will require a new high-low mix of capabilities. On the "low" side, the key attributes will be reduced procurement and sustainment costs and the ability to field large numbers of weapons and platforms for steady-state operations in relatively permissive environments. Many of our legacy forces and capabilities already fit this bill. For instance, we have built up a large fleet of non-stealthy remotely piloted vehicles over the past decade that will continue to have utility in many areas of the world where enemy air defense threats are non-existent or rudimentary.

Conventional deterrence of great powers like Russia and China, however, will necessitate reshaping a large portion of our forces to ensure they can deploy, operate and be sustained in far less permissive operating environments than they have faced since the end of the Cold War. Force planning for the high-end should assume that: (1) forces will operate in denied communications environments; (2) space will be contested; 3) neither our forward bases nor our homeland will be sanctuaries; (4) adversaries will be able to deny us the degree of local air and sea control to which we have grown accustomed; (5) only the most survivable aircraft and munitions will be able to penetrate and conduct surveillance and strikes over hostile territory ringed with advanced air defenses; (6) large surface combatants will be at risk near a hostile coast; and (6) large land formations will run far greater risks entering contested theaters in crisis or after a war has begun.

Consistent with these assumptions, the high-end force can be divided into two basic elements: highly survivable and lethal regionally-tailored forces to counter local power projection by potential adversaries, and a globally fungible surveillance and strike "swing force" that can operate from long ranges to penetrate denied areas and hold at risk large numbers of hostile military forces and other targets with conventional, nuclear, or non-kinetic weapons.

Regionally-tailored forces in Europe and Asia would place a premium on permanently stationed ground forces because it may be too risky to deploy them in crisis or time of war or they may be too slow arriving to make a difference. Rather than serving simply as local "tripwire" forces as in the Cold War, U.S. ground forces working side-by-side local allied forces should be far more capable of repelling invading forces by dominating the land approaches, denying hostile forces aircover, holding enemy ships at risk, and preventing an enemy's effective use of the electro-magnetic spectrum. Unmanned ground vehicles would be particularly useful for a forward-stationed force in Europe as they would increase the lethality of the force while helping to minimize the risks to Soldiers in close proximity to numerically superior enemy strike forces. Given Russia's ability to overrun the small Baltic states in a matter of hours, the United States should give serious consideration to the permanent forward stationing of several multi-domain combat brigades on the territory of the Baltic states. These forces should be armed with multi-mission missile launchers to conduct air defense, counter-battery, deep strike, electronic warfare and anti-ship strikes armed with a deep magazine of various munitions to repel military attacks or incursions against the frontline NATO states. Similarly, Special Forces should be stationed in the Baltics and Poland to work with local territorial defense militias, training, advising, assisting them in resistance tactics and air-ground integration employing short-range precision-guided mortars, artillery and rocket systems to hold at risk invading or occupying foreign forces.

The United States should also reconsider long-standing arms control conventions such as the INF Treaty, which proscribes land-based missiles with ranges between 500–5,500km. INF-class missiles could play a greater role in maintaining regional military balances in the coming years, particularly given that Russia is already violating the treaty while China, North Korea and Iran are building up sizable arsenals of missiles with those ranges. Allowing the U.S. Army to re-enter the long-range strike enterprise would be a game changer in great power competitions and greatly complicate the calculations of potential adversaries.

At the same time, the globally fungible long-range surveillance and strike element of the force will need to emphasize air and naval platforms as well as munitions with the ability to: respond rapidly to threats globally while operating from long-range with large sensor and weapons payloads; penetrate into denied areas; evade

detection and persist to strike elusive targets; conduct electronic and cyber attacks; and sustain with minimal theater basing or logistical support.

For combat air forces, unmanned long-range penetrating surveillance and strike aircraft could help the U.S. military operate more effectively in the face of growing threats China could pose to close-in airbases. Similarly, sea-based surveillance and strike aircraft will need to operate from beyond the reach of enemy anti-ship sensor and strike capabilities, be capable of aerial refueling at the outer edge of an enemy's own maximum fighter range, and be sufficiently survivable to penetrate sophisticated air defenses in order to locate and strike mobile fleeting targets in coastal areas, including enemy air defenses. Given the demands of endurance, high-end combat air forces should be unmanned.

A greater proportion of naval high-end standoff strike capability will need to migrate undersea to perform close-in missions in contested maritime areas. Submarines and unmanned underwater vehicles, which are among the most fungible elements of the Joint Force, may also take on new cross-domain missions such as suppressing enemy air defenses, holding high-value aircraft at risk, and disrupting an enemy's long-range sensors to "open" a theater for other naval and joint forces. At the same time, 100+ ton displacement unmanned underwater vehicles could complement manned submarines to achieve a more distributed undersea surveillance and strike constellation and perform riskier combat missions. Puncturing enemy-imposed air and sea denial areas may also place a greater premium on cyber warfare and electro-magnetic operations conducted by naval and amphibious forces to create a multitude of false target apparitions that overwhelm the processing capabilities of enemy sensor nets.

The U.S. military's space posture, which by its nature is inherently fungible, will also need to be modernized to support regionally tailored forces and global surveillance and strike with strategic early warning; persistent and resilient surveillance; and protected long-haul communications systems. In turn, this will necessitate exploration of innovative low-cost means of accessing space, disaggregating some sensor systems to improve their resiliency, and fielding larger constellations of smaller satellites to more frequently revisit and survey targets.

A key metric for munitions in the past several decades has been the probability of kill, which was largely a function of precision. Confronting enemies possessing advanced air defenses, future munitions will need a higher probability of arrival at the target, which will be a function of their survivability and/or return to larger, massed raid salvos that can saturate enemy air defenses. New classes of weapons—including cooperative weapons systems that can swarm targets, longer-range air-to-air munitions that out-range those of enemy fighters, survivable standoff nuclear and conventional cruise missiles, hypersonic weapons, and high-power microwave cruise missiles—will be needed to strengthen the effectiveness of the global surveillance and strike component of the force.

As Russia, China and Iran seek to circumvent or avoid traditional U.S. military conventional strength, they are turning increasingly to the use of Gray Zone active measures short of armed conflict, influence operations and covert action, propaganda and disinformation, as well as financial or economic warfare to achieve their own strategic aims. The United States will need to take account of such threats and devise both military and non-military means for deterring or defeating them. Special operations forces (SOF) will have a critical role to play. As they pivot from the counter-terrorism missions of the past decade, SOF will need to expand their capacity for special warfare missions including unconventional warfare, foreign internal defense, psychological warfare, and train/advise/assist.

Renewed great power rivalries—alongside continued global Jihadism and the disintegration of the Middle East—also suggest that strategic competitions will be highly protracted in character. And in the remote case of potential conflict with China, the possibility that combat that could stretch for many months or years means that we must have: (1) far deeper munitions magazines at the ready long before war begins; (2) a greater margin for attrition in our land, air, and naval combat systems than we have since the end of the Cold War; (3) far more robust combat logistics forces capable to sustaining our forces under attack for many months; and (4) well-defended, "warm" production lines for weapons systems in our defense industrial base. In particular, stockpiling munitions and conducting exercises that demonstrate American preparedness for protracted warfare may strengthen deterrence by reducing an adversary's calculation that it could win quickly or at low cost.

Finally, the range of potential strategic attacks that could be conducted against the U.S. homeland, its space constellation, or its undersea infrastructure, particularly through the increasing employment of cyber or electro-magnetic attacks, is increasing. Major strategic challengers all have at least some capability to affect U.S. homeland security. Russia and China, in particular, are pursuing capabilities in less

mature domains like cyber, the electro-magnetic spectrum, space and undersea. To address these threats, the United States will need to reshape its forces to ensure a range of new defensive and offensive measures. The Department of Defense should ensure, above all, that its nuclear command, control and communications are safeguarded during peacetime, crisis or war and that the credibility of America's most devastating military response options are beyond question. The Pentagon will also have to consider how to conduct new missions, such as the defense of its undersea infrastructure or the protection of its land-based space launch and ground segment infrastructure as it reshapes the U.S. military.

CONCLUSION

Reshaping the U.S. military should be treated as an urgent matter. Increasing the size of our legacy force—even at the highest state of readiness—will simply be inadequate to meet the military challenges we face across Europe, Asia and the Middle East, and will squander previous resources in the process. Now is the time to make the transition and begin to reshape a portion of our military so that we can effectively deter or prevail across a range of competitions and conflicts over the next several decades.

Chairman MCCAIN. Mr. Donnelly?

STATEMENT OF THOMAS M. DONNELLY, RESIDENT FELLOW AND CO–DIRECTOR OF THE MARILYN WARE CENTER FOR SECURITY STUDIES, AMERICAN ENTERPRISE INSTITUTE FOR PUBLIC POLICY RESEARCH

Mr. DONNELLY. Thank you, Mr. Chairman, and to the rest of the members of the committee for the opportunity share my thoughts with you.

My role here is a little bit to be troglodyte knuckle-dragger, and I am happy to play that part. I do not really know any other, so I am going to focus less on technological capabilities, although when photon torpedoes are invented, I hope we are the first people to field them.

I think also that I have a certain sense of deja vu, going back to the end of the Cold War, in that our failure is less that we have not adequately responded to the technological tactical or operational challenges that we face, but that we have sort of failed to define our strategic purposes in the world, although Jim Thomas? testimony began to, I think, head in the right direction.

We have certainly behaved since 1945 as though our principal strategic interest was the balance of power across Eurasia, a favorable balance of power in those three theaters that Jim talked about.

However, we have fallen into the habit of defining wars by types rather than by particulars, by the location, by the adversaries, and again by our own definition of what success would be. Especially lately, we have gotten into the habit of substituting the idea of strategic agility for strategic sustainment. In other words, we have withdrawn from the posture that we had through the end of the Cold War, beginning with the withdrawal from the Philippines in the late 1980s, almost 30 years ago, and the process more or less has continued uninterrupted since then.

What we see today is less the development of stunning new capabilities on the part of our adversaries and potential adversaries, but the fact that they can operate without coming into contact with U.S. Forces. To put it simply enough, when we are not there, the "axis of weevils," as Walter Russell Mead has called them, burrow into the woodwork and make a lot of mischief.

Finally, my testimony as written is shaped by a sense of urgency about this. The United States has thought that we have been in a strategic pause since the end of the Cold War, and now we see what the results of that attitude have led to.

Therefore, I am more interested in figuring out what we can do in the near term with the forces we have to reverse the geopolitical tide that seems so desperate just from reading the headlines every day. I have four suggestions, things that can be invested in within not only this fiscal year but over the course of a future years defense budget and can return significant benefits within the period.

First of all, forward-positioning forces is the single most important reform that we could make. Again, not being there is a recipe for mischief, and the actions especially of the Russians and the Chinese reflect an absence of American presence much more than their own really innovative capabilities. They are using technologies that we invented or others invented 20 years ago, but simply using them against less capable people who are our allies and our friends but without the backstop of American forces.

Secondly, we could get a lot more from the force that we already have by fully funding readiness accounts. We just recently did a series of naval deployment games in addition to quantifying what the difference of forward-basing would be. It is also pretty clear that we could improve our readiness models. Since the end of the Cold War, we have gotten into a rotation model of readiness. The consequence is, particularly when forces return from the deployment, they almost immediately begin to degrade at a precipitant rate. They are not really available to be redeployed. The investments that we have made, both in readying them in the first place and then deploying them, dissipate remarkably quickly.

My final two recommendations are basically subsets of the readiness one. Again, one of my recent projects has been to understand how the next brigade that will deploy the European Readiness Initiative that is based at Fort Riley in Kansas is preparing itself for that rotation.

Putting it simply, the biggest problem they have is personnel readiness. Because the force is too small, they are unable to sustain small unit or large unit cohesion over the course of time. It is often the case that, again, even sort of at the company level and below and even at the crew level and below, cohesion and teamwork get broken up incredibly rapidly, the result being that even at the small unit level, infantry company commanders will only have, say, a quarter to a third of their Bradley systems fully manned and mobilized, and they will not have any dismounts whatsoever across the company.

Related to this is the dangerously low level of munitions stocks. Tomahawk cruise missiles are probably the paradigmatic example of this. These get cross-leveled. As ships come, the ships go into repair, but the missiles go into other ships, which are going back out to sea. That is just simply, again, an example of the kinds of things that are being done simply to sustain day-in/day-out patrolling and presence even at the diminished rate we are at.

I think there are things that can be done in the near term while we are waiting to field new and more capable and more technologically advanced systems, but we still have a lot of capability left

within the force that we have. If we use it more efficiently, more effectively, and fully fund— make sure that the platforms that we have were completely up to speed, we could get a lot more mileage out of the old jalopy that we have got.

Thank you.

[The prepared statement of Mr. Donnelly follows:]

PREPARED STATEMENT BY THOMAS DONNELLY

MAKING SENSE OF AMERICA'S BALANCE-OF-POWER INTERESTS

The post-Cold War era has been a confounding period for the United States military and for the country as a whole. The collapse of the Soviet empire, an entirely unforeseen event, seemed at first to create a "unipolar moment," a self-sustaining Pax Americana. This "end" to history begat a holiday from history. Now history is having its revenge. The impulse to "make America great again" is a reflection of our anxieties as much as our aspirations.

These varying assessments of our geopolitical power directly reflect attitudes about the strength of the military; "unipolarity" was grounded in the primacy of United States military forces demonstrated in the 1991 Persian Gulf War, and our current feeling of decline stems from the frustrations of the Iraq and Afghanistan conflicts. As President Trump put it: "We don't win wars, we just fight, we just fight. It's like . . . you're vomiting: just fight, fight, fight."

Having struggled with the costs—in blood, in treasure, and in domestic political support and leadership attention—of these long-running irregular contests, we now find ourselves also facing deficits in the conventional realm, which we have so long taken for granted. The Joint Chiefs of Staff fret over China's ability to target our surface Navy, over the range advantages of the Russian Army's artillery, and over the difficulty our aircraft face in penetrating modern air defenses everywhere. These are real and growing concerns.

However, my greatest fear stems less from our ability to meet the technological, tactical, or operational challenges of the times but from three more fundamental but repeated failures of the last generation. First, the reluctance of political leaders to define their purposes in traditional geopolitical terms; second, the U.S. defense community's propensity to define wars as types—"great-power conventional conflict," for example—rather than in particular—"deterring Russian aggression and influence in Eastern Europe;" and third, the faith in "strategic agility" in place of strategic persistence. To prevail over our most threatening competitors, we must define victory, be attuned to the particular strategic circumstances that define the contest, and ready ourselves for the long haul.

THE PURPOSE OF AMERICAN POWER

Defining victory demands clear-eyed self-knowledge, something that is often difficult for Americans trained to look to the future and dismiss the past. But the roots of American strategy-making predate our republic. Since the mid-16th century, English-speaking peoples have sought to defend the "liberties" of the international system against the prospect of a "Universal Monarchy," that is, the would-be hegemons of Eurasia: the houses of Hapsburg and Bourbon, German "Reichs," Russian and Soviet tsars, and Japan's emperors. In the 20th century, the standard in this struggle to preserve a favorable great-power balance passed from Great Britain to the United States. Even as we have imagined ourselves as benevolent, commercial, maritime "offshore balancers," our actions have betrayed our rhetoric: the Eurasian great-power balance has been our principal geostrategic concern.

The logic in these deeply ingrained habits of strategy is powerful. As John Donne, as deep a politician as he was a poet, wrote:

No man is an island entire of itself;
every man is a piece of the continent, a part of the main;

This is to say that our "exceptional" experiment in self-government is inseparable from the nature of government elsewhere in the world and in particular in those parts of Eurasia where power, wealth, and great geopolitical ambitions lie. The bell tolls for us in 2017 as it did for Donne in 1624; the Stuart regime's attempts to absent itself through the 17th century from the continent's great-power conflicts, the Thirty Years' War and the wars of Louis XIV, twice cost them their crowns and lost Charles I his head on the chopping block. Any government in Washington that simi-

larly fails to secure Eurasia's "liberties" against the assaults of 21st-century absolutists will lose not only international respect but also domestic legitimacy.

What does it mean to be "a part of the main" today? It means we must formulate an effective response to the challenge that China, Russia, and Iran pose to the balance of power across Eurasia. Walter Russell Mead has dubbed this trio the "Axis of Weevils," a phrase as apt as it is clever. The first order of business for China, Russia, and Iran is to undermine the American global order. Each pursues military designs meant to confound United States influence in their "near abroad" and then establish regional spheres of influence. Even their principal "strategic" systems—their nuclear weaponry—are intended as a deterrent. None of these three powers is a proximate challenge to or substitute for U.S. primacy on the global commons of the seas, the skies, in space, or in cyberspace. Thus the Weevils' principal investments have been in "anti-access" and "area-denial" forces and systems, although more recently these have been balanced with a growing capacity for power projection; having had substantial local successes in rolling back the tide of the United States and its allies, the Weevils are increasingly leaning forward.

It will be very difficult to make the military changes necessary until we can be clear and precise about the geopolitical outcome we wish to achieve. "Everything in war is simple," wrote Clausewitz, "but the simplest things are difficult." Over the past generation, American military planners have suffered from a great deal of self-induced "friction" stemming not from our inability to understand our enemies but from our inability to understand ourselves.

WARS IN PARTICULAR VERSUS WAR IN GENERAL

One of the distinguishing and consistent features of the many U.S. defense reviews conducted since the end of the Cold War has been a desire to define wars by type rather than in particular. This began with the 1993 Bottom-Up Review (BUR), which measured the requirements of the post-Cold War armed forces by their ability to conduct two "major regional conflicts" at the same time. Although the review rested, at least in part, on detailed analyses of the Gulf War and studies of what a renewed conflict on the Korean peninsula might be like, the purpose of the effort was to distill various common "phases" of generic military "campaigns" that would be "employed" in a contest against "Country X." The universal model clearly was derived from the Gulf War experience; the four phases of any campaign would be to "halt the invasion," then "build up U.S. combat power in the theater while reducing the enemy's," culminating in a "decisive defeat [of] the enemy," and "providing for post-war stability." With some recent modifications and much debate about "Phase Zero operations," this basic structure remains more or less intact as the American model of campaigning.

The review also acknowledged that the United States might employ military power in other ways and for other missions—for "smaller-scale conflicts or crises" of short duration, "overseas presence" patrols, and deterrence, both nuclear and for other "weapons of mass destruction." However, these were assessed as "lesser, included cases" for force-sizing, posturing and defense budgeting purposes in the belief that a military capable of fighting two nearly-simultaneous regional conflicts could handle anything else that might come its way.

Two final distinguishing features of the Bottom-Up Review were that it took the post-Cold War to be a "new era," defined not by the enduring interests of the United States but by the collapse of the Soviet Union and, relatedly, that it looked warily outward for signs of new threats rather than new opportunities to secure interests.

In these significant ways—seeking a typology of possible conflict, placing faith in the unprecedented novelty of international competition, and measuring the challenge by dangers rather than enduring geopolitical goals—subsequent Quadrennial Defense Reviews and other official studies have been, essentially, footnotes to the BUR.

This method has had a powerful grip on American defense planning. However, it ought to be plain by now that it has been powerfully problematic. That is not because its analyses have failed to predict events accurately or that they were insufficiently detailed; the reams of possible-future studies produced across the U.S. intelligence community and the detailed campaign modeling churned out by the Pentagon and federally-funded think-tanks represent immense effort. But this approach has deprived our adversaries of their particular qualities, strengths, and weaknesses. In a profound way, we've been looking through the wrong end of the telescope to define the many things that might lead to defeat rather than to chart a path to victory.

If the United States is to respond successfully to the emerging challenges to its Eurasian interests, it must first define what constitutes success in the three prin-

cipal arenas of competition. In Europe and East Asia, for all the troubles of recent decades, a favorable overall balance of power persists: our alliances are fundamentally sound, our force presence remains and could be augmented, and our ability to project additional force is considerable. Deterrence—a relatively low-cost strategy—is a practicable posture. Alas, and particularly with the precipitate reduction in presence of recent years, there is no stable "status quo" to preserve in the Middle East; the weevils are on the loose and eating everything in sight. To achieve our traditional strategic aims, it will be necessary to compel change, to reverse the course of current events.

SHOWING UP IS 80 PERCENT

One of Woody Allen's most famous quips was that "eighty percent of success is just showing up." The same applies to sustaining the life of the liberal international order. When the United States doesn't show up or goes home, things begin to unravel.

Alas, U.S. military presence in critical regions is, increasingly, American absence. Beginning with the withdrawal from the Philippines in the early 1990s, the global "footprint" of United States Forces has been steadily shrinking. Perversely, we have come to imagine this as a virtue: the model of "campaigning" enshrined in the Bottom-Up Review was one that emphasized rapid response rather than continuous presence. In contrast to the patrol-the-frontiers-of-freedom approach of the Cold War—even, as in West Berlin, where the tactical situation was all but untenable—U.S. Armed Forces have increasingly withdrawn from forward garrisons and sought "strategic" deployments from bases in the continental United States. This approach has had mounting consequences: rather than being in position to check rising revisionists, we have ceded them the initiative and, with diminished overall forces, been slow to respond and lacking in the capacity to tend to multiple contingencies.

Belatedly, the Obama Administration appeared to recognize this. The European Reassurance Initiative, one would hope, represents a form of repentance for and reversal of the drawdown that has opened an opportunity to Vladimir Putin to begin to overturn the result of the Cold War. But rotational forces—not only American troops but also those of NATO allies in the Baltic States—cannot supply the day-in, day-out deterrence that the alliance's exposed eastern flank demands. Further, current plans do little to cover alliance commitments in southeastern Europe, where Russian bribery and "political warfare" have helped to bring truculent and nationalist leaders and parties to the fore.

The situation in the South China Sea is similar. In the face of the administration's much-protested "Pacific Pivot," Chinese irregular and, increasingly, regular forces have dredged their way across the sea, island-making rather than island-hopping. Not only have we withdrawn from the business of long-term basing, but an overstretched Navy—whose principal task has been to maintain a robust presence in the Persian Gulf and Arabian Sea to offset the lack of land-based forces—also lacks the assets to interpose itself between China and the ASEAN states it tries to intimidate. Philippine President Rodrigo Duterte is a mercurial man, but his periodic pronouncements about American weakness and Chinese strength reflect, at the least, the region's nightmares.

Alongside these mounting worries in Europe and East Asia, the policy of "ending" America's wars in the Middle East has led to a precipitate collapse of what little order there was, although, in retrospect, the situation in 2009 stands as a high-water mark of American influence in the region, the very-hard earned result of efforts made not only since 2001 but since 1979 as well to stabilize an inherently volatile region. From a traditional American strategic perspective, the return of Russia and the ascent of Iran from the Levant to the Hindu Kush is a catastrophe of epochal proportions. Damascus, Baghdad, and Beirut, three of the great capitals of the Arab world, are essentially satrapies to Tehran. Iran's rise was aided immeasurably by Russia's willingness to deploy a few thousand troops and a few dozen aircraft; in the vacuum left by United States withdrawal, a little went a long way. The change has unnerved our remaining traditional allies and partners in Riyadh, Cairo, Tel Aviv, and, especially, Istanbul; if there is to be a near-term settlement to the horrific conflict in Syria, America will have little to say about it.

As a post-script on presence, it is worth asking whether we have made the most of the promised partnership with India. This was supposedly a priority of both the second Bush and the Obama presidencies; the expectation that the Indian Ocean and the surrounding littoral might someday become a fourth critical Eurasian "theater" was sound, and it would only be prudent to anticipate such a development—if only because the Chinese are headed in that direction. Although this is more a

failure-to-advance opportunity missed than a tangible retreat, the region's weight in the Eurasian balance of power can only increase.

RECOMMENDATIONS

What, then, is to be done?

To begin with, the new administration ought to bring a greater sense of urgency to restoring a favorable Eurasian balance. It has been a commonplace argument that the post-Cold War period was not only a time of "strategic pause" but also an era of rapid technological change, and that the United States could afford and might even benefit from a time-out, awaiting developments and positioning itself as a "second mover." Even if that were once true, the contradictions of "leading from behind" and superpower passivity have been increasingly apparent. Dreaming of a "transformation" of military forces or waiting further to "offset" adversaries initiatives is to reinforce geostrategic failure. Therefore we must work with what we have, immediately improve and increase what we can in the near-term, and selectively develop new capabilities that can be fielded within a foreseeable future. Photon torpedoes, warp drives, and cloaking devices would be cool; once they're invented, we should build them. In the meantime, we must:

- *Forward-position forces.* No other single defense reform would pay a bigger or more rapid return on defense investment than negotiating a return of forces based or home-ported closer to the zones of contention. Though this is an obvious measure of efficiency, it is even a greater measure of effectiveness in reassuring and mobilizing alliance partners. Advancing to patrol the new frontiers in Eastern Europe—the line from the Baltic to the Black Sea—and Southeast Asia is critical to reestablishing a credible deterrent. But the same is true in the Middle East, although the task will be much harder; we cannot expect to much influence, let alone reverse, the terrible trend of events from over the horizon or "offshore."
- *Fully fund force readiness accounts.* The force we now have could be made significantly more effective if a "sustained readiness" model were implemented to replace the "just-in-time" rotational model of the last 15 years. We have imagined that deployments can be made eternally predictable and created a system whereby units are brought to adequate levels of manning, equipment, and training just before they are sent into harm's way. Then, immediately on their return to home station—and mostly to save money—the people are dispersed to new assignments or schools, the equipment sent to the depot for "reset," and tactical proficiency and teamwork thereby lost. No matter the emergency, within a matter of weeks it makes little sense to attempt to redeploy these forces; they've lost their edge.
- *Increase personnel strength.* The most crippling factor in force readiness is personnel instability and shortages. These factors are intertwined. The current personnel system was designed at the height of the Cold War, when deployments and missions were relatively constant, end-strength levels much higher, and service raise-train-and-equip institutions much more robust. Over the course of an extended career, this system produced a force of incredible tactical competence—its ability simply to operate helped immeasurably to make up for the strategic errors of recent decades. Personnel reductions have diminished both unit stability and cohesion as well as the services' ability to produce the needed raw human and intellectual capital.
- *Increase munitions stocks and spares.* Material readiness and force deployment capacity are most limited by sparse stocks of precision-guided munitions—Tomahawk land-attack cruise missiles are the poster children for what is now a widespread dilemma—and spare parts—even the smallest units have taken to cannibalizing some systems to field others; there is hardly a hangar, a dock, or a motor pool in every service that does not have a "cann bird" or two.

I will conclude my testimony here. I cannot convince myself that many other defense investments—with perhaps, the expansion of F–35 purchases or deciding not to mothball modernized *Ticonderoga*-class cruisers—would have a substantial and timely effect upon the degenerating balance of power in the critical regions of Eurasia. The immediate need is for restored capacity, not innovative capabilities. The Weevils have gotten into the woodwork, and it's time to call the exterminator, not the architect.

Chairman MCCAIN. Mr. Clark?

STATEMENT OF BRYAN CLARK, SENIOR FELLOW, CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

Mr. CLARK. Chairman McCain, Ranking Member Reed, and distinguished members of the committee, thanks for inviting us to testify on this important subject today. I am honored to be here with my colleagues and former bosses. Hopefully I do not embarrass them too much.

I believe we all agree that we need to reshape and grow the military. One thing we will have to think about as we do that is the fact that it will take at least a decade for us to get down the road of building up a bigger fleet and a bigger Air Force and getting more ground forces and developing new capabilities.

We already see that great powers like Russia and China are likely to be big players, and that is only going to get worse as we go a decade down the road. We are not going to be able to necessarily consider the Islamic State as the most important threat to deal with. Great powers in that time frame are likely to be the most important factor in our force planning.

That has some significant implications for how we need to structure and posture the force in the future. In particular, the objectives of countries like China and Russia are relatively close at hand, when you think about Russia wanting to go into the Baltics potentially. They certainly have gone into Ukraine. Look at China looking at potentially trying to coerce Taiwan into submission or to attack the Senkakus and take them from Japan. Those are all objectives that can be gained within a very short period of time by those countries. The so-called anti-access/area denial capabilities or the long-range missiles and surveillance systems they have would enable them to slow down a U.S. and allied response enough to where they could achieve those objectives and be done before we arrive. Now the United States and its allies look like the aggressor that is trying to change the status quo. When you think about what happened in Crimea, if we were to try to overturn the results of the Crimea invasion, we would look like we are trying to change the facts on the ground as opposed to coming to the aid of an ally or a partner.

What that means is that in the future, we are not going to be able to take the same model we took with Iraq and Afghanistan where we let something happen, aggression occurs, bad things occur, we try to come back in after the fact and overturn that aggression and change the status quo maybe and change the regime of the adversary that started the aggression. We are going to have to prevent those things from happening in the first place, otherwise our alliances are going to begin to fray, our security assurances will not have the value that they need in order to sustain alliances that we rely on.

We are going to have to think about deterring rather than trying to come in after the fact and overturn the results of aggression. That has some significant implications when you think about the capabilities of great powers like Russia and China. There are three main things that I would advocate that we really consider and take a hard look at, which my colleagues have talked about.

First of all, a much more robust overseas presence or posture. Not just putting forces out there for the purpose of creating a faster

response time, but putting forces out there for the purpose of denying or defeating aggression when it occurs. When you think about the Cold War, we were worried about Soviet forces coming across the Fulda Gap, coming into Japan across the Kamchatka Peninsula, relatively fast operations that required us to be there to be able to stop it rather than come in after the fact and try to recover. That is where we are going to have to go in the future, is manage that much more robust presence with greater forward-basing and forward-stationing of forces.

But we are going to have to reshape the military to give it the capabilities to survive in these kinds of environments and conduct the offensive operations necessary to defeat aggression so we can demonstrate to adversaries that we are going to be able to stop them. That is the heart of deterrence really.

I think growing the military to allow it to sustain this more robust overseas posture, while affording it sufficient time for training and maintenance between deployments—our readiness crisis of today is a function both of not putting enough money into readiness necessarily, but it is mostly a function of not having the time to do the training and maintenance between deployments because the force is not large enough for the demands we are placing on it today.

Some specific things with regard to those three elements. In terms of posture, not just increasing the presence of forces but making sure they are tailored with the capabilities necessary to deal with the threats and opportunities of that environment. Today we deploy forces more or less on a one-size-fits-all basis. It is the same kind of unit, whether it goes to Europe or it goes to Asia or it goes to the Middle East with some minor tailoring. We are going to have to re-equip those forces and they are going to be much different between regions because what Russia cares about in the Baltics is much different than what Russia might care about and be able to do in the Mediterranean, the same with China in the South China Sea versus the East China Sea. We need to think about tailoring the forces much more.

Some of these changes will be counterintuitive to address the particular challenges that a great power might provide to us. For example, we might have to rely on naval forces to a greater degree in Europe to help address a Russian challenge in the face of NATO being unable to respond quickly and therefore NATO forces and our own ground forces in NATO not being able to respond to a Russian aggression in the Baltics.

So really, ground forces in the Pacific might be necessary to be able to provide us the ability to hinder Chinese power projection beyond the first island chain of the Philippines and Japan.

As Dave talked about, we need to improve our basing, but we also need to improve the ability of our bases to defend themselves, shifting to shorter- and medium-range air defenses like he discussed.

The increased use of forward-stationing where we have equipment and ships or aircraft that remain forward and rotationally send crews out there to man them. That is a model that the Navy and other forces have used somewhat and we used a little bit in the Cold War, but it is a model that might enable us to more

affordably increase the posture overseas without necessarily having to grow the number of people in the force dramatically.

In terms of reshaping, we are going to have to think about making the force able to survive in these highly contested environments at the onset of conflict and do two main things: to deliver high-volume missile-based fires very quickly on short notice with very little warning. For example, you think about a Russian aggression in the Baltics. It could be done in 2 or 3 days, so you got to be able to mount a very strong defense with something that is going to give you a lot of fire power very quickly. A lot of that is going to be missile-based, so you think about surface-to-surface missiles the Army has, missiles that the Navy and Air Force have. That is the kind of fire power that is going to be necessary for that very short period at the beginning of hostilities, followed by some moderate volume but sustained combat that might have to occur for a very long time in order to demonstrate to the adversary that the U.S. is able to carry on the fight for the long haul.

We are going to need new operating concepts that allow the force to survive and conduct these kinds of high-volume initial and then moderate-volume follow-on operations. Increasing the capacity of air and missile defenses by shifting to shorter ranges and using capabilities like IFPC or other short-range air defenses, being much better at electronic and electromagnetic spectrum warfare, being able to find the enemy without ourselves being counter-detected, being able to deny the ability to communicate with themselves and conduct networked operations, and going back to some of the old Cold War techniques of concealment and cover and deception where we might have to rely on physical decoys to deal with the growing prevalence of electro-optical and infrared sensors, ground force multi-domain fires, like the Army is working on right now, to contribute to strike and anti-ship warfare from the ground, and then as you talked about, Mr. Chairman, undersea warfare. We are going to have to look at shifting to unmanned systems to carry a larger number of undersea missions as our own submarine force shrinks but also dealing with the fact that our adversaries are mounting more capable anti-submarine warfare efforts of their own.

Reshaping the force is going to require reform in how we acquire military systems and how we build strategy to define the priorities for those systems.

The last priority in terms of growing the military, again, we need to address the size of the military because of the current readiness shortfall, which is a symptom of not having sufficient forces to do training and maintenance between deployments.

But growing the military is also going to require some changes and reform of the Department to eliminate excess organizations and excess personnel and infrastructure that currently are going to constrain the ability of the military to grow itself to the size needed to sustain its readiness.

I think we can accomplish these changes over the next decade, but it is going to require a strategy and the leadership to follow it.

I am looking forward to your questions, and thank you very much.

[The prepared statement of Mr. Clark follows:]

PREPARED STATEMENT BY BRYAN CLARK

Chairman McCain, Ranking Member Reed, thank you for inviting me to testify today on this important and timely subject. The United States is at an inflection point in its national security. After enjoying almost three decades of military superiority, the United States now faces competitors with strategies and capabilities that could circumvent, undermine, or defeat the defense posture and forces of America and its allies. In some regions and mission areas, the U.S. Military is already behind those of its potential adversaries. If we fail to reshape our military and implement new ways to deter aggression, respond to provocation, suppress terrorism and insurgency, and protect the homeland, we risk the security assurances upon which our alliances are based and, with them, the security and economic health of the United States.

I applaud Senator McCain's recent white paper, "Sustaining American Power," which recognized the loss of U.S. Military overmatch. The paper's recommendations to rebuild U.S. Forces would significantly improve America's ability to counter the efforts of its competitors and adversaries.

EMERGING CHALLENGES

The Department of Defense (DOD) describes five major adversaries it must address: China, Russia, Iran, North Korea, and violent Islamic extremists.[1] Today, DOD's level of effort indicates it considers terrorism its most important challenge. Thousands of U.S. troops are fighting the Islamic State in Iraq and Syria; a carrier strike group and dozens of aircraft ashore are conducting air strikes against Islamic State and Al Qaeda targets; and U.S. strike and special operations have expanded into Somalia, Yemen, and Libya.

Although terrorism and violent extremism will continue to threaten the United States, the importance of challenges from great powers such as China and Russia will likely increase over the next decade as they further modernize their militaries. Of greatest concern, both countries now deploy networks of long-range sensors and precision weapons able to threaten military forces in the air, on the sea, or on the ground hundreds of miles from their territory. These networks could enable Russia or China to delay or prevent intervention by the United States and its allies long enough to conduct a rapid attack or invasion against nearby targets like Taiwan for China or the Baltic states for Russia. After such an act of great power aggression, the United States and other allies will need to either accept the result and subsequent collapse of American security alliances or counterattack and risk triggering a great power conflict that could have potentially catastrophic consequences.

The sophisticated capabilities being fielded by Russia and China are also proliferating to regional powers such as Iran and North Korea, giving them the ability to threaten their neighbors and delay intervention by U.S. forces. Moreover, these adversaries can exploit geographic advantages, such as Iran's proximity to the Strait of Hormuz and North Korea's location near Japan and China, to quickly conduct an attack that could greatly impact the global economy and lives of millions of people.

RETURN TO AN OLD STRATEGY

During the Cold War, America and its allies deterred Soviet aggression by posturing conventional forces where they could defeat or delay a Soviet offensive and relying on nuclear weapons as a backstop in the event conventional forces failed. Since the Cold War, however, America's approach to aggression has been to mount a response after the fact, such as in Iraq, Afghanistan, or Kosovo. Conventional deterrence was achieved by the presence of some U.S. forces in the region that would signal America's resolve and act as the leading edge of an eventual counterattack.

The mere presence of United States Forces and the threat of response were enough to deter aggression by regional powers such as Iran or North Korea, who did not yet have the capabilities to rapidly achieve their objectives or to defend themselves from eventual U.S. and allied retaliation. This approach won't be enough in the future to deter great powers such as China and Russia or regional powers with improved defensive capabilities. Moreover, because the targets of their aggression are close and achievable within days, U.S. attempts to reverse the results of

[1] Chairman of the U.S. Joint Chiefs of Staff, Military Strategy of the United States of America 2015, U.S. Department of Defense, 2015, p. 1–2, available at: *http://www.jcs.mil/Portals/36/Documents/Publications/2015—National—Military—Strategy.pdf.*

the aggression after the fact-as the United States and its allies did in the first Gulf War-could potentially place America in the position of being the aggressor.

Nuclear deterrence may also be less useful in these scenarios than during the Cold War. Aggression by Russia against border regions of NATO allies in Eastern Europe or by China against Japan's Senkaku Islands may not be perceived as existential threats that warrant a United States nuclear response. United States threats to use nuclear weapons in those cases may not be credible to Russian or Chinese leaders.

Instead of simply threatening to respond to aggression after the fact, the United States will need to deter an attack before it occurs or defeat it promptly using conventional military forces. U.S. and allied intervention that delays aggression may also be successful at eventually stopping aggression if it enables the economic and diplomatic costs of the aggression to mount to unacceptable levels. As in the Cold War, this approach will require forces and capabilities in proximity to the aggressor's territory or objectives so they can interdict an offensive or punish the aggressor by promptly attacking targets of value to compel the aggression to stop.

American military forces will need to adopt a new posture that places them near potential adversaries and their targets—areas that are likely to be highly contested in wartime by the long-range surveillance and weapons systems these countries have been putting in place over the last two decades. Deterrence will, therefore, rely on new operational concepts and capabilities that enable ships, aircraft, ground units, and their bases to survive and conduct offensive operations in these highly-contested areas long enough for them to stop aggression and punish the aggressor. These operational concepts and capabilities should be the focus of efforts to reshape the U.S. military over the next decade.

NEW OPERATIONAL CONCEPTS

New technologies could improve the lethality of U.S. Forces and their ability to defend themselves in highly contested areas. But technologies alone will not enable U.S. Forces to deter, deny, or delay aggression, or operate effectively in range of long-range enemy weapons. New technologies must be incorporated into operational concepts for U.S. Forces to integrate new and existing systems and fully exploit the new capabilities technology can bring.

The improvement and proliferation of adversary military systems and new technologies for precision weapons, sensors, and autonomy are prompting a series of shifts in warfare that should be reflected by new U.S. operational concepts. DOD is beginning to pursue some of these concepts and supporting technologies, but slowly and only by small portions of the force. They will need to be incorporated more broadly across the U.S. Military to enable it to compete effectively with the militaries of other great powers and regional adversaries. The most important areas for DOD to address in reshaping the force are air and missile defense, electromagnetic spectrum (EMS) warfare, strike and surface warfare, land warfare, and undersea warfare.

Air and Missile Defense

Air and missile defense is arguably the most important area for new operational concepts. Each of the most important adversaries identified by DOD relies to a large degree on precision-guided weapons to level the playing field between their relatively less proficient forces and highly-trained and prepared U.S. operators. In some cases, these competitors have built up large inventories of precision-guided missiles and rockets that could overwhelm the current defenses used by U.S. Forces, which mostly rely on expensive interceptor missiles to physically destroy incoming weapons.

New directed energy technologies could significantly increase the air defense capacity of U.S. Forces. Lasers can damage the external structure or seeker of an incoming missile and high-power radiofrequency (RF) transmitters can damage its internal electronics; because they use energy instead of physical interceptors, their capacity is only constrained by electrical power and cooling. Both technologies are now mature enough to be incorporated into U.S. Forces.

Directed energy weapons will not always work against all threats, however. Some missiles have hardened shells that can resist lasers or lack apertures for high-power RF signals to penetrate. "Hard-kill" weapons that physically destroy missiles will still be needed in those cases. Hypervelocity projectiles that travel at Mach 5 or greater could enable today's naval or ground artillery to damage or destroy attacking missiles, creating more air defense capacity. And new shorter-range interceptors such as the Army's LowerAD and AIM–9X used by the Indirect Fires Protection Capability (IFPC) launcher or the Navy's Rolling Airframe Missile (RAM) and Evolved

Sea Sparrow Missile (ESSM) can be less expensive and smaller than most current interceptors, enabling more to be carried in weapons magazines.

New energy weapons and interceptors, however, engage incoming missiles at 10–30 miles away, compared to larger and more expensive interceptors-such as Patriot Advanced Capability (PAC)-2, Terminal High Altitude Area Defense (THAAD), or the Navy's Standard Missiles-that can engage threats more than 100 miles away. U.S. Forces will need to adopt new operational concepts that engage air threats closer to the defended target to increase their capacity and enable them to shift to energy-based defenses with virtually infinite magazines.

Although new air defenses will not make U.S. Forces impervious to attack, they will increase the number of weapons an adversary will need to launch at ships, bases, or ground units to defeat them. If combined with new concepts for distributed operations and EMS warfare, improved air defense capacity could make individual targets too costly to defeat in detail.

EMS Warfare

Despite increases in air defense capacity, an enemy near his own territory may still be able to concentrate fires and overwhelm U.S. ships, aircraft, and ground units. Conducting large attacks, however, requires detecting and tracking the target to ensure it can be classified and its location determined with sufficient precision for the weapons to be used. Most sensors, except for undersea, rely on EMS-based technologies such as radar or passive signal reception.

U.S. Forces can confuse or deceive these sensors using new operational concepts and technologies for EMS warfare. U.S. Forces will need to improve their ability to jam and confuse active EMS sensors like radar by exploiting advances in cognitive and autonomous electronic warfare such as in the DARPA Adaptive Radar Countermeasures (ARC) program. These systems go beyond today's jammers that use preplanned techniques against recognized threat radars and instead develop new techniques that they employ iteratively against signals they may not be able to recognize, but whose characteristics can be classified as potential threats. To fully exploit the capability of new electronic warfare systems, U.S. operational concepts should employ large numbers of jammers and decoys like the Air Force's Miniature Air-Launched Decoy (MALD) across a force, networked together to create a false target picture in the EMS, as in the Office of Naval Research's Multi-Element Signatures Against Integrated Sensors (NEMESIS) program.

Passive sensors are an even greater challenge for U.S. Forces. They are hard to find and an adversary on its own territory can deploy large numbers of them with overlapping fields of view to improve their accuracy and range. An enemy can be expected to employ passive sensors to target U.S. radars and radios and attempt to jam them. To counter these efforts, new U.S. EMS warfare concepts will need to move away from relying on high-power active radars like the SPY–1 on Aegis ships or the APY–2 on Airborne Early Warning and Control (AWAC) aircraft.

Instead of active radars, U.S. Forces will need to rely on passive and low probability of interception or detection (LPI/LPD) sensors and communications that can circumvent enemy jamming. DOD is developing technologies to support these concepts, like new passive RF receivers in the E/A–18G Growler or F–35 Lightning II aircraft and communication systems such as the DARPA Collaborative Operations in Denied Environment (CODE) or Communications in Extreme Environments (COMMEx) programs.

Where DOD will need to make the most improvement, however, is in countering electro-optical (EO) and infrared (IR) sensors, which rely on the visual or heat signature of targets and therefore cannot be defeated simply by turning off radars and radios. Commercial EO/IR satellite imagery providers such as BlackSky and Planet Labs are proliferating while China and other countries are expanding their own government EO/IR satellite constellations.

U.S. operational concepts will need to return to old counter-surveillance approaches using obscurants, physical decoys, and camouflage to prevent classification and tracking by these sensors. Although they have improved dramatically in recent years, obscurants, decoys, and camouflage do not need to be perfect. They only need to make real targets and decoys indistinguishable from one another. An adversary must then decide whether to use enough weapons to destroy both potential targets, which further increases the number of weapons required, or risk choosing the wrong one.

Strike and Surface Warfare

In addition to simply surviving in a contested area, to deter, defeat, or delay aggression U.S. Forces must be able to attack the enemy at sea and on the ground. New concepts for EMS Warfare will improve the ability of U.S. Forces to find and

target the enemy while themselves not being effectively tracked. They must then exploit their targeting by conducting attacks rapidly and with sufficient capacity to overcome enemy air and missile defenses.

Like the United States, potential adversaries like China and Russia have been improving their defensive capacity in an effort to make attacks too costly except against the most important targets. U.S. Forces can gain an advantage in this "salvo competition" by increasing the size and survivability of their attack salvos. This requires using smaller strike weapons that can be carried in larger numbers by strike platforms and developing operational concepts or weapon features that improve their ability to evade defenses.

To exploit fleeting target information from passive and LPI/LPD sensors, U.S. Forces will need standoff missiles that can quickly engage targets throughout the sensor's field of view. Weapons platforms also should be distributed to increase the number of individual targets an enemy must attack and thus the number of weapons it will need to use to defeat U.S. Forces. Both these factors argue for long-range standoff weapons. Weapon range, however, will need to be balanced with weapon size because longer-range weapons are larger and reduce the number that can be carried in a ship, aircraft, or ground launcher. Previous CSBA studies found that strike weapons with ranges of 100–500 miles have enough standoff range to protect the launcher from counterattack and are small enough to fit on most air, ship, or ground launchers.

DOD's current weapons portfolio, unfortunately, consists almost entirely of direct attack weapons with less than 100 nm range that are useful in the permissive air environments of Iraq and Afghanistan. It has a small percentage of longer-range weapons, but they are generally too expensive to buy and employ in large salvos. DOD should accelerate development of less expensive weapons with ranges between 100 and 500 miles, such as the rocket-propelled Joint Standoff Attack Weapon (JSOW) and powered variants of the Small Diameter Bomb (SDB).

To improve weapons survivability, U.S. Forces can adopt new operational concepts that incorporate jammers or decoys into weapons themselves, or into missiles like the MALD that would fly with weapons salvos to the target. The DOD can also employ weapons such as hypersonic missiles that can fly at more than Mach 5 and are very difficult for air defense systems to detect and engage. Hypersonic weapons are in development under several programs and could include air-launched variants similar in cost to existing missiles like the Joint Air-to-Surface Standoff Missile (JASSM).

Land Warfare

Ground operations are likely to become increasingly specialized as adversaries grow more sophisticated and better able to exploit their local environments. In Eastern Europe, U.S. Forces must survive and conduct combined—arms combat against a multi-dimensional Russian force that, although relatively small, is more capable and adapted to that environment than are U.S. Forces. In the Middle East, ground units will continue to encounter irregular terrorist and insurgent forces that will require highly coordinated intelligence and special operations to address. And in the Pacific, long-range sensor and weapon networks and the archipelagic geography will place a premium on operations combining ground-based air defenses, surface-to-surface fires, and EMS Warfare capabilities.

After more than a decade focused on stabilization and counter-insurgency operations, the Army and Marine Corps are not prepared for these challenging scenarios. Even in the Middle East, U.S. ground forces will need to address improving threats from precision weapons, electronic warfare systems, and sensors. They will need to develop new operating concepts and capabilities, especially for EMS Warfare and surface-to-air and surface-to-surface fires.

To improve their survivability against enemies with improved sensors and precision weapons, ground forces will need to use more distributed formations and employ new operational concepts, as described above, for EMS Warfare and air defense. They will need to invest in more air defense systems like the IFPC, so each deployed unit can be equipped with them. The Army and Marine Corps will also need to field multi-function EMS warfare systems, including unmanned air and ground vehicles, to passively detect and track enemy transmissions, jam enemy radios and radars, and enable secure communications.

In addition to protecting maneuver forces on the ground, air defense and EMS warfare concepts and capabilities can also be used by ground forces to threaten enemy aircraft attempting to pass overhead. Similarly, ground-based surface-to-surface missile launchers such as the high-mobility artillery rocket system (HIMARS) could carry anti-ship versions of missiles like the MGM–140 Army Tactical Missile System (ATacMS) or M–31 Guided Multiple Rocket Launch System (GMLRS). To-

gether, these capabilities could enable concepts that turn the "First Island Chain" of Japan, Taiwan, and the Philippines into a barrier to hinder the projection of Chinese forces into the open ocean.

More distributed ground forces will need new approaches and systems for logistics and sustainment. Current Army and Marine Corps logistics capabilities are designed for more concentrated formations such as Brigade Combat Teams or Marine Expeditionary Units. They may not be able to support highly distributed formations down to the company level scattered across islands or in rough terrain and using large numbers of missiles and fuel for radars and EMS warfare systems. Unmanned vehicles like the Marine's K–Max aircraft or Army "Big Dog" ground vehicle may be needed to sustain forces in the field.

Undersea Warfare

As potential adversaries improved their ability to threaten U.S. ships, aircraft and ground units, the United States increased its reliance on submarines for surveillance, strike, and anti-ship operations near their coasts in wartime. This, in turn, is leading potential adversaries, particularly China, to deploy seabed sonar arrays and larger numbers of maritime patrol aircraft to challenge U.S. access undersea.

As undersea areas forward become more contested, the U.S. Navy should shift to using more unmanned vehicles and systems for surveillance missions currently conducted by submarines. Unmanned systems will likely also be able to conduct offensive operations such as mining, attacks on enemy warships, and strike missions. At the same time, submarines will need to move from being front-line tactical platforms, like fighter aircraft, to being operational-level command and control platforms, like aircraft carriers.

Against the growing number and capability of Russian and Chinese submarines, U.S. naval forces will not be able to continue today's anti-submarine warfare (ASW) approach that would track and try to destroy every enemy submarine. This effort would require time and platforms that are needed to counter adversary aggression. Instead, the United States should focus on suppressing, rather than destroying, enemy submarines. Using overt sensors like sonar and radar and harassing attacks, U.S. Forces could exploit the inherent limitations of submarines: They are relatively slow, especially when trying to remain stealthy; they have little self-defense capability; and have much less situational awareness than surface or air platforms. When attacked or counter-detected a submarine is therefore likely to evade, rather than standing and fighting as a surface warship might.

U.S. naval forces can best support these new ASW concepts by fielding active sensors such as low-frequency variable-depth sonars and periscope detection radars and inexpensive weapons such as the Compact Very Lightweight Torpedo (CVWLT). To cover large areas and reduce the vulnerability of manned platforms to counterattack, these sensors and weapons should be deployed by unmanned surface, undersea, and air vehicles. Further, combinations of active and passive sensors could be used by unmanned vehicles to conduct multistatic surveillance and targeting operations.

THE IMPORTANCE OF POSTURE AND CAPACITY

New technologies and operational concepts can only help deter, defeat, or delay aggression if U.S. Forces are positioned where they can use their new capabilities to interdict an enemy offensive. Russia could invade the Baltic States and China could devastate Taiwan before American forces coming from the continental United States or another theater would be able to intervene. Scenarios involving regional powers such as Iran closing the Strait of Hormuz or North Korea attacking South Korea similarly require a local response.

The United States must return to the more robust military posture that defined its Cold War-era force. Forward-based forces will need to be increased and joined by larger numbers of rotationally-deployed units from the United States, as well as forward stationed ships, aircraft, and equipment with rotational crews that deploy from the United States.

U.S. military posture will also need to be more tailored to enable new operating concepts and address the threats, adversaries, and opportunities present in each region. For example, the form aggression from Russia might take will be different in Eastern Europe compared to the Mediterranean; protecting objectives of Chinese aggression in the East China Sea will require different forces than those in the South China Sea. Today's military forces are usually not tailored to the specifics of their region, in the interest of promoting efficiency by reducing the number of training pipelines needed to prepare them and enabling the flexibility to deploy units to different regions over time. The elevation of efficiency over effectiveness will need to end if the United States hopes to deter great power aggression in the future.

A more robust U.S. military posture will translate into a larger and more diverse set of military units than today. For example, CSBA's recent fleet architecture study found the Navy should grow to more than 340 ships by the 2030s to address the future security environment, close to the Navy's subsequent assessment of 355 ships and about 20 percent larger than today's fleet. Similar increases would likely be needed in other parts of the joint force.

There is much discussion today about the urgent need to address readiness shortfalls in today's force before trying to grow its capacity. This is a false choice. Today's readiness crisis is a product of the U.S. military's lack of capacity and the increasing demands placed on it that are symptomatic of the emerging strategic environment. When more ships, aircraft, and personnel are deployed overseas from a shrinking force, each unit must deploy longer or more frequently. This reduces the time available for training and maintenance and eliminates flexibility in maintenance scheduling that could allow for unforeseen repairs. Although DOD has received increasing amounts of supplemental Overseas Contingency Operations (OCO) funding in the last five years to pay for more operations and maintenance, this funding cannot be accurately projected and is not efficiently used because of schedule changes and emergent work resulting from the high operational tempo being sustained by the smaller U.S. military.

CONCLUSION

America's military is the best in the world as an overall force but is already falling behind those of its competitors in some regions and missions. In Eastern Europe, U.S. ground forces lack the fires, surveillance and targeting, and electronic warfare capabilities to counter battle-hardened Russian forces fighting in Ukraine. In the Western Pacific, the U.S. Fleet has fewer ships than the Chinese Navy and faces a wide array of land-based counter-maritime capabilities. And in the Middle East, U.S. air forces are struggling to sustain an air war against the Islamic State, which lacks its own aircraft or long-range air defenses.

There is no quick fix to this situation, which resulted from almost two decades of decisions to prioritize efficiency and savings without reducing the demands placed on U.S. armed forces for peacekeeping, security, and stabilization operations. Reversing it and restoring our military will require a sustained effort to reshape it for the ways it will need to fight in the future and grow it to provide the posture and readiness it will require to remain forward. If we fail to do so, competitors will erode the security assurances and alliances that underpin America's position in the world and with it the economic and security benefits that position provides.

Chairman MCCAIN. Thank you very much.

Leaving out the issue of sequestration, which is a big leave-out, what would be your first two or three top priorities that this committee and this administration should address, beginning with you, Mr. Ochmanek?

Mr. OCHMANEK. Mr. Chairman, clearly we have unrealized potential in many of our platforms, and I think all of the other witnesses observed that as well. I believe the quickest way to fill that gap is to ramp up the production and procurement of advanced munitions, cruise missiles, guided weapons, things of that nature that can allow our forces from the outset of a campaign to deliver these high-volume fires that Bryan talked about. I think that would be number one for me.

Chairman MCCAIN. Mr. Thomas?

Mr. THOMAS. I absolutely agree. I would start with the munitions inventory and figuring out how we thicken our density of a whole range of munitions that we simply lack today. We have got this huge mismatch between the number of platforms we have and the weapons to deliver them and to persist in a lot of these fights.

The other thing I would add is getting on with the business of looking seriously at the issue of forward-stationing our forces. I think this has really been delayed. We have been in this expeditionary warfare mindset for 25 years, and I think that really needs

to be revisited because I think it is very dangerous for the world that we are going to be in for the next couple decades.

Chairman MCCAIN. Well, I also would give some credit to the previous administration for the European Reassurance Initiative on that issue.

Mr. Donnelly?

Mr. DONNELLY. I would agree with the two points brought up before. Again, I would add the need to add people to flesh out hollow units. We lose the investment. Even when the platforms are ready, the crews are not. If we could just have more people within the unit structures and within the institutional structures, the headquarters—I know this is like anathema, but there needs to be a training base to be able to produce trained and ready forces.

Chairman MCCAIN. Mr. Clark?

Mr. CLARK. I would say munitions, as we just discussed, but maybe even more importantly, the ability to passively sense the adversary and target the adversary. Today our potential adversaries know exactly where we operate with our radars and our other active sensors, and if we do not have the ability to find them passively without being detected ourselves, our weapons are not going to be that useful because we will be counter-detected.

Chairman MCCAIN. Well, we will begin with you with my other question, Mr. Clark. We have not talked in this conversation much about cyber, and that obviously the aspects of cyber have dominated our news and our priorities here for some time. What do you think we ought to be doing there?

Mr. CLARK. Clearly, we need to be refocusing ourselves on cyber defense of our own networks, particularly our classified networks. I think one challenge we are going to face is we are focused on our unclassified networks being a potential source of exploitation, particularly industrial networks where you can get information on acquisition systems. But we need to look at the defense of our classified networks where there has been a lot of work done by our potential adversaries on how to get into those systems as potentially a trusted user. Dealing with that would be a key factor I think that we have to deal with in cyber.

Chairman MCCAIN. How about developing a policy as to how to counter it, Mr. Donnelly?

Mr. DONNELLY. I would also add that we need to understand better what the impact of these things is at the tactical level. We have not operated in a contested electronic environment really since the end of the Cold War. It is more like old-style electronic warfare than it is cyber. Again, this brigade from Fort Riley in its National Training Center rotation is really going to be the first sort of tactical experiment because the opposing force at Fort Irwin will have Russian-style capabilities in the exercise. I think that will be a great learning experience for us to understand what these developments mean for actual people in the field operating in this kind of environment.

Mr. THOMAS. Mr. Chairman, we have been talking about cyber for more than 20 years, and everyone thinks that they do cyber to a certain extent if you look across the services. The reality is no one is singularly focused on it as a mission the way we focus on the air domain or the undersea or the land domain. I think it is

time to reconsider do we need a single organization which focuses on organizing, training, and equipping for cyber warfare. I would start there.

Chairman MCCAIN. Cyber Command is not doing that?

Mr. THOMAS. I think Cyber is taking component efforts from the services, but it is playing the role of a combatant commander in terms of how it thinks about fighting the force. But I think we are not doing as well as we could be doing when it comes to just basically recruiting, organizing, and training those forces. In particular, I think about the role of the Reserve component, which could be a huge advantage for the United States in how we approach cyber warfare in the years ahead.

We also need to fully integrate cyber into our war plans today. Oftentimes it is treated as an annex and special technical operations, and it is not fully appreciated by our operational commanders.

The last is I think we need to move beyond the ghettoizing of cyber and we need to fully integrate it with electromagnetic warfare—electronic warfare as we move forward. These two are just integrally related.

Mr. OCHMANEK. Very quickly, I would endorse what Bryan said about the importance of cyber defense, that is the threat to the integrity of our command and control systems. But I want to take a page out of Tom Donnelly's book and be the troglodyte here.

Cyber is sometimes invoked by people as a magic wand they can pass over things to make up for gaps in kinetic capabilities. I am skeptical about that. We do not have a lot of ability to test the efficacy of our cyber tools, to the extent we have them, nor do we know how long they will last if they are in fact in place. So at some level, there is no substitute for putting holes in things and breaking them.

Chairman MCCAIN. Senator Reed?

Senator REED. Well, thank you, Mr. Chairman.

This has been very insightful and I appreciate it very much.

We all talked about priorities, but in reality, they are competing priorities. We would all like to do them all and we would all like to resource them robustly. But when push comes to shove, it is going to be the competition between these priorities.

The three key ones I think that have been mentioned by the panel—one is the readiness of the existing force today. Second is growing that force with comparable readiness, and then the third is the new technologies, the third offset, the leap ahead, the investing in something that today does not appear to be of immediate consequence but could be the changing system.

Starting with Mr. Ochmanek, just kind of your response to how do we deal with those competing priorities. Do we emphasize immediately one and then shift? Or do we concentrate on the one that is going to be neglected and that might be the new technology? And so your comments and then right down the line.

Mr. OCHMANEK. Senator Reed, could I respectively take a little bit of issue with your third priority? I do not think I would equate modernization of the force with third offset and exotic technologies. I think there are some very near-term mature things that we can invest in quickly like munitions that we have already tested to

really get a rapid return on that investment in terms of improved power projection capability.

I would hope that this Nation could find the will and the resources to, at the same time, bring our troops and units the training and readiness they need and accelerate this modernization program, again buying into near-term munitions, sensor systems, forward posture, putting another heavy brigade in Europe. These are not high-tech, high-cost, exotic things. I think you would get some very quick strategic returns on those kinds of things.

Senator REED. Mr. Thomas, please.

Mr. THOMAS. For a long time, we have drawn this line between near-term readiness and long-term readiness, and maybe our adversaries are doing a favor because those really now are almost one and the same. The problems we are talking about here, whether it is great-power competitions dealing with Russia and China or dealing with nuclear powers and potential nuclear powers like North Korea and Iran or dealing with the continued global jihadist threat—these are all with us today and they are going to be with us for quite some time. We do not have the luxury of just saying here is what we can do about Russia and China 10 or 15 years from now. As Bryan Clark said, I mean, a lot of the scenarios we think about are scenarios that could happen tonight. These really are not that futuristic.

I think it is a question of balance between what are the near-term steps, as Dave Ochmanek is talking about, in terms of building up our munitions inventories, forward-stationing, and these sorts of steps that we could take immediately, as well as skating to the puck of the future in terms of what are we going to need as the threats continue to evolve 10 years hence. Ee have to do both of those things more or less simultaneously.

Senator REED. Mr. Donnelly, please.

Mr. DONNELLY. I would basically agree with what has been said by Dave and Jim. A dollar spent today is probably worth $5 or more programmed 5 or 10 years from now. There are some exciting technologies. We have also failed to buy really anything new in numbers for 2 decades. We have very few choices about what we could throw money at.

Again, I think there are some things we could do differently, particularly with platforms like the F–35B, that again would give us capabilities that we do not necessarily have on station at the moment but could really use. I believe, Senator Reed, you are the one who said the future is now and that is pretty much true.

Senator REED. Thank you.

Mr. Clark?

Mr. CLARK. To restore the readiness of the force, even down the road just a few years, we are going to have to reduce the amount of operations we do today. There is no other way to reset the force because we cannot build a bunch of new force today. One choice we are going to have to make is reduce the operations we do and the stress we put on the force today to enable it to get the readiness it might need in 5 or 10 years. That is the only way we are going to be able to reset it.

I think in terms of technology and new systems, as Dave was saying, there are a lot of new technologies that are currently being

demonstrated, tested, prototyped. They are just not transitioning. They are just sitting waiting for somebody to take them on and say I am going to put you onto my platform and begin to use you as a system. Examples of this might be IFPC, like Dave was saying, which could really improve our air defense capabilities. Active protection systems for tanks and other armored vehicles. We do not have active protection systems on our ground vehicles today, and every other NATO country does. Those systems are available and could be strapped on, bolted onto our existing systems.

Munitions, electronic warfare, sensors. There are a lot of systems that we currently are just waiting to bring on board and we could incorporate those into the existing fleet or force.

Senator REED. Mr. Clark, just quickly because my time has run out. These systems are out there. Our NATO allies, who we generally consider to be sort of less advanced or progressive, have them. Why do we not have them? Is it a budget issue or is it a cultural issue? What is it?

Mr. CLARK. To some degree a cultural issue. When you do not think you are going to have to fight in an environment where you are going to be faced with people shooting high-end weapons at you all the time, then you tend not to invest in those things. And now that we are faced with a situation where all of our forces are going to be in contested environments against high-tech weapons, they are going to have to start thinking about how to defend themselves.

Senator REED. Thank you.

Thank you, Mr. Chairman.

Chairman MCCAIN. Senator Inhofe?

Senator INHOFE. Thank you, Mr. Chairman.

I think it is important just to get in the record because of this very distinguished panel that we are in a threatened position today in this country and times have changed from the past.

We had a hearing—I chair the Readiness Subcommittee—last week. We had the vice chiefs come in. It was a pretty sobering experience there. They made their testimony such as General Allen said we have had most of our modernization programs on life support for the last several years. Currently our modernization is 50 percent of what it was in 2009.

It was General Wilson, and this is a quote. He said at the very bottom what we called the hollow force of the 1970s, pilots were flying 15 sorties a month, about 20 hours. Today we are flying less hours, less sorties than we did in the 1970s. He was saying essentially we have a hollow force today. We have to recognize that.

The first question I would ask you probably in anticipation of this, you read some of the statements that were made by the four vice chiefs. If so, do you agree pretty much with them?

Mr. OCHMANEK. Senator Inhofe, I do agree. Some of this is probably unavoidable as a result of 15 years of heavy use of the force and ongoing operations. Some of it is certainly related to budget constraints that have been placed on the force by the Budget Control Act. But we absolutely do need to get our men and women in uniform and our units the training and resources they need to be at their peak level of readiness.

Senator INHOFE. Thank you very much.

The rest of you, do you generally agree with them?

Mr. CLARK. Yes, sir, Senator.

One thing I would add, though, is part of the reason we had this readiness problem is we do not have the time for the forces to train and maintain between deployments. The other part is the budget uncertainty, not so much the lack of money overall. It is the fact you cannot plan your maintenance in advance and then budget to it and carrying it out. As a result, you have to do maintenance on an emergent basis or it is insufficiently planned, which causes growth. It increases the cost, and then you do less work in the end.

Senator INHOFE. Yes, but of course, if you are in a period, as we have been, of starving the military, the first thing that goes is maintenance and then modernization because that is less visible out there.

Now, you, Mr. Clark, mentioned just a minute ago—yes, it was you that said it would take at least a decade preparing right now for what we are going to try to have for the future to face these threats that are coming. I think, Mr. Thomas, you also made reference to taking a decade.

It reminds me a little bit of my last year on the House Armed Services Committee before I came to the Senate. We had someone testify—this is 1994—that in 10 years we would no longer need ground troops. It kind of puts us in a situation. If it is going to be 10 years, what do we prepare for today? That is a problem.

Now, the one agreement—and I think it is very significant that we get this in the record from the four of you. You have already done it I think in your opening statements and in your responses—is you are looking very much at forward-deployment. I think we all agree that that is necessary.

We remember also—it was back in the 1990s during the Clinton administration—the emphasis was the other way. In our political system, something you folks do not have to deal with but we do, people, when they start talking about going through a BRAC round just say, fine, just do not do it here at home. Do it overseas. Well, that is what happened.

I remember when Vincenza was under attack. That was in Italy, and it was one of them that was going to be reduced down in the process of the BRAC round.

Now, we all remember what happened when we were trying to get troops into Iraq and we were not able to take them on the ground through Turkey, and so Vincenza came through. Well, if that had been bad weather at that time, we could not have done it, so we went in. It was very difficult to do, but we rebuilt in Aviano the capability of sending these kids in no matter what the weather conditions and all that.

I am saying I agree wholeheartedly. I disagreed back in the 1990s when the reverse was true. I would like to have each one of you make a comment as to the necessity for the forward-deployment, anything you have not already said so it will be in the record, starting with you.

Mr. OCHMANEK. Senator Inhofe, our alliance relationships and the integrity of those security commitments that we give to our allies are the bedrock of our national security strategy. If we are going to influence events in Eurasia, which have the potential to directly affect the security and wellbeing of Americans, it is impor-

tant that those security alliances be viable. Forward-stationed U.S. Forces are both a tangible demonstration of the U.S.'s will and ability to defend common interests abroad, and they are the advance lead elements of our initial defensive operations. I absolutely agree that forward-stationed forces are essential to the viability of our strategy and that we are under-postured certainly in Europe and to some degree in the western Pacific as well to meet the challenge.

Senator INHOFE. My time has expired. Do the rest of you generally agree with that statement? Thank you very much.

Thank you, Mr. Chairman.

Chairman MCCAIN. Senator Warren?

Senator WARREN. Thank you, Mr. Chairman.

Thank you to the witnesses for lending your expertise here today.

You know, when I look at what is happening, it seems to me that right now our potential adversaries are more interested in challenging us through cheap and asymmetric means, whether that is through cyber activities, the use of local agents, separatists, paramilitary forces, as we have seen in Ukraine and other places. All the ships and all the aircraft in the world cannot solve that challenge. In fact, our adversaries pursue alternative means to achieve their ends precisely because we have always had such dominance in the air and sea.

To start, I would like to focus on one of these asymmetric threats. Mr. Clark, what capabilities do we need in the cyber realm specifically to deter asymmetric actions that fall short of open conflict?

Mr. CLARK. The first thing, Senator, would be to have a cyber policy that clearly defines what our actions are going to be in the event of an attack and clearly defining what it is that we mean by attack. This might involve being a little bit more open with things that we now treat as classified and do not want people to hear about. Just like in other areas of warfare, we are going to have to be more open about it.

Senator WARREN. That is very helpful. Thank you.

Do you believe that future conflict with a sophisticated adversary will involve attempts to exploit our cyber vulnerabilities, disrupt our reliance on space, or distort our ability to communicate and share information rapidly?

Mr. CLARK. Certainly, yes, Senator. Also, it is going to involve electronic warfare where they do not just use the wired Internet but also use the radio frequency spectrum to affect our ability to conduct the kinds of operations we are used to.

Senator WARREN. What kinds of investments should we be making in order to prepare for this kind of contingency?

Mr. CLARK. The focus should be maybe on the ability of our forward forces to be able to operate in an environment where they are going to lose a lot of the long-range communications that they today are used to having. So line-of-sight communications, more resilient communications that are jam-resistant. There are technologies out there. DARPA has a lot of programs that are building these. They are very successful. It is sort of amazing how well that they are able to protect communications. You just have to accept

the fact that you are going to be down to a much shorter-range set of operations than you are used to.

Senator WARREN. I think that is very helpful, and I appreciate that.

We have heard a lot today about conventional equipment, but I think that these new domains may well be decisive in any future conflict and we should be putting a lot of attention on them.

We have also heard a lot today about the size of the force, and I just want to take a minute to ask another question about the focus on its future capability. The Department recently briefed this committee on its third offset strategy and advanced technology, and while it all sounds very promising, the fact is many of these technologies that they are talking about are still in development.

So given that that is the reality, what priority should we give to maintaining or increasing the size of the RDT&E budget in fiscal year 2018 so that the investments are in place to support the Department's third offset and other offsets and efforts like the ones that you all have described in your testimony? Mr. Clark?

Mr. CLARK. I would say we need to increase the RDT&E budget not just to bring on some of the far future technologies but to transition some of the ones that have been developed. We have a lot of really effective technologies that have been demonstrated that I have seen but just have not been transitioned into the force because they have not made that last set of testing or that last set of transition developments that are enabled to be plugged into an existing platform.

Senator WARREN. Well, let me actually just hone in on that a little bit more. As you point out, we may be 10 to 20 years away from some of these technologies like autonomy before they are fully mature. Are there other more achievable near-term technologies that we should be investing in right now to put us on the right path?

Mr. CLARK. Electronic warfare systems I think would be a key area and undersea warfare systems. Autonomy undersea is very hard because of sensor capabilities, and so the other place I would look at investing is in sensor capabilities to enable an autonomous system to better see where it is going. I mean, the problem we have with autonomous systems in a lot of cases today is they do not have a good enough sense of their environment to make a good decision. They can be really smart, but they cannot see what they are doing.

Senator WARREN. It is very helpful. I see lots of nodding heads. I will put this in as a question for the record so I can get everyone's views on this.

You know, I think we should be budgeting our defense resources based on 21st century threats. I want us to invest smartly not simply rolling out more of the last century's equipment off the production line, but instead focusing our investment on the next generation and even leap-ahead technologies that are more likely to ensure our military's superiority across multiple domains.

Thank you very much.

Thank you, Mr. Chair.

Chairman MCCAIN. Senator Cotton?

Senator COTTON. Thank you, Mr. Chairman.

Thank you, gentlemen, for your testimony today. A lot of the talk today has focused on three buckets, about which we frequently speak: end strength or how many troops we have; readiness, how those troops are trained, ready to fight; and modernization, buying new stuff for the future, new vehicles, new aircraft. We have not yet touched on a subset of that third bucket, nuclear modernization, some of which is both nuclear conventional like the F–35 or the B–21, some of which is exclusively nuclear like the ground-based strategic deterrent or the nuclear command and control system.

Could we just maybe start at my left, your right, and go down the panel and get your thoughts on nuclear modernization? Mr. Ochmanek?

Mr. OCHMANEK. Senator Cotton, I think the Nation at this point does not have a choice but to modernize its strategic nuclear forces simply because of the block obsolescence of our major platforms and weapon systems. Nuclear weapons remain the bedrock of our security. We must have a viable deterrent. We must have a viable second strike capability so that no adversary ever could see an advantage to crossing that threshold and using nuclear weapons against us. I think the *Ohio* replacement program rightly has first place in line both because of the age of the Ohio ships and also because I personally believe that the undersea portion of our nuclear triad is the bedrock of that survivable second strike force.

Senator COTTON. Mr. Thomas?

Mr. THOMAS. I would just add to that and say we need to be paying closer attention to our tactical nuclear forces and the tactical nuclear balance. The most likely nuclear confrontation we are going to have is going to be a theater range tactical contingency, and this is one that I think we have largely given—we have been inattentive to over the past 25 years. For example, in the case of Europe, we know that Russia is in violation of the INF Treaty. They are developing medium-range both cruise and ballistic missile systems that could hold NATO military targets at risk. I think we should question the ability of fourth generation fighters armed with gravity bombs, B–61's, to respond in the presence of precision air defenses that would likely ring almost any militarily significant target. We need to have viable theater-range, lower-yield response options than we currently do.

Senator COTTON. Before we move on, I have got to follow up on that. What is your best estimate on the imbalance today between Russia and NATO forces on tactical nuclear weapons?

Mr. THOMAS. Well, there is obviously a numerical asymmetry that favors Russia. I would say more importantly is the qualitative asymmetry. In terms of these middle rungs on the escalatory ladder, I think Russia has the advantage, and we need symmetrical, in-kind response options that we lack. We talk a lot about LRSO and that is a viable option. There may be other systems more similar to JASSM, which allow us some low observable standoff capability with a very high probability of the weapon arriving at the target that we are going to need to consider in the years ahead.

Senator COTTON. You mentioned Russian violations of the Intermediate-Range Nuclear Forces Treaty. If media reports are to be believed and Russia has now not just tested but put into oper-

ational use a road mobile cruise missile of intermediate range, does that mean that the United States is the only Nation on the face of the earth that has restrained itself from such a missile?

Mr. THOMAS. I do not know if it is the only Nation on the face of the earth, but if you think about the robust arsenal of intermediate-range ballistic missiles that China has built up, the IRBM capabilities of North Korea and Iran, and now Russia in flagrant violation of the INF Treaty, the United States is kind of the last party standing. We look sort of like a chump in this class of problems. This is an area where we need to probably be thinking about a world beyond the INF Treaty both because that may be the world that becomes our reality, but also if we want to go back and try to reinforce the INF Treaty, we have to have some viable military backstop for any sort of negotiations. Right now we would be negotiating from a position of technological weakness.

Senator COTTON. Thank you.

Mr. Donnelly?

Mr. DONNELLY. I would agree again with what Dave and Jim have said, but Jim's point I think is a larger one than he suggested. That is, we have a strategy deficit when it comes to nuclear warfighting. I hate to use that terrible term. We have a world that is increasingly a multipolar nuclear world. There was a report yesterday that the Chinese have allegedly reached parity both qualitatively and quantitatively with the U.S. nuclear arsenal. I have no idea whether that is actually true or not, but if it is not true today, it will be true tomorrow or pretty soon.

So we think in Cold War very tit for tat terms. I am not sure what the new paradigm should be, but I am pretty sure that the old one is inappropriate to the world that we are living in now.

Senator COTTON. Mr. Clark?

Mr. CLARK. I would agree with the comments of all my predecessors here, particularly with regard to the tactical nuclear weapon question because if we do not have the ability to respond to that kind of threat, it is not so much that we might have an exchange there, but it is just the fact that we are vulnerable to coercion then. The Russians threaten the Baltics. We threaten to come in on their behalf. The Russians threaten a small nuclear attack, and we do not have any way to respond to that, so we are forced to back down.

Senator COTTON. Thank you.

Chairman MCCAIN. Senator Hirono?

Senator HIRONO. Thank you, Mr. Chairman.

All of you have identified a number of countries in the Asia-Pacific region as threats, and you additionally identified the prepositioning of U.S. Forces as a key strategy in the proposed reshaping of the military.

Relative to what is in place in Pacific Command right now, what additional assets and capabilities would you recommend placing in the Asia-Pacific theater? We can start with Mr. Ochmanek.

Mr. OCHMANEK. Senator, I would start by ensuring that the bases and facilities that we rely on in that theater have what they need to defend themselves in the case of attack. As I mentioned in my remarks, there are some fairly rudimentary things we can do. Putting gravel out there to fill holes in runways, building inexpen-

sive shelters so that our airplanes are not exposed to observation and attack, moving those airplanes around more frequently would go a long way toward bolstering our deterrent posture in that region.

Going beyond that, these deficits we see in capabilities across the board for standoff weapons and munitions, for sensors that can survive in a contested environment, those sorts of things. As we begin fielding more of those capabilities, the Asia-Pacific region should have perhaps first claim on those as they reach the force.

Senator HIRONO. Do we need more submarines in the area?

Mr. OCHMANEK. I think that submarines can make very important contributions. Every combatant commander but particularly the commander of PACOM would like to have more submarines.

Senator HIRONO. If the rest of the panel pretty much agrees, if you have something to add, please do so, otherwise I can go to my next question.

Mr. DONNELLY. I have a couple of things. First of all, we need to be more forward, particularly in Southeast Asia and the South China Sea. It is very unfortunate that President Duterte is not only an erratic personality but seems very interested in at least balancing American influence with Chinese influence.

Secondly, you need to think about the theater more broadly speaking. We are treating it now only as a maritime theater. China is principally a continental power and its most traditional strategic vulnerabilities have been from Southeast Asia and also from Central Asia. This is a case where a continental power is going to sea and projecting power, and we are doing nothing to divert its attention back to its most traditional and the things that make the Chinese most neuralgic.

Mr. CLARK. I would add that we need to increase the forward posture of surface naval forces, as well as submarines, because that is maybe a more visible deterrent to Chinese aggression, at least over next 5 or 10 years.

Australia is a place we need to be putting investment with regard to infrastructure and expeditionary basing in the northern part of Australia. In our wargaming, we find a lot of times that Australia ends up being the sustainment point for a lot of United States Forces that would be operating in the South China Sea.

Senator HIRONO. Well, right now, we have rotational forces in Australia. But what about Guam then to what you are seeing?

Mr. CLARK. We already rely on Guam, but what happens in some of these games is that Guam ends up supporting operations in the East China Sea and we end up having to rely on Australia to a greater degree to provide the fuel and the back office logistics, if you will, for the force that is in the South China Sea.

Senator HIRONO. Do we not have some concerns about Australia's willingness to have our ongoing presence there?

Mr. CLARK. Not necessarily. I was in Australia a month ago and talking with the government officials there. They are very supportive of a U.S. presence and using the—they call them expeditionary bases in northern Australia to a greater degree than we do today.

Senator HIRONO. Thank you.

Our reliance on special forces—the U.S. has relied very heavily on special operations forces over the past decade and a half, and they have been very successful in many missions, including anti-terror operations. There is speculation that President Trump could rely even more on these forces that, some would argue, have been overused and in need of better dwell ratios.

What are your thoughts on the role of special operations in the future? Anyone?

Mr. THOMAS. Well, I would just comment and say I think the role of special operations is going to continue to expand. We have already taken steps over the last decade to grow our special operations forces. They can only grow at a certain pace, and we are limited in terms of recruitment and the training pipeline. It will always be a very limited, highly valued asset.

But as we think about great power competitions, I think that the special warfare role of the special operations forces is going to increase; that is, think about unconventional warfare, training our allied and partner forces in resistance techniques, helping them to assert more effective local defenses in the event of an invasion or even low-intensity gray zone activity in those countries. They will also have a much greater role to play in some of the missions Dave Ochmanek was talking about earlier, in things like disrupting the sensor grid of an opponent early in a campaign. But direct action and special reconnaissance roles for special operations forces in high-intensity conflicts I think is also an area that will increase.

Senator HIRONO. Do the rest of you agree? Very briefly.

Mr. DONNELLY. I disagree pretty strongly. We have grown our SOF. They have done remarkable things over the last 15 years, but they have had no discernable strategic effect from my point of view. I think that is in the nature of special warfare. It is very difficult to achieve a large-scale effect by raids and things like that. I think it has diverted our attention from things that are more strategically critical.

Senator HIRONO. Thank you very much, Mr. Chairman.

Chairman MCCAIN. Senator Ernst?

Senator ERNST. Thank you all very much for your testimony today.

I chair the Emerging Threats and Capabilities Subcommittee. Yesterday I held our first briefing and focused on Russia's increasing anti-access/area denial capabilities in Europe. The current problem set that is posed by Russia right now is expanding placement of their air defense systems, surface-to-surface missiles, and coastal defense weapons. All of this is not just concerning to me. It is concerning to a lot of folks out there.

My concern is compounded by Russia's aggressive actions. We see it every day on the news, not just with their naval vessels, but their ground forces as well.

Mr. Ochmanek, you argue that a significant portion of the capability gap we face on NATO's eastern flank can be addressed today through appropriate U.S. Force structure changes. Could you explain a little more about that, and really, what is the most immediate need that you would see to counter the rising threat that we see from Russia?

Mr. OCHMANEK. Senator Ernst, in our gaming, we found that there is sort of a critical threshold of about three heavy brigades that need to be present to actually give the defending forces the ability to effectively slow down an advancing Russian attack on the Baltic States. So positioning that kind of asset, along with artillery forces forward, would make a big effect on deterrence.

But there is a capability dimension to this as well, and you mentioned the Russian air defenses. Since the end of the Cold War, the Russians have deployed whole new generations of surface-to-air missile systems. These are longer-range systems than we ever encountered before, very powerful radars, very capable electronics. We are still shooting at them a weapon that was developed in the 1970s, and it is out-ranged by the things it is shooting at. So we are asking pilots to go into situations to suppress SAM systems that they cannot reach with their weapon.

Solving this particular problem has nothing to do with high-tech. It has to do with building a bigger rocket. We know how to do that. That is why I say this is not necessarily a set of things that requires a lot of high, exotic technology. It involves ramping up investments in things we know how to do today.

Senator ERNST. The suggestion of three heavy brigades in Eastern Europe—would that be a permanent presence? Is that a rotational force? Is that a combination of the two?

Mr. OCHMANEK. we are examining those options for the Army right now at RAND. I think it could be a combination of the two. You certainly want to have some on-the-ground presence all the time, if only to cope with the possibility of a surprise attack out of the blue, but I think also just positioning a lot of the heavy equipment there and ensuring that we can fly people into marrying up with it quickly would also be a part of the solution.

Senator ERNST. Also part of the solution is just different munitions as well.

Mr. OCHMANEK. Absolutely right. Having those also forward so that they are available from the outset of a conflict.

Senator ERNST. I appreciate that very much. Thank you.

Mr. Donnelly, in your testimony you talk about how things—I like this—like warp drives and cloaking devices would be cool, but in the meantime, we really do have to refurbish our current force. After hearing the service vice chiefs testify on readiness last week, I think all of us where appalled once again this year. I think you raise an important point.

Focusing on readiness and ensuring our current capabilities can address the threat we face today is very important. That is why I have been a proponent of upgrading small arms.

General Allen last week in his testimony—he said something that was pretty striking I think that we all should listen to. He had said if we do not have soldiers carrying guns, we do not have anything. So true for the Army. How important is it for fixing today's readiness in making sure that we are ready to fight the wars of tomorrow?

Mr. DONNELLY. I think it is really a disservice to disaggregate wars by type and to abstract out the element of time from any strategic competition. We could invent some really nifty gizmos and we could probably do it pretty quickly. We actually have a lot of tech-

nology that is backed up in the pipeline that just has not made it to the field that we could accelerate by modifying some of the things that we failed to field and be in much better shape. But really, we always take the element of time out of our reckoning of our military posture, so that is why we are where we are today.

Senator ERNST. Exactly. Thank you very much.

Thanks, Mr. Chair.

Chairman MCCAIN. Senator King?

Senator KING. Thank you, Mr. Chairman.

All of you have testified in one way or another about one of the important features of a new strategy is the dispersement of assets, a distribution somewhat across the country. I do not question that strategically except that it puts a much greater strain on communications. The tide of the Civil War turned when Lee lost his ISR, otherwise known as Jeb Stuart, at the Battle of Gettysburg. As we distribute, I am just worried about our communications, cable and satellite principally, being disrupted on the first day, and with a distributed system, then you have a lot of autonomous units without necessarily the command and control that can put them effectively into the field.

Your response?

Mr. OCHMANEK. A very good point, Senator King. We are constantly balancing between the efficiency of having small numbers of lucrative targets out there and the survivability of distributing the force in a way that makes it more difficult to attack. And absolutely, distributing the force places a premium on survivable communications and also training that force so that they can operate in what we call a low bandwidth environment. Our analysis suggests that with modest investment, we can assure ourselves of having at least minimal communications with disbursed forces even in highly jammed electronic warfare environments. But there is a culture dimension to this, as well as a technology dimension, and learning how to operate in that low bandwidth environment where you are not getting massive amounts of data from higher headquarters but still being effective is part of the solution.

Senator KING. Do others have thoughts on that issue of communication?

Mr. THOMAS. I would just add that we have a huge opportunity in places like Japan to move from wireless communications to go to buried fiber. We can have very, very secure communications links between distributed cluster bases across the country and our ability to immediately disperse aircraft out not only to military bases but also potentially to civil airfields and then to be able to net them together with buried fiber that is very hard to attack is a potential advantage that we have and we could exploit.

Senator KING. Let me change the subject for a minute. We have been talking principally about peer adversaries and those kind of conflicts. Yet, the real conflict that we have faced over the last generation has been asymmetric, non-state actors, terrorists, lone wolves. That is an entirely different kind of adversary. What has bothered me—and I have been going to these hearings in Intelligence for 4 years, and we are engaged in a kind of international whack-a-mole where we are trying to kill the hydra and it keeps growing back.

Should we not also be talking about a much more vigorous, strong, focused information war with this Islamic terrorist faction that is so dangerous? For example, I think in 1998 we did away with USIA. It drives me crazy that we are the country that invented Hollywood and Facebook, and yet we are losing the information war. I see a lot of nods. For the record, could you say yes?

Mr. CLARK. I would say, obviously, the information war involves being better at doing public diplomacy. But also part of the information war is defeating the adversary out in the field.

Senator KING. You cannot kill an idea with a gun.

Mr. CLARK. Right, but you can start to erode the viability of that idea by demonstrating that it does not have an effect in the end. If you can show the terrorist acts that are attempted and fail or that the IS troops are dying and losing in the field, that is part of the information campaign, and then you have got to communicate that to the potential recruits they are trying to seek.

Mr. DONNELLY. A couple things.

First of all, you can kill an idea with a gun. The counter-Reformation was killed because it failed militarily. Spain's bid or the Hapsburg bid to dominate Europe was defeated on the battlefield by both Catholic and Protestant powers.

Secondly, again abstract out the phenomenon of Islamic terrorism from the geopolitical—the struggle for power in the Muslim world, the Arab world—chose your term of art— is again bound to be misleading. That leads you to not only whacking moles but whacking the wrong moles. So putting war back in its political context would be the most clarifying thing that we could do especially in the Middle East.

Senator KING. But war does not always necessarily—when you use the term "war," you are not necessarily, at least in this day and age, talking about nation states. That is the conventional thought of war.

Mr. DONNELLY. In the period of the 17th century, the wars of the Reformation and counter-Reformation were conducted not—there were nation states involved, but there were what we would describe as terrorists. You know, we could use the very same language to describe that conflict as we use today to describe the conflict in the Middle East.

Senator KING. Perhaps there are some lessons we could take from that period.

Mr. DONNELLY. Well, history is good.

Senator KING. Thank you.

Thank you, Mr. Chairman.

Chairman MCCAIN. Senator Sullivan?

Senator SULLIVAN. Thank you, Mr. Chairman.

Gentlemen, thank you for being here. Your testimony is very helpful.

I just have one question. I think a number of us have to go vote. But it is about missile defense and about the recent threats, the growing threats, the inevitable threats—let us face it—of North Korea. This is all unclassified. It is not if but when he is going to be able to range the continental United States with an intercontinental ballistic missile, likely with a nuclear intercontinental ballistic missile. That is going to happen at some point. You know, the

classified estimates are a little bit nerve-racking. He is already being able to range places like my home State of Alaska—the North Korean leadership.

Do you think we need to do more on missile defense to buy us an insurance policy if you have a leader of a rogue nation who is trying to shoot one or two nuclear missiles at the United States and to be able to say, hey, we are definitely going to shoot this down and then if you do this, we will massively retaliate? What should we be doing? I think we are not doing nearly enough on missile defense, but given the threat, what do you think we should be doing? I just want the answer focused on missile defense. I know there is a whole other dimension of what we should be doing on North Korea.

Mr. DONNELLY. As a matter of missile defense, I mean, the North Koreans still have liquid fuel missiles. So they need to bring it out of the garage and put gas in it. We should figure out how to find that missile on the launch pad and destroy before it is launched.

Mr. OCHMANEK. But we have to assume that one day they will also have a solid fuel mobile missile that we cannot be confident—I think this is one area, Senator, where we are ahead of the power curve with our national missile defense ground-based interceptor systems. As I understand it, the focus now is on improving the reliability of each of those missiles and their guidance systems, which were admittedly kind of rushed into initial operational capability. So continuing to focus on that, making sure they are reliable as well.

But I agree that this is not a nation that we can be confident of being able to deter from using nuclear weapons through the threat of retaliation because of their very weakness and the unpredictability of this leadership.

Senator SULLIVAN. Anyone else on missile defense as it relates to North Korea?

Mr. CLARK. Clearly, this is one case where the ground-based defenses in the United States make sense because it is a small-scale threat that could be dealt with those kind of capabilities, and it is one that is not likely to be deterred with the threat of retaliation because there is not much for us to gain by immolating North Korea.

Senator SULLIVAN. Great. Thank you, gentlemen.

Senator REED [presiding]. Thank you very much, Senator Sullivan.

I am informed that Senator Blumenthal and Senator Strange would very much like to come and ask questions. I have the opportunity to bedevil you a bit, and I will take that opportunity.

One of the issues that we face—we have talked about how we grow the force, how we make it more ready, and how we do the innovation. On the innovation side, so much seems to be now in the commercial sector, particularly with cyber, some electronic products, autonomous vehicles. It is not the old industrial model of an arsenal, a contract for the Department of Defense doing the cutting-edge work, a national laboratory doing the really great work. I think this is important.

How do we make the connection with the commercial sector? What are the obstacles? How do we do it better? All your comments would be appreciated.

Mr. OCHMANEK. Senator Reed, I am not an expert on acquisition or industrial policy, but I can only agree with you that much of the dynamism in these areas is happening in the private sector. I know Secretary Carter and Deputy Secretary Work have reached out to Silicon Valley to improve our connections there between them and the Department of Defense.

The point I would make from a force planning standpoint is we have to assume that any advances we make in exploiting these kinds of information technologies for our armed forces are not likely to be monopolized by us. Right? Those technologies are available through private R&D throughout the world. These are not long-lasting advantages we are going to have. We are interested in finding ways to use red teams in a more vigorous way to ensure that we can anticipate what our adversaries will do in response to these kinds of developments.

Senator SULLIVAN. I have noticed the return of my colleagues. I will suspend that wonderful line of questioning. Senator Strange, on behalf of Chairman McCain, you are recognized.

Senator STRANGE. Thank you very much, Senator.

I want to express my appreciation to the panel for being here today.

I am very pleased to serve on this committee. It is my first hearing. I respect the long tradition of bipartisanship on this committee. The armed services, military is critical to my State. I am following in the footsteps of Jeff Sessions, but I have a rich military tradition in my family. Senator Reed and I talked about my uncle who went to West Point, the contribution of our State. I am highly concerned with the issues you have raised. I am very new, obviously.

But the one thing that I have learned in the short time I have been here is the urgency of these needs. The question I have for you—and I know Mr. Donnelly addressed it. There are two or three things that you had on your urgency list. Is there anything else—and feel free, anyone, to comment on this—that the Pentagon could do immediately that would address some of these urgency needs? So much of what we talk about has a long horizon. But is there anything in particular you would like to add that you have not already mentioned for the record that we could be thinking about immediately to address some of these issues?

Mr. OCHMANEK. One thing we have not really mentioned is the importance of training and exercises, both as a way of improving the facility of our forces but also demonstrating to adversaries that we have capabilities they may not have taken into account. So we have been very predictable over the last few decades of where we operate in the Western Pacific, out of Okinawa, out of Guam. If airplanes start showing up in small numbers unpredictably at places where we have not been before—and here the Philippines is the perfect place, if we can ever get the politics right again. But Australia, Southeast Asia—you know, here are eight airplanes that are going to operate for 2 weeks and demonstrate the capability to sustain a high tempo of operations from an austere base. That is a cul-

tural change for our United States Air Force. The Marines are better at it than the Air Force. That would alter the deterrent calculus of China because all of a sudden they have uncertainty about how we are going to operate and what they have to contend with in war. That is just one small thing.

Senator STRANGE. Thank you.

Mr. THOMAS. I would just pick up on Dave's demonstration point and say it is also thinking about surprising ways in which we can repurpose some of the forces that we have in existence today. So the classic example is the SM–6 missile, which is designed for air defense but could also be used in a surface attack role. We could think about the use of bombers firing air-to-air weapons. We could think about submarines and novel missions they could perform or demonstrate perhaps involving the suppression of enemy air defenses. So there are a lot of ways we could be perplexing and surprising our potential adversaries and changing their calculations by demonstrating that many of our systems could be used in ways they have not anticipated.

Mr. DONNELLY. Sir, I think there are a number of things we could do to better harvest the technologies and the programs that we did not bring to fruition. One thing that is very obvious is the Navy's cruiser modernization program. We were going to upgrade the *Ticonderoga*-class but then put half of them in mothballs so that we can have another 10 years' worth of cruisers. Again, if time is an important part of your calculation, bringing that extra capability into the fleet earlier rather than saving it for a rainy day makes a heck of a lot of sense.

Also, take, for example, the very troubled Zumwalt program. It was just poorly conceived from the start. It is a big boat with a big engine in it. I have been told it is technologically possible to turn that—to equip it with electromagnetic guns or directed energy weapons, which would be a very effective fleet air defense platform. Again, I am not enough of an engineer or a budgeteer to figure out what that would cost, but again, if we are looking about how to get quick return on investment beyond just making what we have got a little bit better, there are modifications like that that we could make that would bring greater capability and greater capacity to the table faster.

Mr. CLARK. I would say to build on what Jim and Dave talked about, the idea of experimentation—it is not just demonstrations, but the idea of going out and doing experiments to be able to figure out how to employ these modifications to existing weapons. The OSD's Office of Strategic Capabilities is doing a lot of really good work in terms of modifying existing weapons to make them usable for other types of missions, and then doing experiments to say, well, how is that going to work and come up with the operating concepts and the tactics and publish those. Those are things you do within the next 2 years and you would have new capability. So that is an urgent thing that we could do now.

Senator STRANGE. That is very helpful to me. I take away this urgency message. It comes through loud and clear. The repurposing concept is very helpful and encouraging. I am already over my time. Mr. Chairman, I apologize. My first appearance at the committee. Thank you.

Senator REED. Thank you, Senator.
On behalf of Chairman McCain, Senator Blumenthal.
Senator BLUMENTHAL. Thanks, Senator Reed.
As you know, we are moving toward a new world with new technology. You know better than we do what those new technologies may be. One way to address this challenge is the third offset strategy, which seeks to improve the Department of Defense's operational concepts, organizational constructs, and technological capabilities to restore United States power projection and deter conflict. Deputy Secretary Work, for example, has been heavily involved, emphasizing that it is about, quote, preserving peace, not fighting wars. End quote. As we invest in these new technologies, we need people who can help us develop and implement them, and we need to be able to recruit the right talent.
Do any of you have any thoughts about how we actually recruit that talent that we need so desperately in these new technological areas?
Mr. THOMAS. Senator, it is a great question. One area that I think this committee might explore further is repurposing and kind of re-imagining the Reserve component of the armed forces. For a lot of things we are talking about, you are looking for creativity and ingenuity. You do not necessarily need that 40 hours a week. You need it periodically. You almost want kind of your mission impossible set of resumes that you can flip on the table and say I need this guy, this guy, and this woman over here to go as a special team and think about a new concept, think about the application of a new technology, think about how they can confound an adversary. We have this almost inexhaustible pool of talent in the United States, both technologically, in the humanities, in terms of the ethnic heritages of Americans, and I do not think we are nearly exploiting that sufficiently.
Mr. CLARK. One thing I think we need to do is carefully look at the technologies that are being pursued in the commercial sector that we may harvest our own. There are some great examples of that in communications in particular, the work that Google is doing with the *Loon Balloon program is a great example of a technology we can just harvest ourselves without having to develop and then things that we develop uniquely in the military and try to attract the engineers into those fields where they want to do interesting work but they do not want to go do communication technology work for DOD when they can go do it for Google. But if you want to do work in electronic warfare or electrical engineering that relates to electronic warfare or undersea warfare on acoustics, then the military is the main place you are going to be able to do those kinds of technology developments. So if we clearly strategize our technology development to focus on things that are uniquely military, we are more likely to attract those engineers who can only come to you to be able to do that work.
Senator BLUMENTHAL. Thank you.
Mr. DONNELLY. Sir, if I can say, again, I sound like such a knuckle-dragger here I am sure. But if we could get some new stuff in the hands of soldiers and sailors and airmen and marines, they would figure out amazing ways to employ it.

Things that others have talked about earlier about operating aircraft in a dispersed environment—that is what the Army and the Marines already do with their helicopters. Doing it with an everyday stealthy strike aircraft—we do not even know what that would mean. Again, we have very talented and innovative people who wear the uniform, again, not for a paycheck but because of a whole host of other reasons. If we could just get them some new tinker toys to play with, they would build some amazing structures out of them.

The adaptation that the force made in the course of Iraq and Afghanistan was quite remarkable. Again, if we could just—I think it has mostly been a problem of the government and the Nation as a whole that we are not giving the people the tools of innovation, not a question of talent but of capability and capacity.

Senator BLUMENTHAL. Speaking of new technology, I am assuming that all of you on the panel believe that we need to move ahead with the *Columbia*-class submarine, which is going to be critical to our nuclear deterrent program as a matter of stealth and survivability and strength, and also the F–35, the next generation of fighter aircraft.

My time is about to expire. So if any of you disagree, I hope that you will submit responses in writing. But there is continuing controversy about at least the F–35. All of us agree we have to drive down the cost but still proceed with that aircraft. If any of you have thoughts specifically about either of those two programs, I would very much welcome them in writing rather than go over my time now.

Thank you, Mr. Chairman.

Senator REED. Thank you very much.

Gentlemen, thank you for your excellent testimony and not only that, for really a lifetime of contribution to a very serious and provocative intellectual debate about our national defense policy which aids us immensely and ultimately aids the troops in the field, which we are all committed to do. So thank you very much.

On behalf of Chairman McCain, let me call the hearing adjourned. Thank you.

[Whereupon, at 11:13 a.m., the Committee adjourned.]