

TESTIMONY

STATEMENT BEFORE THE SENATE ARMED SERVICES COMMITTEE ON RESHAPING THE MILITARY

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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

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.

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 U.S. 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 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 U.S. nuclear response. U.S. 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 pre-planned 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 (COMME_x) 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). Together, 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.

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