TESTIMONY
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Chairman Thornberry, Ranking Member Smith, and Members of the Committee, thank you for your invitation to testify on the issue of readying the U.S. military for future warfare. While North Korea is the most acute foreign threat facing the United States and its allies at the moment, it is Russia and China that present the most vexing military challenges to the United States' global position and they will likely continue to do so over the next decade and beyond. I do not believe that war with Russia or China is in any way inevitable, but prudence dictates taking actions to arrest the erosion of our military positions in Europe and the Far East, lest weakness encourage hegemonic appetites for further probing and expansion. In my testimony today, I will focus on America's ongoing strategic reorientation toward great power competitions with Russia and China and highlight the significant implications this reorientation will entail.

Over the last twenty-five years, "future warfare" connoted for many a science fiction-like competition with a near-peer rival that might emerge one day in the far-off future to challenge the United States, but such a competition was not viewed as a pressing or particularly serious matter. Lacking a sense of urgency, there was little impetus for the U.S. military to orient itself to such a challenge. Even as it fought extended wars in Iraq and Afghanistan and conducted global counterterrorism operations, the U.S. military has with a few notable exceptions (e.g., expansion of Special Operations Forces and creation of armed-reconnaissance UAV squadrons) retained the post-Cold War shape and size outlined in the 1993 Bottom-Up Review for fighting wars against mid-sized regional states like Iraq and North Korea.

Over the past decade, though, the future has rapidly converged with the present. In place of a faceless near-peer competitor, China and Russia have arisen as determined rivals attempting to redefine the world order. The challenge Russia and China each pose is markedly different from the other and each will demand a tailored and differentiated approach to counter. Russia's military challenges stem from the Kremlin's sense of self-decline and its attempt to reclaim some of its former sphere of subjugation in its near-abroad while it still can. By contrast, China's military challenge is driven largely by the wealth it has generated as an economic powerhouse and used to acquire formidable full-spectrum military capabilities for righting what it perceives as a century of foreign humiliation. Both of these powers are challenging the United States and its allies at multiple levels:

- Below the threshold of armed conflict in the so-called gray zone with non-military and paramilitary forces, covert activities, and influence operations aimed at gradually shifting territorial and geopolitical realities as well as undermining foreign societal cohesion and governance in the twilight between peace and war;
- At the theater warfare level with advanced conventional capabilities, including sophisticated sensor networks, arsenals of precision-guided munitions (PGMs), cyber

and electronic warfare systems, world-class air defenses, fifth generation fighters, quiet submarines, large numbers of sea-mines, and sizable arsenals of ground-based rocket artillery and coastal defense missiles; and

- At the strategic level with modernized, survivable nuclear forces capable of attacking the U.S. homeland, and novel forms of strategic attack such as cyber and counterspace warfare capabilities to hold at risk critical infrastructure or threaten U.S. nuclear command and control.

Both Russia and China assess that they have sufficiently survivable nuclear arsenals to preclude the possibility of disarming strikes by the United States, and that allows them to take varying degrees of risk regionally below the strategic nuclear threshold (Russia tending to be more open to risk-taking, China being more cautious). Their conventional anti-access and area denial (A2/AD) capabilities, in turn, are perceived as able to prevent the U.S. military from coming to the aid of allies and partners while also providing overwatch for sub-conventional gray zone activities. Neither state intentionally seeks a war with the United States and its allies, but they see backdoor vulnerabilities in the American expeditionary style of warfare that confer time and space advantages for them to achieve their strategic goals without fighting. Consequently, Russia and China are waging new "struggles for mastery" that will decide the fates of countries in Eastern Europe and maritime Asia, as well as determine what America's power position will be entering the second half of the century.

The new National Defense Strategy has recognized that great power contests are likely to be the defining national security challenge for the foreseeable future. It therefore calls for treating the competitions with China and Russia as the Department's top priorities for force and operational planning. This prioritization of great power competitions represents a potential sea-change for readying the U.S. military for future war (*if we take seriously its implementation*) and should lead to an aggressive rebalancing of effort and reallocation of resources. To understand why such rebalancing will be necessary requires understanding the profound ramifications of this modern multisided great power competition for U.S. defense planning:

1. Devaluation of Expeditionary Warfare

First and foremost, a renewed emphasis on great power competition with Russia and China should lead to a comprehensive reevaluation of the U.S. military's joint expeditionary warfare approach to power projection. Expeditionary warfare has been the defining characteristic of the U.S. military for the last quarter-century. Since the end of the Cold War, the U.S. military has drawn down forward-stationed forces in Europe and the Far East while favoring months-long rotational deployments of forces from the continental United States to maintain a forward military presence in these regions, as well as in the Middle East. If conflict broke out in any of these theaters, U.S. forces envisage surging from the continental United States over several weeks, inserting into theater sea- and airports, and then conducting counter-offensives to defeat hostile forces. In the past, this planning assumed the U.S. military enjoyed gross qualitative and quantitative advantages over potential regional aggressors such as Iraq and North Korea, as well as escalation dominance given its nuclear deterrent. It assumed unfettered logistical lines of communication to distant theaters; ports and airfields for receiving U.S. forces that would be largely safe from attack; and the ability

to gain local air, sea, and land control quickly. But these assumptions collapse when confronting the Russian or Chinese militaries.

Both the Russian and Chinese militaries are capable of achieving limited local military or paramilitary objectives before the bulk of U.S. forces could enter proximate theaters. And both have built up formidable A2/AD complexes that would hinder the U.S. military from gaining footholds nearby or operating with impunity. Russia enjoys favorable time-distance factors for quick land grabs, while China benefits from U.S. forces relying on a very small number of airbases and ports in the Western Pacific and the vast distances at which U.S. forces would have to operate if they were deprived of those forward bases.

The fact that expeditionary warfare lacks the potency and credibility it once had requires United States to undertake a broad reevaluation of the U.S. military's posture, capabilities, organization, concepts, and plans for force generation in crafting a fundamentally new approach to projecting power. Perhaps it will require permanently forward stationing certain types of ground forces in Europe. These forces might include heavy armor for blocking the advance of mechanized ground forces; short-range air defenses for denying an enemy forces' air cover; rocket artillery for suppressing enemy air defenses and deep strike; special electronic warfare units to gain advantage in the electro-magnetic spectrum; and Special Forces and Joint Terminal Attack Controller-qualified personnel for bolstering local resistance forces and ensuring air-ground integration. Together, these forces would allow the U.S. military to create unconventional defensive barriers against conventional aggression (in other words, friendly A2/AD complexes). Such an approach would benefit from the construction of deep underground facilities and tunnel complexes for command and control and pre-positioned weapons storage, as well as the clandestine laying of fiber optic cables for protected local communications. This ground posture might need to be coupled with air and naval assets that could operate from 1,000-plus mile ranges to penetrate into contested air and maritime areas and circumvent or overcome enemy coastal and air defenses to engage hostile forces.

It is also necessary to reconsider the force management / force generation model the Department uses, placing less emphasis on rotational deployments of forces and more on some combination of permanent forward stationing in overseas theaters, differentiated units of force depending on the theater to which they are assigned, and the conduct of sustained high-tempo naval and air strike operations from ports and airfields outside the reach of most of an adversary's A2/AD forces.

2. Re-Emphasis of Nuclear Weapons and Strategic Warfare

For the last quarter-century, the United States has sought to de-emphasize the role of nuclear weapons in national security while Russia and China have modernized and placed increased emphasis on their own nuclear forces. In the case of Russia, it has leaned more heavily on theater-range nuclear forces as an insurance policy against the failure of its conventional forces in a regional conflict involving NATO. The prioritization of great power competition in U.S. strategy means that nuclear forces should once again come to the forefront of planning efforts. Wargames and other planning exercises must consider scenarios involving their use in an effort to understand potential escalatory dynamics. Beyond investments in strategic nuclear forces like new penetrating bombers, land-based intercontinental ballistic missiles, nuclear ballistic missile submarines, and nuclear command

and control and communications systems, the United States must also shore up its theater nuclear warfare capabilities to deter symmetrically the use of enemy theater nuclear weapons and thereby, seemingly paradoxically, reduce the possibility that strategic forces would have to be generated in a theater war with another major nuclear power. This will likely require the development and rapid fielding of a theater-range, difficult-to-intercept nuclear cruise missile. Such a missile could be air- or submarine-launched, and should have a high probability of arrival at a target despite the presence of precision air defenses.

In addition to countering classic nuclear weapons threats, the U.S. military will also have to identify or develop defenses, resiliency measures, counter-attack capabilities, and declaratory policies against novel forms of strategic attack, including attacks on:

- Critical infrastructure or the financial system;
- Agriculture and livestock;
- Transoceanic fiber optic cables; and
- Constellation of satellites for intelligence warning, communications, and position, navigation and timing.

3. Prioritization of Capabilities and Forces Optimized for Contested Environments

Great power competition will also require significant rebalancing of U.S. conventional military forces. In particular, it will place a premium on low-signature forces with light logistics footprints capable of operating independently far forward in denied areas. Such forces include submarines and unmanned underwater vehicles, long-range penetrating surveillance and strike aircraft, special operations forces, ground-based missile forces, cyber and electronic attack capabilities, and space-based persistent surveillance systems coupled with vastly greater quantities of precision standoff and direct attack munitions. These forces represent only a small fraction of the current U.S. military but are likely to constitute the core element of a joint vanguard force in any future great power contingency and would play the most demanding roles deterring opportunistic aggression by a second party. Over time, a greater proportion of resources should be allocated to such forces at the expense of those forces and capabilities less suited for operations in contested environments.

4. Intensified Military Activities in Space, Cyber/Electromagnetic and the Undersea Domains

Modern "great games" in the form of constant probing and dueling are already being played out in the space, cyberspace and undersea domains. As during the Cold War, when a silent war was fought undersea between dueling U.S. and Soviet submarines, great powers may engage in covert activities prior to conflict to map each other's networks, place destructive or corruptive implants on those networks—including submarine telecommunications cables and seabed energy extraction infrastructure—and interfere or prepare to interfere with one another's satellite constellations using lasers, radio-frequency jamming, or kinetic vehicles. Inadvertent detection or contact in one or more of these domains could be a trigger for rapid escalation to overt, general war.

The expansion of military activity in these domains should lead to the emergence of new military missions, particularly for suppressing sensor networks and achieving domain superiority. Just as the suppression of enemy air defenses (SEAD) has historically been the

primary precursor mission for achieving air superiority and permitting strike operations, in the future, similar missions may be necessary to suppress enemy anti-satellite systems, disable hostile network security systems, and deafen undersea sensor networks using swarms of small underwater vehicles. A common characteristic of such new missions is that they will likely be conducted using robotic, automated, and increasingly autonomous systems.

5. Refocused R&D Efforts

Since the defeat of Nazi Germany, the United States has been unrivalled in basic technological research. The nuclear, precision strike, and information revolutions in technology all stemmed from U.S. government-led efforts. Today, however, the U.S. government enjoys less commanding leads in the pursuit of quantum computing and communications, artificial intelligence, massive data set analytics, gene editing, directed energy, hypersonics and advanced materials science relative to its great power rivals. A large portion of U.S. spending on research and development, moreover, comes from private companies focused on commercialization, not national security. In the fields of quantum, directed energy and hypersonics, the Chinese government has made sizable investments that have been driven by a perception of national security as well as industrial opportunities. While China will be a tougher R&D competitor across-the-board, Russia, too, has protected select industrial R&D efforts in niche military areas including nuclear weapons design, submarines and torpedoes, ballistic missiles, hypersonic systems, and cyber and electronic warfare.

Given the stiffer technological competition posed by China and Russia, the United States will need to update its R&D approach. It will need to improve dramatically its intelligence efforts aimed at monitoring the research efforts of competitors to avoid technological surprise. It will have to focus its limited government resources on national security "big bets" that the commercial sector has little incentive to make in order to roll out new technological surprises to influence the decision calculations of great power rivals. And it will have to become a much more effective second mover technologically by quickly comprehending the significance of foreign technological developments to adopt them itself and operationalize them faster than its competition.

6. Warfare at Scale: Stockpiling, Industrial Production, and Mobilization

Preparing for the possibility of war with Russia and/or China with the aim of deterring such an event is radically different from planning for the possibility of wars with smaller regional opponents and presents an enormous problem of scale. Potential target sets are orders of magnitude greater and more geographically distributed than those for regional opponents like North Korea. As a reference, in 2003 the U.S. military delivered on average 750 PGMs per day during the opening combat phase of Operational Iraqi Freedom against a country that is one twenty-second the size of the United States with less than one tenth the population and at the time possessed relatively antiquated air defenses. Operations against great powers would likely require many times more sorties per day, and preferred PGMs could be depleted within days. Shallow magazines of standoff and direct attack precision munitions, as well as insufficient numbers of launchers and survivable delivery systems represent critical gaps between the ambition of the defense strategy and the means to execute it that will need to be addressed quickly.

Beyond scale is the issue of protraction. War is difficult to imagine between great powers, but it is even harder to imagine a swift, decisive outcome if it breaks out. Protracted or frozen conflict may be more likely, creating enormous societal burdens that are more comparable our grandparents' experience in the world wars of the early twentieth century than to any conflicts we have engaged in over the last fifty years. Such a protracted war would require large-scale mobilization of civilian resources and could massively disrupt the global economy. Large-scale strategic physical and cyber attacks on the U.S. homeland should be treated as a likely condition of future war against a great power.

The ability to sustain war efforts despite economic dislocations and to surge production of war-related items could be critical to winning such a war. Our defense industrial base, however, is ill-suited for such a conflict. While the United States and its close allies have in the aggregate excess capacity for shipbuilding and aircraft manufacturing, they have grossly inadequate industrial capacity for precision munitions, trusted foundries for microelectronics, and advanced sensor production to support a large-scale and likely protracted war against one or more great powers. In the armaments industry there will always be inefficiencies, but could excess capacity be driven down over time in areas where it is less useful and increased in areas that would confer advantage and strengthen deterrence in long-term competitions?

7. Increasing Important of Concurrency

During the post-Cold War period, U.S. force planning constructs dictated that the U.S. military should be shaped and sized to wage two nearly simultaneous regional wars more or less unilaterally. This two-war principle was seen as critical for deterrence, because it discouraged collusion between potential aggressors as well as opportunistic aggression by a second belligerent if U.S. forces were already engaged in one war. Whatever dangers of collusion or opportunistic aggression there were with respect to regional rogue states, though, they pale in comparison to the risks associated with Russia and China. Indeed, should war break out between the United States and one of these powers, it is difficult to imagine that one party would not coordinate its warfighting effort with the other. A strategy that emphasizes great power competitions should take account of the likelihood that other great powers will collude in opposing the United States both during peacetime competitions as well as in a state of armed conflict, placing a premium on concurrency.

One possible way to maintain the strategic imperative of concurrency while avoiding the cost of a large force build would be to refine the unit of concurrency—how war is defined—while emphasizing globally fungible forces and capabilities that could be used to inflict unacceptable levels of punishment on multiple adversaries simultaneously. Long-range surveillance and strike aircraft, non-kinetic cyber capabilities, globally-available space-based capabilities and deep magazines of PGM stocks could all play a role in maintaining concurrency as a force planning principle.

8. Re-Thinking Arms Control

A resumption of great power competitions also should entail a reevaluation of arms control arrangements, both to jettison constraints that no longer make strategic sense for the United States in this new era as well as to identify new arrangements that should be pursued to manage the competitions and increase strategic stability in areas of mutual interest.

Thus far, Russian violations of the 1987 Intermediate-Range Nuclear Forces (INF) Treaty and China's build-up of a sizable arsenal of ground-launched intermediate-range ballistic missiles, have gone unanswered by the United States. It has done little to redress the disadvantages under which it is operating in the area of intermediate-range ground-launched strike systems. The U.S. Congress might consider a commission to reevaluate the INF Treaty and its costs and benefits in the years ahead, and to make recommendations for a path forward. In the meantime, it may be prudent to postpone major investments in new treaty-compliant, ground-based precision fires pending the outcome of such a review to avoid squandering resources should the United States ultimately withdraw from or amend the treaty. We should not lock in the U.S. military's future investment plans based on treaty constraints from a previous era.

On the other hand, the United States should explore the possibility that verifiable arms control measures could be developed in other areas. For example, all of the great powers would have an interest in mutual non-targeting of dedicated (exclusive use) nuclear command and control systems. Although the technical verification challenges appear daunting, such a regime would be beneficial to all great powers through its enhancement of strategic stability. Similarly, prohibitions on biological weapons might need to be updated to account for the growing potential of gene editing. And new arms control measures should be considered to address the expansion of military-related activities in space, cyberspace and undersea perhaps by prohibiting certain types of countervalue, or non-military, targeting.

9. Full-Spectrum Civil Defense

It has been many decades since the United States has put serious effort into civil defense and integrated it into a broader defense strategy. A re-emphasis on great power competition will necessitate such efforts. Greater thinking about civil defense is needed to confront an array of nuclear and non-nuclear forms of strategic attacks, including electro-magnetic pulse, biological warfare, and catastrophic cyber attacks. Part and parcel to this will be enhancing the resiliency of our critical infrastructure, our "national hardware." But the United States must also be concerned with protecting its "national software": its societal cohesion and governance, which can be undermined through influence operations and information campaigns. These efforts must be integrated with more classical military preparations.

10. Fiscal / Economic Competition

The competitions the United States faces with Russia and China are likely to last for decades. "Winning" is likely to be much more a matter of staying power than victory in any decisive battle of annihilation. For this reason, maintaining national solvency over time and the judicious application of scarce resources—fiscal, human, natural, allied and technological—will be critical to successful competitive strategies. We have a duty to provide for the common defense not only for ourselves but also for our posterity. The continued postponement of hard choices and major shifts in the U.S. military's program of record both extends gross inefficiencies and costs into the future and retards the development of credible deterrent forces that are already required to arrest the erosion of our regional military positions and strengthen deterrence.

While there may be a need for increased defense spending, there are risks in applying new funds toward near-term capacity needs (increasing end-strength and force structure) at the

expense of improvements in capabilities. The erosion of the U.S. military's positions in Europe and the Far East is less a consequence of being out-manned than of being increasingly out-gunned, out-sticked, and out-postured in tough away games. A strategy that prioritizes great power competitions should, in turn, ensure that the reshaping of the U.S. military in terms of its capability mix takes precedence over resizing. It should be wary of increases in personnel during what is likely to be only a fleeting period of defense budgetary growth. The longer term fiscal picture suggests an almost inevitable and persistent downturn in defense spending in the years ahead given the crowding out effects from interest payments on publicly held debt and growth in entitlement spending. When such a downturn occurs, personnel increases will cause cutbacks to be all the more painful.

Conclusion

Only a few years ago, senior defense leaders believed it was inconceivable that the United States would ever fight Russia or China. Such thinking has vanished almost overnight. While the probability of war against one or both of these revisionist powers remains thankfully low, war is far from inconceivable any longer. It is commendable that the new defense strategy prioritizes great power competitions as the central force planning and deterrence challenge for the U.S. military, but the implications of great power competitions must be fully absorbed to ensure the strategy's effective implementation.