April 1, 2015

China's Offensive Missile Forces: Implications for the United States

Robert Haddick
Independent Contractor, U.S. Special Operations Command

Testimony before the U.S.-China Economic and Security Review Commission

The United States has employed a forward presence strategy in East Asia for seven decades. The security provided since World War II by the presence of U.S. military power in the region has prevented another major power war. America's forward presence during this era has also set the conditions for the region's rapid economic, political, and social development. Since World War II, the foreign policy of the United States under all presidents has sought to promote economic prosperity, representative government, improving human rights, expanding freedom, and social progress. No region has experienced more success on these measures over the past seven decades than has East Asia. America's security and diplomatic presence in the region has been a major factor in this success.

China's rapid military modernization is raising the cost of sustaining this forward presence strategy. Even so, there is no alternative to America's forward presence. In my judgment, the region would unlikely find a stable balance of power on its own, just as Europe was unable to adjust to Imperial Germany's rapid and disruptive rise in the decades leading up to World War I. The region is too important to America's standard of living and its role as the leading global power to take that risk. The challenge U.S. policymakers and planners now face is designing a strategy that will maintain forward presence in a sustainable manner when the costs and risks of that approach will inevitably rise due to China's reemergence as a great power.

Security Risk Assessment

Since the end of World War II, operational concepts and plans for U.S. military forces in the Asia-Pacific theater have assumed that the U.S. would have secure forward bases on the periphery of Eurasia from which to operate and that U.S. military logistics operations would nearly always have unimpeded access to this archipelago of bases. With these assumptions settled and indeed supported by actual experience up to the present, U.S. military investments have increasingly focused on firepower platforms with relatively short range: for the Air Force, tactical fighter-bombers; for the Navy, aircraft carrier strike groups; and for the ground forces, an assumption that they would have secure ports of embarkation and large bases close to their missions in Eurasia. China's large-scale and highly successful exploitation of the precision missile and sensor revolution is quickly undermining these central assumptions underlying the fundamental design of U.S. military forces. Offensive missile forces – which include land-attack and anti-ship missiles deployed on land, aircraft, surface warships, and submarines -- now enjoy an era of technical dominance. Fixed forward bases in the region are increasingly at risk, as are U.S. surface naval forces and aircraft carrier strike groups.

China's military forces currently suffer from significant shortfalls in command relationships, joint operational experience, training, personnel quality, and other problems, limitations well known to People's Liberation Army (PLA) officers.[1] However, the PLA has dramatically improved its capabilities and capacities over the past two decades. U.S. policymakers and military planners should expect these trends to continue. As that happens, the question will turn to whether China's leaders in 2020 and beyond might perceive that they will possess military options during potential future crises in the Asia-Pacific region involving the security of Taiwan, U.S. allies and partners, or other critical U.S. interests. Such a change in escalatory perceptions could foreshadow a breakdown in the deterrence provided by U.S. military power, with destabilizing consequences for the region.

Regional Net Assessment

One of China's most significant and enduring competitive advantages is its continental position. China can project its airpower over the Western Pacific from dozens of hardened bases on and near its coast.[2] These bases are protected by what the U.S. Department of Defense terms "one of the largest forces of advanced [surface to air missile] systems in the world."[3]

China has made a substantial investment in variants of the Su-27/30 Flanker strike fighter, roughly equivalent to the U.S. Air Force F-15E Strike Eagle. China's Flanker variants possess a combat radius of 1,500 kilometers,[4] exceeding the approximately 1,100-kilometer unrefueled combat radius of the U.S. Navy's F-35C and F/A-18 E/F strike-fighters.[5] China has produced the J-11B, an indigenous version of the Flanker, with more advanced indigenous Flanker variants under development. The PLA's inventory of Flanker variants could number over 400 aircraft by next decade.[6] China's Flankers and other strike aircraft (in 2014 the U.S. Defense Department estimated China's total air defense and strike aircraft inventory at 2,100 aircraft) will be armed with a variety of land-attack and anti-ship cruise missiles, some with supersonic speed and ranges up to 400 kilometers.[7] By the end of this decade China is expected to begin forming squadrons of the J-20 strike-fighter, a stealthy aircraft with a possible combat radius of up to 2,000 kilometers.[8]

According to the U.S. Department of Defense, China possesses up to 1,800 theater-range land-based ballistic and cruise missiles, most of which are mounted on road-mobile transporter-erector-launchers and are thus capable of hiding and relocating in China's complex terrain.[9] The revolution in missile and sensor technology has greatly increased the accuracy of ballistic and cruise missiles and lowered the relative cost of these munitions. Finally, China is assembling a multi-dimensional sensor, command, and communications network that by next decade should allow it to effectively employ the platforms and munitions in its inventory.[10] It should be unsurprising that China is exploiting its continental position and the missile and sensor revolution to craft a cost-imposing strategy on the United States in the Western Pacific.

In contrast to China's continental position and its wide-ranging missile forces, the United States faces the burden of operating largely as an expeditionary power, which increases its costs and thus makes it harder to compete with the expansion of China's forces. Further, the 1987

Intermediate Nuclear Forces treaty prohibits the United States from matching China's comparatively economical land-based theater missile strategy.

The U.S. Air Force operates from just six main bases in the theater. The U.S.-China Economic and Security Review Commission concluded that five of these bases (located in Japan and South Korea) are highly vulnerable to suppression by China's missiles.[11] U.S. Navy and Marine Corps naval and air bases in Japan (Yokosuka, Sasebo, Iwakuni, Atsugi, and other facilities) are similarly vulnerable to attack.[12] Although at a farther distance from Chinese land-based forces, the growing complex of bases on Guam will become increasingly vulnerable to suppression as China's land-attack missiles spread to more platforms (such as China's growing fleet of nuclear attack submarines) and increase in range and numbers.[13]

There is increasing concern that U.S. surface warships, including aircraft carrier strike groups, will become vulnerable to multi-axis saturation cruise missile attacks, an operation we should assume Chinese strike-fighter regiments and perhaps its submarines will be able to execute before the end of this decade. In addition, the recent debate over whether the U.S. Navy should require the future Unmanned Carrier-Launched Surveillance and Strike aircraft (UCLASS) to be able to autonomously search for and attack targets at very long range in defended airspace is an acknowledgment that the Navy's carrier strike groups will soon not be able to safely conduct persistent operations inside adversary missile threat zones.[14]

Thus we can see that by next decade China's cruise missile-armed Flanker regiments, the mobile theater-range missiles in the PLA's Second Artillery Corps, and China's submarines fleet will increasingly hold at risk U.S. bases and surface ships out to about 2,000 kilometers from China's coast.

With these capabilities in place by the early 2020s, we can foresee the next expansion in the range of China's access denial capability that may begin to emerge past 2025. Beginning at the end of this decade, the U.S. Department of Defense expects China to begin fielding the J-20 strike-fighter, a stealthy fighter-bomber with a combat radius this Commission estimated at about 2,000 kilometers. Given the advancements we have already witnessed with China's missile programs, the large J-20 could be armed with a smart, precision air-to-surface missile with a range up to 1,000 kilometers, similar to the U.S. Air Force's JASSM-ER missile. That combination would give China a precision strike capability out to 3,000 kilometers.

China's development of an anti-ship ballistic missile has received much attention in recent years. Should China master the technology of mating a guided and maneuvering warhead on its 1,500 kilometer medium-range ballistic missile, it would be reasonable to forecast the mating of this warhead to an intermediate-range ballistic missile, with a range exceeding 3,500 kilometers.

These systems will only be useful to the extent that China develops the sensors, long range communication networks, command relationships, doctrine, training, and personnel to effectively employ these potential capabilities. Questions remain about whether the PLA will be able to remedy these known gaps. However, as mentioned above, Chinese military leaders are aware of these shortcomings and are applying additional resources to remedy these problems. Absent a concerted effort on their part to counteract these trends, U.S. policymakers and military planners

should expect the vulnerability of U.S. forward-deployed forces in the region to increase over the next ten years and beyond. This would increase the risk of miscalculation during potential crises with harmful consequences for U.S. and allied interests.

Mitigating China's Conventional Missile Capabilities

The single most important policy the United States should pursue to mitigate the growing conventional missile threat in East Asia would be to diversify the U.S. force structure away from the current heavy investment in relatively short range tactical platforms and weapons toward systems with much longer ranges and stealthy characteristics.

For example, the U.S. Navy is moving forward on plans to bolster the air and missile defenses of its surface ships.[15] But the economics of the missile and sensor revolution will continue to favor China's investment in offensive missiles; it will be cheaper for China to add more Flankers, J-20s, and cheap but smart missiles than it will be for the Navy to add additional ships, radars, and defensive missiles. In the longer-run, many are hoping that ship-mounted directed energy weapons will be able to swing the advantage back to missile defense. But according to the Congressional Research Service, reliably defending against high-end supersonic cruise missiles will require megawatt-class free-electron lasers, which at the earliest won't be available until the second half of the next decade.[16] Electromagnetic rail-guns offer the promise of delivering high-energy projectiles at long ranges. But using such projectiles to defend against saturation attacks of maneuvering supersonic missiles remains a speculative proposition.

Economics may also argue against hardening fixed bases in the region that are within range of China's most common land-attack missile types. It will likely be cheaper for China to acquire additional missiles than it will be for the U.S. to add protective reinforced concrete and other hardening measures to its air and naval bases, in a manner that would keep those bases functioning effectively in wartime.

U.S. military forces should be prepared to degrade and disrupt China's intelligence-surveillance-reconnaissance (ISR) sensors and the command and communication networks that will support and direct Chinese missile and aerospace forces. By doing so, U.S. forces would deny Chinese systems such as the DF-21D anti-ship ballistic missile, long range land-attack cruise missiles, and hypersonic glide vehicles (HGV) the targeting and guidance information they would need to complete their missions. Such "left kill chain" solutions will be critical for U.S. forces, especially for high-end threats such DF-21D and HGVs which will likely be very difficult challenges for conventional missile defense systems.

But U.S. forces must similarly be prepared for Chinese "blinding" attacks on U.S. sensors and communication networks. In a potential conflict in East Asia, such an exchange of blows against both side's ISR and command networks could favor the Chinese "home team" which could have an easier task of restoring these functions than would U.S. expeditionary forces. U.S. forces should therefore anticipate the disruption of its space-based ISR and command networks and be prepared to execute its missions without the benefit of those assets.

More broadly, the United States should greatly increase its investment in long range platforms that are based outside the range of China's main missiles forces and that are stealthy enough to operate at will inside China's defenses. U.S. platforms that meet these conditions include the new Long Range Strike Bomber (LRS-B) and U.S. attack and guided missile submarines armed with land-attack missiles. When acquired in sufficient quantities, such platforms would be able to hold at risk assets and conditions highly valued by China's leaders. Doing so would create doubts about the efficacy of Chinese military options, thus enhancing deterrence and stability in the region.

Mitigating China's Nuclear Capabilities

China is pursuing several programs to modernize its nuclear weapon delivery systems. The purpose of these programs is to enhance the survivability of China's nuclear deterrent by allowing its nuclear-armed missiles to move, disperse, and hide. The Second Artillery Force recently brought into service the DF-31A road-mobile intercontinental ballistic missile (ICBM), which is thought to have a range exceeding 11,200 kilometers, sufficient to reach most of the continental United States. A new road mobile ICBM, the DF-41 is similar but has the added capability of delivering multiple independently targeted warheads (MIRVs). At sea, the *Jin*-class ballistic missile submarine (Type 094) is a high priority for the Chinese navy. This class of submarine will carry the JL-2 strategic nuclear missile with an estimated range of 7,400 kilometers.[17]

China's deployment of multi-warhead MIRV missiles, its possible development of nuclear-armed and maneuvering HGVs, and its development of technologies designed to thwart missile defenses will increase the sophistication of China's nuclear forces. U.S. defenses against ICBMs have not been designed to provide robust protection against substantial nuclear powers such as Russia and China. And as with conventional missiles, a spending competition between additional Chinese offensive missiles and U.S. ICBM interceptors would not be favorable for the United States because the marginal cost of interceptors will likely exceed the cost of their targets by at least an order of magnitude.

The United States will thus need to rely on the long-standing principles of nuclear deterrence to mitigate potential quantitative and qualitative expansions of China's nuclear forces. In order to maintain effective nuclear deterrence for the decades ahead, the United States should commit to programs such as the new generation of ballistic missile submarines to replace the current Trident submarine class, the new long range bomber (mentioned above), and improvements to global communication systems to ensure nuclear command and control under all conditions. Funding and fielding these next-generation systems will provide enduring nuclear capabilities and signal to potential adversaries a strong commitment by the United States to nuclear deterrence.

The Intermediate Nuclear Forces Treaty and Security Trends in the Asia-Pacific Region

The Intermediate Nuclear Forces (INF) Treaty, entered into by the United States and the Soviet Union in 1987, prohibited both countries from possessing land-based ballistic and cruise missiles with ranges between 500 and 5.500 kilometers. This treaty remains in force and continues to proscribe the theater-range missile forces of the United States and Russia. China is not a party to the treaty; land-based theater-range ballistic and cruise missiles are a major component of China's military modernization program and its access-denial strategy in the Western Pacific region.

As long as U.S. military planners could count on the dominance of U.S. naval and aerospace power projection systems, the restraints imposed by the INF treaty were of little concern. However, as described above, these assumptions will become increasingly questionable over the medium term and will require the United States to search for affordable means and ways to retain its power projection capabilities in the region.

U.S. policymakers should study the benefits and costs of abrogating the INF treaty. Current U.S. modernization programs such as the LRS–B and a new sea-launched land-attack cruise missile offer the prospect of maintaining robust power projection capacity in spite of China's growing access-denial capabilities. However, there are always risks that technical shortcoming, program mismanagement, and adversary countermeasures could thwart the arrival of the power projection capacities promised by these programs (and which are permitted under the treaty). Supplementing these air and sea approaches with land-based theater-range missiles would diversity the power projection portfolio. Land-based theater-range missiles, the deployment of which would require abrogation of the treaty, will not be an affordable substitute for the sustained striking power of the future LRS-B force.[18] But fielding such a capability would provide more options to U.S. policymakers and commanders while complicating an adversary's planning.

Abrogating the treaty would come with costs and risks. The United States would pay a political and diplomatic price for abrogating the treaty. It would release Russia from any remaining inhibitions on its missile programs (the U.S. State Department already believes that recent Russian missile tests have violated the treaty),[19] which could have harmful effects for European security. And the United States would have to find acceptable bases in Asia for such missiles, a task which could be politically complicated.

U.S. policymakers will have to examine whether the diversification benefits of theater-range land-based missiles in the Asia-Pacific would be worth the political and program costs a new missile force would require. The U.S. at present is not compelled to abrogate the treaty to achieve its goals in the region. But policymakers should monitor the factors that could compel such a decision.

China's Views on National Missile Defense

China is developing its ballistic missile defense capabilities for the purpose of defending its homeland and strategic assets.[20] China's most advanced surface-to-air missile systems (the S-300 system imported from Russia and the indigenously-produced CSA-9 system) currently provide a

limited capability to intercept ballistic missiles with ranges from 500 to 1,000 kilometers. China has a research program to develop the capability to achieve exo-atmospheric intercepts of ballistic missile warheads, a capability suitable for intercepting theater and intermediate range ballistic missiles.

In July 2014 China conducted a non-destructive missile interceptor test from Chinese territory up to the altitude of low earth orbit. Although China termed this a "land-based missile interception test," the United State government is highly confident that this was instead a test of an anti-satellite weapon.[21]

While China develops its own ballistic missile defenses, it has objected to the enhancement of U.S. ballistic missile defense capacity in Asia. China recently protested the proposed deployment of the U.S. Army's Terminal High Altitude Air Defense (THAAD) missiles and radar to South Korea.[22] The purpose of the THAAD deployment to South Korea is to defend against the North Korean missile threat to South Korea and Japan.

U.S. State Department officials have explained to counterparts in China that U.S. national missile defense capabilities present no threat to the efficacy of China's strategic nuclear deterrent and thus are not destabilizing.[23] By the same token, China's national missile defense program is in its relative infancy and is not likely to present a challenge to U.S. strategic nuclear forces for some time if ever. We should thus expect that absent an unexpected breakthrough in missile defense technology, national missile defense developments on both sides will not likely pose a threat to nuclear stability for at least the medium term.

Missiles, Defenses, and Diplomatic Prospects

Both the United States and Chinese governments should recognize an interest in sustaining nuclear stability. Both sides should also be wary about the potential for unexpected technical breakthroughs that could suddenly improve the effectiveness and reduce the cost of national missile defenses. Such a development could destabilize the strategic nuclear relationship.

There should thus be an incentive for the United States and China to discuss ways to maintain nuclear stability. Such discussions should include a review of intentions and developments regarding national missile defense. However, as with much of the rest of its military modernization and strategic intentions, Chinese officials have displayed little interest in substantive discussion of these issues.

China's buildup of its missiles forces, combined with the increasing vulnerability of the U.S. military's short-range, forward-based forces, creates an increasingly unstable military situation in East Asia. U.S. military planners believe that China's conventional missile doctrine is based on deception, surprise, and mass strikes on an adversary's perceived centers of gravity, such as command systems and bases.[24] With ballistic missile flight times so short, U.S. commanders in the theater may increasingly believe themselves to be in a "use it, or lose it" situation. This only increases the incentives for both sides to strike first during a potential crisis, an obviously worrying trend.[25]

There should thus be incentives for both sides to discuss ways of reducing risk, increasing stability, forming ways to avoid crises, and defusing them should they occur. On-and-off attempts at military-to-military contacts between the United States and China have yet to produce much progress toward reassurance and confidence-building. More broadly, Chinese officials remain resistant to exchanging data on China's nuclear forces, its missile inventories, or their views on China's security requirements over the medium to long term. There would seem to be little prospect for successful arms control negotiations until Chinese officials are ready for substantive discussions on military-technical issues.

In spite of these barriers, U.S. officials should continue to engage their Chinese counterparts on the full range of strategic issues in order to keep open the opportunity for progress. Meanwhile the U.S. government should accelerate the modernization of its military forces and operational concepts, and expand diplomacy with its partners in the region. Continuing engagement with China, accelerated military modernization, and stepped up diplomatic action with regional partners are complementary activities and will boost deterrence and stability.

Conclusion

China is exploiting the missile and sensor technical revolution to execute a cost-imposing strategy on the United States and its partners in the Asia-Pacific region. The United States and its partners need to fashion an effective and affordable response if they are to maintain stability in this vital region. A competitive strategy would expand U.S. engagement and security assistance in the region, rebalance U.S. striking power toward long-range airpower and submarines, and assemble a broad portfolio of military and non-military tools to increase the leverage of the United States and its partners.

A well-designed and competently executed U.S. strategy for the Asia-Pacific region will create affordable and sustainable leverage with an aim to influence China's behavior in favorable ways during an open-ended peacetime security competition. The result from that will be increased deterrence, enhanced regional stability, and the conditions for continued prosperity that will benefit all, including China. Achieving this outcome will require imaginative and sustained commitment by future generations of America's policymakers. That is the challenge these leaders face but one that promises great benefits for the United States and the region.

Notes

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