



Center for Strategic and Budgetary Assessments

STUDIES

Sustaining America's Strategic Advantage in Long-Range Strike

September 14, 2010 | **Mark Gunzinger**

Resources: Forces & Capabilities

The ability to conduct long-range strike operations has long provided the United States with a decisive military advantage over its enemies. Today, that advantage is dissipating. Despite the crucial role long-range strike capabilities have played in our nation's wars over the last seventy years, it is unclear whether the United States will make the investments needed to sustain this advantage in the future. Chronic underinvestment in the US military's long-range strike "family of systems" — land-based bombers, carrier-based strike aircraft, cruise missiles and supporting airborne electronic attack platforms — combined with the creeping obsolescence of current systems could lead to a future force that is relegated to fighting on the periphery and cannot effectively penetrate anti-access/area-denial (A2/AD) battle networks. Considering the time that is required to develop and field new weapon systems, if the next defense budget continues to defer needed long-range strike investments, a gap is likely to emerge in which the nation could lose its conventional long-range strike advantage for a decade or more. Consequently, the United States has a critical choice to make: either accept this loss on the assumption that long-range strike is less relevant in the future, or implement a plan and provide sufficient resources to maintain its long-range strike advantage. This paper suggests options for the latter choice as a point of departure for developing and sequencing new capabilities that will sustain America's long-range strike strategic advantage for the next thirty years

A Framework For Thinking About Long-Range Strike

Defining a framework of assumptions for thinking rigorously about the opportunities and risks of various capability options is a first critical step toward assessing the US military's long-range strike requirements. Using the wrong assumptions about the character of plausible conflicts, airbase availability, emerging threats and potential target sets could lead to flawed analysis and, ultimately, plans and investments that would leave the United States ill-prepared for the future.

The planning framework developed by the Defense Department in the immediate aftermath of the Cold War was based on assumptions that its power-projection capabilities would be able to deploy and operate from forward bases relatively unhindered by enemy threats. This "sanctuary" status extended to in-theater operations of tactical fighter aircraft, aircraft carriers, aerial refueling tankers, C4ISR networks and supporting logistics systems. The First Gulf War reinforced these assumptions and contributed to the Defense Department's development of a new force-planning construct based on sizing and structuring US military forces primarily for conducting two nearly simultaneous "rapid halt" regional conflicts, putatively in Iraq/Iran and Korea. Pentagon planners viewed long-range strike as a "first day" capability that would be needed to help rapidly halt invading enemy forces, after which short-range tactical aircraft flying from nearby bases in relatively permissive operating environments could carry out the majority of strike missions. Collectively, these assumptions led to twenty years of defense budgets that have favored investments in both land- and carrier-based short-range fighters at the expense of major new long-range strike programs.

On reevaluation, the Defense Department's 1990s planning assumptions provide an unsuitable framework for assessing strike capabilities that may be needed for future contingency operations. Today, a number of foreign militaries — including, but not limited to, those of China and Iran — are investing in A2/AD battle networks that can pose a direct and formidable challenge to the traditional forms of US conventional power-projection in all operating domains. Conflicts involving such A2/AD networks would likely require US short-range land- and sea-based strike aircraft to operate from much longer ranges, nullifying their ability to attack land targets at depth and greatly reducing sortie generation rates. Moreover, enemy integrated air defense systems may render areas under their coverage all but impassable to non-stealthy aircraft and cruise missiles. Potential adversaries are also adopting defensive measures to defeat attacks from US precision-guided munitions, such as concealing, camouflaging and mobilizing military systems, and hardening or deeply burying key facilities.

This monograph offers an alternative framework for evaluating options for the next long-range strike family of systems. It is based on the fundamental premise that future operating environments will be increasingly non-permissive in nature, regardless of the level of conflict. This new framework should assume US land- and sea-based forces will have to operate from longer ranges, will need to penetrate and persist in high-threat environments, may not be supported by on-call C4ISR, and will need the capacity to strike thousands of targets that are increasingly mobile, relocatable, hardened, deeply buried, and located deep in an enemy's territory.

Assessing Attributes For A Future Long-Range Strike Family of Systems

The new framework of assumptions proposed by this paper suggests the Defense Department's next long-range strike family of systems will require certain attributes. The vast distances involved in operating in some potential theaters of operation, the growing missile threat to US forward bases, and an increasingly challenging target set will require land-based strike platforms with the capability of flying 4,000–5,000 nautical miles (nm) between aerial refuelings and persisting over target areas located in contested environments characterized by dense, modern air defense networks. Anti-access/area-denial networks like the one being developed by the PRC and other states with the resources to buy advanced military systems will likely pose unacceptably high risks to US Navy surface forces and compel them to operate initially as far as 1,000 nm or more from an adversary's coastline. This suggests the need for a carrier-based aircraft with a range that is at least two to three times that of the F/A-18E/F or F-35C if carriers are to contribute meaningful strike capacity at the outset of future operations. Moreover, land- and sea-based aircraft penetrating dense, sophisticated integrated air defenses will require all-aspect, broadband low-observable characteristics. Finally, hedging against the loss of vulnerable C4ISR battle networks will require strike platforms to be capable of operating effectively independent of these networks. Simply put, the combination of range, persistence, stealth and independence of action will likely be the sine qua non for effective strike operations over the coming decades.

The Next Long-Range Strike Family of Systems

Using this new framework to assess the Defense Department's current long-range strike family of systems reveals the following capability shortfalls:

- Land-based bombers, with the exception of the small B-2 force, lack the ability to penetrate and persist in high-threat air defense environments;
- US carrier air wings lack the range, persistence and survivability to support long-range strike operations in A2/AD environments, especially if enemy threats force carriers to operate beyond

effective ranges for strike operations;

- Current and planned land- and sea-based strike systems, including both manned and unmanned, lack the capability and capacity to strike large target sets that are increasingly mobile, relocatable, hardened, deeply buried, and located deep in contested areas;
- Standoff weapons lack the ability to strike targets which are increasingly mobile, relocatable, time-critical, hardened or deeply buried; and
- Airborne electronic attack platforms lack the range and survivability needed to support long-range strike operations in contested airspace.

The Air Force's current bomber force lacks the capabilities and capacity needed to penetrate contested airspace to strike thousands of targets in future air campaigns. While a new penetrating bomber will require all-aspect, broadband stealth and other self-protection features, its weight and payload capacity cannot result in an average unit cost that is so great that it would effectively limit the Air Force to procuring a small "silver bullet" force on the order of today's twenty- aircraft B-2 fleet. Options that could reduce a new bomber program's impact on the defense budget include avoiding requirements creep; fully resourcing program development and competitive prototyping; taking advantage of technologies and systems developed for other programs; and delivering capabilities in incremental block upgrades. Developing a new bomber that could be optionally manned depending on mission requirements would increase combatant commanders' options in future air campaigns, especially in degraded satellite communications environments. An optionally manned bomber, if appropriately designed, could also preserve the option to carry nuclear weapons with relatively minimal modifications, thereby preserving future flexibility.

Reversing the erosion of the Navy's strike advantage will require investments in a new generation of capabilities to increase the range, persistence and survivability of carrier aircraft. The Navy's Unmanned Combat Air System Demonstration program represents a first possible step toward fielding an unmanned platform with all-aspect, broadband low observability, a combat radius of 1,500 nautical miles, and mission durations of up to fifty hours with aerial refueling. Without such investments, US aircraft carriers will be locked into a concept of operations that is dependent on relatively benign, permissive operating conditions. With new investments, the Navy could make a bold shift toward enabling effective strike operations against enemies with robust A2/AD battle networks, thereby ensuring that its future forward presence and immediately employable strike forces will remain effective.

Given the expected service life of the Air Force's current bombers and their continued ability to perform standoff attack missions, it may be possible to defer development of a new standoff platform until production of a penetrating bomber is nearly completed. In lieu of this option, investing in a joint Air Force-Navy cruise missile that could be air- and sea-launched from a wide variety of platforms would increase the US military's standoff weapons magazine while taking advantage of economies of scale via a larger procurement and steady sustained production over time to reduce total cost per missile. The Defense Department should also consider buying a small magazine — one hundred or fewer — of conventional prompt global strike munitions for defeating a small number of critical targets that might have to be engaged within an hour or less.

To support penetrating strike systems, including standoff attack missiles, the Defense Department should develop a long-range penetrating airborne electronic attack aircraft. As DoD assesses alternatives for this new aircraft, it must ensure they have the same attributes that are needed by other long-range strike systems, e.g., all-aspect, broad-band low observability and sufficient range and persistence to support operations deep into an enemy's landmass. Leveraging other development programs and off-the-shelf technologies to develop this platform may help reduce its cost and avoid the long lead times typically associated with developing new aircraft designs.

Initiatives and Implementation

This report presents four options to illustrate how the Defense Department might prioritize investments over time to meet DoD's known and emerging long-range strike capability shortfalls. All options recommend developing an unmanned multi-mission aircraft to extend the range of the Navy's carrier air wings. They also recommend procuring a small magazine of conventional prompt global strike weapons. Option 1 defers a new bomber decision until the mid-2020s to allow the maturation or invention of new technologies for an even more capable penetrating aircraft. Option 2 calls for developing a new standoff-only bomber without the stealth and supporting systems needed for it to survive in contested airspace. Option 3 accords priority to developing a new penetrating bomber first, while taking advantage of the lengthy remaining service lives of existing bombers for standoff attack operations. Option 4 suggests procuring one penetrating aircraft to replace the Air Force's entire bomber force.

This report argues that Option 3 appears to offer the most balanced approach for sustaining the nation's long-range strike strategic advantage over the next thirty years. Accordingly, it recommends that the Department of Defense:

- Initiate a new Air Force program to procure up to one hundred new optionally-manned penetrating bombers with all-aspect, broadband stealth, a payload capacity of approximately 20,000 pounds and a range of 4,000 to 5,000 nautical miles. The bomber should have on-board surveillance and self-defense capabilities to permit independent operations against fixed and mobile targets in degraded C4ISR environments;
- Defer procuring a new standoff strike platform until production of a penetrating bomber is nearly completed;
- Develop an air-refuelable naval UCAS with at least a 1,500 nautical mile combat radius and the all-aspect, broadband low-observable characteristics required to survive in the face of advanced air defense networks;
- Invest in a joint cruise missile that could be launched from long-range and short-range strike platforms and be capable of carrying either conventional or nuclear warheads;

- >Develop a small inventory (a hundred or fewer) of conventional prompt global strike weapons to support limited strikes against very-high-value targets requiring a total response time measured in hours;
- Field an AEA platform to support long-range strike operations, leveraging other DoD programs and off-the-shelf technologies to reduce program development time and cost; and
- Design the new penetrating bomber to have the potential to carry nuclear weapons to sustain the air leg of the nuclear triad and hedge against uncertainty.

Of course, developing the next long-range strike family of systems is more than a question of incorporating new technologies and procuring new platforms. It will also require the Defense Department to deliberately and effectively manage its program investments to ensure its industry partners sustain a highly skilled workforce upon which, ultimately, the US military's future capabilities depend. Accordingly, the Defense Department and Congress should work together to determine resources required to do so, and to support programs that will enable the US military to sustain its long-range strike advantage over the nation's future adversaries.