http://nationalinterest.org/print/blog/the-buzz/5-ways-russia-china-could-sink-americas-aircraft-carriers-19811?page=2

5 Ways Russia and China Could Sink America's Aircraft Carriers

Robert Farley
3/18/2017

And it’s not just those pesky "carrier-killer" missiles.

Aircraft carriers have been the primary capital ship of naval combat since the 1940s, and remain the currency of modern naval power. But for nearly as long as carriers have existed, navies have developed plans to defeat them. The details of these plans have changed over time, but the principles remain the same. And some have argued that the balance of military technology is shifting irrevocably away from the carrier [3], driven primarily by Chinese and Russian innovation.

So let’s say you want to kill an aircraft carrier. How would you go about it?

Torpedo

On September 17, 1939, the German submarine *U-29* torpedoed and sank HMS *Courageous*. *Courageous* was the first aircraft carrier lost to submarine attack, but would not be the last. Over the course of World War II, the United States, the UK and Japan lost numerous carriers to submarines, culminating in the destruction of the gigantic HIJMS *Shinano* in 1944.

Submarine-fired torpedoes remain a critical threat to modern carriers. Russian and Chinese submarines regularly practice attacks on U.S. carrier groups, as do those of allied navies. Modern torpedoes cause damage by exploding beneath a ship, an impact that can break the ship’s back with dramatic effects. Fortunately, no such torpedo has ever hit a ship the size of a U.S. supercarrier, although the U.S. Navy did conduct a variety of tests on the hulked USS *America* in 2005. Those tests, which may have involved underwater charges (of the sort that damaged USS *Cole*) did not result in America’s sinking; she was scuttled in the wake of the process. The short answer is that no one knows how many modern torpedoes a U.S. carrier could take before sinking, but we can estimate with little doubt that even a single torpedo would cause extensive damage, and severely impede operations.

Cruise Missile

In 1943, the Germans used a precision-guided bomb to destroy the Italian battleship *Roma*. Such bombs soon gave way to self-propelled cruise missiles, which could launch from aircraft, ships, submarines, or surface installations. During the Cold War, the Soviets developed a dizzying array of platforms for launching cruise missiles at carrier strike groups, ranging from small patrol boats to massive formations of strategic bombers.

Today, China, Russia and several other countries field a wide variety of cruise missiles capable of striking U.S. carrier battle groups. These missiles vary widely in range, speed and means of approach, but the most advanced can fly at high (often supersonic) speeds while offering a very low radar profile. As with torpedoes, the available evidence on the effectiveness of cruise missiles against a modern supercarrier is virtually nil. Much smaller ships have survived such hits, as have civilian tankers similar in size to CVN-78. Nevertheless, even a nonfatal cruise missile hit would probably result in severe damage to the flight deck, impeding or completely stopping flight operations.

Ballistic Missile

The most important development in carrier-killing technology over the last decade has been the antiship ballistic missile (ASBM). The Chinese Df-21 has the potential to strike American carriers from heretofore unrealizable ranges, and threatens to penetrate existing defense systems. The missile can maneuver in its terminal phase, targeting a moving carrier on a high-velocity final approach. The kinetic energy alone of the weapon could inflict devastating damage on a flight deck, putting a carrier out of action if not sinking it entirely.

The development of the Df-21 has forced the U.S. Navy to significantly step up its ballistic-missile defense efforts. However, the ability of a U.S. task force to manage a large barrage of ASBMs is in great question; more than anything else, the development of the ASBM has forced the U.S. Navy to reconsider the role of the carrier in high-intensity warfare.

Cost Overrun

The new Ford class (CVN-78) carriers cost somewhere around $13 billion [4], a price that does not include the air wing. With a contingent of F-35Cs, F/A-18E/Fs and various support aircraft, the price of an individual carrier is simply staggering, and the numbers go higher when accounting for the escort group that a carrier requires. Although the per-unit cost will go down as more ships are acquired, the Fords take so long to build that each new ship will need to incorporate a host of new technologies, just as with the Nimitz class.

The tolerance for large defense expenditure in the United States has varied considerably over the past three decades. The Trump administration has combined a fondness for increased spending with a grand strategy of retrenchment, an odd pairing. If retrenchment takes hold, then generating enthusiasm for defense spending may become increasingly difficult. And at some point, the military utility of an aircraft carrier may become literally irrelevant, relative to the cost of building, maintaining and effectively deploying the ship and its air wing.

Excess of Caution

Maybe China and Russia don’t need to kill a carrier to drive the species to extinction. All of the factors above—the weapon systems that can kill carriers, and the costs associated with the ships themselves—come together to create caution about how to use the ships. In the event of a conflict, U.S. Navy admirals and the U.S. president may grow so concerned about the vulnerability of carriers that they don’t use them assertively and effectively. The extraordinary value of the carriers may become their greatest weakness; too valuable to lose, the carriers could remain effectively on the sidelines in case of high-intensity, peer-competitor conflict.

And if aircraft carriers can’t contribute in the most critical conflicts that face the United States, it will become impossible to justify to the resources necessary to their construction and protection. That, more than anything else, will lead to obsolescence, and the end of the aircraft carrier as the currency of national power.

Do these factors mean that the aircraft carrier has become obsolete as a platform? No. China and Russia have worked relentlessly on ways to kill aircraft carriers because they perceive those ships as critical security threats. Moreover, China and Russia have developed the array of systems they now deploy because aircraft carriers have good answers to many of these weapons. Finally, China has embarked on its own carrier program; the PLAN will soon operate the second-largest carrier force in the world.

Nevertheless, aircraft carriers face real dangers from advanced military technology. The greatest threat, though, probably comes from the procurement process; unless the United States can restrain cost growth in the carrier and its air wing, the ships will struggle to retain their place in the overall architecture of U.S. defense policy.